

Programmable Controller

MELSEC iQ-R
series

SECS/GEM Communication Software Reference Manual (For GEM300 Standards)

SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully, and pay full attention to safety to handle the product correctly.

The precautions in this manual concern this product only. Regarding the safety precautions as a programmable controller system, refer to the user manual of the module to be used.

CONDITIONS OF USE FOR THE PRODUCT

(1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;

- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
- ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

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Prohibited Applications include, but not limited to, the use of the PRODUCT in;

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- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

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(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing SECS/GEM communication software.

This manual describes the necessary system configuration, specifications, wiring, and troubleshooting to use SECS/GEM communication software.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of SECS/GEM communication software to handle the product correctly.

Note that the menu names and operating procedures may differ depending on an operating system in use and its version.

When reading this manual, replace the names and procedures with the applicable ones as necessary.

Please make sure that the end users read this manual.

About this manual

This manual describes SECS/GEM communication software that has been installed on a C Controller module or C intelligent function module. Before using SECS/GEM communication software, carefully read the relevant manuals of the C Controller module or C intelligent function module to thoroughly understand the functions and performance of the module.

For details of the SEMI[®] standards, please check the SEMI standards.

Relevant product

RD55UP12-V-BZ15

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RELEVANT MANUALS

The following manuals are relevant to this product.

Manual name [manual number]	Description
SECS/GEM Communication Software Reference Manual (For GEM300 Standards) [SH-082616ENG] (this manual)	GEM300 standards supported by SECS/GEM communication software
C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual [SH-082483ENG]	Specifications, procedure before operation, wiring, functions, and troubleshooting of a C Controller module pre-installed model

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Buffer memory	Memory in an intelligent function module to store data such as setting values and monitor values. For CPU modules, it refers to memory to store data such as setting values and monitor values of the Ethernet function, or data used for data communication of the multiple CPU system function.
Global label	A label that is valid for all the program data when multiple program data are created in the project. There are two types of global label: a module specific label (module label), which is generated automatically by GX Works3, and an optional label, which can be created for any specified device.

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations.

Generic term/abbreviation	Description
SECS/GEM communication software pre-installed model module	Q12DCCPU-V-BZ11, Q12DCCPU-V-BZ13, Q12DCCPU-V-BZ15, RD55UP06-V-BZ11, RD55UP06-V-BZ13, RD55UP06-V-BZ15, RD55UP12-V-BZ11, RD55UP12-V-BZ13, RD55UP12-V-BZ15
SECS/GEM communication software	A generic product name for the following software pre-installed on SECS/GEM communication software pre-installed model modules: SW1PVC-Q12V-EBZ11, SW1PVC-Q12V-EBZ13, SW1PVC-Q12V-EBZ15, SW1PVC-RD55-EBZ11, SW1PVC-RD55-EBZ13, SW1PVC-RD55-EBZ15
Object	A generic term for GEM300-related objects managed by SECS/GEM communication software pre-installed models
Setting tool	A SECS/GEM communication software setting tool pre-installed on a personal computer

MEMO

1 OVERVIEW

SECS/GEM communication software is software that allows a C Controller module or C intelligent function module to communicate with manufacturing equipment using SECS without a gateway personal computer used for communication between the equipment and MES.

For details on SECS/GEM communication software, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

This manual explains GEM300 standards that SECS/GEM communication software is compliant with.

Compliance with GEM300 standards

SECS/GEM communication software (for GEM300 standards) allows RD55UP12-V-BZ15, which is compliant with SEMI E30 (GEM), to communicate using SECS for semiconductor manufacturing equipment handling 300 mm wafers.

■GEM300 standard support functions

SECS communication-related general functions, which are compliant with GEM300 standards, can be performed simply by SECS/GEM communication software settings and commands from a control CPU.

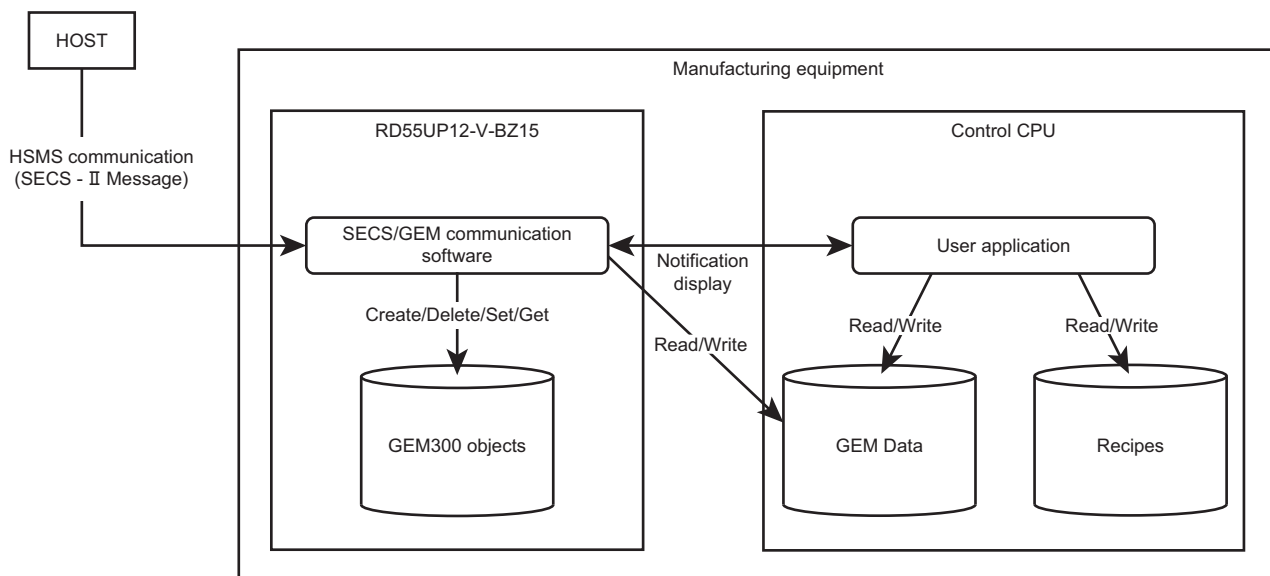
- Unnecessary to assign devices related for GEM300.*¹
- Available to exchange data with a control CPU by offset specification.*²

*¹ Assignment settings of devices related for SEMI E30 (GEM) are required.

*² Data can be read and written for each structure label using an engineering tool. However, offset needs to be defined according to the label.

■Management of GEM300 objects

GEM300 objects are managed by RD55UP12-V-BZ15. Therefore, GEM300 objects do not need to be managed by a user application.



Recipes and data for SEMI E30 (GEM) are managed by devices of a control CPU.

MEMO

2 SPECIFICATIONS

This chapter explains specifications for GEM300 standard support functions.

2

Point

This manual does not explain the following specifications:

- SEMI standards compliance
- GEM300 standards compliance
- GEM300-related specifications

For details, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

2.1 Control CPU Interfaces

GEM300 standard support functions use the buffer memory of RD55UP12-V and exchange data with a control CPU and external devices in an event message format.

For details on the control CPU interfaces, refer to the following:

 Page 151 Control CPU Interface Formats

The fixed buffer memory areas for 'CITL to CPU (when this product issues a control CPU interface)' and 'CPU to CITL (when a control CPU issues a control CPU interface)' are used to exchange data. (Each area consists of the following sections: status flag, header, and data.)

For details on the buffer memory, refer to the following:

 Page 362 Buffer Memory

Exchanged data

- Exchanged data is identified by a combination of an information type (decimal) and detail type (decimal).
( Page 11 Information type and detail type)

- An acknowledge is required for a request. In addition, the number of a detail type is the same for them.
- A response is required for a notification from a control CPU.
- A response is not required for a notification from this product.

This product notifies a control CPU of the processing result of a service message by using GEM300 standard support functions.

■ Information type and detail type

- The information type consists of 'data sending direction (1 digit) + SEMI standard number (4 digits).'

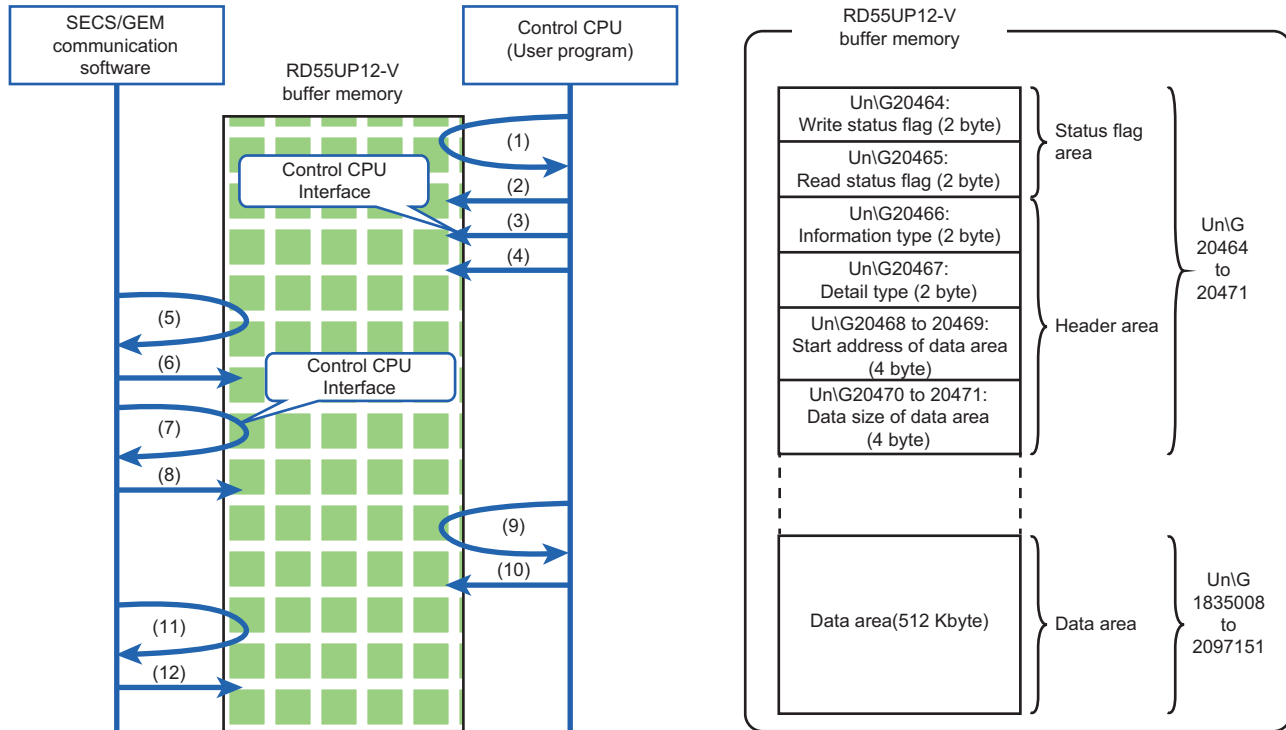
(Data sending direction: '0: CPU to CITL,' '1: CITL to CPU')

For example, the information types related to E87-CMS are as follows:

- 00087: Indicates information related to E87-CMS transmitted from CPU to CITL.
 - 10087: Indicates information related to E87-CMS transmitted from CITL to CPU.
- The detail type consists of 'category (3 digits) + sequential number (2 digits).'

2.2 CPU to CITL (when a Control CPU Issues a Control CPU Interface)

This section explains the buffer memory configuration for data exchange and the operation flow when a control CPU interface is issued.



No.	SECS/GEM communication software	Control CPU (controlled by user program)
(1)	—	A control CPU checks that 'Queue full of control CPU interfaces for CPU to CITL' (b7) of 'CA-SECS status' (Un\G16384) and 'In-use flag' (b0) of 'Read status flag' (Un\G20465) are turned OFF.
(2)	—	The CPU turns ON 'In-use flag' (b0) of 'Write status flag' (Un\G20464). (OFF→ON control)
(3)	—	<p>The CPU writes data of the header area in the control CPU interface according to ① to ③, and also writes data of the data area according to ④.</p> <ul style="list-style-type: none"> ① 'Information type' (Un\G20466): Information type ② 'Detail type' (Un\G20467): Detail type ③ 'Data size of data area' (Un\G20470 to 20471): Data size ④ Data for the data size starting from 'Data writing area' (Un\G1835008) <p>For details on exchanged data identifiers of 'CPU to CITL,' refer to the following:</p> <p>Page 161 00000: CPU to CITL, Page 166 00039: CPU to CITL, Page 183 00087: CPU to CITL, Page 330 00090: CPU to CITL</p>
(4)	—	The CPU turns ON 'Write completion flag' (b1) of 'Write status flag' (Un\G20464). (OFF→ON control)
(5)	SECS/GEM communication software detects that 'Write completion flag' (b1) of 'Write status flag' (Un\G20464) is turned ON.	—
(6)	The software turns ON 'In-use flag' (b0) of 'Read status flag' (Un\G20465). (OFF→ON control)	—
(7)	<p>The software reads data of the header area in the control CPU interface according to ① to ③, and also reads data of the data area according to ④.</p> <ul style="list-style-type: none"> ① 'Information type' (Un\G20466): Information type ② 'Detail type' (Un\G20467): Detail type ③ 'Data size of data area' (Un\G20470 to 20471): Data size ④ Data for the data size starting from 'Data writing area' (Un\G1835008) 	—

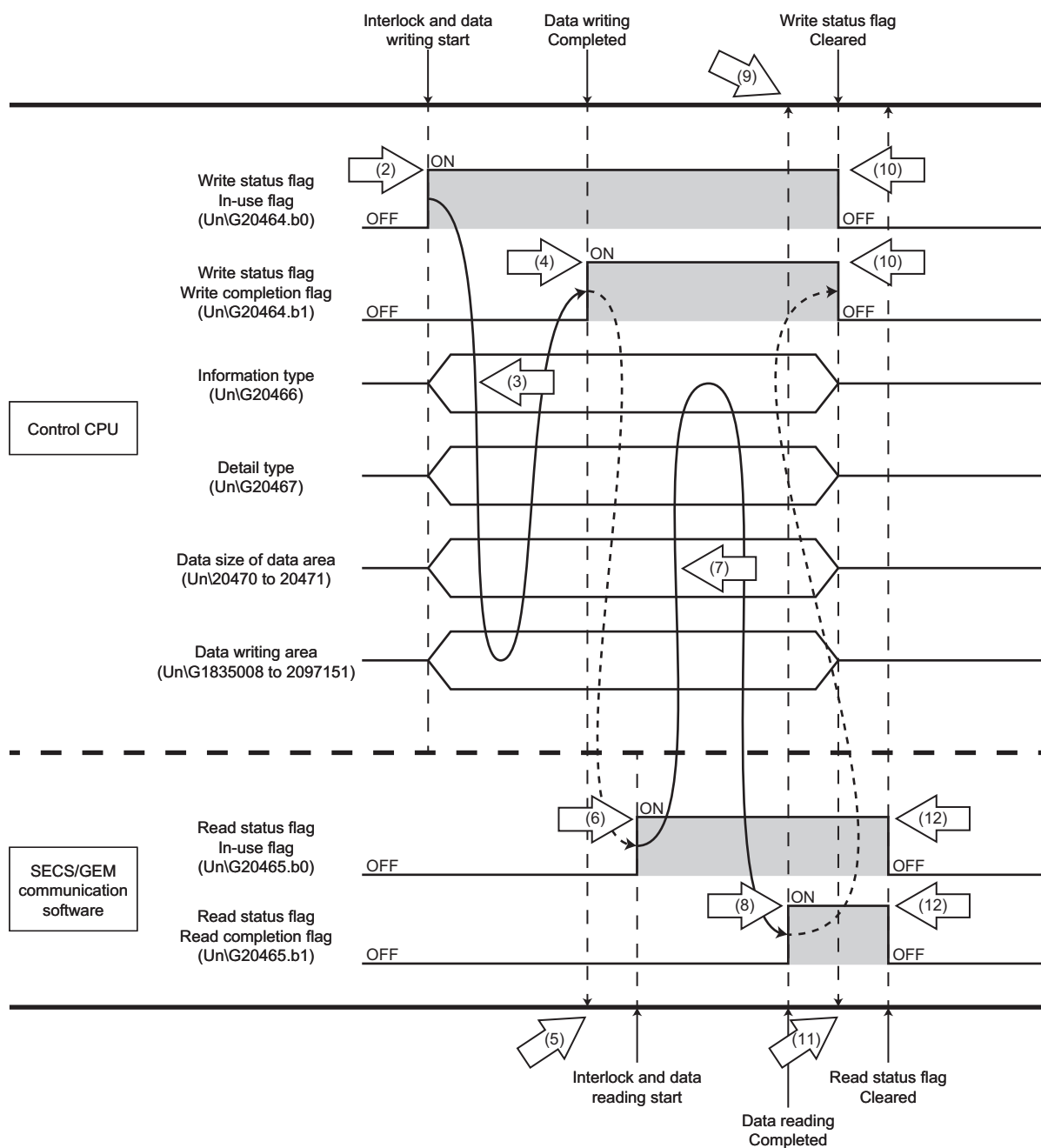
No.	SECS/GEM communication software	Control CPU (controlled by user program)
(8)	The software turns ON 'Read completion flag' (b1) of 'Read status flag' (Un\G20465). (OFF→ON control)	—
(9)	—	The CPU detects that 'Read completion flag' (b1) of 'Read status flag' (Un\G20465) is turned ON.
(10)	—	The CPU clears (3→0 control) 'Write status flag' (Un\G20464).
(11)	The software detects that 'Write status flag' (Un\G20464) is cleared.	—
(12)	The software clears (3→0 control) 'Read status flag' (Un\G20465).	—

Point

- If an error occurs in event data stored by a control CPU, SECS/GEM communication software will store the information type, detail type, and data size to the following buffer memory range: 'Latest CPU to CITL I/F error-detected information (Un\G20432)' to 'Data size at latest error detection' (Un\G20435 to 20436).
- SECS/GEM communication software has an internal memory area called the control CPU interface queue for CPU to CITL to temporarily store data in consideration of delays in processing of a control CPU interface under high load. If the next control CPU interface from a control CPU is stored before the processing of the previous control CPU interface is completed, the data is temporarily stored in the control CPU interface queue for CPU to CITL after performing the processing from No.(5) to (8).
- Up to five control CPU interfaces can be stored in the control CPU interface queue for CPU to CITL. If the next control CPU interface from a control CPU is stored while five control CPU interfaces are stored ('Queue full of control CPU interfaces for CPU to CITL' (b7) of 'CA-SECS status' (Un\G16384) is ON), data exchange of SECS/GEM communication software is stopped and the error description is output to a control CPU interface log.
- When the processing of the control CPU interfaces by SECS/GEM communication software is completed and the control CPU interface queue for CPU to CITL becomes available, the data exchange is restarted. If 'Queue full of control CPU interfaces for CPU to CITL' (b7) of 'CA-SECS status' (Un\G16384) turns ON, stop issuing control CPU interfaces from a control CPU to SECS/GEM communication software, then perform the processing again after a while.

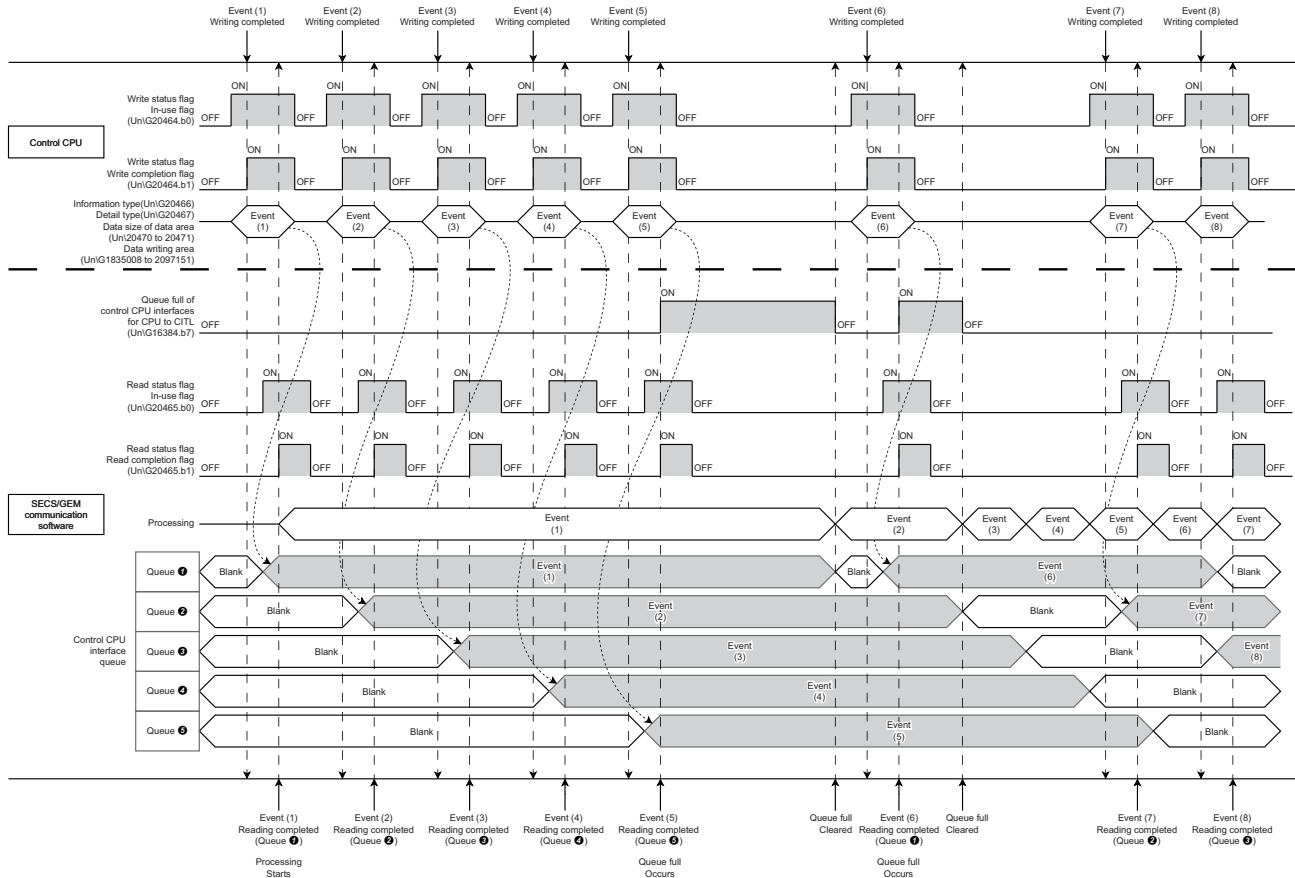
Timing chart

The following shows the operation timing chart when a control CPU interface is issued.



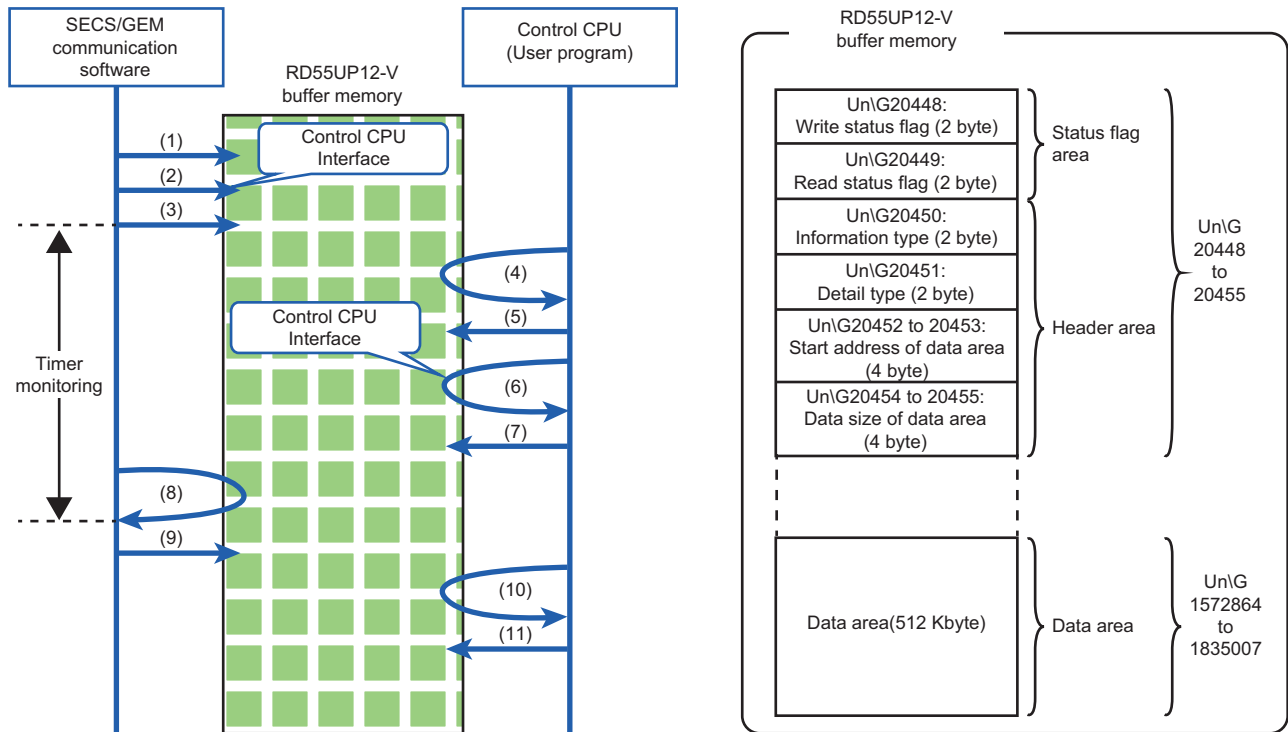
Timing example

The following shows the timing example when the queue full state of a control CPU interface occurs.



2.3 CITL to CPU (when SECS/GEM communication software Issues a Control CPU Interface)

This section explains the buffer memory configuration for data exchange and the operation flow when a control CPU interface is issued.



No.	SECS/GEM communication software	Control CPU (controlled by user program)
(1)	SECS/GEM communication software turns ON 'In-use flag' (b0) of 'Write status flag' (Un\G20448) while 'Read status flag' (Un\G20449) is OFF. (OFF→ON control)* ¹	—
(2)	The software writes data of the header area in the control CPU interface according to ① to ③, and also writes data of the data area according to ④. <ul style="list-style-type: none"> ① 'Information type' (Un\G20450): Information type ② 'Detail type' (Un\G20451): Detail type ③ 'Data size of data area' (Un\G20454 to 20455): Data size ④ Data for the data size starting from 'Data reading area' (Un\G1572864) 	—
(3)	The software turns ON 'Write completion flag' (b1) of 'Write status flag' (Un\G20448). (OFF→ON control)* ¹	—
(4)	—	A control CPU detects that 'Write completion flag' (b1) of 'Write status flag' (Un\G20448) is turned ON.
(5)	—	The CPU turns ON 'In-use flag' (b0) of 'Read status flag' (Un\G20449). (OFF→ON control)* ²
(6)	—	The CPU reads data of the header area in the control CPU interface according to ① to ③, and also reads data of the data area according to ④. <ul style="list-style-type: none"> ① 'Information type' (Un\G20450): Information type ② 'Detail type' (Un\G20451): Detail type ③ 'Data size of data area' (Un\G20454 to 20455): Data size ④ Data for the data size starting from 'Data reading area' (Un\G1572864) For details on exchanged data identifiers of 'CITL to CPU,' refer to the following: ☞ Page 163 10000: CITL to CPU, Page 175 10039: CITL to CPU, Page 229 10087: CITL to CPU, Page 344 10090: CITL to CPU
(7)	—	The CPU turns ON 'Read completion flag' (b1) of 'Read status flag' (Un\G20449) after acquiring event data. (OFF→ON control)* ²

No.	SECS/GEM communication software	Control CPU (controlled by user program)
(8)	The software detects that 'Read completion flag' (b1) of 'Read status flag' (Un\G20449) is turned ON.	—
(9)	The software clears (3→0 control) 'Write status flag' (Un\G20448). ^{*1}	—
(10)	—	The CPU detects that 'Write status flag' (Un\G20448) is cleared.
(11)	—	The CPU clears (3→0 control) 'Read status flag' (Un\G20449). ^{*2}

*1 The flag is turned OFF after the time set for "CPU Interface Timer" elapses, regardless of the operation of the control CPU. (Page 33 CPU interface)

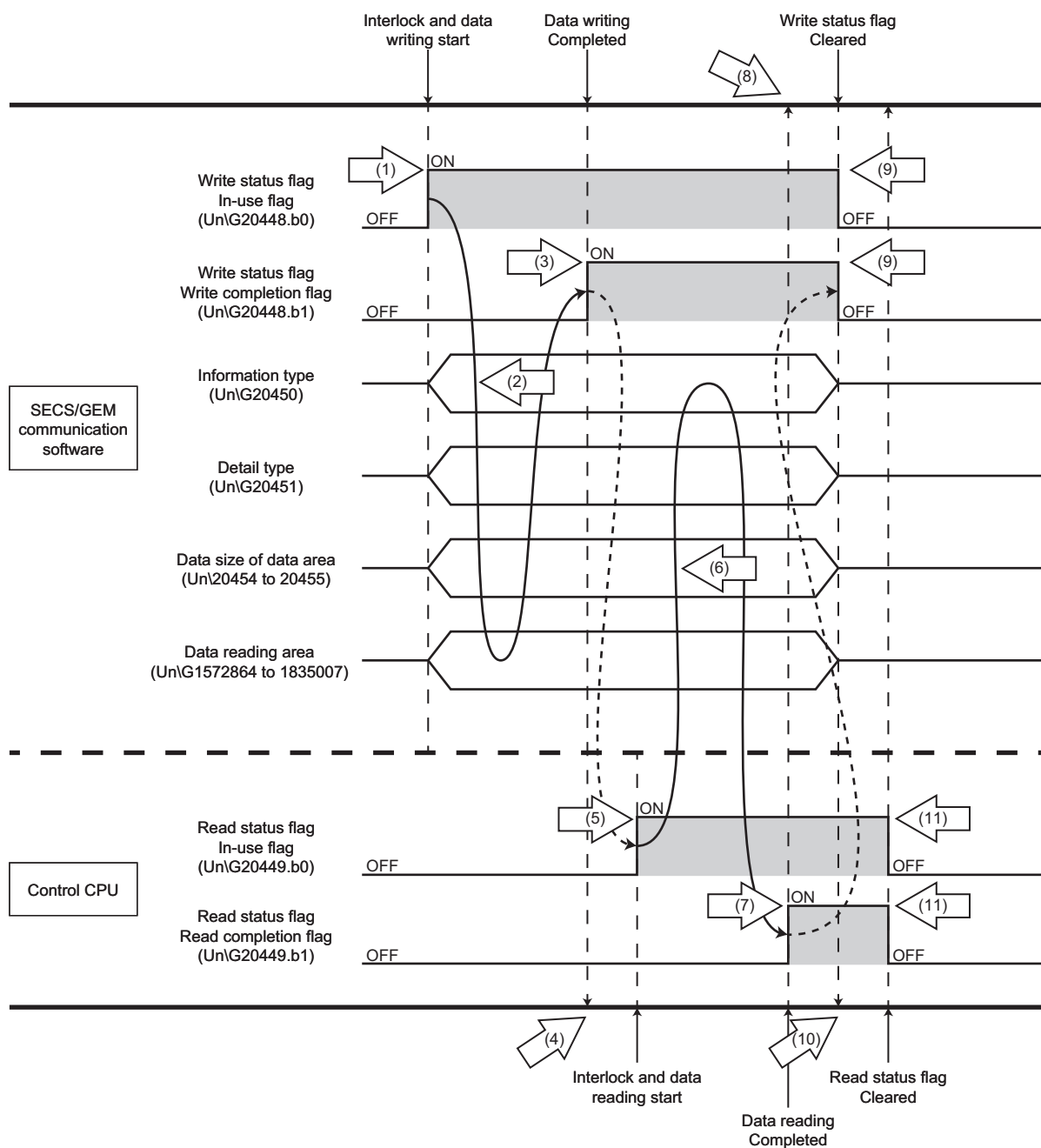
*2 The control is not required if 'Write status flag' (Un\G20448) is cleared (3→0 control) due to timeout.

Point

- When SECS/GEM communication software issues a new control CPU interface (such as when a service message of GEM300 standard support functions is issued from the host) during the operations from No.(1) to (11) before the control CPU completes the operations up to No.(11), the interface is stored in the control CPU interface queue for CITL to CPU (a memory area to temporarily store data).
- Up to five control CPU interfaces can be stored in the control CPU interface queue for CITL to CPU. When five control CPU interfaces are stored and the queue becomes unavailable, 'Queue full of control CPU interfaces for CITL to CPU' (b8) of 'CA-SECS status' (Un\G16384) turns ON.
- If SECS/GEM communication software issues the next control CPU interface while five control CPU interfaces are stored in the control CPU interface queue for CITL to CPU, the error description is output to a control CPU interface log. In addition, the issued interface is discarded.
When the queue full state of the control CPU interface queue for CITL to CPU is cleared, 'Queue full of control CPU interfaces for CITL to CPU' (b8) turns OFF.
- When the operations up to No.(11) (buffer memory data reading processing) are completed in the control CPU while the control CPU interfaces are stored in the control CPU interface queue for CITL to CPU, the operations from No.(1) to (3) are immediately performed. (Among the stored control CPU interfaces, the oldest one is written and the data in the buffer memory is overwritten.)

Timing chart

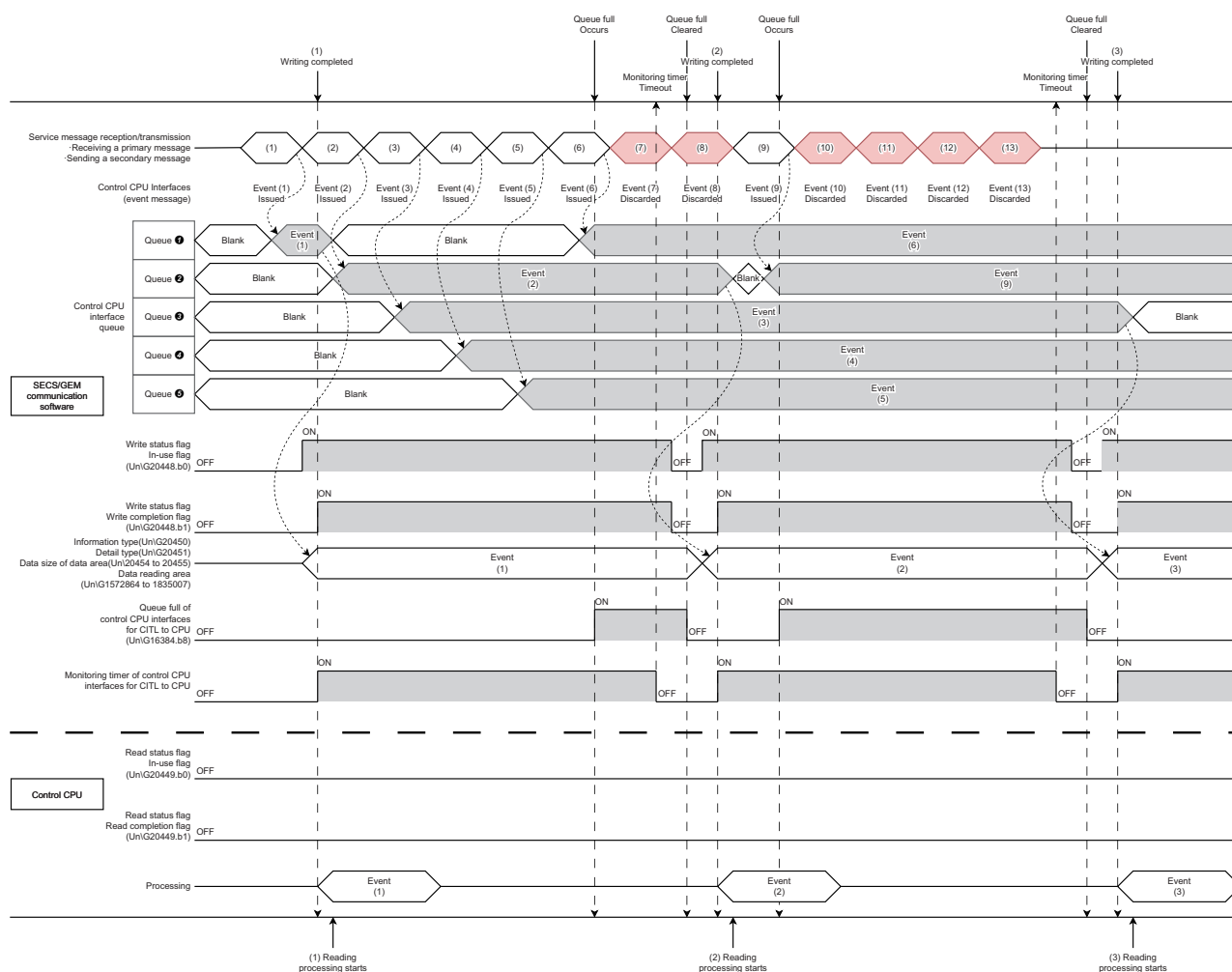
The following shows the operation timing chart when a control CPU interface is issued.



Timing example

The following shows the timing example when control CPU interfaces are discarded due to the queue full states.

The following shows the operation example where control CPU interface timers are timed out without using a read status flag.



Precautions

- If a control CPU interface is issued by SECS/GEM communication software while the control CPU interface queue for CITL to CPU is full, the interface is discarded. To prevent this, perform the following actions until 'Queue full of control CPU interfaces for CITL to CPU' (b8) of 'CA-SECS status' (UnIG16384) turns OFF.
 - Prevent a control CPU from issuing a control CPU interface.
 - Notify the host not to send a service message. (Page 374 Service Messages)
- When the value of 'Write status flag' (UnIG20448) is cleared (3→0 control) due to a timeout while that of 'Read status flag' (UnIG20449) is '0', data stored in the control CPU interface queue for CITL to CPU is immediately written. (Data in the buffer memory is overwritten.)
 - To prevent missing any control CPU interfaces, read them before a timeout occurs.

3 PROCEDURE BEFORE OPERATION

This chapter shows the procedure before the operation of GEM300 standard support functions.

Point

To use the functions, settings are required according to the pre-operation procedure for a SECS/GEM communication software pre-installed model module. For details, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

1. Setting equipment specifications

Set an equipment name and the number of load ports using a setting tool.

 Page 26 EQUIPMENT SPECIFICATION SETTINGS

For using GEM300 standard support functions, select "RD55UP12-V(GEM300)" for the target module.

After setting equipment specifications, update the setting file stored on the SECS/GEM communication software pre-installed model module.

2. Starting the operation of GEM300 standard support functions

Command '00000-00001: GEM300 Initial request' to start the operation of GEM300 standard support functions.

3.1 Starting the Operation of GEM300 Standard Support Functions

To start the operation of GEM300 standard support functions, use the control CPU interface '00000-00001: GEM300 Initial request' from a control CPU to request SECS/GEM communication software to start and initialize the functions. ( Page 161 00001: GEM300 Initial request)

- A processing result is returned by the control CPU interface '10000-00001: GEM300 Initial acknowledge.' ( Page 163 00001: GEM300 Initial acknowledge)
- When the GEM300 standard support functions start running, 'GEM300 status' (b5) of 'CA-SECS status' (Un\G16384) turns ON (is enabled). ( Page 365 CA-SECS status (Un\G16384))

For the specifications of a control CPU interface, refer to the following:

 Page 11 SPECIFICATIONS

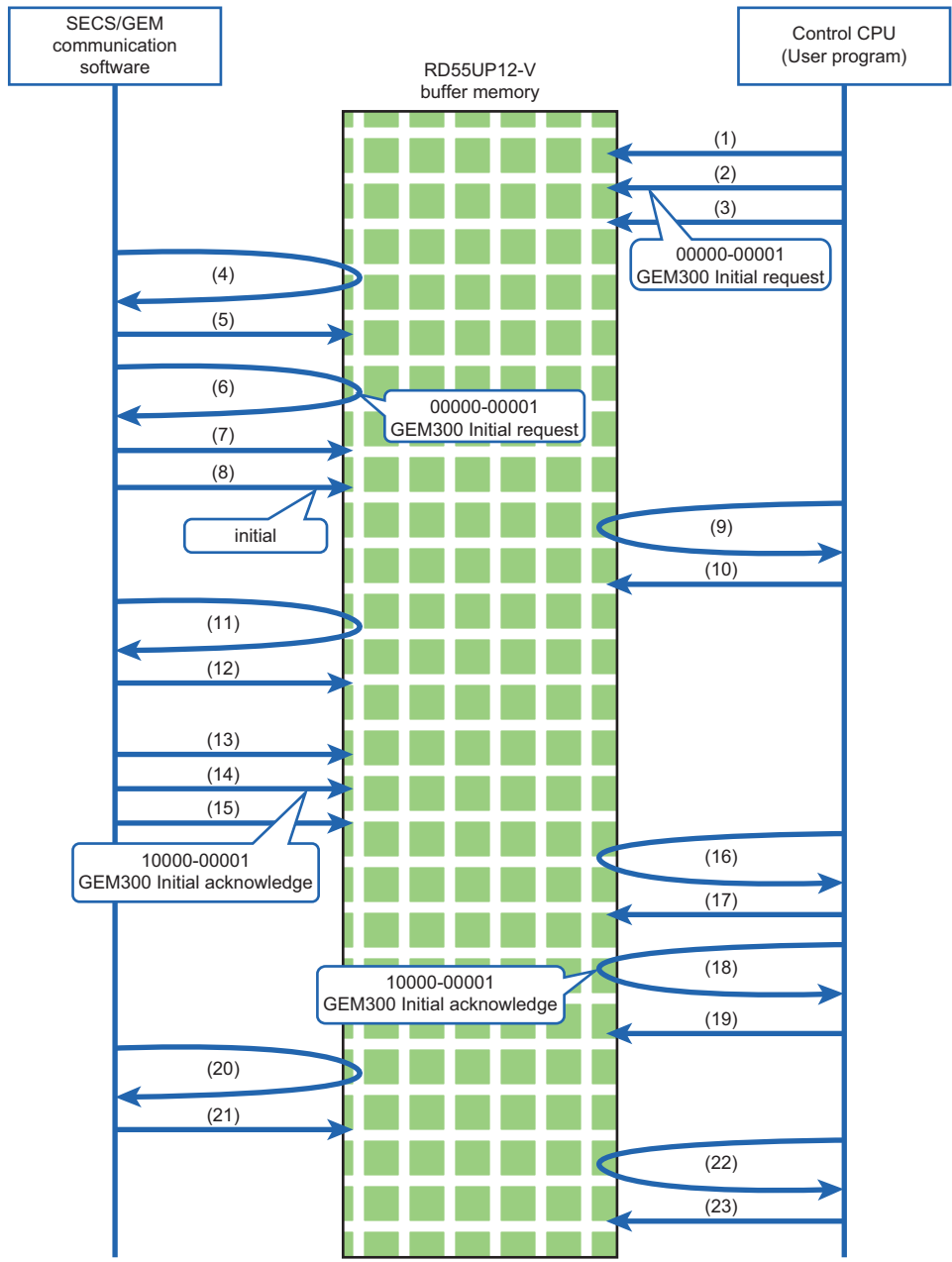
For the format of a control CPU interface, refer to the following:

 Page 151 Control CPU Interface Formats

The following shows the flow when starting the operation of GEM300 standard support functions.



- For on-line operation, use the communication establishment function and online transition function of SEMI E30 (GEM).
- For examples of using control CPU interfaces when creating a user program compliant with GEM300 standards, refer to the use cases. (Page 535 Use Cases)



No.	SECS/GEM communication software	Control CPU (controlled by user program)
(1)	—	A control CPU turns ON 'In-use flag' (b0) of 'Write status flag' (Un\G20464). (OFF→ON control)
(2)	—	<p>The CPU writes data of the header area in '00000-00001: GEM300 Initial request' according to ❶ to ❸.</p> <ul style="list-style-type: none"> • ❶ 'Information type' (Un\G20466): 0 • ❷ 'Detail type' (Un\G20467): 1 • ❸ 'Data size of data area' (Un\G20470 to 20471): 0 (byte units) <p>There is no data to be written for the data area of '00000-00001: GEM300 Initial request.'</p> <p>For details, refer to the following:</p> <p>☞ Page 161 00001: GEM300 Initial request</p>
(3)	—	The CPU turns ON 'Write completion flag' (b1) of 'Write status flag' (Un\G20464). (OFF→ON control)
(4)	SECS/GEM communication software detects that 'Write completion flag' (b1) of 'Write status flag' (Un\G20464) is turned ON.	—
(5)	The software turns ON 'In-use flag' (b0) of 'Read status flag' (Un\G20465). (OFF→ON control)	—
(6)	<p>The software reads data of the header area in '00000-00001: GEM300 Initial request' according to ❶ to ❸.</p> <ul style="list-style-type: none"> • ❶ 'Information type' (Un\G20466): 0 • ❷ 'Detail type' (Un\G20467): 1 • ❸ 'Data size of data area' (Un\G20470 to 20471): 0 (byte units) 	—
(7)	The software turns ON 'Read completion flag' (b1) of 'Read status flag' (Un\G20465). (OFF→ON control)	—
(8)	The software turns ON 'GEM300 status' (b5) of 'CA-SECS status' (Un\G16384). (OFF→ON control)	—
(9)	—	The CPU detects that 'Read completion flag' (b1) of 'Read status flag' (Un\G20465) is turned ON.
(10)	—	The CPU clears (3→0 control) 'Write status flag' (Un\G20464).
(11)	The software detects that 'Write status flag' (Un\G20464) is cleared.	—
(12)	The software clears (3→0 control) 'Read status flag' (Un\G20465).	—
(13)	The software turns ON 'In-use flag' (b0) of 'Write status flag' (Un\G20448). (OFF→ON control)*1*2	—
(14)	<p>The software writes data of the header area in '10000-00001: GEM300 Initial acknowledge' according to ❶ to ❸, and also write data of the data area according to ❹.*1</p> <ul style="list-style-type: none"> • ❶ 'Information type' (Un\G20450): 10000 • ❷ 'Detail type' (Un\G20451): 1 • ❸ 'Data size of data area' (Un\G20454 to 20455): 2 (byte units) • ❹ Data of '10000-00001: GEM300 Initial acknowledge' starting from 'Data reading area' (Un\G1572864) (for 2 bytes) 	—
(15)	The software turns ON 'Write completion flag' (b1) of 'Write status flag' (Un\G20448). (OFF→ON control)*1*2	—
(16)	—	The CPU detects that 'Write completion flag' (b1) of 'Write status flag' (Un\G20448) is turned ON.
(17)	—	The CPU turns ON 'In-use flag' (b0) of 'Read status flag' (Un\G20449). (OFF→ON control)*3
(18)	—	<p>The CPU reads data of the header area in '10000-00001: GEM300 Initial acknowledge' according to ❶ to ❸, and also reads data of the data area according to ❹.</p> <ul style="list-style-type: none"> • ❶ 'Information type' (Un\G20450): 10000 • ❷ 'Detail type' (Un\G20451): 1 • ❸ 'Data size of data area' (Un\G20454 to 20455): 2 (byte units) • ❹ Data of '10000-00001: GEM300 Initial acknowledge' starting from 'Data reading area' (Un\G1572864) (for 2 bytes) <p>For details on '10000-00001: GEM300 Initial acknowledge,' refer to the following:</p> <p>☞ Page 163 00001: GEM300 Initial acknowledge</p>
(19)	—	The CPU turns ON 'Read completion flag' (b1) of 'Read status flag' (Un\G20449). (OFF→ON control)*3
(20)	The software detects that 'Read completion flag' (b1) of 'Read status flag' (Un\G20449) is turned ON.	—
(21)	The software clears (3→0 control) 'Write status flag' (Un\G20448).	—

No.	SECS/GEM communication software	Control CPU (controlled by user program)
(22)	—	The CPU detects that 'Write status flag' (Un\G20448) is cleared.
(23)	—	The CPU clears (3→0 control) 'Read status flag' (Un\G20449). ^{*3}

*1 It is executed without waiting for 'Write status flag' (Un\G20464) to be cleared.

*2 The flag is turned OFF after the time set for "CPU Interface Timer" elapses. (☞ Page 33 CPU interface)

*3 The control is not required if 'Write status flag' (Un\G20448) is cleared (3→0 control) due to timeout.

4 FUNCTION LIST

This chapter explains GEM300 standard support functions.

Function		Description	Reference
Equipment specification setting		To set equipment specifications (such as the number of load ports and carrier slots)	☞ Page 26 EQUIPMENT SPECIFICATION SETTINGS
Object management	Carrier object	To manage objects compliant with E87-CMS	☞ Page 59 Carrier Objects
	Control job object ^{*1}	To manage objects compliant with E94-CJM	☞ Page 103 Control Job Object
	Process job object ^{*1}	To manage objects compliant with E40-PJM	☞ Page 125 Process Job Objects
	Substrate object ^{*2}	To manage objects compliant with E90-STC	☞ Page 136 Substrate Objects
	Substrate location object ^{*2}		☞ Page 140 Substrate Location Objects
	Batch location object ^{*2}		☞ Page 141 Batch Location Objects
	Load port object	To manage the load port status ^{*3}	☞ Page 54 Load port object
	Carrier location object ^{*2}	To manage the carrier location status ^{*3}	☞ Page 56 Location object
	Internal buffer object ^{*2}	To manage the internal buffer status ^{*3}	☞ Page 57 Internal buffer object
Object attribute variable definition	CMS variable	To define variables with object attributes. Object attributes can be used as discrete variables (DVVAL).	☞ Page 82 CMS Variables
	CJM variable ^{*1}		☞ Page 114 CJM Variables
	PJM variable ^{*1}		☞ Page 132 PJM Variables
	STS variable ^{*2}		☞ Page 143 STS Variables
Logging ^{*2}	Control CPU interface log	To log sending and receiving for a control CPU interface	☞ Page 52 Control CPU Interface Log
State model compliance	Carrier State Model	To transition the status of 'Carrier ID Status (CIDS),' 'Carrier Slot Map Status (CSMS),' and 'Carrier Accessing Status (CAS)'	☞ Page 63 Carrier State Model
	Load Port Transfer State Model	To transition the status of 'Load Port Transfer State (LTS)'	☞ Page 69 Load Port Transfer State Model
	Load Port Reservation State Model	To transition the status of 'Load Port Reservation State (LRS)'	☞ Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)
	Load Port/Carrier Association State Model	To transition the status of 'Load Port/Carrier Association State (LCAS)'	☞ Page 77 Load Port/Carrier Association State Model
	Access Mode State Model	To transition the status of 'Access Mode State (AMS)'	☞ Page 80 Access Mode State Model
	Control Job State Model ^{*1}	To transition the status of control job state model	☞ Page 109 Control Job State Model Management
	Process Job State Model ^{*1}	To transition the status of process job state model	☞ Page 129 Process Job State Model Management
GEM300 service message	OSS service message ^{*2}	To help service processing which is compliant with service messages from the host	☞ Page 58 OSS Service Messages
	CMS service message		☞ Page 62 CMS Service Messages
	CJM service message ^{*1}		☞ Page 108 CJM Service Messages
	PJM service message ^{*1}		☞ Page 128 PJM Service Messages
	STS service message ^{*2}		☞ Page 142 STS Service Messages
Event notification	CMS event	To notify the host automatically or manually of an event requested by GEM300	☞ Page 85 CMS Events and Reports
	CJM event ^{*1}		☞ Page 116 CJM Events and Reports
	PJM event ^{*1}		☞ Page 134 PJM Events and Reports
	STS event ^{*2}		☞ Page 145 STS Events and Reports
Checking recipe variables ^{*1}		To check whether the recipe variable values provided by the host are within the range defined by a user.	—
Control CPU interface		To exchange GEM300-related data with a control CPU in an event message format via the fixed buffer memory (maximum 512 KB)	☞ Page 11 Control CPU Interfaces

*1 Supported only by SECS/GEM communication software with software version 1.43V or later.

*2 Supported only by SECS/GEM communication software with software version 1.40S or later.

*3 A proprietary object which is compliant with GEM300 standards

5 EQUIPMENT SPECIFICATION SETTINGS

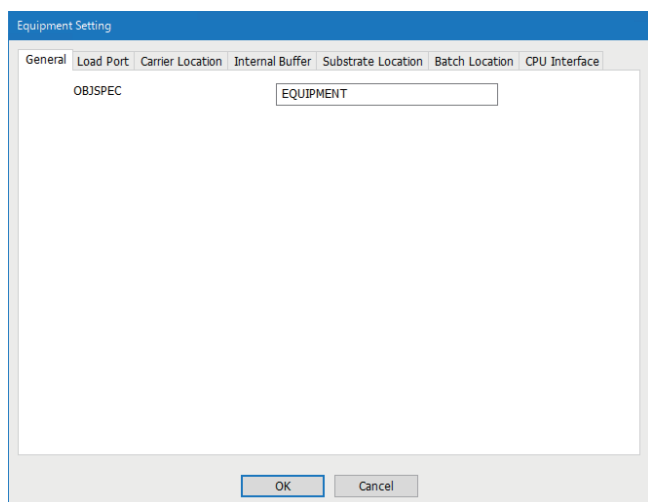
This function can set equipment specifications, such as the number of load ports and carrier slots.

5.1 Equipment Settings

This section explains the method for setting whether to use GEM300 standard support functions.

Window

🔗 Main screen ⇒ [GEM300Function] ⇒ [Equipment Setting]



Displayed items

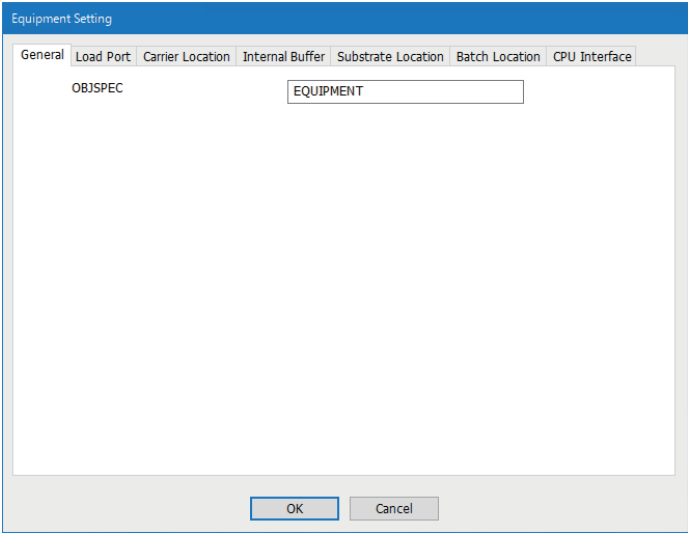
Item	Description	Setting range	Default
[General] tab	Set OBJSPEC. (🔗 Page 27 General)	—	—
[Load Port] tab	Set the number of load ports and the load port ID. (🔗 Page 28 Load port)		
[Carrier Location] tab	Set the number of locations and the location ID. (🔗 Page 29 Carrier location)		
[Internal Buffer] tab	Set the number of partitions, a partition ID, partition type, and the maximum capacity of a logical partition. (🔗 Page 30 Internal buffer)		
[Substrate Location] tab	Set a substrate location, substrate location ID, and the event disable setting for a substrate location that are specific to equipment. (🔗 Page 31 Substrate location)		
[Batch Location] tab	Set the number of batch locations, a batch location ID, the number of batch configuration substrates, and the event disable setting for a batch location. (🔗 Page 32 Batch location)		
[CPU Interface] tab	Set the monitoring timer for a control CPU interface. (🔗 Page 33 CPU interface)		

General

The following explains the method for setting parameters specific to equipment.

Window

 [Equipment Setting] ⇒ [General] tab



5

Displayed items

Item	Description	Setting range	Default
OBJSPEC	Set OBJSPEC.	1 to 80 characters	EQUIPMENT

Carrier location

The following explains the method for setting the location ID of a carrier specific to equipment.

Window

 [Equipment Setting] ⇒ [Carrier Location] tab

[illegible]

Displayed items

Item	Description	Setting range	Default
Location Count	Specify the number of carrier locations on equipment.	1 to 32	6
LocationID	Set the list of carrier location IDs. The specified LocationID is applied to the instance of a location object.	1 to 80 characters	<ul style="list-style-type: none"> • Location 01 • Location 02 • Location 03 • Location 04 • Location 05 • Location 06

Substrate location

The following explains the method for setting a substrate location specific to equipment.

Window

 [Equipment Setting] ⇒ [Substrate Location] tab

[illegible]

Displayed items

Item	Description	Setting range	Default
Equipment Substrate Location Count	Specify the number of substrate locations specific to equipment.	0 to 32	0
Equipment Substrate LocationID	Set the list of substrate location IDs specific to equipment. The specified EquipmentSubstrateLocationID is applied to the instance of a substrate location object.	1 to 80 characters	None
Equipment Substrate Location DisableEvents	Set whether to enable or disable an event for a substrate location specific to equipment. The specified DisableEvents is applied to the instance of a substrate location object.	<ul style="list-style-type: none"> • Not selected • Selected 	Not selected

window



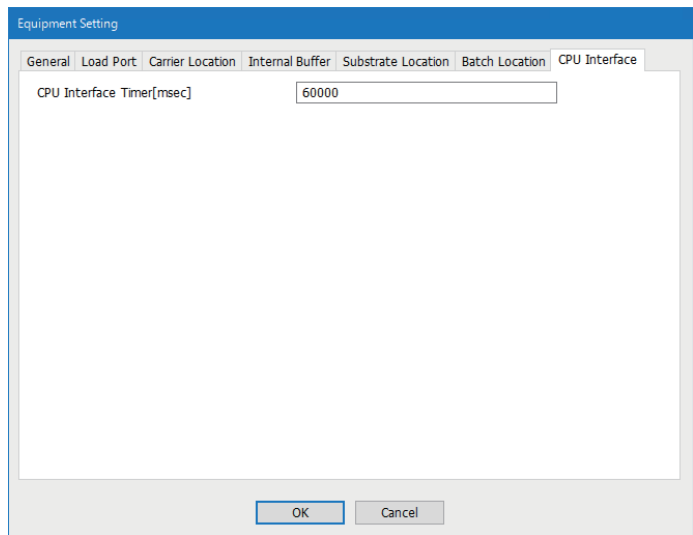
Displayed Items

CPU interface

The following explains the method for configuring settings for a control CPU interface.

Window

[Equipment Setting] ⇒ [CPU Interface] tab



5

Displayed items

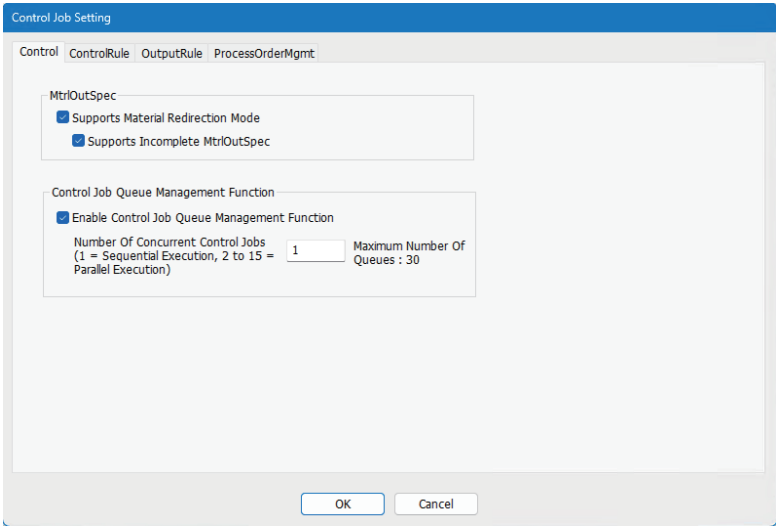
Item	Description	Setting range	Default
CPU Interface Timer[msec]	Set a monitoring time (milliseconds) from when SECS/GEM communication software turns ON 'Write completion flag' (b1) of 'Write status flag' (Un\G20448) in a control CPU interface to when a control CPU turns ON 'Read completion flag' (b1) of 'Read status flag' (Un\G20449). When the specified time elapses, SECS/GEM communication software clears (3→0 control) 'Write status flag' (Un\G20448) regardless of the operation of the control CPU.	10 to 120000	60000

5.2 Control Job Settings

This section explains the method for setting details of the control job.

Window

☞ Main screen ⇒ [GEM300Function] ⇒ [Control Job Setting]



Displayed items

Item	Description	Setting range	Default
[Control] tab	Set parameters specific to equipment. (☞ Page 35 Control)	—	—
[ControlRule] tab	Define ControlRule as user-defined. (☞ Page 36 ControlRule)		
[OutputRule] tab	Define OutputRule as user-defined. (☞ Page 39 OutputRule)		
[ProcessOrderMgmt] tab	Define ProcessOrderMgmt as user-defined. (☞ Page 42 ProcessOrderMgmt)		

Control

The following explains the method for setting parameters specific to equipment.

Point

- The "MtrlOutSpec" setting is referred to at the error judgment of control job object attribute "MtrlOutSpec." When not selecting the checkbox of "Supports Material Redirection Mode," errors are determined in the slot integrity mode.
(MtrlOutSpec verification)
- For details on the control job queue management function, refer to the following:
(Page 117 Control Job Queue Model)

Window

[Control Job Setting] ⇒ [Control] tab

Displayed items

Item	Description	Setting range	Default
Supports Material Redirection Mode	Select whether to support the material redirection mode.	<ul style="list-style-type: none">• Not selected• Selected	Selected
Supports Incomplete MtrlOutSpec	Select whether to support incomplete MtrlOutSpec.	<ul style="list-style-type: none">• Not selected• Selected	Selected
Enable Control Job Queue Management Function	Select whether to enable the control job queue management function.	<ul style="list-style-type: none">• Not selected• Selected	Selected
Number Of Concurrent Control Jobs (1 = Sequential Execution, 2 to 15 = Parallel Execution)	Set the number of concurrent control jobs. The maximum number of queues managed by this product is displayed according to the setting value. It is inversely proportional to the number of concurrent control jobs. For each increase (decrease) of 1 in the number of concurrent control jobs, the maximum number of queues decreases (increases) by 2.	1 to 15	1

[illegible]

Operation	Description
Right-click ⇨ shortcut menu [Insert]	To add a new ControlRule definition.
Right-click ⇨ shortcut menu [Modify]	To display the "ControlRule Define" screen to edit the selected ControlRule definition.
Right-click ⇨ shortcut menu [Duplicate]	To copy and add the selected ControlRule definition to the row below.
Right-click ⇨ shortcut menu [Move Up]	To move the selected ControlRule definition.
Right-click ⇨ shortcut menu [Move Down]	
Right-click ⇨ shortcut menu [Delete]	To delete the selected ControlRule definition.

ControlRule Define

Edit a ControlRule definition selected in the [ControlRule] tab.

Window

Select a ControlRule definition in the [ControlRule] tab, then right-click and select [Modify] from the shortcut menu.

ControlRule Define

Rule Name

NewRule_001

Data Type

U2

Range Check

Minimum Value

0

Maximum Value

0

Matching Check

No.

Matching Pattern

New(N)

Edit(E)

Delete(D)

Clear(C)

(No Pattern)

Rules That Require Specification From The Host

OK

Cancel

5

Displayed items

Item	Description	Setting range	Default
Rule Name	Set RuleName.	1 to 80 characters	"NewRule_%03d"*1
Data Type	Set the data type of RuleValue.	<div><div>• BIN</div><div>• BOOL</div><div>• ASCII</div><div>• I1</div><div>• I2</div><div>• I4</div><div>• U1</div><div>• U2</div><div>• U4</div><div>• F4</div><div>• F8</div></div>	U2
Range Check	Select this to perform the range check of RuleValue and set the minimum and maximum range values.	<div><div>• BIN: 0 to 255</div><div>• I1: -128 to 127</div><div>• I2: -32768 to 32767</div><div>• I4: -2147483648 to 2147483647</div><div>• U1: 0 to 255</div><div>• U2: 0 to 65535</div><div>• U4: 0 to 4294967295</div><div>• F4: -3.402823466e+38 to 3.402823466e+38</div><div>• F8: -1.79769313486231e+308 to 1.79769313486231e+308</div></div>	0

5 EQUIPMENT SPECIFICATION SETTINGS
5.2 Control Job Settings

37

Item	Description	Setting range	Default
Matching Check	<p>Select this to perform the matching check of RuleValue and set the check pattern.</p> <p>■When the data type is other than BOOL Set the pattern for the matching pattern list (1). [New] button: To add new matching check pattern. [Edit] button: To edit pattern of selected matching check. [Delete] button: To delete pattern of selected matching check. [Clear] button: To delete all pattern of matching check.</p> <p>■When the data type is BOOL Select the pattern in the pattern list (2).</p>	<p>■When the data type is other than BOOL</p> <ul style="list-style-type: none"> • BIN: 0 to 255 • ASCII: 0 to 80 characters • I1: -128 to 127 • I2: -32768 to 32767 • I4: -2147483648 to 2147483647 • U1: 0 to 255 • U2: 0 to 65535 • U4: 0 to 4294967295 • F4: -3.402823466e+38 to 3.402823466e+38 • F8: -1.79769313486231e+308 to 1.79769313486231e+308 <p>■When the data type is BOOL</p> <ul style="list-style-type: none"> • (No Pattern) • true • false 	<p>■When the data type is other than BOOL None</p> <p>■When the data type is BOOL (No Pattern)</p>
Rules That Require Specification From The Host	Select whether to require specification from the host.	<ul style="list-style-type: none"> • Not selected • Selected 	Not selected

*1 The smallest number among available numbers from 001 to 256 is assigned to '%03d.'

OutputRule

Defined OutputRule is displayed in a list.

Up to 255 OutputRule can be defined.

Point

This setting is referred to at the error judgment of control job object attribute "ProcessingCtrlSpec."

For details, refer to the following:

👉 ProcessingCtrlSpec verification

Window

 [Control Job Setting] ⇒ [OutputRule] tab

[illegible]

Operation in the [OutputRule] tab

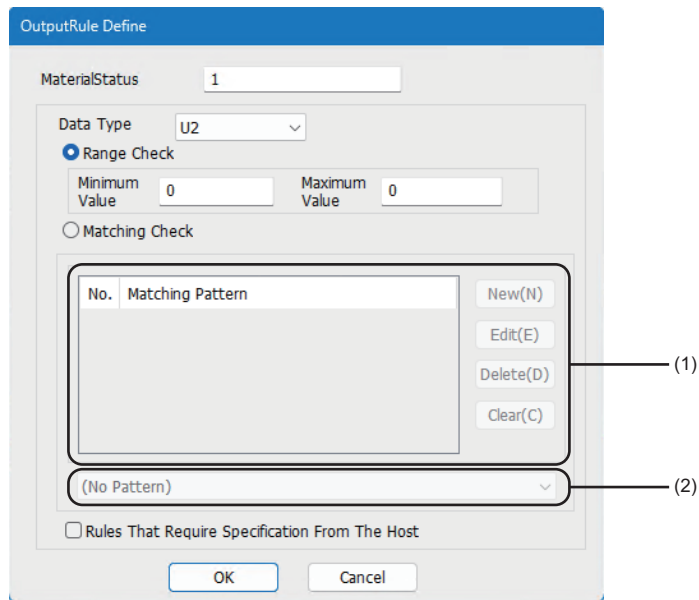
Operation	Description
Right-click ⇒ shortcut menu [Insert]	To add a new OutputRule definition.
Right-click ⇒ shortcut menu [Modify]	To display the "OutputRule Define" screen to edit the selected OutputRule definition.
Right-click ⇒ shortcut menu [Duplicate]	To copy and add the selected OutputRule definition to the row below.
Right-click ⇒ shortcut menu [Move Up]	To move the selected OutputRule definition.
Right-click ⇒ shortcut menu [Move Down]	
Right-click ⇒ shortcut menu [Delete]	To delete the selected OutputRule definition.

OutputRule Define

Edit an OutputRule definition selected in the [OutputRule] tab.

Window

Select an OutputRule definition in the [OutputRule] tab, then right-click and select [Modify] from the shortcut menu.



Displayed items

Item	Description	Setting range	Default
MaterialStatus	Set MaterialStatus.	• 1 to 255	None
Data Type	Set the data type of OutputRuleValue.	• BIN • BOOL • ASCII • I1 • I2 • I4 • U1 • U2 • U4 • F4 • F8	U2
Range Check	Select this to perform the range check of OutputRuleValue and set the minimum and maximum range values.	• BIN: 0 to 255 • I1: -128 to 127 • I2: -32768 to 32767 • I4: -2147483648 to 2147483647 • U1: 0 to 255 • U2: 0 to 65535 • U4: 0 to 4294967295 • F4: -3.402823466e+38 to 3.402823466e+38 • F8: -1.79769313486231e+308 to 1.79769313486231e+308	0

Item	Description	Setting range	Default
Matching Check	<p>Select this to perform the matching check of OutputRuleValue and set the check pattern.</p> <p>■When the data type is other than BOOL Set the pattern for the matching pattern list (1). [New] button: To add new matching check pattern. [Edit] button: To edit pattern of selected matching check. [Delete] button: To delete pattern of selected matching check. [Clear] button: To delete all pattern of matching check.</p> <p>■When the data type is BOOL Select the pattern in the pattern list (2).</p>	<p>■When the data type is other than BOOL</p> <ul style="list-style-type: none"> • BIN: 0 to 255 • ASCII: 0 to 80 characters • I1: -128 to 127 • I2: -32768 to 32767 • I4: -2147483648 to 2147483647 • U1: 0 to 255 • U2: 0 to 65535 • U4: 0 to 4294967295 • F4: -3.402823466e+38 to 3.402823466e+38 • F8: -1.79769313486231e+308 to 1.79769313486231e+308 <p>■When the data type is BOOL</p> <ul style="list-style-type: none"> • (No Pattern) • true • false 	<p>■When the data type is other than BOOL None</p> <p>■When the data type is BOOL (No Pattern)</p>
Rules That Require Specification From The Host	Select whether to require specification from the host.	<ul style="list-style-type: none"> • Not selected • Selected 	Not selected

ProcessOrderMgmt

The following explains the method for defining ProcessOrderMgmt as user-defined.
Up to 256 ProcessOrderMgmt can be defined.

Point

This setting is referred to at the error judgment of control job object attribute "ProcessOrderMgmt."

For details, refer to the following:

- Page 454 Control job object
- (8) Control job object

Window

[Control Job Setting] ⇒ [ProcessOrderMgmt] tab

Control Job Setting

ControlControlRuleOutputRuleProcessOrderMgmt

Number Of Enabled ProcessOrderMgmt: 3 Items

ProcessOrderMgmt	Enable	Comment
0	☐	
1	☒	ARRIVAL
2	☒	OPTIMIZE
3	☒	LIST
4	☐	
5	☐	
6	☐	
7	☐	
8	☐	
9	☐	
10	☐	
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	
16	☐	
17	☐	

OKCancel

Displayed items

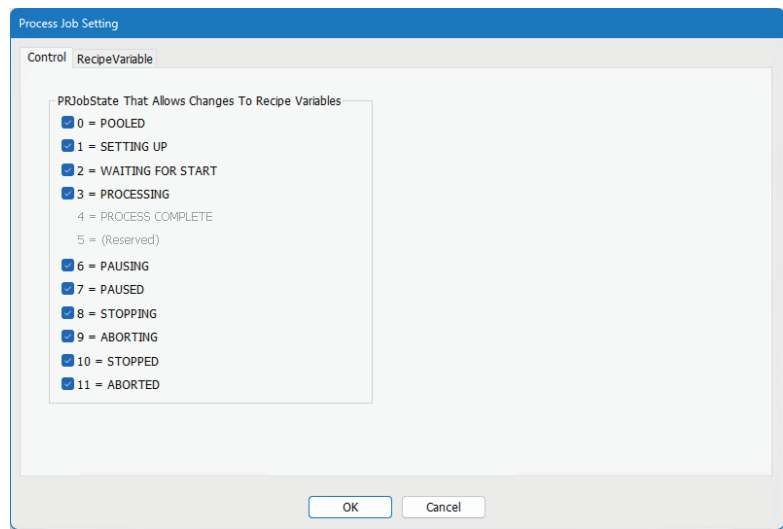
Item	Description	Setting range	Default
Enable	Select whether to enable the control job as ProcessOrderMgmt.	<ul style="list-style-type: none">Not selectedSelected	<ul style="list-style-type: none">0: Not selected1 to 3: Selected4 to 255: Not selected
Comment	Set comments.	0 to 128 characters	<ul style="list-style-type: none">0: Blank1: ARRIVAL2: OPTIMIZE3: LIST4 to 255: Blank

5.3 Process Job Settings

This section explains the method for setting details of the process job.

Window

Main screen ⇒ [GEM300Function] ⇒ [Process Job Setting]



Displayed items

Item	Description	Setting range	Default
[Control] tab	Set parameters specific to equipment. (Page 44 Control)	—	—
[RecipeVariable] tab	Define RecipeVariable as user-defined. (Page 45 RecipeVariable)		

Control

The following explains the method for setting parameters specific to equipment.

Select the checkbox of each item to allow changes to recipe variables. (Default: Selected)

However, the following items cannot be selected.

- 4 = PROCESS COMPLETE
- 5 = (Reserved)

Point

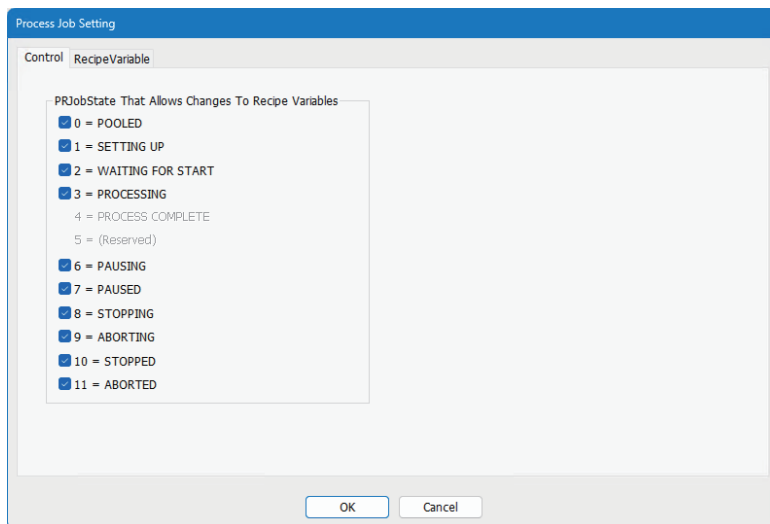
The "PRJobState That Allows Changes To Recipe Variables" setting is referred to at the error judgment of "S16F23: PRJobSetRecipeVariable."

For details, refer to the following:

 Page 494 S16F23: PRJobSetRecipeVariable

Window

 [Process Job Setting] ⇒ [Control] tab



RecipeVariable

Defined RecipeVariable is displayed in a list.
Up to 512 RecipeVariable can be defined.

Point

This setting is referred to at the error judgment of process job object attribute "RecVariableList."

For details, refer to the following:

Page 477 S16F11: PRJobCreateEnh

Page 481 S16F15: PRJobMultiCreate

Page 494 S16F23: PRJobSetRecipeVariable

Window

 [Process Job Setting] ⇒ [RecipeVariable] tab

[illegible]

Operation in the [RecipeVariable] tab

Operation	Description
Right-click ⇨ shortcut menu [Insert]	To add a new RecipeVariable definition.
Right-click ⇨ shortcut menu [Modify]	To display the "RecipeVariable Define" screen to edit the selected RecipeVariable definition.
Right-click ⇨ shortcut menu [Duplicate]	To copy and add the selected RecipeVariable definition to the row below.
Right-click ⇨ shortcut menu [Move Up]	To move the selected RecipeVariable definition.
Right-click ⇨ shortcut menu [Move Down]	
Right-click ⇨ shortcut menu [Delete]	To delete the selected RecipeVariable definition.

RecipeVariable Define

Edit a RecipeVariable definition selected in the [RecipeVariable] tab.

Window

 Select a RecipeVariable definition in the [RecipeVariable] tab, then right-click and select [Modify] from the shortcut menu.

RecipeVariable Define

RecipeVarName

NewValue_001

Data Type

U2

Range Check

Minimum Value

0

Maximum Value

0

Matching Check

No.

Matching Pattern

New(N)

Edit(E)

Delete(D)

Clear(C)

(No Pattern)

☐ Recipe Variables That Require Specification From The Host

OK

Cancel

(1)

(2)

Displayed items

Item	Description	Setting range	Default
RecipeVarName	Set RecipeVarName.	1 to 256 characters	"NewValue_ %03d" 1
Data Type	Set the data type of RecipeVarValue.	<div><div>• BIN</div><div>• BOOL</div><div>• ASCII</div><div>• I1</div><div>• I2</div><div>• I4</div><div>• U1</div><div>• U2</div><div>• U4</div><div>• F4</div><div>• F8</div></div>	U2
Range Check	Select this to perform the range check of RecipeVarValue and set the minimum and maximum range values.	<div><div>• BIN: 0 to 255</div><div>• I1: -128 to 127</div><div>• I2: -32768 to 32767</div><div>• I4: -2147483648 to 2147483647</div><div>• U1: 0 to 255</div><div>• U2: 0 to 65535</div><div>• U4: 0 to 4294967295</div><div>• F4: -3.402823466e+38 to 3.402823466e+38</div><div>• F8: -1.79769313486231e+308 to 1.79769313486231e+308</div></div>	0

Item	Description	Setting range	Default
Matching Check	<p>Select this to perform the matching check of RecipeVarValue and set the check pattern.</p> <p>■When the data type is other than BOOL Set the pattern for the matching pattern list (1). [New] button: To add new matching check pattern. [Edit] button: To edit pattern of selected matching check. [Delete] button: To delete pattern of selected matching check. [Clear] button: To delete all pattern of matching check.</p> <p>■When the data type is BOOL Select the pattern in the pattern list (2).</p>	<p>■When the data type is other than BOOL</p> <ul style="list-style-type: none"> • BIN: 0 to 255 • ASCII: 0 to 80 characters • I1: -128 to 127 • I2: -32768 to 32767 • I4: -2147483648 to 2147483647 • U1: 0 to 255 • U2: 0 to 65535 • U4: 0 to 4294967295 • F4: -3.402823466e+38 to 3.402823466e+38 • F8: -1.79769313486231e+308 to 1.79769313486231e+308 <p>■When the data type is BOOL</p> <ul style="list-style-type: none"> • (No Pattern) • true • false 	<p>■When the data type is other than BOOL None</p> <p>■When the data type is BOOL (No Pattern)</p>
Recipe Variables That Require Specification From The Host	Select whether to require specification from the host.	<ul style="list-style-type: none"> • Not selected • Selected 	Not selected

*1 The smallest number among available numbers from 001 to 512 is assigned to '%03d.'

5.4 Substrate Object Settings

This section explains the method for setting details of the substrate object.

Window

Main screen ⇒ [GEM300Function] ⇒ [SubstrateObject Setting]

SubstrateObject Setting

Material Status SubstType SubstUsage

Number Of Enabled MaterialStatus: 0 Items

MaterialStatus	Enable	Comment
1	☐	
2	☐	
3	☐	
4	☐	
5	☐	
6	☐	
7	☐	
8	☐	
9	☐	
10	☐	
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	
16	☐	
17	☐	

OK Cancel

Displayed items

Item	Description	Setting range	Default
[MaterialStatus] tab	Define MaterialStatus as user-defined. ( Page 49 MaterialStatus)	—	—
[SubstType] tab	Define SubstType as user-defined. ( Page 50 SubstType)		
[SubstUsage] tab	Define SubstUsage as user-defined. ( Page 51 SubstUsage)		

MaterialStatus

Set MaterialStatus.
1 to 255 of MaterialStatus can be defined.

Point

This setting is referred to at the error judgment of control job object attribute "MtrlOutbyStatus."

For details, refer to the following:

- Page 454 Control job object
- (8) Control job object

Window

[SubstrateObject Setting] ⇒ [MaterialStatus] tab

SubstrateObject Setting

Material StatusSubstTypeSubstUsage

Number Of Enabled MaterialStatus: 0 Items

MaterialStatus	Enable	Comment
1	☐	
2	☐	
3	☐	
4	☐	
5	☐	
6	☐	
7	☐	
8	☐	
9	☐	
10	☐	
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	
16	☐	
17	☐	

OKCancel

Displayed items

Item	Description	Setting range	Default
Enable	Select whether to enable the substrate object as MaterialStatus.	<ul style="list-style-type: none">Not selectedSelected	Not selected
Comment	Set comments.	0 to 128 characters	None

SubstType

Set SubstType.
0 to 255 of MaterialStatus can be defined.

Point

This setting is referred to at the error judgment of substrate object attribute "SubstType."

For details, refer to the following:

- Page 451 Substrate object (register substrate)
- (5) Substrate object

Window

[SubstrateObject Setting] ⇒ [SubstType] tab

SubstrateObject Setting

Material StatusSubstTypeSubstUsage

Number Of Enabled SubstType: 4 Items

SubstType	Enable	Comment
0	☒	WAFER
1	☒	FLAT PANEL
2	☒	CD
3	☒	MASK
4	☐	
5	☐	
6	☐	
7	☐	
8	☐	
9	☐	
10	☐	
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	
16	☐	

OKCancel

Displayed items

Item	Description	Setting range	Default
Enable	Select whether to enable the substrate object as SubstType.	<div>• Not selected</div> <div>• Selected</div>	<div>• 0 to 3: Selected</div> <div>• 4 to 255: Not selected</div>
Comment	Set comments.	0 to 128 characters	<div>• 0: WAFER</div> <div>• 1: FLAT PANEL</div> <div>• 2: CD</div> <div>• 3: MASK</div> <div>• 4 to 255: Blank</div>

SubstUsage

Set SubstUsage.
0 to 255 of SubstUsage can be defined.

Point

This setting is referred to at the error judgment of substrate object attribute "SubstUsage."

For details, refer to the following:

- Page 451 Substrate object (register substrate)
- (5) Substrate object

Window

[SubstrateObject Setting] ⇒ [SubstUsage] tab

SubstrateObject Setting

Material Status

SubstType

SubstUsage

Number Of Enabled SubstUsage: 3 Items

SubstUsage	Enable	Comment
0	☒	PRODUCT
1	☒	TEST
2	☒	FILLER
3	☐	
4	☐	
5	☐	
6	☐	
7	☐	
8	☐	
9	☐	
10	☐	
11	☐	
12	☐	
13	☐	
14	☐	
15	☐	
16	☐	

OK

Cancel

Displayed items

Item	Description	Setting range	Default
Enable	Select whether to enable the substrate object as SubstUsage.	<ul style="list-style-type: none">Not selectedSelected	<ul style="list-style-type: none">0 to 2: Selected3 to 255: Not selected
Comment	Set comments.	0 to 128 characters	<ul style="list-style-type: none">0: PRODUCT1: TEST2: FILLER3 to 255: Blank

5.5 Control CPU Interface Log

The content of data exchanged in the form of an event message via buffer memory is output as a control CPU interface log. The output log can be checked in a setting tool or display device in the same manner as conventional log data (SECS communication logs, programmable controller logs, and user logs).

For details on log output, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

6 E39-OSS COMPLIANT FUNCTION

This chapter explains the E39-OSS compliant function.

All GEM300 standard-related objects supported by SECS/GEM communication software are inherited from the top object defined by E39-OSS.

6.1 Usage Method

For the usage method of this function, refer to the following:

-  Page 537 E87-CMS compliance
-  Page 686 E90-STC compliance

6.2 Top Object

This section explains the top object provided by SECS/GEM communication software.

Attributes

The following table shows the attributes of the top object.

Name	Format	Access from host	Description
ObjType	ASCII[1..80]* ¹	Read Only	Object type
ObjID	ASCII[1..80]* ¹	Read Only	Object ID

*¹ Excluding the control characters.

6.3 GEM300-Related Object List

This section shows objects managed by SECS/GEM communication software.

Name	ObjType	Description
Carrier object	Carrier	E87 compliant object
Load port object	LoadPort	Proprietary object of SECS/GEM communication software. It is used for the E87-CMS compliant function.
Location object	Location	
Internal buffer object	InternalBuffer	
Control job object* ¹	ControlJob	E94 compliant object
Process job object* ¹	ProcessJob	E40 compliant object
Substrate object	Substrate	E90 compliant object
Substrate location object	SubstLoc	
Batch location object	BatchLoc	

*¹ Supported only by SECS/GEM communication software with software version 1.43V or later.

6.4 Proprietary Object List

This section explains proprietary objects of SECS/GEM communication software.

Load port objects, carrier locations, and internal buffer objects are not defined as objects in SEMI standards. In SECS/GEM communication software, the objects are provided as proprietary objects to improve operability from a control CPU. Use them as necessary.

Load port object

SECS/GEM communication software instantiates load port-related information to an object and provides the function for exchanging the information between the host and equipment using E39-OSS and E87-CMS services. The software creates the same number of load port objects as the number of load ports set in "Load Port Count" of "Equipment Setting." Load port objects cannot be created or deleted from the host and a control CPU. The status of each load port is applied to the buffer memory from 'Port access mode' (Un\G24576) to 'Port reservation state' (Un\G24597).

Attributes

The following table shows the attributes of a load port object provided by SECS/GEM communication software.

Name	Format	Access from host	Description	Linked buffer memory
ObjType	ASCII[8] ^{*1}	Read Only	Object type (LoadPort)	None
ObjID	ASCII[1..80] ^{*1}	Read Only	Object ID	None
PTN	U1[1]	Read Only	PortID Material port number (material location) of a load port (positive integer)	None
AccessMode	U1[1]	Read Only	Access mode of a load port • 0: MANUAL • 1: AUTO	'Port access mode' (Un\G24576)
PortAssociationState	U1[1]	Read Only	Association status of a load port • 0: NOT ASSOCIATED • 1: ASSOCIATED	'Port association state' (Un\G24596)
LoadPortReservationState	U1[1]	Read Only	Reservation status of a load port • 0: NOT RESERVED • 1: RESERVED	'Port reservation state' (Un\G24597)
PortTransferState	U1[1]	Read Only	Transfer status of a load port ^{*2} • 0: OUT OF SERVICE • 1: TRANSFER BLOCKED • 2: READY TO LOAD • 3: READY TO UNLOAD	'Port transfer state' (Un\G24577 to 24592)
ServiceStatus	U1[1]	Read Only	Service status of a load port • 0: OUT OF SERVICE • 1: IN SERVICE	'Service status' (Un\G24593)
InServiceStatus	U1[1]	Read Only	Lower state of IN SERVICE • 0: TRANSFER READY • 1: TRANSFER BLOCKED	'In service status' (Un\G24594)
TransferReadyStatus	U1[1]	Read Only	Lower state of TRANSFER READY • 0: READY TO LOAD • 1: READY TO UNLOAD	'Transfer ready status' (Un\G24595)
CarrierIDReaderStatus ^{*3}	U1[1]	Read Only	Status of a carrier ID reader • 0: UNAVAILABLE (unusable or unimplemented) • 1: AVAILABLE (usable)	'Carrier ID reader status' (Un\G24599)

*1 Excluding the control characters.

*2 Only lower state is included. (Upper state is excluded.)

*3 Supported only by SECS/GEM communication software with software version 1.40S or later.

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to OSS.

☞ Page 166 00039: CPU to CITL, Page 175 10039: CITL to CPU

In addition, structure labels defined in this product are provided in a sample library.

☞ Page 521 Sample Library

■M+GEM300_LoadPortObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)* ¹ * ²
+40 to 79	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)* ¹ * ²
+80	uPTN	PTN(PortID)	Word [Unsigned]	1 to 6
+81	uAccessMode	AccessMode	Word [Unsigned]	• 0: MANUAL • 1: AUTO
+82	uPortAssociationState	PortAssociationState	Word [Unsigned]	• 0: NOT ASSOCIATED • 1: ASSOCIATED
+83	uLoadPortReservationState	LoadPortReservationState	Word [Unsigned]	• 0: NOT RESERVED • 1: RESERVED
+84	uPortTransferState	PortTransferState	Word [Unsigned]	• 0: OUT OF SERVICE • 1: TRANSFER BLOCKED • 2: READY TO LOAD • 3: READY TO UNLOAD
+85	uServiceStatus	ServiceStatus	Word [Unsigned]	• 0: OUT OF SERVICE • 1: IN SERVICE
+86	uInServiceStatus	InServiceStatus	Word [Unsigned]	• 0: TRANSFER READY • 1: TRANSFER BLOCKED
+87	uTransferReadyStatus	TransferReadyStatus	Word [Unsigned]	• 0: READY TO LOAD • 1: READY TO UNLOAD
+88	uCarrierIDReaderStatus* ³	CarrierIDReaderStatus	Word [Unsigned]	• 0: UNAVAILABLE (unusable or unimplemented) • 1: AVAILABLE (usable)

*¹ Excluding the control characters.

*² If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

*³ Supported only by SECS/GEM communication software with software version 1.40S or later.

Location object

SECS/GEM communication software instantiates location object-related information to an object and provides the function for exchanging the information between the host and equipment using E39-OSS service. Location objects cannot be created or deleted from the host and a control CPU.

Attributes

The following table shows the attributes of a location object provided by SECS/GEM communication software.

Name	Format	Access from host	Description
ObjType	ASCII[8] ^{*1}	Read Only	Object type (Location)
ObjID	ASCII[1..80] ^{*1}	Read Only	Object ID (Matrix)
CarrierLocationMatrix	LIST[1..32]	Read Only	List of LocationID and CarrierID LIST [1..32] LIST [2] LocationID CarrierID ⋮

*1 Excluding the control characters.

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to OSS.

☞ Page 166 00039: CPU to CITL, Page 175 10039: CITL to CPU

Structure labels defined in this product are provided in a sample library.

☞ Page 521 Sample Library

■M+GEM300_LocationObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}
+40 to 79	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}
+80 to 2639	st32CarrierLocation	CarrierLocationMatrix	M+GEM300_CarrierLocation (0..31)	☞ Page 56 M+GEM300_CarrierLocation

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_CarrierLocation

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40LocationID	LocationID	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII) ^{*1*2}
+40 to 79	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII) ^{*1*2}

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Internal buffer object

SECS/GEM communication software instantiates internal buffer object-related information to an object and provides the function for exchanging the information between the host and equipment using E39-OSS service. The software creates the same number of internal buffer objects as the number of partitions set in "Partition Count" of "Equipment Setting." Internal buffer objects cannot be created or deleted from the host and a control CPU.

Attributes

The following table shows the attributes of an internal buffer object provided by SECS/GEM communication software.

Name	Format	Access from host	Description
ObjType	ASCII[14] ^{*1}	Read Only	Object type (InternalBuffer)
ObjID	ASCII[1..80] ^{*1}	Read Only	Partition ID of a logical partition (PartitionID)
PartitionType	ASCII[1..64] ^{*1}	Read Only	Partition type of a logical partition (example: Product, Dummy, Substrate, and Seed)
PartitionCapacity	U1[1]	Read Only	Maximum capacity of a logical partition (Maximum number of carriers that can be stored)
AvailPartitionCapacity	U1[1]	Read Only	Free space (remaining amount) of a logical partition (Free space (remaining amount) = Maximum capacity of a logical partition - Number of stored carriers)
UnallocatedPartitionCapacity	U1[1]	Read Only	Unassigned space (remaining amount) of a logical partition (Unassigned amount (remaining amount) = Maximum capacity of a logical partition - (Number of stored carriers + Number of carriers to be stored))

*1 Excluding the control characters.

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to OSS.

☞ Page 166 00039: CPU to CITL, Page 175 10039: CITL to CPU

Structure labels defined in this product are provided in a sample library.

☞ Page 521 Sample Library

■M+GEM300_InternalBufferObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}
+40 to 79	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}
+80 to 111	u32PartitionType	PartitionType	Word [Unsigned] (0..31)	1 to 64 characters (ASCII) ^{*1*2}
+112	uPartitionCapacity	PartitionCapacity	Word [Unsigned]	0 to 32
+113	uAvailPartitionCapacity	AvailPartitionCapacity	Word [Unsigned]	0 to 32
+114	uUnallocatedPartitionCapacity	UnallocatedPartitionCapacity	Word [Unsigned]	0 to 32

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

6.5 OSS Service Messages

SECS/GEM communication software supports OSS service messages and automatically replies to the messages. Sent or received OSS service messages can be checked in the communication log.

Additionally, the software notifies the processing result of each service message to a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

 Page 175 10039: CITL to CPU

For messages supported by SECS/GEM communication software, refer to the following:

 Page 374 Service Messages

Point

Transaction of all supported OSS service messages can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

6.6 OSS Service for a Control CPU

SECS/GEM communication software provides an OSS service interface for a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

 Page 166 00039: CPU to CITL

For the usage method of an OSS service for a control CPU, refer to the following:

-  Page 537 E87-CMS compliance
-  Page 686 E90-STC compliance

7 E87-CMS COMPLIANT FUNCTION

This chapter explains the E87-CMS compliant function.

7.1 Usage Method

For the usage method of this function, refer to the following:

☞ Page 537 E87-CMS compliance

7.2 Carrier Objects

This section explains carrier objects provided by SECS/GEM communication software.

SECS/GEM communication software instantiates carrier-related information to an object and exchanges the information between the host and equipment using E39-OSS and E87-CMS services. The number of instantiated carrier objects is stored in 'Carrier object count' (Un\G24598). (☞ Page 362 Buffer Memory)

Attributes

The following table shows the attributes of a carrier object.

Name	Format	Access from host	Description
ObjType	ASCII[1..80]* ¹	Read Only	Object type (Carrier)
ObjID	ASCII[1..80]* ¹	Read Only	Carrier ID (CarrierID)
Capacity	U1[1]	Read Only	Capacity (the maximum number of wafers a carrier can hold)* ²
SubstrateCount	U1[1]	Read Only	The number of wafers currently in the carrier* ³
ContentMap	LIST[1..Capacity]	Read Only	List of slot contents LIST[1..Capacity] LIST[2] ASCII[0..80] LotID* ¹ ASCII[0..80] SubstrateID* ¹ ⋮
SlotMap	LIST[1..Capacity]	Read Only	List of slot statuses LIST[1..Capacity] U1[1]SlotStatus ⋮ • 0: UNDEFINED • 1: EMPTY • 2: NOT EMPTY • 3: CORRECTLY OCCUPIED • 4: DOUBLE SLOTTED • 5: CROSS SLOTTED
Usage	ASCII[0..80]* ¹	Read Only	Intended use (Example: PRODUCT, DUMMY, and TEST)
CarrierIDStatus	U1[1]	Read Only	Verification status of a carrier ID • 0: ID NOT READ • 1: WAITING FOR HOST • 2: ID VERIFICATION OK • 3: ID VERIFICATION FAILED
CarrierAccessingStatus	U1[1]	Read Only	Access status to a carrier • 0: NOT ACCESSED • 1: IN ACCESS • 2: CARRIER COMPLETE • 3: CARRIER STOPPED
SlotMapStatus	U1[1]	Read Only	Verification status of a slot map • 0: SLOT MAP NOT READ • 1: WAITING FOR HOST • 2: SLOT MAP VERIFICATION OK • 3: SLOT MAP VERIFICATION FAILED
LocationID	ASCII[0..80]* ¹	Read Only	ID indicating the location of a carrier in equipment

Name	Format	Access from host	Description
Reason	U1 [1]	Read Only	Reason for the occurrence of the state transition No.(14) in Carrier State Model <ul style="list-style-type: none"> • 0: VERIFICATION NEEDED • 1: VERIFICATION BY EQUIPMENT UNSUCCESSFUL • 2: READ FAIL • 3: IMPROPER SUBSTRATE POSITION

*1 Excluding the control characters.

*2 The maximum number of slots of a supported carrier is available. (📖 IC Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual)

*3 Can be stored within the range of 'Capacity.'

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to CMS.

☞ Page 183 00087: CPU to CITL, Page 229 10087: CITL to CPU

Structure labels defined in this product are provided in a sample library.

☞ Page 521 Sample Library

■M+GEM300_CarrierObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2
+40 to 79	u40ObjID	ObjID (CarrierID)	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2
+80	uCapacity	Capacity	Word [Unsigned]	1 to 25
+81	uSubstrateCount	SubstrateCount	Word [Unsigned]	0 to 25
+82 to 2081	st25ContentMap	ContentMap	M+GEM300_ContentMap (0..24)	☞ Page 61 M+GEM300_ContentMap
+2082 to 2106	st25SlotMap	SlotMap	M+GEM300_SlotMap (0..24)	☞ Page 61 M+GEM300_SlotMap
+2107 to 2146	u40Usage	Usage	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII)*1*2
+2147	uCarrierIDStatus	CarrierIDStatus	Word [Unsigned]	<ul style="list-style-type: none"> • 0: ID NOT READ • 1: WAITING FOR HOST • 2: ID VERIFICATION OK • 3: ID VERIFICATION FAILED
+2148	uCarrierAccessingStatus	CarrierAccessingStatus	Word [Unsigned]	<ul style="list-style-type: none"> • 0: NOT ACCESSED • 1: IN ACCESS • 2: CARRIER COMPLETE • 3: CARRIER STOPPED
+2149	uSlotMapStatus	SlotMapStatus	Word [Unsigned]	<ul style="list-style-type: none"> • 0: SLOT MAP NOT READ • 1: WAITING FOR HOST • 2: SLOT MAP VERIFICATION OK • 3: SLOT MAP VERIFICATION FAILED
+2189	u40LocationID	LocationID	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII)*1*2
+2190	uReason	Reason	Word [Unsigned]	<ul style="list-style-type: none"> • 0: VERIFICATION NEEDED • 1: VERIFICATION BY EQUIPMENT UNSUCCESSFUL • 2: READ FAIL • 3: IMPROPER SUBSTRATE POSITION

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_ContentMap

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40LotID	LotID	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII)*1*2
+40 to 79	u40SubstrateID	SubstrateID	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII)*1*2

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_SlotMap

Offset	Label name	Name	Data type	Applicable range
+0	uSlotStatus	SlotStatus	Word [Unsigned]	<ul style="list-style-type: none"> • 0: UNDEFINED • 1: EMPTY • 2: NOT EMPTY • 3: CORRECTLY OCCUPIED • 4: DOUBLE SLOTTED • 5: CROSS SLOTTED

7.3 CMS Service Messages

SECS/GEM communication software supports CMS service messages and automatically replies to the messages. Sent or received CMS service messages can be checked in the communication log.

Additionally, the software notifies the processing result of each service message to a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

 Page 229 10087: CITL to CPU

For messages supported by SECS/GEM communication software, refer to the following:

 Page 374 Service Messages

Point

Transaction of all supported CMS service messages can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

7.4 CMS Service for a Control CPU

SECS/GEM communication software provides a CMS service interface for a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

 Page 183 00087: CPU to CITL

For the usage method of a CMS service for a control CPU, refer to the following:

 Page 537 E87-CMS compliance

7.5 CMS State Model Management

SECS/GEM communication software supports the following state models:

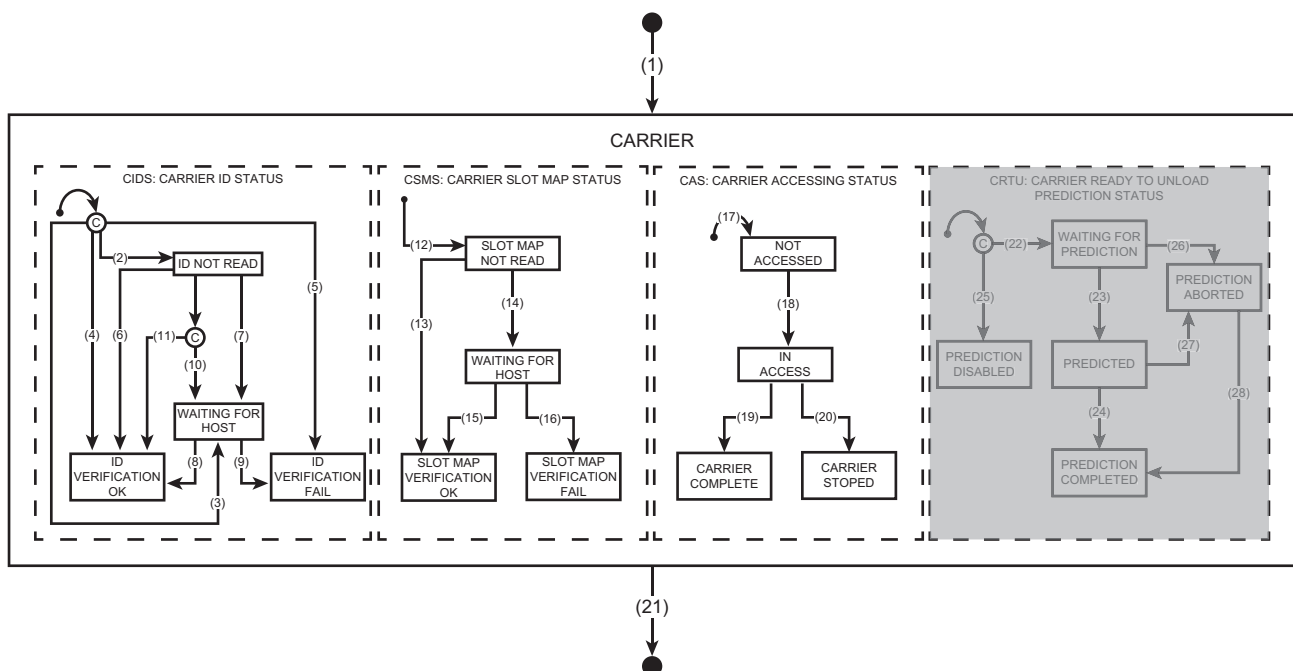
-  Page 63 Carrier State Model
-  Page 69 Load Port Transfer State Model
-  Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)
-  Page 77 Load Port/Carrier Association State Model
-  Page 80 Access Mode State Model

Carrier State Model

Values of carrier object attributes (CarrierIDStatus, SlotMapStatus, and CarrierAccessingStatus) are managed according to the diagram of Carrier State Model and the event report (S6F11) is sent to the host at each state transition.

For details on the event report (S6F11), refer to the following:

-  Page 508 CMS Reports, Page 509 CMS Events



 Not supported



For the Harel notation used in the state model diagram, refer to 'R1-5 Harel Notation' in SEMI E30 (GEM).

State transition of a model diagram

The following table shows the state transition of the Carrier State Model diagram.

Point

- Numbers in the table indicate numbers (1) to (28) of state transition described in the model diagram.
- To manage the state model in a control CPU, use '00087-00003: CarrierObject SetAttr request' or '00087-00004: CarrierObject GetAttr request.' This allows only the values of CarrierIDStatus, SlotMapStatus, and CarrierAccessingStatus to be changed.

—: State transition which is not supported by this product

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(1)	(NO STATE)	A carrier object is instantiated. (Refer to the state transition No.(2), (3), (4), and (5).)	CARRIER	Refer to the action of state transition No.(2), (3), (4), (5), (12), and (17).
(2)	(NO STATE)	<ul style="list-style-type: none"> ① A 'Bind (S3F17)' service message is received from the host. (☞ Page 380 S3F17: Bind) ② A 'CarrierNotification (S3F17)' service message is received from the host. (☞ Page 400 S3F17: CarrierNotification)*¹ ③ The state transition is changed from No.(21). (When a 'CarrierReCreate (S3F17)' service message with PropertiesList provided is received) (☞ Page 407 S3F17: CarrierReCreate)*¹ 	ID NOT READ	<ul style="list-style-type: none"> ■Common action for ①, ②, and ③ <ul style="list-style-type: none"> Generating the instance of a carrier object Changing the CarrierIDStatus attribute value to '0: ID NOT READ' Sending the 'CEID 30000: NO STATE to ID NOT READ' event report (S6F11) to the host ■Common action for ① and ② <ul style="list-style-type: none"> Sending 'Carrier Action Acknowledge (S3F18)' to the host (☞ Page 418 S3F18: Carrier Action Acknowledge) ■Action only for ① <ul style="list-style-type: none"> Sending '10087-00901: Bind service notification' to a control CPU (☞ Page 275 00901: Bind service notification) ■Action only for ② <ul style="list-style-type: none"> Sending '10087-00910: CarrierNotification service notification' to a control CPU (☞ Page 284 00910: CarrierNotification service notification) ■Action only for ③ <ul style="list-style-type: none"> None (Refer to ④ of the state transition No.(21).)
(3)	(NO STATE)	<p>'00087-00501: CarrierID read successful notification' is received from a control CPU. (☞ Page 220 00501: CarrierID read successful notification)*¹</p> <p>■Unregistered carriers in the following two cases are targeted. (☞ Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> An unregistered carrier is delivered to an available load port. An unregistered carrier is delivered to another load port for which the 'Bind' service is used. 	WAITING FOR HOST	<ul style="list-style-type: none"> Generating the instance of a carrier object Changing the CarrierIDStatus attribute value to '1: WAITING FOR HOST' Sending the 'CEID 30001: NOSTATE to WAITING FOR HOST' event report (S6F11) to the host Sending '10087-00501: CarrierID read successful response' to a control CPU (☞ Page 265 00501: CarrierID read successful response)
(4)	(NO STATE)	<p>A 'ProceedWithCarrier (S3F17)' service message is received from the host in response to the 'CEID 30054: CarrierID Read Fail' event or 'CEID 30057: Unknown CarrierID' event notified by the equipment to the host. (☞ Page 411 S3F17: ProceedWithCarrier)*¹</p> <p>(When the host instructs to continue processing as a carrier ID that is not registered in advance as a result of notifying the host of the failure or unavailability of carrier ID reading for a carrier loaded to a load port in the NOT ASSOCIATED state)</p>	ID VERIFICATION OK	<ul style="list-style-type: none"> Generating the instance of a carrier object Changing the CarrierIDStatus attribute value to '2: ID VERIFICATION OK' Sending 'Carrier Action Acknowledge (S3F18)' to the host (☞ Page 418 S3F18: Carrier Action Acknowledge) Sending the 'CEID 30002: NOSTATE to ID VERIFICATIONOK' event report (S6F11) to the host Sending '10087-00918: ProceedWithCarrier service notification' to a control CPU (☞ Page 292 00918: ProceedWithCarrier service notification)
(5)	(NO STATE)	<p>A 'CancelCarrier (S3F17)' service message is received from the host in response to the 'CEID 30054: CarrierID Read Fail' event or 'CEID 30057: Unknown CarrierID' event notified by the equipment to the host. (☞ Page 387 S3F17: CancelCarrier)*¹</p> <p>(When the host instructs to cancel processing as a carrier ID that is not registered in advance as a result of notifying the host of the failure or unavailability of carrier ID reading for a carrier loaded to a load port in the NOT ASSOCIATED state)</p>	ID VERIFICATION FAIL	<ul style="list-style-type: none"> Generating the instance of a carrier object Changing the CarrierIDStatus attribute value to '3: ID VERIFICATIONFAILED' Sending 'Carrier Action Acknowledge (S3F18)' to the host (☞ Page 418 S3F18: Carrier Action Acknowledge) Sending the 'CEID 30003: NOSTATE to ID VERIFICATIONFAIL' event report (S6F11) to the host Sending '10087-00904: CancelCarrier service notification' to a control CPU (☞ Page 278 00904: CancelCarrier service notification)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(6)	ID NOT READ	<p>'00087-00501: CarrierID read successful notification' is received from a control CPU. (☞ Page 220 00501: CarrierID read successful notification)*¹</p> <p>■Registered carriers that succeed in equipment verification in the following three cases are targeted. (☞ Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> • A carrier registered by using the 'Bind' service is delivered to a load port for which the 'Bind' service is used. • A carrier registered by using the 'Bind' service is delivered to an available load port. • A carrier registered by using the 'CarrierNotification' service is delivered to an available load port. <p>If a 'ProceedWithCarrier (S3F17)' service message is received, an error is returned. (☞ Page 411 S3F17: ProceedWithCarrier)</p>	ID VERIFICATION OK	<ul style="list-style-type: none"> • Changing the CarrierIDStatus attribute value to '2: ID VERIFICATION OK' • Sending the 'CEID 30004: IDNOT READ to ID VERIFICATIONOK' event report (S6F11) to the host • Sending '10087-00501: CarrierID read successful response' to a control CPU (☞ Page 265 00501: CarrierID read successful response)
(7)	ID NOT READ	<ul style="list-style-type: none"> • ① '00087-00501: CarrierID read successful notification' is received from a control CPU. (☞ Page 220 00501: CarrierID read successful notification)*¹ • ② '00087-00502: CarrierID read fail notification' is received from a control CPU. (☞ Page 221 00502: CarrierID read fail notification)*¹ <p>■For ①, registered carriers in the following two cases are targeted. (☞ Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> • A carrier registered by using the 'Bind' service is delivered to another load port for which the 'Bind' service is used. • A carrier registered by using the 'CarrierNotification' service is delivered to another load port for which the 'Bind' service is used. <p>■For ②, a carrier associated with a load port in the following case is targeted. (☞ Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> • Carrier ID reading fails for a carrier delivered to a load port reserved by using the 'Bind' service. 	WAITING FOR HOST	<p>■Common action for ① and ②</p> <ul style="list-style-type: none"> • Changing the CarrierIDStatus attribute value to '1: WAITING FOR HOST' • Sending the 'CEID 30005: ID NOT READ to WAITING FOR HOST' event report (S6F11) to the host <p>■Action only for ①</p> <ul style="list-style-type: none"> • Sending '10087-00501: CarrierID read successful response' to a control CPU (☞ Page 265 00501: CarrierID read successful response) <p>■Action only for ②</p> <ul style="list-style-type: none"> • Sending '10087-00502: CarrierID read fail response' to a control CPU (☞ Page 267 00502: CarrierID read fail response)
(8)	WAITING FOR HOST	A 'ProceedWithCarrier (S3F17)' service message is received from the host. (☞ Page 411 S3F17: ProceedWithCarrier)* ¹	ID VERIFICATION OK	<ul style="list-style-type: none"> • Changing the CarrierIDStatus attribute value to '2: ID VERIFICATION OK' • Sending 'Carrier Action Acknowledge (S3F18)' to the host (☞ Page 418 S3F18: Carrier Action Acknowledge) • Sending the 'CEID 30006: WAITING FOR HOST to ID VERIFICATION OK' event report (S6F11) to the host • Sending '10087-00918: ProceedWithCarrier service notification' to a control CPU (☞ Page 292 00918: ProceedWithCarrier service notification)
(9)	WAITING FOR HOST	A 'CancelCarrier (S3F17)' service message is received from the host. (☞ Page 387 S3F17: CancelCarrier)* ¹	ID VERIFICATION FAIL	<ul style="list-style-type: none"> • Changing the CarrierIDStatus attribute value to '3: ID VERIFICATION FAILED' • Sending 'Carrier Action Acknowledge (S3F18)' to the host (☞ Page 418 S3F18: Carrier Action Acknowledge) • Sending the 'CEID 30007: WAITING FOR HOST to ID VERIFICATION FAIL' event report (S6F11) to the host • Sending '10087-00904: CancelCarrier service notification' to a control CPU (☞ Page 278 00904: CancelCarrier service notification)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(10)	ID NOT READ	<p>'00087-00503: Unknown CarrierID notification' is received from a control CPU. (When the PortAssociationState attribute value of a specified load port is '1: ASSOCIATED' and its CarrierIDReaderStatus attribute value is '0: UNAVAILABLE,' and the BypassReadID equipment constant value is 'false') (Page 222 00503: Unknown CarrierID notification)*1*2*3</p> <p>■A carrier associated with a load port in the following case is targeted. (Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> A carrier is delivered to a load port reserved by using the 'Bind' service while BypassReadID is false. 	WAITING FOR HOST	<ul style="list-style-type: none"> Changing the CarrierIDStatus attribute value to '1: WAITING FOR HOST' Sending the 'CEID 30008: ID NOT READ to WAITING FOR HOST' event report (S6F11) to the host Sending '10087-00503: Unknown CarrierID response' to a control CPU (Page 268 00503: Unknown CarrierID response)
(11)	ID NOT READ	<p>'00087-00503: Unknown CarrierID notification' is received from a control CPU. (When the PortAssociationState attribute value of a specified load port is '1: ASSOCIATED' and its CarrierIDReaderStatus attribute value is '0: UNAVAILABLE,' and the BypassReadID equipment constant value is 'true') (Page 222 00503: Unknown CarrierID notification)*1*2*3</p> <p>■A carrier associated with a load port in the following case is targeted. (Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> A carrier is delivered to a load port reserved by using the 'Bind' service while BypassReadID is true. 	ID VERIFICATION OK	<ul style="list-style-type: none"> Changing the CarrierIDStatus attribute value to '2: ID VERIFICATION OK' Sending the 'CEID 30009: ID NOT READ to ID VERIFICATION OK' event report (S6F11) to the host Sending '10087-00503: Unknown CarrierID response' to a control CPU (Page 268 00503: Unknown CarrierID response)
(12)	(NO STATE)	A carrier is instantiated. (Refer to the state transition No.(2), (3), (4), and (5).)	SLOT MAP NOT READ	Changing the SlotMapStatus attribute value to '0: SLOT MAP NOT READ'
(13)	SLOT MAP NOT READ	'00087-00601: SlotMap verification ok notification' is received from a control CPU. (Page 224 00601: SlotMap verification ok notification)*1	SLOT MAP VERIFICATION OK	<ul style="list-style-type: none"> Changing the SlotMapStatus attribute value to '2: SLOT MAP VERIFICATION OK' Sending the 'CEID 30010: SLOT MAP NOT READ to SLOT MAP VERIFICATION OK' event report (S6F11) to the host Sending '10087-00601: SlotMap verification ok response' to a control CPU (Page 270 00601: SlotMap verification ok response)
(14)	SLOT MAP NOT READ	<ul style="list-style-type: none"> ① '00087-00602: SlotMap waiting for host verification notification' is received from a control CPU. (Page 225 00602: SlotMap waiting for host verification notification)*1 ② '00087-00603: SlotMap verification fail notification' is received from a control CPU. (Page 226 00603: SlotMap verification fail notification)*1 ③ '00087-00604: SlotMap read fail notification' is received from a control CPU. (Page 227 00604: SlotMap read fail notification)*1 ④ '00087-00605: SlotMap abnormal substrate position notification' is received from a control CPU. (Page 228 00605: SlotMap abnormal substrate position notification)*1 	WAITING FOR HOST	<p>■Common action for ①, ②, ③, and ④</p> <ul style="list-style-type: none"> Changing the SlotMapStatus attribute value to '1: WAITING FOR HOST' Sending the 'CEID 30011: SLOT MAP NOT READ to WAITING FOR HOST' event report (S6F11) to the host <p>■Action only for ①</p> <ul style="list-style-type: none"> Changing the Reason attribute value to '0: VERIFICATION NEEDED' Sending '10087-00602: SlotMap waiting for host verification response' to a control CPU (Page 271 00602: SlotMap waiting for host verification response) <p>■Action only for ②</p> <ul style="list-style-type: none"> Changing the Reason attribute value to '1: VERIFICATION BY EQUIPMENT UNSUCCESSFUL' Sending '10087-00603: SlotMap verification fail response' to a control CPU (Page 272 00603: SlotMap verification fail response) <p>■Action only for ③</p> <ul style="list-style-type: none"> Changing the Reason attribute value to '2: READ FAIL' Sending '10087-00604: SlotMap read fail response' to a control CPU (Page 273 00604: SlotMap read fail response) <p>■Action only for ④</p> <ul style="list-style-type: none"> Changing the Reason attribute value to '3: IMPROPER SUBSTRATE POSITION' Sending '10087-00605: SlotMap abnormal substrate position response' to a control CPU (Page 274 00605: SlotMap abnormal substrate position response)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(15)	WAITING FOR HOST	A 'ProceedWithCarrier (S3F17)' service message is received from the host. (☞ Page 411 S3F17: ProceedWithCarrier)* ¹	SLOT MAP VERIFICATION OK	<ul style="list-style-type: none"> Changing the SlotMapStatus attribute value to '2: SLOT MAP VERIFICATION OK' Sending 'Carrier Action Acknowledge (S3F18)' to the host (☞ Page 418 S3F18: Carrier Action Acknowledge) Sending the 'CEID 30012: WAITING FOR HOST to SLOT MAP VERIFICATION OK' event report (S6F11) to the host Sending '10087-00918: ProceedWithCarrier service notification' to a control CPU (☞ Page 292 00918: ProceedWithCarrier service notification)
(16)	WAITING FOR HOST	A 'CancelCarrier (S3F17)' service message is received from the host. (☞ Page 387 S3F17: CancelCarrier)* ¹	SLOT MAP VERIFICATION FAIL	<ul style="list-style-type: none"> Changing the SlotMapStatus attribute value to '3: SLOT MAP VERIFICATION FAILED' Sending 'Carrier Action Acknowledge (S3F18)' to the host (☞ Page 418 S3F18: Carrier Action Acknowledge) Sending the 'CEID 30013: WAITING FOR HOST to SLOT MAP VERIFICATION FAIL' event report (S6F11) to the host Sending '10087-00904: CancelCarrier service notification' to a control CPU (☞ Page 278 00904: CancelCarrier service notification)
(17)	(NO STATE)	A carrier is instantiated. (Refer to the state transition No.(2), (3), (4), and (5).)	NOT ACCESSED	Changing the CarrierAccessingStatus attribute value to '0: NOT ACCESSED'
(18)	NOT ACCESSED	'00087-00311: Carrier accessing started notification' is received from a control CPU. (☞ Page 207 00311: Carrier accessing started notification)* ¹	IN ACCESS	<ul style="list-style-type: none"> Changing the CarrierAccessingStatus attribute value to '1: IN ACCESS' Sending the 'CEID 30014: NOT ACCESSED to IN ACCESS' event report (S6F11) to the host Sending '10087-00311: Carrier accessing started response' to a control CPU (☞ Page 251 00311: Carrier accessing started response)
(19)	IN ACCESS	'00087-00313: Carrier accessing normally finished notification' is received from a control CPU. (☞ Page 209 00313: Carrier accessing normally finished notification)* ¹	CARRIER COMPLETE	<ul style="list-style-type: none"> Changing the CarrierAccessingStatus attribute value to '2: CARRIER COMPLETE' Sending the 'CEID 30015: IN ACCESS to CARRIER COMPLETE' event report (S6F11) to the host Sending '10087-00313: Carrier accessing normally finished response' to a control CPU (☞ Page 253 00313: Carrier accessing normally finished response)
(20)	IN ACCESS	'00087-00314: Carrier accessing abnormally finished notification' is received from a control CPU. (☞ Page 210 00314: Carrier accessing abnormally finished notification)* ¹	CARRIER STOPPED	<ul style="list-style-type: none"> Changing the CarrierAccessingStatus attribute value to '3: CARRIER STOPPED' Sending the 'CEID 30016: IN ACCESS to CARRIER STOPPED' event report (S6F11) to the host Sending '10087-00314: Carrier accessing abnormally finished response' to a control CPU (☞ Page 254 00314: Carrier accessing abnormally finished response)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(21)	CARRIER	<ul style="list-style-type: none"> ① '00087-00305: UNLOAD completed notification' is received from a control CPU. (Case in which the processing is successfully completed) (Page 201 00305: UNLOAD completed notification) ② A 'CancelBind (S3F17)' service message is received from the host. (Page 384 S3F17: CancelBind) ③ A 'CancelCarrierNotification (S3F17)' service message is received from the host. (Page 395 S3F17: CancelCarrierNotification)*¹ ④ A 'CarrierReCreate (S3F17)' service message is received from the host. (Page 407 S3F17: CarrierReCreate)*¹ ⑤ '00087-00501: CarrierID read successful notification' is received from a control CPU. (Page 220 00501: CarrierID read successful notification)*¹ ⑥ '00087-00415: UNLOAD completed and Carrier move started to Load Port notification' is received from a control CPU. (Page 219 00415: UNLOAD completed and Carrier move started to Load Port notification)*¹ <p>■For ⑤, other carriers for which the 'Bind' service is used in the following three cases are targeted. (Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> A carrier registered by using the 'Bind' service is delivered to another load port for which the 'Bind' service is used. A carrier registered by using the 'CarrierNotification' service is delivered to another load port for which the 'Bind' service is used. An unregistered carrier is delivered to another load port for which the 'Bind' service is used. 	(NO STATE)	<p>■Common action for ①, ②, ③, ④, ⑤, and ⑥</p> <ul style="list-style-type: none"> Deleting an instance. Sending the 'CEID 30017: CARRIER to NO STATE' event report (S6F11) to the host <p>■Action only for ①</p> <ul style="list-style-type: none"> Sending '10087-00305: UNLOAD completed response' to a control CPU (Page 245 00305: UNLOAD completed response) <p>■Common action for ②, ③, and ④</p> <ul style="list-style-type: none"> Sending 'Carrier Action Acknowledge (S3F18)' to the host (prior to the event report (S6F11)) (Page 418 S3F18: Carrier Action Acknowledge) <p>■Action only for ②</p> <ul style="list-style-type: none"> Sending '10087-00903: CancelBind service notification' to a control CPU (Page 277 00903: CancelBind service notification) <p>■Action only for ③</p> <ul style="list-style-type: none"> Sending '10097-00906: CancelCarrierNotification service notification' to a control CPU (Page 280 00906: CancelCarrierNotification service notification) <p>■Action only for ④</p> <ul style="list-style-type: none"> Sending '10087-00912: CarrierReCreate service notification' to a control CPU (Page 286 00912: CarrierReCreate service notification) <p>[When PropertiesList is not provided] Not creating a new instance [When PropertiesList is provided] Creating a new instance in the state transition No.(2)</p> <p>■Action only for ⑤</p> <ul style="list-style-type: none"> Sending '10087-00501: CarrierID read successful response' to a control CPU (Page 265 00501: CarrierID read successful response) <p>■Action only for ⑥</p> <ul style="list-style-type: none"> Sending '10087-00415: UNLOAD completed and Carrier move started to Load Port response' to a control CPU (Page 263 00415: UNLOAD completed and Carrier move started to Load Port response)
(22)	(NO STATE)	—	WAITING FOR PREDICTION	—
(23)	WAITING FOR PREDICTION	—	PREDICTED	—
(24)	PREDICTED	—	PREDICTION COMPLETED	—
(25)	(NO STATE)	—	PREDICTION DISABLED	—
(26)	WAITING FOR PREDICTION	—	PREDICTION ABORTED	—
(27)	PREDICTED	—	PREDICTION ABORTED	—
(28)	PREDICTION ABORTED	—	PREDICTION COMPLETED	—

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

*2 If a carrier ID reader for a load port is no longer available, use '00087-00204: ID READER unavailable notification.'

*3 To change the value of BypassReadID, use the equipment constant function of SEMI E30 (GEM).

Precautions

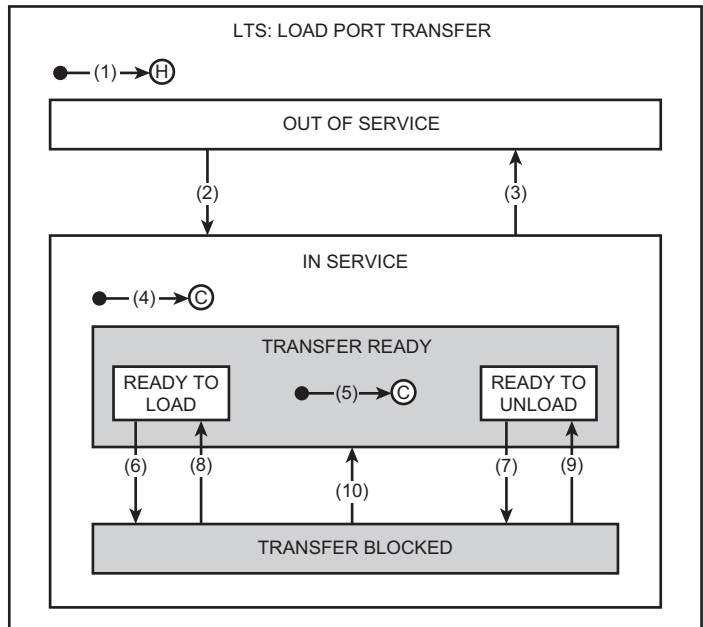
SECS/GEM communication software does not support 'Carrier Ready To Unload (CRTU).'

Load Port Transfer State Model

Values of the load object attribute (PortTransferState) are managed according to the diagram of a load port transport status model and the event report (S6F11) is sent to the host at each state transition.

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events



For the Harel notation used in the state model diagram, refer to 'R1-5 Harel Notation' in SEMI E30 (GEM).

State transition of a model diagram

The following table shows the state transition of the load port transport status model diagram.

Point

- Numbers in the table indicate numbers (1) to (10) of state transition described in the model diagram.
- To manage the state model in a control CPU, use '00039-00103: LoadPortObject SetAttr request' or '00039-00104: LoadPortObject GetAttr request.' This allows only the value of PortTransferState to be changed.
- Attribute values changed by an action of SECS/GEM communication software can be checked in the following buffer memories after an acknowledge/response or notification for a trigger is sent to a control CPU. ( Page 362 Buffer Memory)
 - Port transfer state (Un\G24577 to 24592)
 - Service status (Un\G24593)
 - In service status (Un\G24594)
 - Transfer ready status (Un\G24595)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(1)	(NO STATE)	'00000-00002: LoadPort initial request' is received from a control CPU. (Page 162 00002 : LoadPort initial request)	OUT OF SERVICE, TRANSFER BLOCKED, or READY TO LOAD (History)	<ul style="list-style-type: none"> • Generating an instance • Changing the value of the PortTransferState attribute to that of PortTransferHistory specified in '00000-00002: LoadPort initial request' (Page 162 00002 : LoadPort initial request) • Sending '10000-00002: LoadPort initial acknowledge' to a control CPU (Page 164 00002 : LoadPort initial acknowledge) ■When the PortTransferHistory attribute is '0: OUT OF SERVICE' <ul style="list-style-type: none"> • Sending the 'CEID 30025: NO STATE to OUT OF SERVICE' event report (S6F11) to the host ■When the PortTransferHistory attribute is '1: TRANSFER BLOCKED' <ul style="list-style-type: none"> • Changing the ServiceStatus attribute value to '1: IN SERVICE' • Changing the InServiceStatus attribute value to '1: TRANSFER BLOCKED' • Sending the 'CEID 30026: NO STATE to IN SERVICE' event report (S6F11) to the host • Sending the 'CEID 30030: IN SERVICE to TRANSFER BLOCKED' event report (S6F11) to the host ■When the PortTransferHistory attribute is '2: READY TO LOAD' <ul style="list-style-type: none"> • Changing the ServiceStatus attribute value to '1: IN SERVICE' • Changing the InServiceStatus attribute value to '0: TRANSFER READY' • Changing the TransferReadyStatus attribute value to '0: READY TO LOAD' • Sending the 'CEID 30026: NO STATE to IN SERVICE' event report (S6F11) to the host • Sending the 'CEID 30029: IN SERVICE to TRANSFER READY' event report (S6F11) to the host • Sending the 'CEID 30031: TRANSFER READY to READY TO LOAD' event report (S6F11) to the host ■When the PortTransferHistory attribute value is '3: READY TO UNLOAD' <ul style="list-style-type: none"> • Changing the ServiceStatus attribute value to '1: IN SERVICE' • Changing the InServiceStatus attribute value to '0: TRANSFER READY' • Changing the TransferReadyStatus attribute value to '1: READY TO UNLOAD' • Sending the 'CEID 30026: NO STATE to IN SERVICE' event report (S6F11) to the host • Sending the 'CEID 30029: IN SERVICE to TRANSFER READY' event report (S6F11) to the host • Sending the 'CEID 30032: TRANSFER READY to READY TO UNLOAD' event report (S6F11) to the host
(2)	OUT OF SERVICE	'00087-00201: IN SERVICE request' is received from a control CPU. (Page 193 00201: IN SERVICE request)	IN SERVICE	<ul style="list-style-type: none"> • Changing the ServiceStatus attribute value to '1: IN SERVICE' • Sending the 'CEID 30027: OUT OF SERVICE to IN SERVICE' event report (S6F11) to the host • Transitioning to the state transition No.(4) • Sending '10087-00201: IN SERVICE acknowledge' to a control CPU (Page 237 00201: IN SERVICE acknowledge)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(3)	IN SERVICE	'00087-00202: OUT OF SERVICE request' is received from a control CPU. (Page 194 00202: OUT OF SERVICE request)	OUT OF SERVICE	<ul style="list-style-type: none"> Changing the PortTransferState attribute value to '0: OUT OF SERVICE' Changing the ServiceStatus attribute value to '0: OUT OF SERVICE' Sending the 'CEID 30028: IN SERVICE to OUT OF SERVICE' event report (S6F11) to the host Sending '10087-00202: OUT OF SERVICE acknowledge' to a control CPU (Page 238 00202: OUT OF SERVICE acknowledge)
(4)	IN SERVICE	The state transition is changed from No.(2).	TRANSFER READY or TRANSFER BLOCKED	<p>■When the InServiceStatus attribute value is '0: TRANSFER READY'</p> <ul style="list-style-type: none"> Sending the 'CEID 30029: IN SERVICE to TRANSFER READY' event report (S6F11) to the host Transitioning to the state transition No.(5) <p>■When the InServiceStatus attribute value is '1: TRANSFER BLOCKED'</p> <ul style="list-style-type: none"> Changing the PortTransferState attribute value to '1: TRANSFER BLOCKED' Sending the 'CEID 30030: IN SERVICE to TRANSFER BLOCKED' event report (S6F11) to the host
(5)	TRANSFER READY	<ul style="list-style-type: none"> ❶ The state transition is changed from No.(4). ❷ The state transition is changed from No.(10). 	READY TO LOAD or READY TO UNLOAD	<p>■When the TransferReadyStatus attribute value is '0: READY TO LOAD'</p> <ul style="list-style-type: none"> Changing the PortTransferState attribute value to '2: READY TO LOAD' Sending the 'CEID 30031: TRANSFER READY to READY TO LOAD' event report (S6F11) to the host <p>■When the TransferReadyStatus attribute value is '1: READY TO UNLOAD'</p> <ul style="list-style-type: none"> Changing the PortTransferState attribute value to '3: READY TO UNLOAD' Sending the 'CEID 30032: TRANSFER READY to READY TO UNLOAD' event report (S6F11) to the host
(6)	READY TO LOAD	<ul style="list-style-type: none"> ❶ '00087-00301: LOAD started notification' is received from a control CPU. (Page 197 00301: LOAD started notification) ❷ '00087-00413: Carrier move started to Load Port notification' is received from a control CPU. (Page 217 00413: Carrier move started to Load Port notification)^{*1} 	TRANSFER BLOCKED	<p>■Common action for ❶ and ❷</p> <ul style="list-style-type: none"> Changing the PortTransferState attribute value to '1: TRANSFER BLOCKED' Changing the InServiceStatus attribute value to '1: TRANSFER BLOCKED' Sending the 'CEID 30033: READY TO LOAD to TRANSFER BLOCKED' event report (S6F11) to the host <p>■Action only for ❶</p> <ul style="list-style-type: none"> Sending '10087-00301: LOAD started response' to a control CPU (Page 241 00301: LOAD started response) <p>■Action only for ❷</p> <ul style="list-style-type: none"> Sending '10087-00413: Carrier move started to Load Port response' to a control CPU (Page 261 00413: Carrier move started to Load Port response)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(7)	READY TO UNLOAD	<ul style="list-style-type: none"> ❶ A 'CarrierReCreate (S3F17)' service message is received from the host. (☞ Page 407 S3F17: CarrierReCreate)*¹ ❷ '00087-00304: UNLOAD started notification' is received from a control CPU. (☞ Page 200 00304: UNLOAD started notification) ❸ '00087-00411: Carrier move started to Internal Buffer notification' is received from a control CPU. (☞ Page 215 00411: Carrier move started to Internal Buffer notification)*¹ 	TRANSFER BLOCKED	<p>■ Common action for ❶, ❷, and ❸</p> <ul style="list-style-type: none"> Changing the PortTransferState attribute value to '1: TRANSFER BLOCKED' Changing the InServiceStatus attribute value to '1: TRANSFER BLOCKED' Sending the 'CEID 30034: READY TO UNLOAD to TRANSFER BLOCKED' event report (S6F11) to the host <p>■ Action only for ❶</p> <ul style="list-style-type: none"> Sending 'Carrier Action Acknowledge (S3F18)' to the host (prior to the event report (S6F11)) (☞ Page 418 S3F18: Carrier Action Acknowledge) Sending '10087-00912: CarrierReCreate service notification' to a control CPU (☞ Page 286 00912: CarrierReCreate service notification) <p>■ Action only for ❷</p> <ul style="list-style-type: none"> Sending '10087-00304: UNLOAD started response' to a control CPU (☞ Page 244 00304: UNLOAD started response) <p>■ Action only for ❸</p> <ul style="list-style-type: none"> Sending '10087-00411: Carrier move started to Internal Buffer response' to a control CPU (☞ Page 259 00411: Carrier move started to Internal Buffer response)
(8)	TRANSFER BLOCKED	<ul style="list-style-type: none"> ❶ '00087-00305: UNLOAD completed notification' is received from a control CPU. (☞ Page 201 00305: UNLOAD completed notification) ❷ '00087-00412: Carrier move completed to Internal Buffer notification' is received from a control CPU. (☞ Page 216 00412: Carrier move completed to Internal Buffer notification)*¹ 	READY TO LOAD	<p>■ Common action for ❶ and ❷</p> <ul style="list-style-type: none"> Changing the PortTransferState attribute value to '2: READY TO LOAD' Changing the InServiceStatus attribute value to '0: TRANSFER READY' Changing the TransferReadyStatus attribute value to '0: READY TO LOAD' Sending the 'CEID 30035: TRANSFER BLOCKED to READY TO LOAD' event report (S6F11) to the host <p>■ Action only for ❶</p> <ul style="list-style-type: none"> Sending '10087-00305: UNLOAD completed response' to a control CPU (☞ Page 245 00305: UNLOAD completed response) <p>■ Action only for ❷</p> <ul style="list-style-type: none"> Sending '10087-00412: Carrier move completed to Internal Buffer response' to a control CPU (☞ Page 260 00412: Carrier move completed to Internal Buffer response)
(9)	TRANSFER BLOCKED	'00087-00303: UNLOAD available notification' is received from a control CPU. (☞ Page 199 00303: UNLOAD available notification)	READY TO UNLOAD	<ul style="list-style-type: none"> Changing the PortTransferState attribute value to '3: READY TO UNLOAD' Changing the InServiceStatus attribute value to '0: TRANSFER READY' Changing the TransferReadyStatus attribute value to '1: READY TO UNLOAD' Sending the 'CEID 30036: TRANSFER BLOCKED to READY TO UNLOAD' event report (S6F11) to the host Sending '10087-00303: UNLOAD available response' to a control CPU (☞ Page 243 00303: UNLOAD available response)
(10)	TRANSFER BLOCKED	'00087-00306: TRANSFER failed notification' is received from a control CPU. (☞ Page 202 00306: TRANSFER failed notification)	TRANSFER READY	<ul style="list-style-type: none"> Changing the InServiceStatus attribute value to '0: TRANSFER READY' Sending the 'CEID 30037: TRANSFER BLOCKED to TRANSFER READY' event report (S6F11) to the host Transitioning to the state transition No.(5) Sending '10087-00306: TRANSFER failed response' to a control CPU

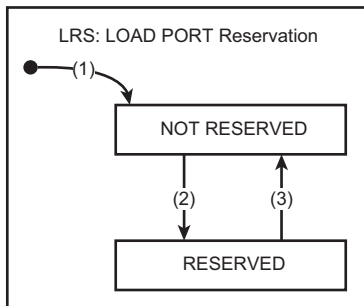
*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

Load Port Reservation State Model (internal buffer equipment/ fixed buffer equipment)

Values of the load port object attribute (LoadPortReservationState) are managed according to the diagram of Load Port Reservation State Model and the event report (S6F11) is sent to the host at each state transition.

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events



For the Harel notation used in the state model diagram, refer to 'R1-5 Harel Notation' in SEMI E30 (GEM).

State transition of a model diagram

The following table shows the state transition of the Load Port Reservation State Model diagram.

Point

- Numbers in the table indicate numbers (1) to (3) of state transition described in the model diagram.
- To manage the state model in a control CPU, use '00039-00103: LoadPortObject SetAttr request' or '00039-00104: LoadPortObject GetAttr request.' This allows only the value of LoadPortReservationState to be changed.
- Attribute values changed by an action of SECS/GEM communication software can be checked in the following buffer memory after an acknowledge/response or notification for a trigger is sent to a control CPU.
([Page 362 Buffer Memory](#))
- Port reservation state (Un\G24597)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(1)	(NO STATE)	'00000-00002: LoadPort initial request' is received from a control CPU. (Page 162 00002 : LoadPort initial request)	NOT RESERVED	<ul style="list-style-type: none"> • Changing the LoadPortReservationState attribute value to '0: NOT RESERVED' • Sending '10000-00002: LoadPort initial acknowledge' to a control CPU (Page 164 00002 : LoadPort initial acknowledge)
(2)	NOT RESERVED	<ul style="list-style-type: none"> • ① A 'Bind (S3F17)' service message is received from the host. (Page 380 S3F17: Bind) • ② '00087-00413: Carrier move started to Load Port notification' is received from a control CPU. (Page 217 00413: Carrier move started to Load Port notification) • ③ '00087-00111: Load Port reservation request' is received from a control CPU. (Page 191 00111: Load Port reservation request) • ④ '00087-00415: UNLOAD completed and Carrier move started to Load Port notification' is received from a control CPU. (Page 219 00415: UNLOAD completed and Carrier move started to Load Port notification) • ⑤ A 'ReserveAtPort (S3F25)' service message is received from the host. (Page 426 S3F25: ReserveAtPort)^{*1} 	RESERVED	<ul style="list-style-type: none"> ■ Common action for ①, ②, ③, ④, and ⑤ <ul style="list-style-type: none"> • Changing the LoadPortReservationState attribute value to '1: RESERVED' ■ Common action for ①, ②, and ④ <ul style="list-style-type: none"> • Sending the 'CEID 30038: NOT RESERVED to RESERVED' event report (S6F11) to the host ■ Common action for ③ and ⑤ <ul style="list-style-type: none"> • Sending the 'CEID 30091: NOT RESERVED to RESERVED' event report (S6F11) to the host ■ Action only for ① <ul style="list-style-type: none"> • Sending 'Carrier Action Acknowledge (S3F18)' to the host (prior to the event report (S6F11)) (Page 418 S3F18: Carrier Action Acknowledge) • Sending '10087-00901: Bind service notification' to a control CPU (Page 275 00901: Bind service notification) ■ Action only for ② <ul style="list-style-type: none"> • Sending '10087-00413: Carrier move started to Load Port response' to a control CPU (Page 261 00413: Carrier move started to Load Port response) ■ Action only for ③ <ul style="list-style-type: none"> • Sending '10087-00111: Load Port reservation acknowledge' to a control CPU (Page 235 00111: Load Port reservation acknowledge) ■ Action only for ④ <ul style="list-style-type: none"> • Sending '10087-00415: UNLOAD completed and Carrier move started to Load Port response' to a control CPU (Page 263 00415: UNLOAD completed and Carrier move started to Load Port response) ■ Action only for ⑤ <ul style="list-style-type: none"> • Sending 'Port Action Acknowledge (S3F26)' to the host prior to the event report (S6F11) (Page 428 S3F26: Port Action Acknowledge) • Sending '10087-00919: ReserveAtPort service notification' to a control CPU (Page 293 00919: ReserveAtPort service notification)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(3)	RESERVED	<ul style="list-style-type: none"> • ❶ A 'CancelBind (S3F17)' service message is received from the host. (📖 Page 384 S3F17: CancelBind) • ❷ '00087-00302: LOAD completed notification' is received from a control CPU. (📖 Page 198 00302: LOAD completed notification) • ❸ '00087-00501: CarrierID read successful notification' is received from a control CPU. (📖 Page 220 00501: CarrierID read successful notification) • ❹ '00087-00414: Carrier move completed to Load Port notification' is received from a control CPU. (📖 Page 218 00414: Carrier move completed to Load Port notification) • ❺ '00087-00112: Load Port cancel reservation request' is received from a control CPU. (📖 Page 192 00112: Load Port cancel reservation request) • ❻ A 'CancelReservationAtPort (S3F25)' service message is received from the host. (📖 Page 426 S3F25: ReserveAtPort)^{*1} <p>■For ❸, load ports to which carriers were to be delivered in the following two cases are targeted. (📖 Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> • A carrier registered by using the 'Bind' service is delivered to an available load port. • A carrier registered by using the 'Bind' service is delivered to another load port for which the 'Bind' service is used. 	NOT RESERVED	<p>■Common action for ❶, ❷, ❸, ❹, ❺, and ❻</p> <ul style="list-style-type: none"> • Changing the LoadPortReservationState attribute value to '0: NOT RESERVED' • Sending the 'CEID 30039: RESERVED to NOT RESERVED' event report (S6F11) to the host <p>■Action only for ❶</p> <ul style="list-style-type: none"> • Sending 'Carrier Action Acknowledge (S3F18)' to the host (prior to the event report (S6F11)) (📖 Page 418 S3F18: Carrier Action Acknowledge) • Sending '10087-00903: CancelBind service notification' to a control CPU (📖 Page 277 00903: CancelBind service notification) <p>■Action only for ❷</p> <ul style="list-style-type: none"> • Sending '10087-00302: LOAD completed response' to a control CPU (📖 Page 242 00302: LOAD completed response) <p>■Action only for ❸</p> <ul style="list-style-type: none"> • Sending '10087-00501: CarrierID read successful response' to a control CPU (📖 Page 265 00501: CarrierID read successful response) <p>■Action only for ❹</p> <ul style="list-style-type: none"> • Sending '10087-00414: Carrier move completed to Load Port response' to a control CPU (📖 Page 262 00414: Carrier move completed to Load Port response) <p>■Action only for ❺</p> <ul style="list-style-type: none"> • Sending '10087-00112: Load Port cancel reservation acknowledge' to a control CPU (📖 Page 236 00112: Load Port cancel reservation acknowledge) <p>■Action only for ❻</p> <ul style="list-style-type: none"> • Sending 'Port Action Acknowledge (S3F26)' to the host prior to the event report (S6F11) (📖 Page 428 S3F26: Port Action Acknowledge) • Sending '10087-00908: CancelReservationAtPortservice notification' to a control CPU (📖 Page 282 00908: CancelReservationAtPort service notification)

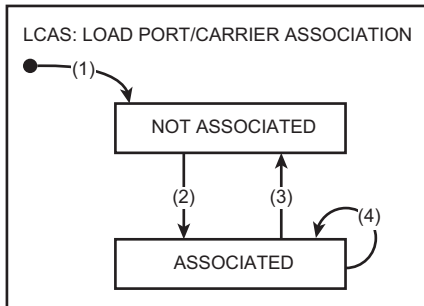
*1 Supported only by SECS/GEM communication software with software version 1.43V or later.

Load Port/Carrier Association State Model

Values of the load port object attribute (PortAssociationState) are managed according to the diagram of Load Port/Carrier Association State Model and the event report (S6F11) is sent to the host at each state transition.

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events



Point

For the Harel notation used in the state model diagram, refer to 'R1-5 Harel Notation' in SEMI E30 (GEM).

State transition of a model diagram

The following table shows the state transition of the Load Port/Carrier Association State Model diagram.

Point

- Numbers in the table indicate numbers (1) to (4) of state transition described in the model diagram.
- To manage the state model in a control CPU, use '00039-00103: LoadPortObject SetAttr request' or '00039-00104: LoadPortObject GetAttr request.' This allows only the value of PortAssociationState to be changed.
- Attribute values changed by an action of SECS/GEM communication software can be checked in the following buffer memory after an acknowledge/response or notification for a trigger is sent to a control CPU.
([Page 362 Buffer Memory](#))
- Port association state (Un\G24596)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(1)	(NO STATE)	'00000-00002: LoadPort initial request' is received from a control CPU. (Page 162 00002 : LoadPort initial request)	NOT ASSOCIATED	<ul style="list-style-type: none"> • Changing the PortAssociationState attribute value to '0: NOT ASSOCIATED' • Sending '10000-00002: LoadPort initial acknowledge' to a control CPU (Page 164 00002 : LoadPort initial acknowledge)
(2)	NOT ASSOCIATED	<ul style="list-style-type: none"> • ❶ A 'Bind (S3F17)' service message is received from the host. (Page 380 S3F17: Bind) • ❷ A 'ProceedWithCarrier (S3F17)' service message is received from the host. (Page 411 S3F17: ProceedWithCarrier) • ❸ A 'CancelCarrier (S3F17)' service message is received from the host. (Page 387 S3F17: CancelCarrier) • ❹ '00087-00501: CarrierID read successful notification' is received from a control CPU. (Page 220 00501: CarrierID read successful notification)*1 • ❺ '00087-00401: Load Port Carrier association request' is received from a control CPU. (Page 211 00401: Load Port Carrier association request)*1 • ❻ '00087-00413: Carrier move started to Load Port notification' is received from a control CPU. (Page 217 00413: Carrier move started to Load Port notification) • ❼ '00087-00415: UNLOAD completed and Carrier move started to Load Port notification' is received from a control CPU. (Page 219 00415: UNLOAD completed and Carrier move started to Load Port notification) <p>■For ❷ and ❸, available load ports in the following two cases are targeted. (Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> • Carrier ID reading fails for a carrier delivered to an available load port. • A carrier is delivered to a load port that is available but the carrier ID reader is not available. <p>■For ❹, available load ports in the following three cases are targeted. (Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> • A carrier registered by using the 'Bind' service is delivered to an available load port. • A carrier registered by using the 'CarrierNotification' service is delivered to an available load port. • An unregistered carrier is delivered to an available load port. <p>■For ❼, an available load port is targeted.</p>	ASSOCIATED	<p>■Common action for ❶, ❷, ❸, ❹, ❺, and ❻</p> <ul style="list-style-type: none"> • Changing the PortAssociationState attribute value to '1: ASSOCIATED' • Sending the 'CEID 30040: NOT ASSOCIATED to ASSOCIATED' event report (S6F11) to the host <p>■Common action for ❶, ❷, and ❸</p> <ul style="list-style-type: none"> • Sending 'Carrier Action Acknowledge (S3F18)' to the host (prior to the event report (S6F11)) (Page 418 S3F18: Carrier Action Acknowledge) <p>■Action only for ❶</p> <ul style="list-style-type: none"> • Sending '10087-00901: Bind service notification' to a control CPU (Page 275 00901: Bind service notification) <p>■Action only for ❷</p> <ul style="list-style-type: none"> • Sending '10087-00918: ProceedWithCarrier service notification' to a control CPU (Page 292 00918: ProceedWithCarrier service notification) <p>■Action only for ❸</p> <ul style="list-style-type: none"> • Sending '10087-00904: CancelCarrier service notification' to a control CPU (Page 278 00904: CancelCarrier service notification) <p>■Action only for ❹</p> <ul style="list-style-type: none"> • Sending '10087-00501: CarrierID read successful response' to a control CPU (Page 265 00501: CarrierID read successful response) <p>■Action only for ❺</p> <ul style="list-style-type: none"> • Sending '10087-00401: Load Port Carrier association acknowledge' to a control CPU (Page 255 00401: Load Port Carrier association acknowledge) <p>■Action only for ❻</p> <ul style="list-style-type: none"> • Sending '10087-00413: Carrier move started to Load Port response' to a control CPU (Page 261 00413: Carrier move started to Load Port response) <p>■Action only for ❼</p> <ul style="list-style-type: none"> • Sending '10087-00415: UNLOAD completed and Carrier move started to Load Port response' to a control CPU (Page 263 00415: UNLOAD completed and Carrier move started to Load Port response)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(3)	ASSOCIATED	<ul style="list-style-type: none"> 1 A 'CancelBind (S3F17)' service message is received from the host. (Page 384 S3F17: CancelBind) 2 '00087-00305: UNLOAD completed notification' is received from a control CPU. (Page 201 00305: UNLOAD completed notification) 3 '00087-00501: CarrierID read successful notification' is received from a control CPU. (Page 220 00501: CarrierID read successful notification)*¹ 4 '00087-00412: Carrier move completed to Internal Buffer notification' is received from a control CPU. (Page 216 00412: Carrier move completed to Internal Buffer notification)*¹ 5 A 'CarrierReCreate (S3F17)' service message without PropertiesList provided is received from the host. (Page 407 S3F17: CarrierReCreate)*¹ 6 '00087-00402: Load Port Carrier cancel association request' is received from a control CPU. (Page 212 00402: Load Port Carrier cancel association request)*¹ <p>■For 3, load ports to which carriers were to be delivered in the following two cases are targeted. (Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> A carrier registered by using the 'Bind' service is delivered to an available load port. A carrier registered by using the 'Bind' service is delivered to another load port for which the 'Bind' service is used. 	NOT ASSOCIATED	<p>■Common action for 1, 2, 3, 4, 5, and 6</p> <ul style="list-style-type: none"> Changing the PortAssociationState attribute value to '0: NOT ASSOCIATED' Sending the 'CEID 30041: ASSOCIATED to NOT ASSOCIATED' event report (S6F11) to the host <p>■Common action for 1 and 5</p> <ul style="list-style-type: none"> Sending 'Carrier Action Acknowledge (S3F18)' to the host (prior to the event report (S6F11)) (Page 418 S3F18: Carrier Action Acknowledge) <p>■Action only for 1</p> <ul style="list-style-type: none"> Sending '10087-00903: CancelBind service notification' to a control CPU (Page 277 00903: CancelBind service notification) <p>■Action only for 2</p> <ul style="list-style-type: none"> Sending '10087-00305: UNLOAD completed response' to a control CPU (Page 245 00305: UNLOAD completed response) <p>■Action only for 3</p> <ul style="list-style-type: none"> Sending '10087-00501: CarrierID read successful response' to a control CPU (Page 245 00305: UNLOAD completed response) <p>■Action only for 4</p> <ul style="list-style-type: none"> Sending '10087-00412: Carrier move completed to Internal Buffer response' to a control CPU (Page 260 00412: Carrier move completed to Internal Buffer response) <p>■Action only for 5</p> <ul style="list-style-type: none"> Sending '10087-00912: CarrierReCreate service notification' to a control CPU (Page 286 00912: CarrierReCreate service notification) <p>■Action only for 6</p> <ul style="list-style-type: none"> Sending '10087-00402: Load Port Carrier cancel association acknowledge' to a control CPU (Page 256 00402: Load Port Carrier cancel association acknowledge)
(4)	ASSOCIATED	<ul style="list-style-type: none"> 1 '00087-00501: CarrierID read successful notification' is received from a control CPU. (Page 220 00501: CarrierID read successful notification)*¹ 2 '00087-00401: Load Port Carrier association request' is received from a control CPU. (Page 211 00401: Load Port Carrier association request)*¹ 3 A 'CarrierReCreate (S3F17)' service message with PropertiesList provided is received from the host. (Page 407 S3F17: CarrierReCreate)*¹ 4 '00087-00415: UNLOAD completed and Carrier move started to Load Port notification' is received from a control CPU. (Page 219 00415: UNLOAD completed and Carrier move started to Load Port notification) <p>■For 1, load ports to which carriers are delivered in the following three cases are targeted. (Page 86 Carrier ID Verification)</p> <ul style="list-style-type: none"> A carrier registered by using the 'Bind' service is delivered to another load port for which the 'Bind' service is used. A carrier registered by using the 'CarrierNotification' service is delivered to another load port for which the 'Bind' service is used. An unregistered carrier is delivered to another load port for which the 'Bind' service is used. 	ASSOCIATED	<p>■Common action for 1, 2, 3, and 4</p> <ul style="list-style-type: none"> Changing the PortAssociationState attribute value to '1: ASSOCIATED' Sending the 'CEID 30042: ASSOCIATED to ASSOCIATED' event report (S6F11) to the host <p>■Action only for 1</p> <ul style="list-style-type: none"> Sending '10087-00501: CarrierID read successful response' to a control CPU (Page 265 00501: CarrierID read successful response) <p>■Action only for 2</p> <ul style="list-style-type: none"> Sending '10087-00401: Load Port Carrier association acknowledge' to a control CPU (Page 255 00401: Load Port Carrier association acknowledge) <p>■Action only for 3</p> <ul style="list-style-type: none"> Sending 'Carrier Action Acknowledge (S3F18)' to the host (prior to the event report (S6F11)) (Page 418 S3F18: Carrier Action Acknowledge) Sending '10087-00912: CarrierReCreate service notification' to a control CPU (Page 286 00912: CarrierReCreate service notification) <p>■Action only for 4</p> <ul style="list-style-type: none"> Sending '10087-00415: UNLOAD completed and Carrier move started to Load Port response' to a control CPU (Page 263 00415: UNLOAD completed and Carrier move started to Load Port response)

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

Access Mode State Model

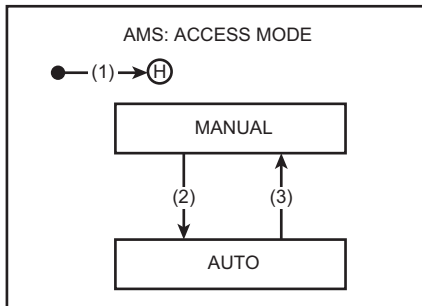
Values of the load port object attribute (AccessMode) are managed according to the diagram of Access Mode State Model and the event report (S6F11) is sent to the host at each state transition.

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

Point

A change request is denied when the reservation status (LoadPortReservationState) of a target load port is 'RESERVED' or when the transfer status (PortTransferState) of the load port is 'TRANSFER BLOCKED.'



Point

For the Harel notation used in the state model diagram, refer to 'R1-5 Harel Notation' in SEMI E30 (GEM).

State transition of a model diagram

The following table shows the state transition of the Access Mode State Model diagram.

Point

- Numbers in the table indicate numbers (1) to (3) of state transition described in the model diagram.
- To manage the state model in a control CPU, use '00039-00103: LoadPortObject SetAttr request' or '00039-00104: LoadPortObject GetAttr request.' This allows only the value of AccessMode to be changed.
- Attribute values changed by an action of SECS/GEM communication software can be checked in the following buffer memory after an acknowledge/response or notification for a trigger is sent to a control CPU. (📖 Page 362 Buffer Memory)
 - Port access mode (Un\G24576)

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(1)	(NO STATE)	'00000-00002: LoadPort initial request' is received from a control CPU. (📖 Page 162 00002 : LoadPort initial request)	AUTO or MANUAL (History)	<ul style="list-style-type: none"> • Changing the value of the AccessMode attribute to that of AccessModeHistory specified in '00000-00002: LoadPort initial request' (📖 Page 162 00002 : LoadPort initial request) • Sending '10000-00002: LoadPort initial acknowledge' to a control CPU (📖 Page 164 00002 : LoadPort initial acknowledge) ■When the AccessModeHistory attribute value is '0: MANUAL' <ul style="list-style-type: none"> • Sending the 'CEID 30043: NO STATE to MANUAL' event report (S6F11) to the host ■When the AccessModeHistory attribute value is '1: AUTO' <ul style="list-style-type: none"> • Sending the 'CEID 30044: NO STATE to AUTO' event report (S6F11) to the host

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(2)	MANUAL	<p>❶ A 'ChangeAccess (S3F27)' service message that instructs the transition to AUTO is received from the host. (Page 430 S3F27: Change Access)*²</p> <p>❷ '00087-00101: AccessMode AUTO request' is received from a control CPU. (Page 189 00101: AccessMode AUTO request)*¹</p>	AUTO	<p>■ Common action for ❶ and ❷</p> <ul style="list-style-type: none"> Changing the AccessMode attribute value to '1: AUTO' Sending the 'CEID 30045: MANUAL to AUTO' event report (S6F11) to the host <p>■ Action only for ❶</p> <ul style="list-style-type: none"> Sending 'ChangeAccess Acknowledge (S3F28)' to the host prior to the event report (S6F11) (Page 431 S3F28: Change Access Acknowledge) Sending '10087-00916: ChangeAccess service notification' to a control CPU (Page 289 00916 : ChangeAccess service notification) <p>■ Action only for ❷</p> <ul style="list-style-type: none"> Sending '10087-00101: AccessMode AUTO acknowledge' to a control CPU (Page 233 00101: AccessMode AUTO acknowledge)
(3)	AUTO	<p>❶ A 'ChangeAccess (S3F27)' service message that instructs the transition to MANUAL is received from the host. (Page 430 S3F27: Change Access)*²</p> <p>❷ '00087-00102: AccessMode MANUAL request' is received from a control CPU. (Page 190 00102: AccessMode MANUAL request)*¹</p>	MANUAL	<p>■ Common action for ❶ and ❷</p> <ul style="list-style-type: none"> Changing the AccessMode attribute value to '0: MANUAL' Sending the 'CEID 30046: AUTO to MANUAL' event report (S6F11) to the host <p>■ Action only for ❶</p> <ul style="list-style-type: none"> Sending 'ChangeAccess Acknowledge (S3F28)' to the host prior to the event report (S6F11) (Page 431 S3F28: Change Access Acknowledge) Sending '10087-00916: ChangeAccess service notification' to a control CPU (Page 289 00916 : ChangeAccess service notification) <p>■ Action only for ❷</p> <ul style="list-style-type: none"> Sending '10087-00102: AccessMode MANUAL acknowledge' to a control CPU (Page 234 00102: AccessMode MANUAL acknowledge)

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

*2 Supported only by SECS/GEM communication software with software version 1.43V or later.

7.6 CMS Variables

SECS/GEM communication software provides variables required for E87-CMS.

A value of each variable whose class is SV or DVVAL refers to the attributes of an object provided by SECS/GEM communication software.

○: Complied

VID	Class	Variable name	Format	Access from host	Target object	Description	E87 standard
30000	DVVAL	AccessMode	U1[1]	ReadOnly	Load port object	Access mode of a load port • 0: MANUAL • 1: AUTO	○
30001 to 30006	SV	AccessMode_1 to AccessMode_6	U1[1]	ReadOnly	Load port object	Access modes ^{*1} of load port 1 to 6 • 0: MANUAL • 1: AUTO	○
30007 to 30012	ECV	BypassReadID_1 to BypassReadID_6	BOOL[1]	• Read • Write	None	BypassReadID of load port 1 to 6 Switching the state transition of Carrier State Model between No.(10) and No.(11) when a carrier ID reader is not available • true: Transitioned to 'ID VERIFICATION OK' (No.(11)) • false: Transitioned to 'WAITING FOR HOST' (No.(10))	○
30013	DVVAL	CarrierAccessingStatus	U1[1]	ReadOnly	Carrier object	Access status to a carrier • 0: NOT ACCESSED • 1: IN ACCESS • 2: CARRIER COMPLETE • 3: CARRIER STOPPED	○
30014	DVVAL	CarrierID	ASCII[1..80] J ²	ReadOnly	Carrier object	Carrier ID (ObjID)	○
30015 to 30046	SV	CarrierID_1 to CarrierID_32	ASCII[0..80] J ²	ReadOnly	Location object	CarrierID that exists in the carrier location 1 to 32 ^{*3}	○
30047	DVVAL	CarrierIDStatus	U1[1]	ReadOnly	Carrier object	Verification status of a carrier ID • 0: ID NOT READ • 1: WAITING FOR HOST • 2: ID VERIFICATION OK • 3: ID VERIFICATION FAILED	○
30048	SV	CarrierLocationMatrix	LIST[1..32]	ReadOnly	Location object	List of LocationID and CarrierID ^{*3} LIST[1..32] LIST [2] LocationID CarrierID ⋮	○
30049	DVVAL	LocationID	ASCII[0..80] J ²	ReadOnly	Carrier object	ID indicating the location of a carrier in equipment	○
30050 to 30081	SV	LocationID_1 to LocationID_32	ASCII[0..80] J ²	ReadOnly	Location object	LocationID of carrier location 1 to 32 ^{*3}	○
30082	DVVAL	LoadPortReservationState	U1[1]	ReadOnly	Load port object	Reservation status of a load port • 0: NOT RESERVED • 1: RESERVED	○
30083 to 30088	SV	LoadPortReservationState_1 to LoadPortReservationState_6	U1[1]	ReadOnly	Load port object	Reservation statuses ^{*1} of load port 1 to 6 • 0: NOT RESERVED • 1: RESERVED	○
30089	SV	LoadPortReservationStateList	LIST[1..6]	ReadOnly	None	List of reservation statuses of all load ports LIST[1..6] LoadPortReservationState ⋮	○
30090	DVVAL	PortAssociationState	U1[1]	ReadOnly	Load port object	Association status of a load port • 0: NOT ASSOCIATED • 1: ASSOCIATED	○

VID	Class	Variable name	Format	Access from host	Target object	Description	E87 standard
30091 to 30096	SV	PortAssociationState_1 to PortAssociationState_6	U1[1]	ReadOnly	Load port object	Association statuses ^{*1} of load port 1 to 6 • 0: ASSOCIATED • 1: NOT ASSOCIATED	○
30097	SV	PortAssociationStateList	LIST[1..6]	ReadOnly	None	List of association states of all load ports LIST[1..6] PortAssociationState ⋮	○
30098	DVVAL	PortID	U1[1]	ReadOnly	Load port object	PTN: Material port number (material location) of a load port (positive integer) • 0 to 6	○
30099 to 30104	SV	PortID_1 to PortID_6	U1[1]	ReadOnly	Load port object	PTN: Material port numbers (material locations) of load port 1 to 6 (positive integer) ^{*1} • 0, 1 to 6 (0: Invalid)	○
30105	DVVAL	PortStateInfo	LIST[2]	ReadOnly	Load port object	Association and transfer status of a load port LIST[2] PortTransferState PortAssociationState	○
30106 to 30111	SV	PortStateInfo_1 to PortStateInfo_6	LIST[2]	ReadOnly	Load port object	Association and transfer statuses ^{*1} of load port 1 to 6 LIST[2] PortTransferState PortAssociationState	○
30112	SV	PortStateInfoList	LIST[1..6]	ReadOnly	None	List of association and transfer statuses of all load ports LIST[1..6] PortStateInfo ⋮	○
30113	DVVAL	PortTransferState	U1[1]	ReadOnly	Load port object	Transfer status of a load port • 0: OUT OF SERVICE • 1: TRANSFER BLOCKED • 2: READY TO LOAD • 3: READY TO UNLOAD	○
30114 to 30119	SV	PortTransferState_1 to PortTransferState_6	U1[1]	ReadOnly	Load port object	Transfer statuses ^{*1} of load port 1 to 6 • 0: OUT OF SERVICE • 1: TRANSFER BLOCKED • 2: READY TO LOAD • 3: READY TO UNLOAD	○
30120	SV	PortTransferStateList	LIST[1..6]	ReadOnly	None	List of transfer statuses of all load ports LIST[1..6] PortTransferState ⋮	○
30121	DVVAL	Reason	U1[1]	ReadOnly	Carrier object	Reason for the occurrence of the state transition No.(14) in Carrier State Model • 0: VERIFICATION NEEDED • 1: VERIFICATION BY EQUIPMENT UNSUCCESSFUL • 2: READ FAIL • 3: IMPROPER SUBSTRATE POSITION	○
30122	DVVAL	SlotMap	LIST[0..25]	ReadOnly	Carrier object	List of slot statuses LIST[0..25] U1[1] SlotStatus ⋮ ■SlotStatus • 0: UNDEFINED • 1: EMPTY • 2: NOT EMPTY • 3: CORRECTLY OCCUPIED • 4: DOUBLE SLOTTED • 5: CROSS SLOTTED	○
30123	DVVAL	SlotMapStatus	U1[1]	ReadOnly	Carrier object	Verification status of a slot map • 0: SLOT MAP NOT READ • 1: WAITING FOR HOST • 2: SLOT MAP VERIFICATION OK • 3: SLOT MAP VERIFICATION FAILED	○

VID	Class	Variable name	Format	Access from host	Target object	Description	E87 standard
30124	DVVAL	AvailPartitionCapacity	U1[1]	ReadOnly	Internal buffer object	Free space (remaining amount) of a logical partition • 0 to 32	○
30125 to 30156	SV	AvailPartitionCapacity_1 to AvailPartitionCapacity_32	U1[1]	ReadOnly	Internal buffer object	Free space (remaining amount) of logical partition 1 to 32 • 0 to 32	○
30157	SV	BufferCapacityList	LIST[1..32]	ReadOnly	Internal buffer object	List of information related to logical partition 1 to 32 LIST[1..32] BufferPartitionInfo ⋮	○
30158	DVVAL	BufferPartitionInfo	LIST[5]	ReadOnly	Internal buffer object	Logical partition-related information LIST[5] PartitionID PartitionType AvailPartitionCapacity PartitionCapacity UnAllocatedPartitionCapacity	○
30159 to 30190	SV	BufferPartitionInfo_1 to BufferPartitionInfo_32	LIST[5]	ReadOnly	Internal buffer object	Information related to logical partition 1 to 32 LIST[5] PartitionID PartitionType AvailPartitionCapacity PartitionCapacity UnAllocatedPartitionCapacity	○
30191	DVVAL	PartitionCapacity	U1[1]	ReadOnly	Internal buffer object	Maximum capacity of a logical partition • 0 to 32	○
30192 to 30223	SV	PartitionCapacity_1 to PartitionCapacity_32	U1[1]	ReadOnly	Internal buffer object	Maximum capacity of logical partition 1 to 32 • 0 to 32	○
30224	DVVAL	PartitionID	ASCII[1..80] j*2	ReadOnly	Internal buffer object	Partition ID of a logical partition	○
30225 to 30256	SV	PartitionID_1 to PartitionID_32	ASCII[1..80] j*2	ReadOnly	Internal buffer object	Partition ID of logical partition 1 to 32	○
30257	DVVAL	PartitionType	ASCII[1..64] j*2	ReadOnly	Internal buffer object	Partition type of a logical partition	○
30258 to 30289	SV	PartitionType_1 to PartitionType_32	ASCII[1..64] j*2	ReadOnly	Internal buffer object	Partition type of logical partition 1 to 32	○
30290	DVVAL	UnAllocatedPartitionCapacity	U1[1]	ReadOnly	Internal buffer object	Unassigned space (remaining amount) of a logical partition • 0 to 32	○
30291 to 30322	SV	UnAllocatedPartitionCapacity_1 to UnAllocatedPartitionCapacity_32	U1[1]	ReadOnly	Internal buffer object	Unassigned space (remaining amount) of logical partition 1 to 32 • 0 to 32	○

*1 Up to the maximum number of load ports set for equipment specification settings are available. (📖 Page 28 Load port)

*2 Excluding the control characters.

*3 Up to the maximum number of carrier locations set for equipment specification settings are available. (📖 Page 29 Carrier location)

7.7 CMS Events and Reports

SECS/GEM communication software supports state transition events, additional events, and reports of state models for CMS state model management.

Supported events and reports are subjected to the dynamic event report setting function, which is compliant with GEM (E30).

For the dynamic event report setting, refer to the "Dynamic Setting Change" of the following manual:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

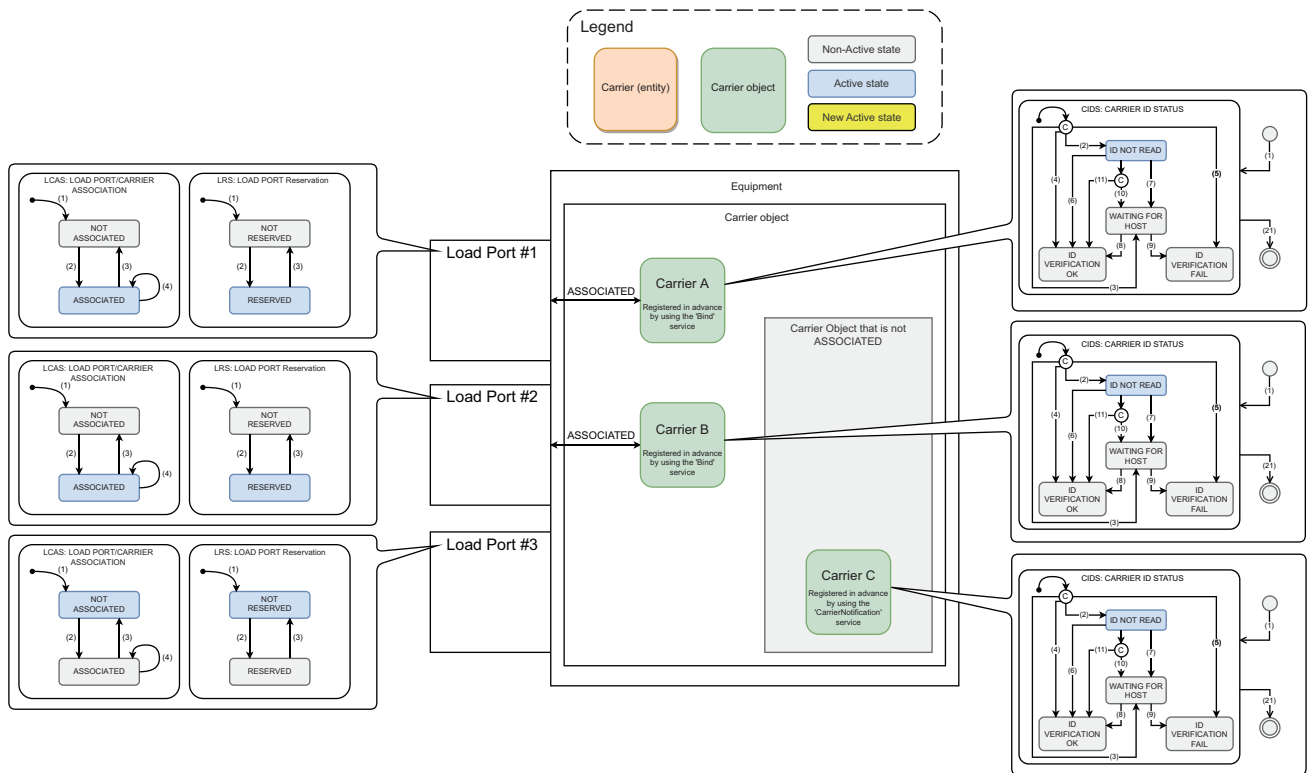
For supported events and reports, refer to the following:

 Page 508 CMS Reports, Page 509 CMS Events

7.8 Carrier ID Verification

SECS/GEM communication software supports the carrier ID verification function required for E87-CMS.

Status example before carrier delivery



■Processing cases for carrier ID verification

The following table shows the processing cases for carrier ID verification performed by SECS/GEM communication software for the status example before carrier delivery.

Case No.	Description	Carrier ID reading	Carrier ID verification processing
1	Page 88 Case in which a carrier registered by using the 'Bind' service is delivered to a load port for which the 'Bind' service is used	Success	Equipment verification: Success
2	Page 89 Case in which a carrier registered by using the 'Bind' service is delivered to an available load port		
3	Page 90 Case in which a carrier registered by using the 'Bind' service is delivered to another load port for which the 'Bind' service is used		Host verification: Waiting for a verification result from the host
4	Page 92 Case in which a carrier registered by using the 'CarrierNotification' service is delivered to an available load port		Equipment verification: Success
5	Page 93 Case in which a carrier registered by using the 'CarrierNotification' service is delivered to another load port for which the 'Bind' service is used		Host verification: Waiting for a verification result from the host
6	Page 94 Case in which an unregistered carrier is delivered to an available load port		
7	Page 95 Case in which an unregistered carrier is delivered to another load port for which the 'Bind' service is used		
8	Page 97 Case in which carrier ID reading fails for a carrier delivered to a load port reserved by using the 'Bind' service	Failure	
9	Page 98 Case in which carrier ID reading fails for a carrier delivered to an available load port		
10	Page 99 Case in which a carrier is delivered to a load port reserved by using the 'Bind' service while BypassReadID is false	Unavailable	
11	Page 100 Case in which a carrier is delivered to a load port reserved by using the 'Bind' service while BypassReadID is true		Carrier ID verification omitted
12	Page 101 Case in which a carrier is delivered to an available load port while BypassReadID is false		Host verification: Waiting for a verification result from the host
13	Page 102 Case in which a carrier is delivered to an available load port while BypassReadID is true		

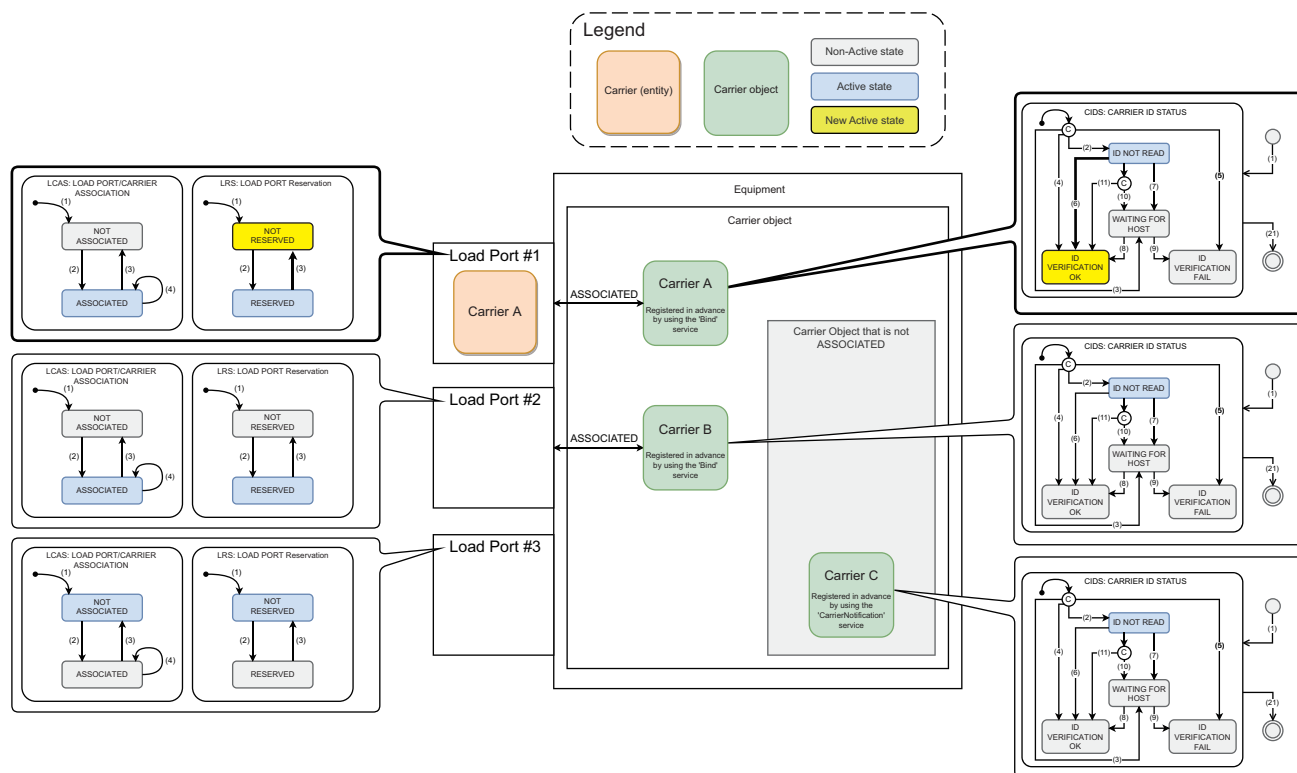
When carrier ID reading succeeds

The following shows the flow of carrier ID verification when carrier ID reading succeeds.

■ Case in which a carrier registered by using the 'Bind' service is delivered to a load port for which the 'Bind' service is used

Case in which carrier A is delivered to Load Port#1

- Status example after carrier delivery



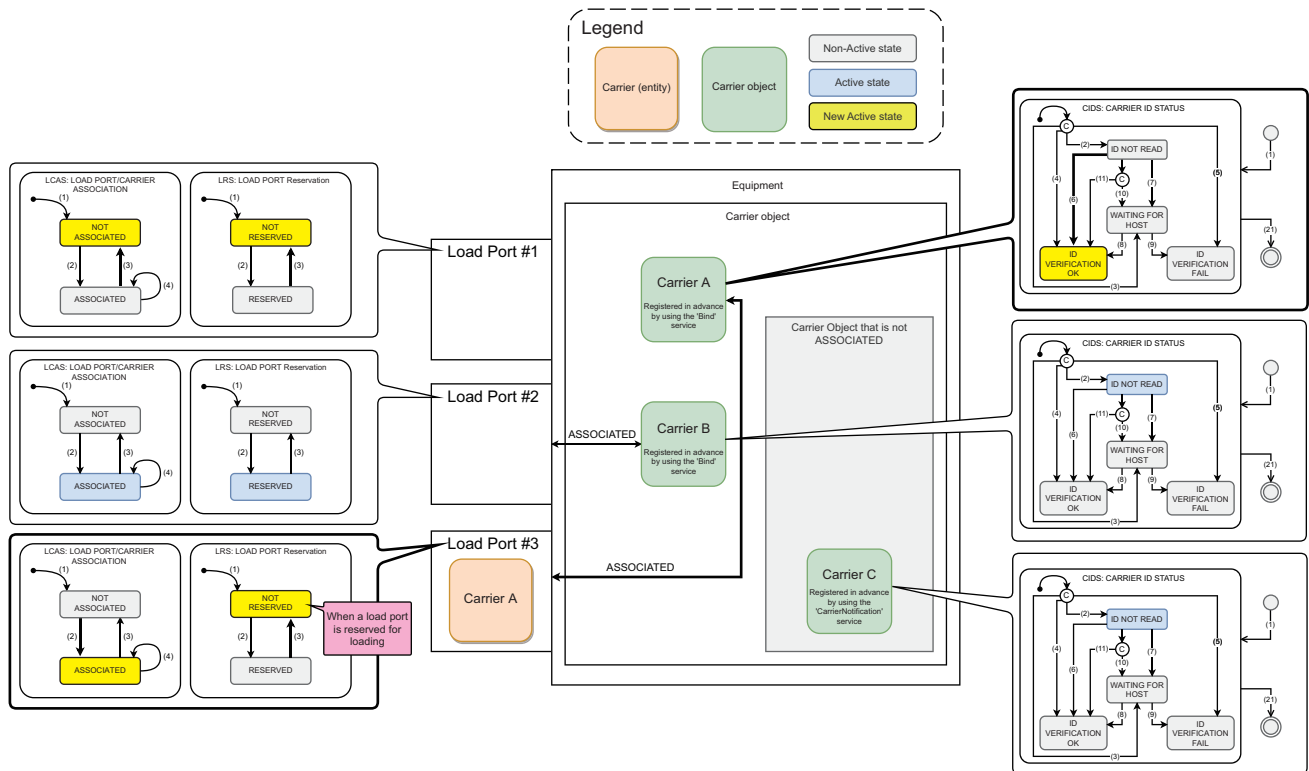
- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading a carrier in Load Port#1 is notified by using '00087-00302: LOAD completed notification.'
2	RESERVED for Load Port#1 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The success of carrier ID reading in Load Port#1 and the result that the carrier ID is 'A' are notified by using '00087-00501: CarrierID read successful notification.'
4	The carrier ID verification is performed.	—
4-1	Carrier A is delivered to Load Port#1 as scheduled; therefore, the equipment verification for the carrier ID succeeds. Refer to the Carrier State Model state transition No.(6). (Page 63 Carrier State Model)	—

■Case in which a carrier registered by using the 'Bind' service is delivered to an available load port

Case in which carrier A is delivered to Load Port#3 that is not ASSOCIATED or RESERVED in advance

- Status example after carrier delivery



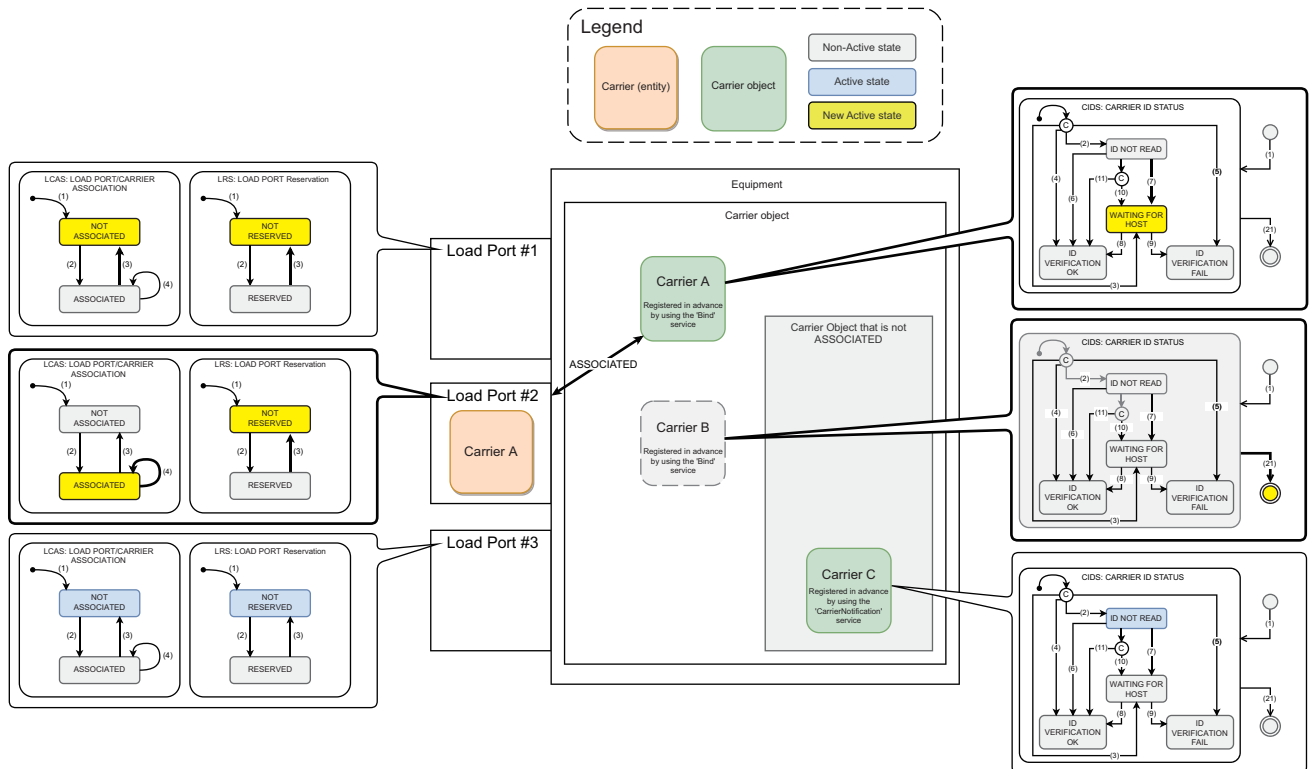
- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#3 is notified by using '00087-00302: LOAD completed notification.'
2	If Load Port#3 is RESERVED when loading, the reservation of Load Port#3 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The success of carrier ID reading in Load Port#3 and the result that the carrier ID is 'A' are notified by using '00087-00501: CarrierID read successful notification.'
4	The carrier ID verification is performed.	—
4-1	ASSOCIATED for Load Port#1 to which carrier A was to be delivered is canceled. Refer to the Load Port/Carrier Association State Model state transition No.(3). (Page 77 Load Port/Carrier Association State Model)	—
4-2	RESERVED for Load Port#1 to which carrier A was to be delivered is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
4-3	Load Port#3 to which a carrier is delivered and carrier A are ASSOCIATED. Refer to the Load Port/Carrier Association State Model state transition No.(2). (Page 77 Load Port/Carrier Association State Model)	—
4-4	Carrier A is delivered to Load Port#3 that is not as scheduled but is available; therefore, the equipment verification for the carrier ID succeeds. Refer to the Carrier State Model state transition No.(6). (Page 63 Carrier State Model)	—

■ Case in which a carrier registered by using the 'Bind' service is delivered to another load port for which the 'Bind' service is used

Case in which carrier A is delivered to Load Port#2

- Status example after carrier delivery



- Flow of carrier ID verification

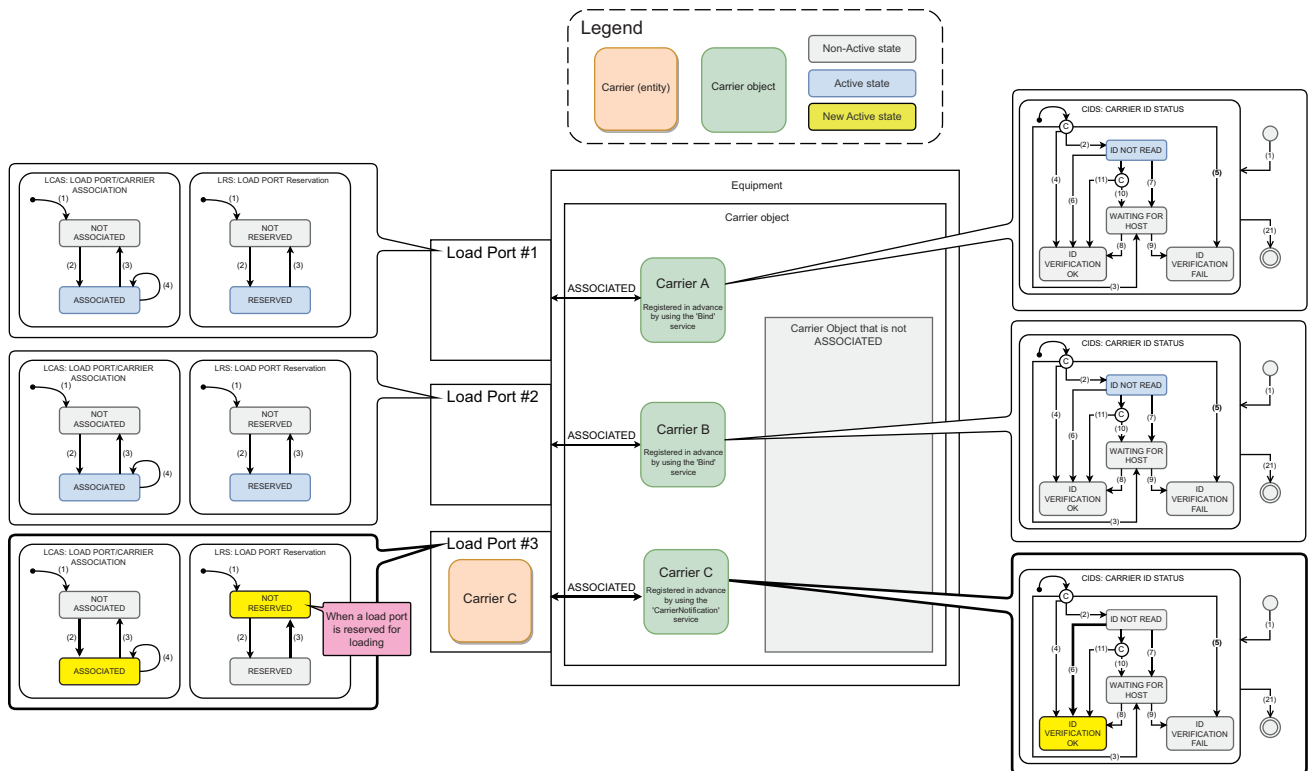
No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#2 is notified by using '00087-00302: LOAD completed notification.'
2	RESERVED for Load Port#2 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The success of carrier ID reading in Load Port#2 and the result that the carrier ID is 'A' are notified by using '00087-00501: CarrierID read successful notification.'
4	The carrier ID verification is performed.	—
4-1	ASSOCIATED for Load Port#1 to which carrier A was to be delivered is canceled. Refer to the Load Port/Carrier Association State Model state transition No.(3). (Page 77 Load Port/Carrier Association State Model)	—
4-2	RESERVED for Load Port#1 to which carrier A was to be delivered is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
4-3	Carrier B ASSOCIATED with Load Port#2 to which a carrier is delivered is deleted. Refer to the Carrier State Model state transition No.(21). (Page 63 Carrier State Model)	—
4-4	Load Port#2 to which the carrier is delivered and carrier A are ASSOCIATED. Refer to the Load Port/Carrier Association State Model state transition No.(4). (Page 77 Load Port/Carrier Association State Model)	—

No.	SECS/GEM communication software	Control CPU
4-5	<p>Carrier A is delivered to Load Port#2 reserved for carrier B; therefore, the processing transitions to the host verification for the carrier ID, and the carrier A is set to wait for instructions from the host.</p> <p>Refer to the Carrier State Model state transition No.(7). (Page 63 Carrier State Model)</p>	—

■Case in which a carrier registered by using the 'CarrierNotification' service is delivered to an available load port

Case in which carrier C is delivered to Load Port#3 that is not ASSOCIATED or RESERVED in advance

- Status example after carrier delivery

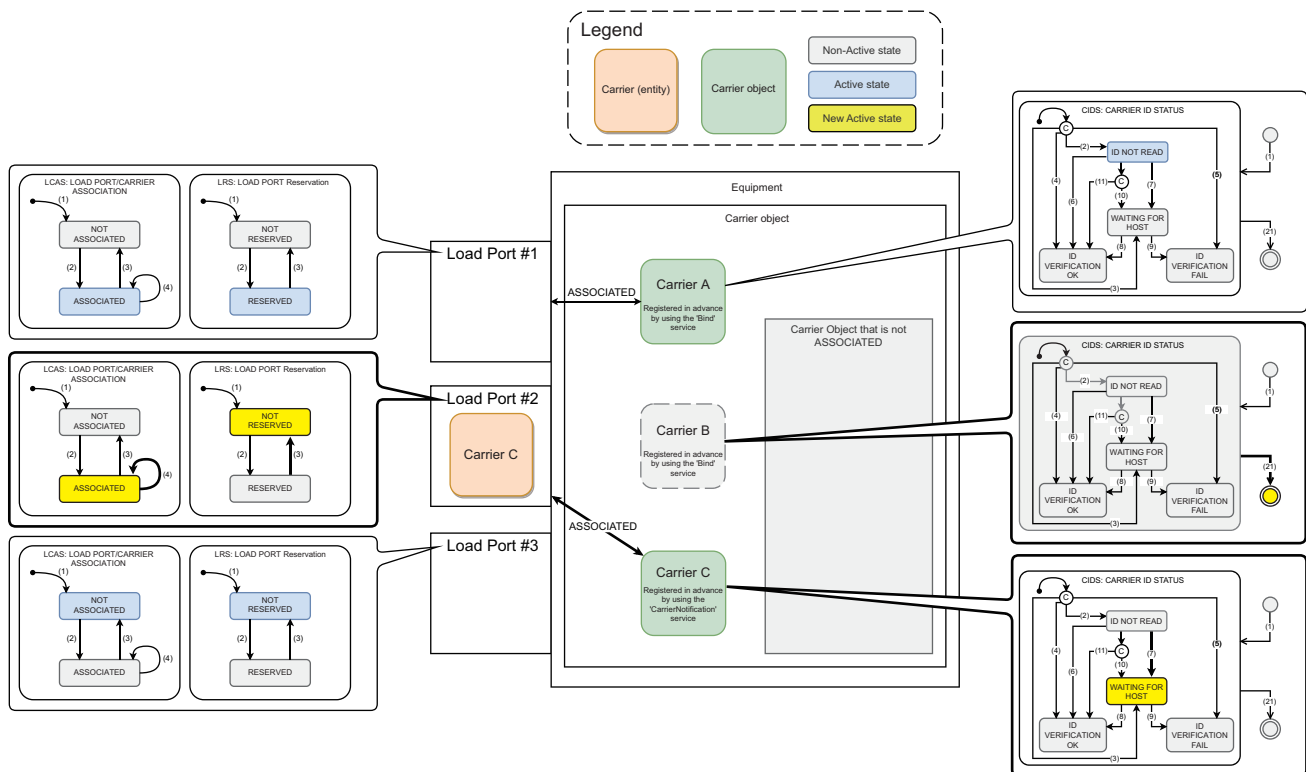


- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#3 is notified by using '00087-00302: LOAD completed notification.'
2	If Load Port#3 is RESERVED when loading, the reservation of Load Port#3 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The success of carrier ID reading in Load Port#3 and the result that the carrier ID is 'C' are notified by using '00087-00501: CarrierID read successful notification.'
4	The carrier ID verification is performed.	—
4-1	Load Port#3 to which a carrier is delivered and carrier C are ASSOCIATED. Refer to the Load Port/Carrier Association State Model state transition No.(2). (Page 77 Load Port/Carrier Association State Model)	—
4-2	Carrier C is delivered to Load Port#3 that is available; therefore, the equipment verification for the carrier ID succeeds. Refer to the Carrier State Model state transition No.(6). (Page 63 Carrier State Model)	—

Case in which carrier C is delivered to Load Port#2

- Status example after carrier delivery



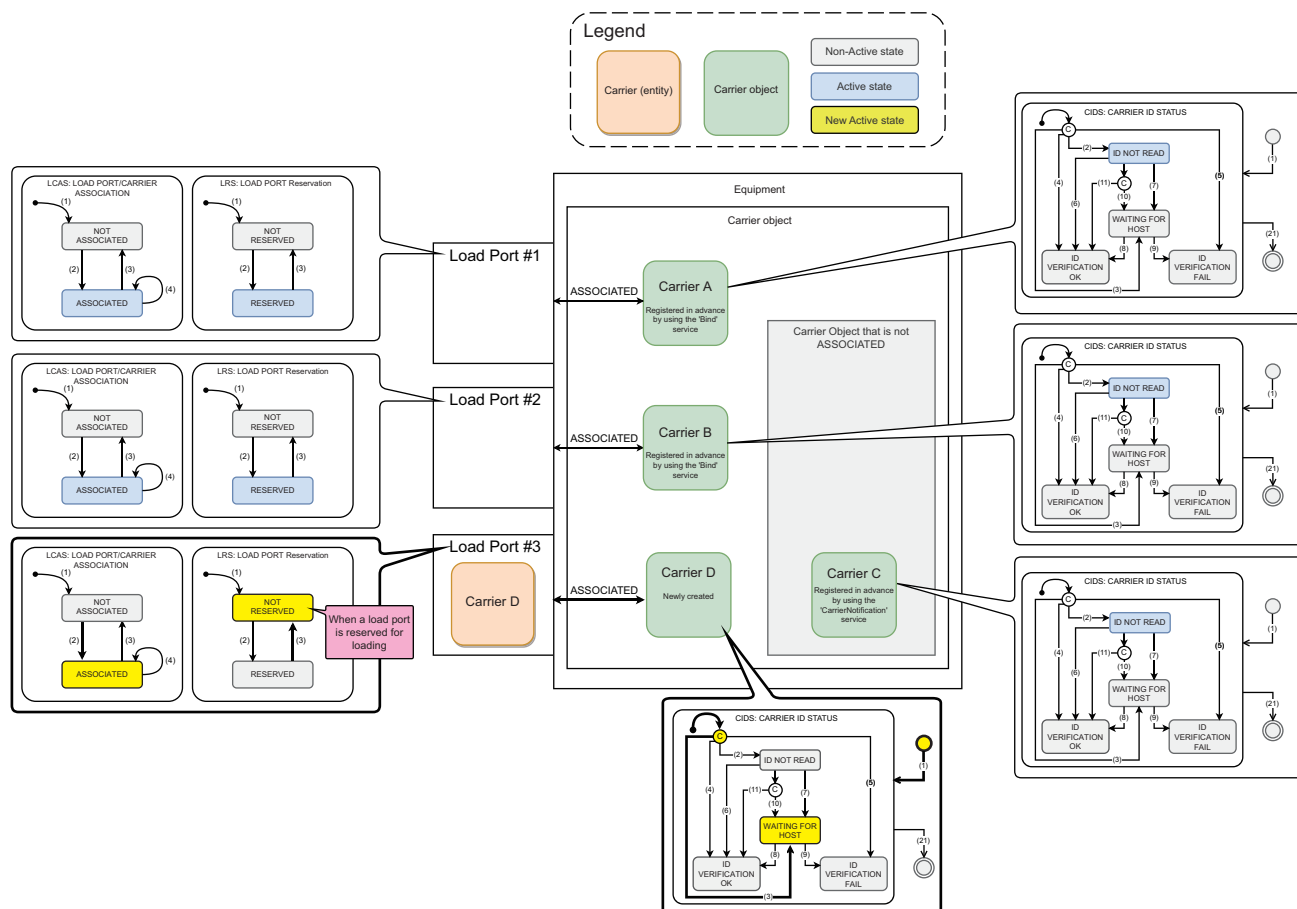
- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#2 is notified by using '00087-00302: LOAD completed notification.'
2	RESERVED for Load Port#2 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). ( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The success of carrier ID reading in Load Port#2 and the result that the carrier ID is 'C' are notified by using '00087-00501: CarrierID read successful notification.'
4	The carrier ID verification is performed.	—
4-1	Carrier B ASSOCIATED with Load Port#2 to which a carrier is delivered is deleted. Refer to the Carrier State Model state transition No.(21). ( Page 63 Carrier State Model)	—
4-2	Load Port#2 to which the carrier is delivered and carrier C are ASSOCIATED. Refer to the Load Port/Carrier Association State Model state transition No.(4). ( Page 77 Load Port/Carrier Association State Model)	—
4-3	Carrier C is delivered to Load Port#2 reserved for carrier B; therefore, the processing transitions to the host verification for the carrier ID, and the carrier C is set to wait for instructions from the host. Refer to the Carrier State Model state transition No.(7). ( Page 63 Carrier State Model)	—

■Case in which an unregistered carrier is delivered to an available load port

Case in which an unregistered carrier is delivered to Load Port#3 that is not ASSOCIATED or RESERVED in advance

- Status example after carrier delivery



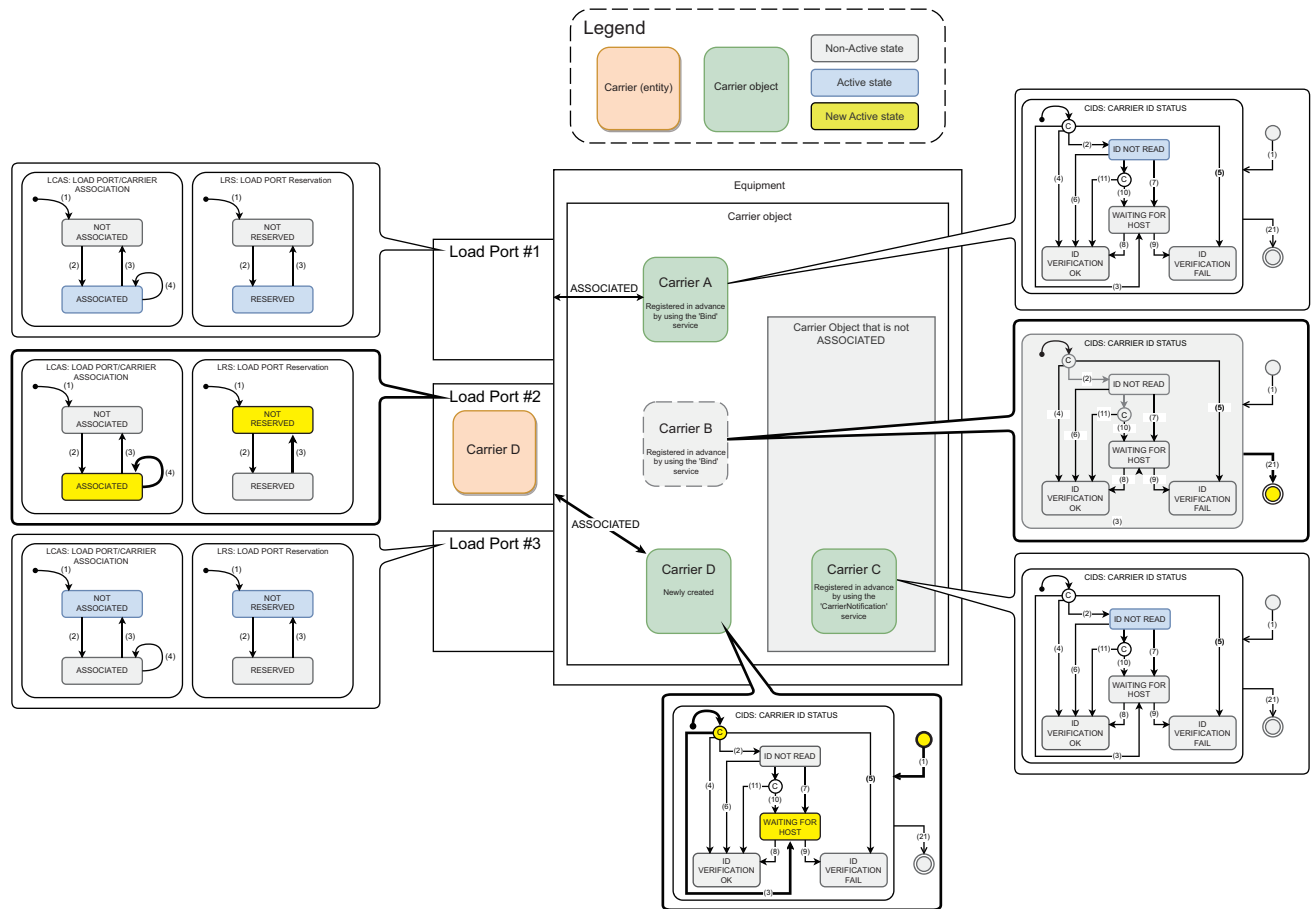
- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#3 is notified by using '00087-00302: LOAD completed notification.'
2	If Load Port#3 is RESERVED when loading, the reservation of Load Port#3 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The success of carrier ID reading in Load Port#3 and the result that the carrier ID is 'D' are notified by using '00087-00501: CarrierID read successful notification.'
4	The carrier ID verification is performed.	—
4-1	Carrier D is not registered in advance; therefore, a new instance is created. Refer to the Carrier State Model state transition No.(1). (Page 63 Carrier State Model)	—
4-2	Load Port#3 to which a carrier is delivered and carrier D are ASSOCIATED. Refer to the Load Port/Carrier Association State Model state transition No.(4). (Page 77 Load Port/Carrier Association State Model)	—
4-3	Carrier D is not registered in advance; therefore, the processing transitions to the host verification for the carrier ID, and the carrier D is set to wait for instructions from the host. Refer to the Carrier State Model state transition No.(3). (Page 63 Carrier State Model)	—

■Case in which an unregistered carrier is delivered to another load port for which the 'Bind' service is used

Case in which an unregistered carrier is delivered to Load Port#2

- Status example after carrier delivery



- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#2 is notified by using '00087-00302: LOAD completed notification.'
2	RESERVED for Load Port#2 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The success of carrier ID reading in Load Port#2 and the result that the carrier ID is 'D' are notified by using '00087-00501: CarrierID read successful notification.'
4	The carrier ID verification is performed.	—
4-1	Carrier B ASSOCIATED with Load Port#2 to which a carrier is delivered is deleted. Refer to the Carrier State Model state transition No.(21). (Page 63 Carrier State Model)	—
4-2	Carrier D is not registered in advance; therefore, a new instance is created. Refer to the Carrier State Model state transition No.(1). (Page 63 Carrier State Model)	—
4-3	Load Port#2 to which the carrier is delivered and carrier D are ASSOCIATED. Refer to the Load Port/Carrier Association State Model state transition No.(4). (Page 77 Load Port/Carrier Association State Model)	—

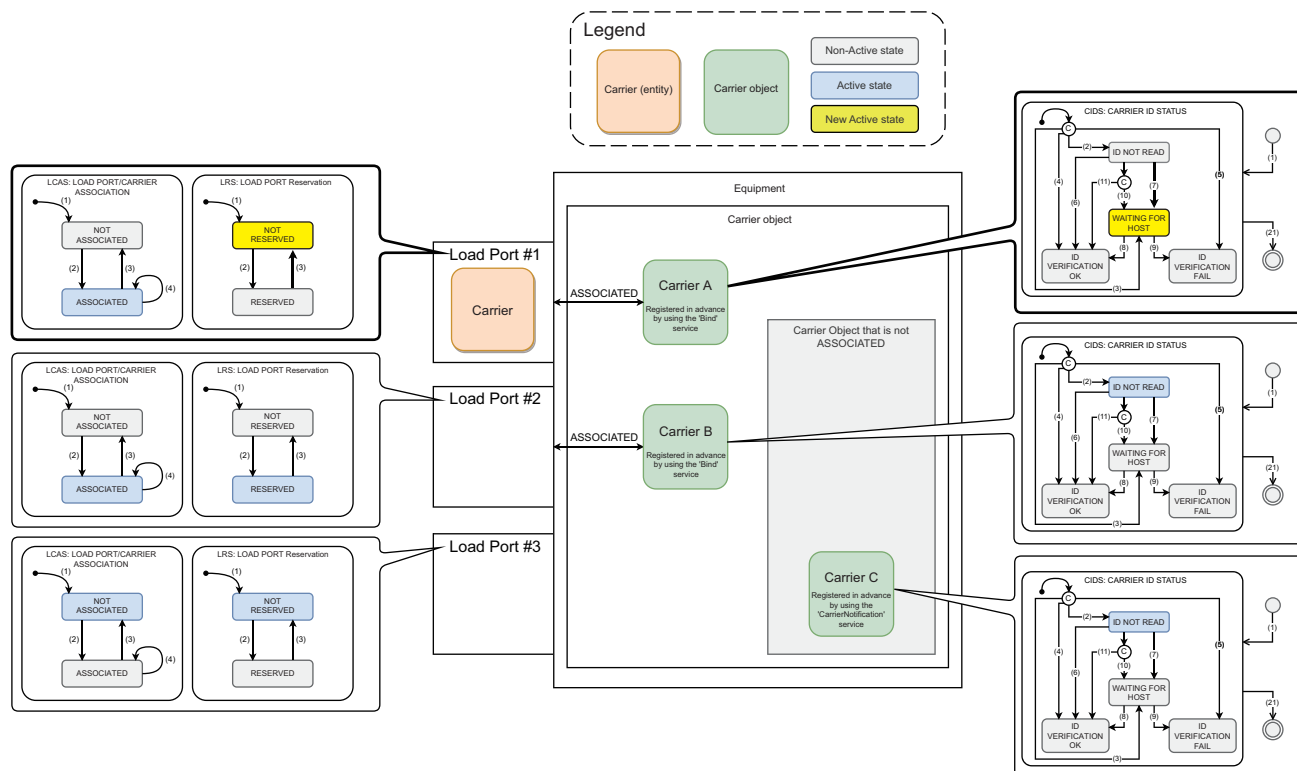
No.	SECS/GEM communication software	Control CPU
4-4	<p>Carrier D is not registered in advance; therefore, the processing transitions to the host verification for the carrier ID, and the carrier D is set to wait for instructions from the host.</p> <p>Refer to the Carrier State Model state transition No.(3). (Page 63 Carrier State Model)</p>	—

When carrier ID reading fails

■ Case in which carrier ID reading fails for a carrier delivered to a load port reserved by using the 'Bind' service

Case in which a carrier is delivered to Load Port#1

- Status example after carrier delivery



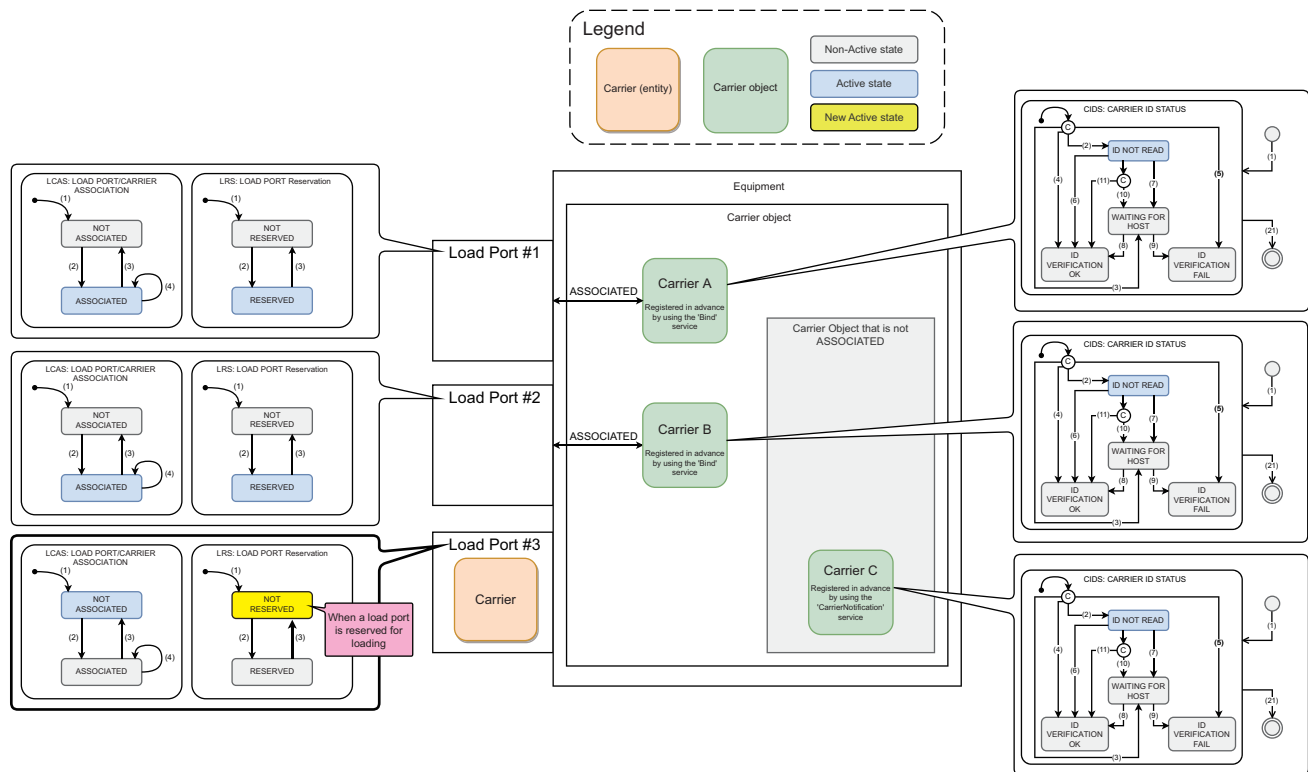
- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#1 is notified by using '00087-00302: LOAD completed notification.'
2	RESERVED for Load Port#1 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The failure of carrier ID reading in Load Port#1 is notified by using '00087-00502: CarrierID read fail notification.'
4	Carrier ID reading fails; therefore, the processing transitions to the host verification.	—
4-1	Carrier A is associated with Load Port#1; therefore, the carrier A is set to wait for instructions from the host. Refer to the Carrier State Model state transition No.(7). (Page 63 Carrier State Model)	—

■Case in which carrier ID reading fails for a carrier delivered to an available load port

Case in which a carrier is delivered to Load Port#3 that is not ASSOCIATED or RESERVED in advance

- Status example after carrier delivery



- Flow of carrier ID verification

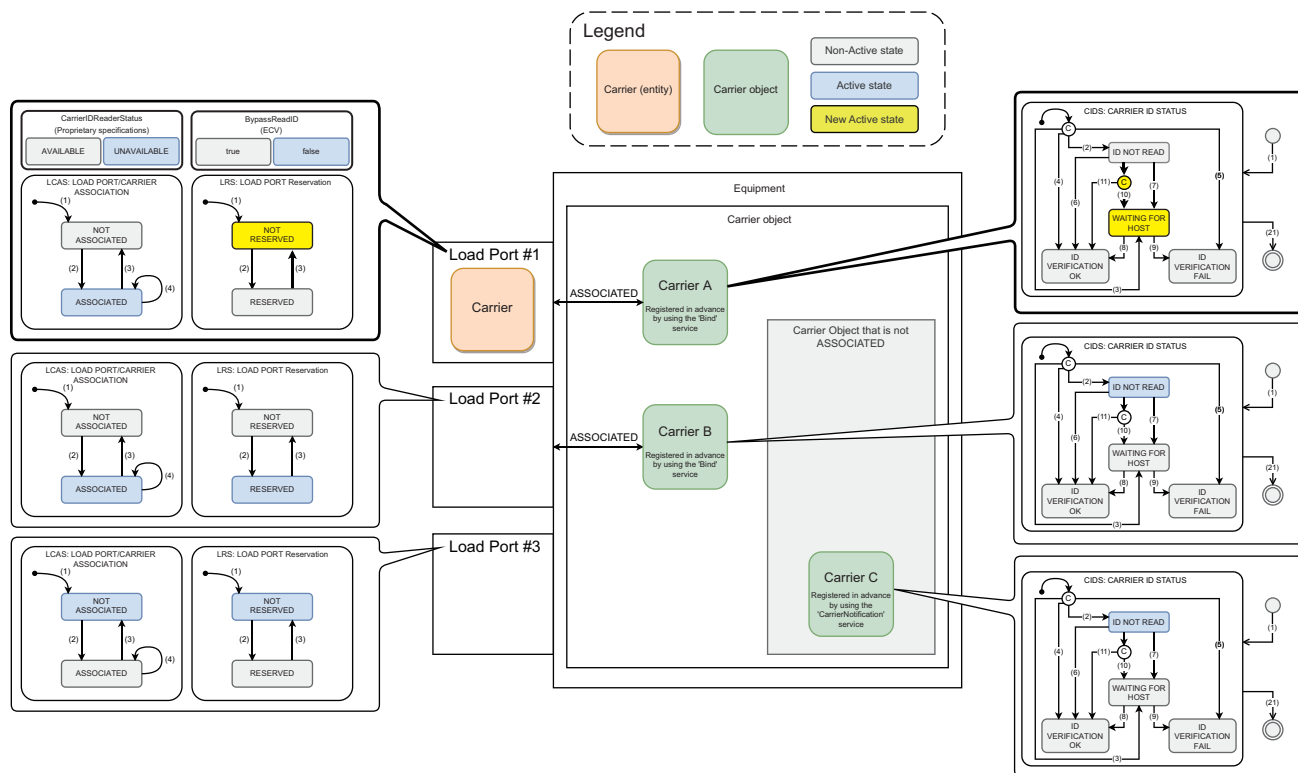
No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#3 is notified by using '00087-00302: LOAD completed notification.'
2	If Load Port#3 is RESERVED when loading, the reservation of Load Port#3 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	The failure of carrier ID reading in Load Port#3 is notified by using '00087-00502: CarrierID read fail notification.'
4	Carrier ID reading fails; therefore, the processing transitions to the host verification.	—
4-1	A carrier is not associated with Load Port#3; therefore, 'CarrierID read fail event report (S6F11)' is sent to the host and SECS/GEM communication software waits for instructions from the host.	—

When a carrier ID reader is not available or not implemented

■ Case in which a carrier is delivered to a load port reserved by using the 'Bind' service while BypassReadID is false

Case in which a carrier is delivered to Load Port#1

- Status example after carrier delivery



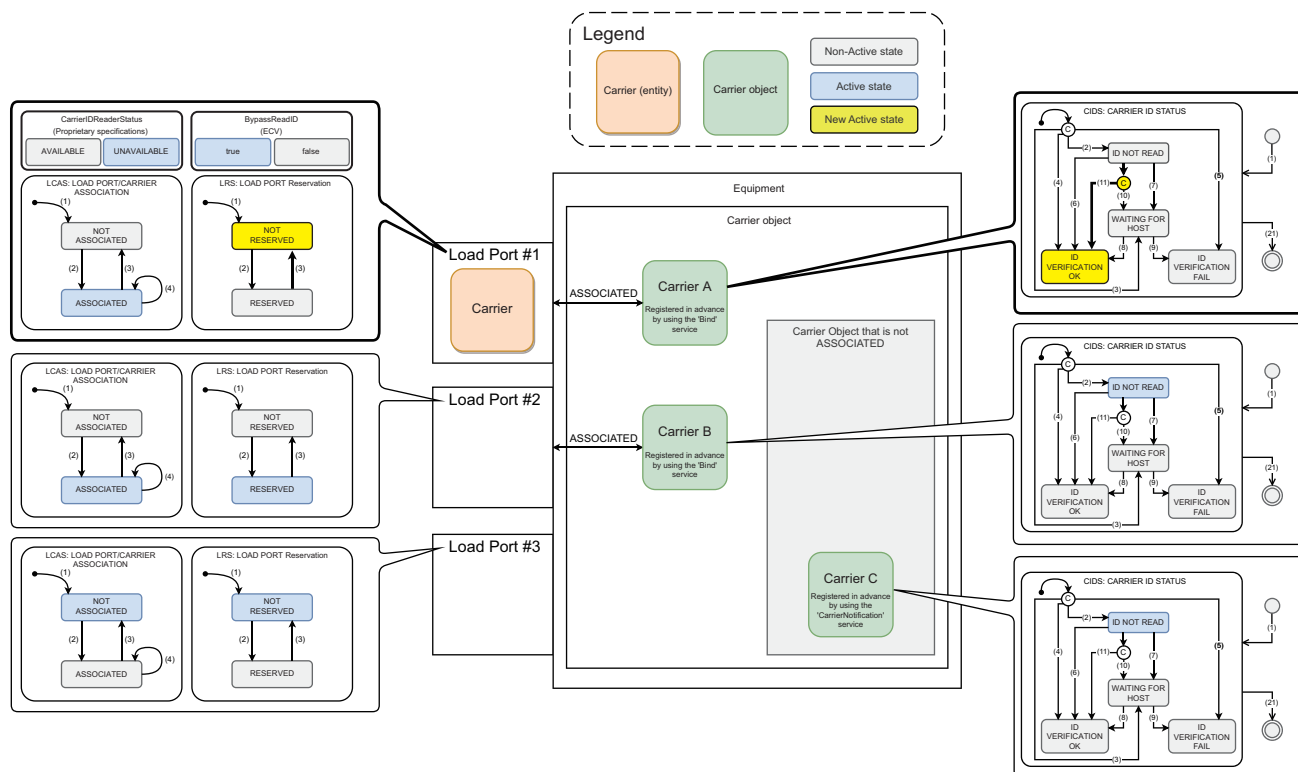
- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#1 is notified by using '00087-00302: LOAD completed notification.'
2	RESERVED for Load Port#1 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	A carrier ID reader is not available for Load Port#1; therefore, it is notified that the carrier ID is unknown by using '00087-00503: Unknown CarrierID notification.'
4	A carrier ID reader is not available and BypassReadID is false; therefore, the processing transitions to the host verification.	—
4-1	Carrier A is associated with Load Port#1; therefore, the carrier A is set to wait for instructions from the host. Refer to the Carrier State Model state transition No.(10). (Page 63 Carrier State Model)	—

■Case in which a carrier is delivered to a load port reserved by using the 'Bind' service while BypassReadID is true

Case in which a carrier is delivered to Load Port#1

- Status example after carrier delivery



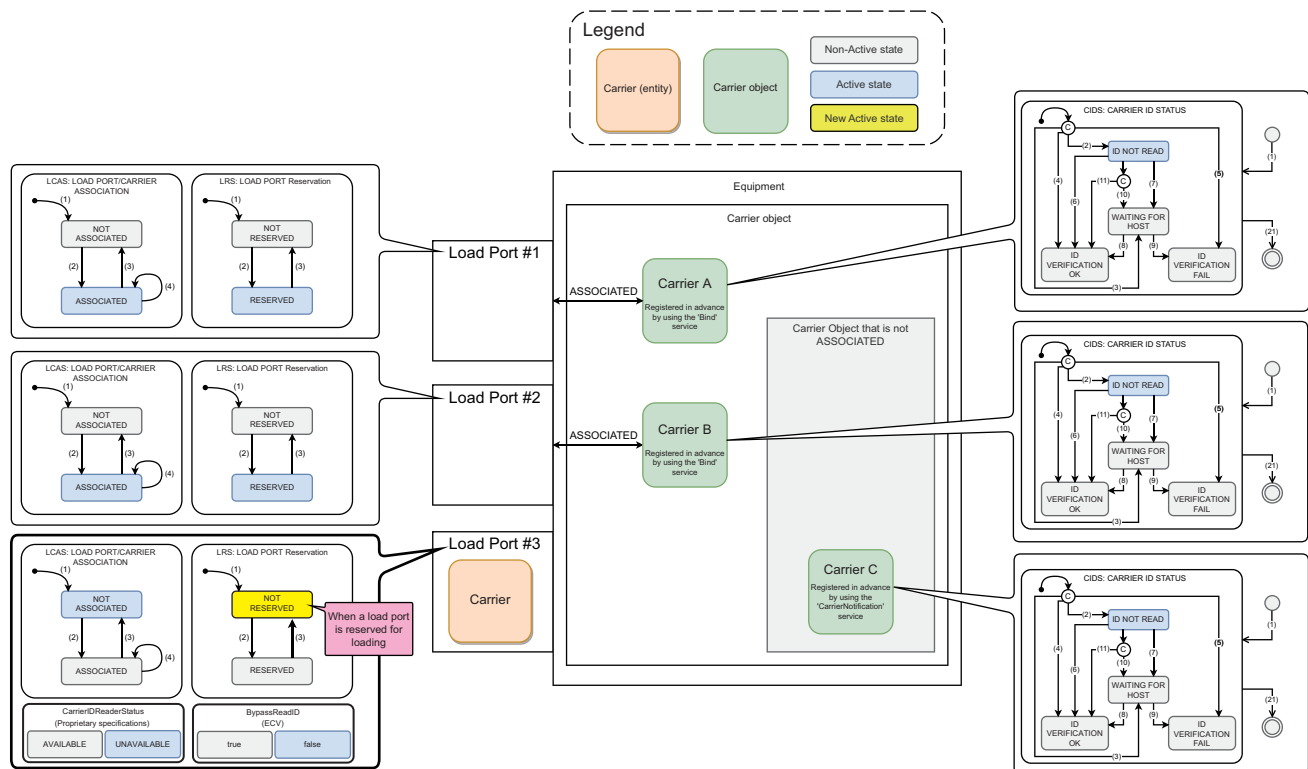
- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#1 is notified by using '00087-00302: LOAD completed notification.'
2	RESERVED for Load Port#1 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	A carrier ID reader is not available for Load Port#1; therefore, it is notified that the carrier ID is unknown by using '00087-00503: Unknown CarrierID notification.'
4	A carrier ID reader is not available and BypassReadID is true; therefore, the carrier ID verification is omitted and the equipment verification succeeds. Refer to the Carrier State Model state transition No.(11). (Page 63 Carrier State Model)	—

■Case in which a carrier is delivered to an available load port while BypassReadID is false

Case in which a carrier is delivered to Load Port#3 that is not ASSOCIATED or RESERVED in advance

- Status example after carrier delivery



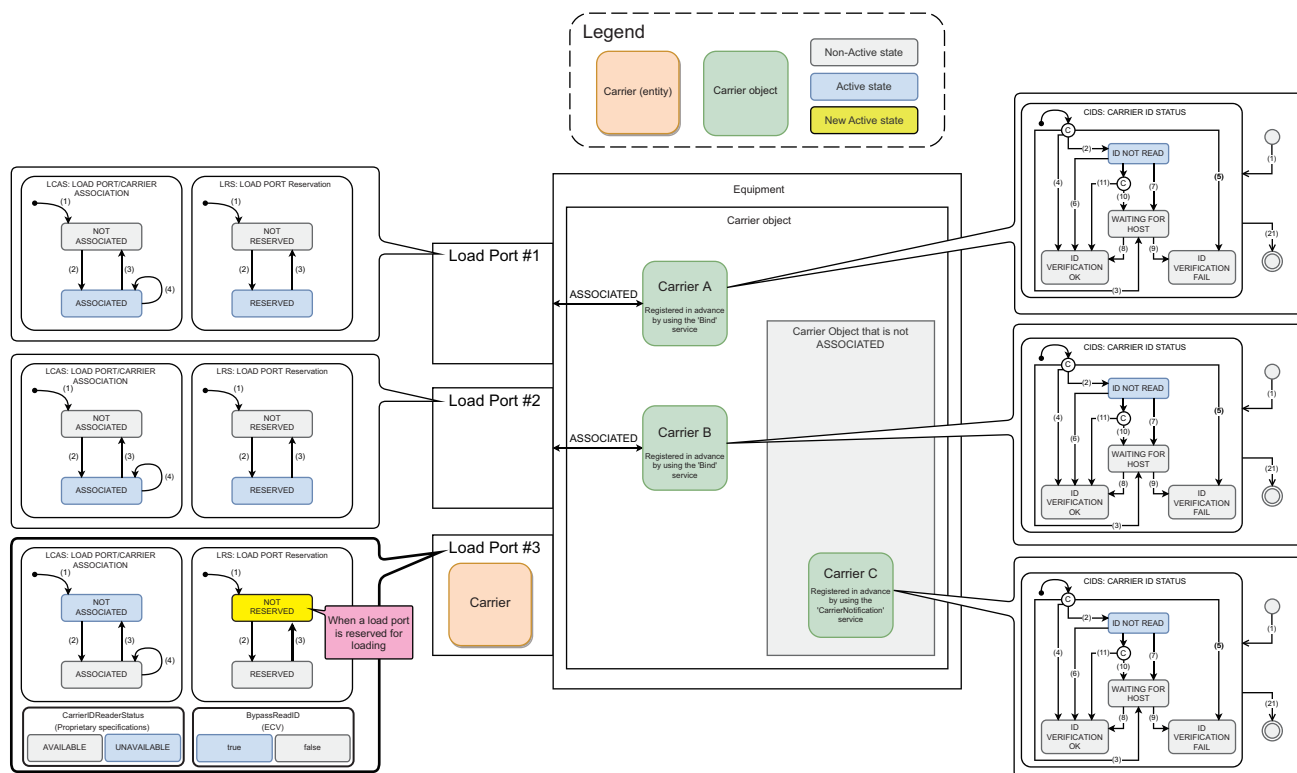
- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#3 is notified by using '00087-00302: LOAD completed notification.'
2	If Load Port#3 is RESERVED when loading, the reservation of Load Port#3 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	A carrier ID reader is not available for Load Port#3; therefore, it is notified that the carrier ID is unknown by using '00087-00503: Unknown CarrierID notification.'
4	A carrier is not associated with Load Port#3; therefore, 'UnKnown CarrierID event report (S6F11)' is sent to the host, and SECS/GEM communication software waits for instructions from the host.	—

■Case in which a carrier is delivered to an available load port while BypassReadID is true

Case in which a carrier is delivered to Load Port#3 that is not ASSOCIATED or RESERVED in advance

- Status example after carrier delivery



- Flow of carrier ID verification

No.	SECS/GEM communication software	Control CPU
1	—	The completion of loading in Load Port#1 is notified by using '00087-00302: LOAD completed notification.'
2	If Load Port#3 is RESERVED when loading, the reservation of Load Port#3 is canceled. Refer to the Load Port Reservation State Model state transition No.(3). (Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—
3	—	A carrier ID reader is not available for Load Port#3; therefore, it is notified that the carrier ID is unknown by using '00087-00503: Unknown CarrierID notification.'
4	A carrier is not associated with Load Port#3; therefore, 'UnKnown CarrierID event report (S6F11)' is sent to the host, and SECS/GEM communication software waits for instructions from the host.	—

8 E94-CJM COMPLIANT FUNCTION

This chapter explains the E94-CJM compliant function.

8.1 Usage Method

For the usage method of this function, refer to the following:

📖 Page 633 E94-CJM compliance

8.2 Control Job Object

This section explains control job objects provided by SECS/GEM communication software.

SECS/GEM communication software instantiates control job-related information to an object and exchanges the information between the host and equipment using E39-OSS and E94-CJM services.

The number of instantiated control job objects is stored in 'Control job object count' (Un\G28672). (📖 Page 362 Buffer Memory)

Attributes

The following table shows the attributes of a control job object.

Name	Format	Access from host	Description
ObjType	ASCII [1..80]* ¹	Read Only	Object type "ControlJob"
ObjID	ASCII [1..80]* ¹	Read Only	Control job identifier defined by the host (CtrlJobID)
ProcessingCtrlSpec	LIST [1..96]	Read Write	Rule for process jobs to be executed in this control job and for executing each of them LIST [1..96] LIST [3] ASCII [1..80] PRJobID* ^{1 2} LIST [0..16] (ControlRule) LIST [2] ASCII [1..80] RuleName* ^{1 2} any RuleValue* ³ : LIST [0..16] (OutputRule) LIST [2] U1 [1] MaterialStatus* ² any OutputRuleValue* ³ : : : • The LIST type cannot be used for 'RuleValue' and 'OutputRuleValue.'
CarrierInputSpec	LIST [0..32]	Read Write	List of CarrierID of material used in this control job. A blank list is allowed. LIST [0..32] ASCII [1..80] CarrierID* ^{1 2} : :

Name	Format	Access from host	Description
MtrlOutSpec	LIST [0..32]	Read Write	<p>List for specifying carriers and slots to collect substrates (wafers) after the processing.</p> <p>The list is left blank in the slot integrity mode.</p> <p>LIST [0..32]</p> <p>LIST [2]</p> <p>LIST [0 or 2] (SourceMap)</p> <p>ASCII [1..80] CarrierID^{*1*2}</p> <p>LIST [0..25]^{*4}</p> <p>U1 [1] SubstrateLocation (SlotID)^{*2}</p> <p>:</p> <p>LIST [0 or 2] (DestinationMap)</p> <p>ASCII [1..80] CarrierID^{*1*2}</p> <p>LIST [0..25]^{*5}</p> <p>U1 [1] SubstrateLocation (SlotID)^{*2}</p> <p>:</p> <p>:</p>
MtrlOutbyStatus	LIST [0..16]	Read Write	<p>List for specifying collection destinations (carrier, slot) depending on the substrate (wafer) status</p> <p>LIST [0..16]</p> <p>LIST [2]</p> <p>U1 [1] MaterialStatus^{*2}</p> <p>LIST [0 or 2] (DestinationMap)</p> <p>ASCII [1..80] CarrierID^{*1*2}</p> <p>LIST [0..25]</p> <p>U1 [1] SubstrateLocation (SlotID)^{*2}</p> <p>:</p> <p>:</p>
ProcessOrderMgmt	U1 [1]	Read Write	<p>Specification for execution order rule of process jobs.</p> <p>Initial definition:</p> <ul style="list-style-type: none"> • 1 = ARRIVAL (Material arrival order) • 2 = OPTIMIZE (In-equipment algorithm) • 3 = LIST (ProcessingCtrlSpec instruction order)
StartMethod	BOOL [1]	Read Only	<p>Switching between 'starting this control job automatically' and 'waiting for a start instruction'</p> <ul style="list-style-type: none"> • true = Auto • false = UserStart
PauseEvent	LIST [0..512]	Read Write	<p>List of events to pause this control job</p> <p>LIST [0..512]</p> <p>U(1, 2, 4) [1] CEID^{*2}</p> <p>:</p>
DataCollectionPlan	ASCII [0..80] ^{*1}	Read Write	Identifier of data collection plan used during the control job execution
State	U1 [1]	Read Only	<p>Current state of this control job</p> <ul style="list-style-type: none"> • 0 = QUEUED • 1 = SELECTED • 2 = WAITINGFORSTART • 3 = EXECUTING • 4 = PAUSED • 5 = COMPLETED
CurrentPRJob	LIST [0..96]	Read Only	<p>List of process jobs in the ACTIVE state under the management of this control job</p> <p>LIST [0..96]</p> <p>ASCII [1..80] PRJobID^{*1*2}</p> <p>:</p>
PRJobStatusList	LIST [1..96]	Read Only	<p>State list of process jobs under the management of this control job</p> <p>LIST [1..96]</p> <p>LIST [2]</p> <p>ASCII [1..80] PRJobID^{*1*2}</p> <p>U1 [1] PRJobState</p> <p>:</p>

*1 Excluding the control characters.

*2 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*3 Any of the following: BIN [1], BOOL [1], ASCII [1..80], I1 [1], I2 [1], I4 [1], U1 [1], U2 [1], U4 [1], F4 [1], F8 [1]

*4 If omitted, it is assumed that all SlotIDs are specified in ascending order.

*5 If omitted, it is regarded as the same specification as 'SubstrateLocation' of 'SourceMap.'

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to CJM.

☞ Page 294 00094: CPU to CITL, ☞ Page 304 10094: CITL to CPU

Structure labels defined in this product are provided in a sample library.

☞ Page 521 Sample Library

■M+GEM300_ControlJobObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2
+40 to 79	u40ObjID	ObjID (CtrlJobID)	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2
+80 to 189775	st96ProcessingCtrlSpec	ProcessingCtrlSpec	M+GEM300_ProcessingCtrlSpec(0..95)	☞ Page 105 M+GEM300_ProcessingCtrlSpec
+189776 to 191055	st32CarrierInputSpec	CarrierInputSpec	M+GEM300_CarrierInputSpec(0..31)	☞ Page 106 M+GEM300_CarrierInputSpec
+191056 to 195215	st32MtrlOutSpec	MtrlOutSpec	M+GEM300_MtrlOutSpec(0..31)	☞ Page 106 M+GEM300_MtrlOutSpec
+195216 to 196271	st16MtrlOutbyStatus	MtrlOutbyStatus	M+GEM300_MtrlOutbyStatus(0..15)	☞ Page 106 M+GEM300_MtrlOutbyStatus
+196272	uProcessOrderMgmt	ProcessOrderMgmt	Word [Unsigned]	0 to 255
+196273	uStartMethod	StartMethod	Word [Unsigned]	<ul style="list-style-type: none"> • 0 = false (UserStart) • 1 to 65535 = true (Auto)
+196274 to 197297	st512PauseEvent	PauseEvent	M+GEM300_PauseEvent(0..511)	☞ Page 107 M+GEM300_PauseEvent
+197298 to 197337	u40DataCollectionPlan	DataCollectionPlan	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII)*1*2
+197338	uState	State	Word [Unsigned]	<ul style="list-style-type: none"> • 0 = QUEUED • 1 = SELECTED • 2 = WAITINGFORSTART • 3 = EXECUTING • 4 = PAUSED • 5 = COMPLETED
+197339 to 201178	st96CurrentPRJob	CurrentPRJob	M+GEM300_CurrentPRJob(0..95)	☞ Page 107 M+GEM300_CurrentPRJob
+201179 to 205114	st96PRJobStatusList	PRJobStatusList	M+GEM300_PRJobStatusList(0..95)	☞ Page 107 M+GEM300_PRJobStatusList

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_ProcessingCtrlSpec

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40PRJobID	PRJobID	Word [Unsigned] (0..39)	NULL code (00H)*1, 1 to 80 characters (ASCII)*2*3
+40 to 1319	st16ControlRule	ControlRule	M+GEM300_ControlRule(0..15)	☞ Page 105 M+GEM300_ControlRule
+1320 to 1975	st16OutputRule	OutputRule	M+GEM300_OutputRule(0..15)	☞ Page 106 M+GEM300_OutputRule

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_ControlRule

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40RuleName	RuleName	Word [Unsigned] (0..39)	NULL code (00H)*1, 1 to 80 characters (ASCII)*2*3
+40 to 79	u40RuleValue	RuleValue	Word [Unsigned] (0..39)	<ul style="list-style-type: none"> • According to the user setting of ControlRule. (☞ Page 36 ControlRule) • Handled as a binary dump in little-endian format due to the unspecified data type.

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_OutputRule

Offset	Label name	Name	Data type	Applicable range
0	uMaterialStatus	MaterialStatus	Word [Unsigned]	0 ^{*1} , 1 to 255
+1 to 40	u40OutputRuleValue	OutputRuleValue	Word [Unsigned] (0..39)	<ul style="list-style-type: none"> According to the user setting of OutputRule. (☞ Page 39 OutputRule) Handled as a binary dump in little-endian format due to the unspecified data type.

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

■M+GEM300_CarrierInputSpec

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	NULL code (00H) ^{*1} , 1 to 80 characters (ASCII) ^{*2*3}

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_MtrlOutSpec

Offset	Label name	Name	Data type	Applicable range
+0 to 64	stSourceMap	SourceMap	M+GEM300_SourceMap	☞ Page 106 M+GEM300_SourceMap
+65 to 129	stDestinationMap	DestinationMap	M+GEM300_DestinationMap	☞ Page 106 M+GEM300_DestinationMap

■M+GEM300_SourceMap

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	NULL code (00H) ^{*1} , 1 to 80 characters (ASCII) ^{*2*3}
+40 to 64	st25SlotIDList	SlotIDList	M+GEM300_SlotIDList(0..24)	☞ Page 106 M+GEM300_SlotIDList

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_DestinationMap

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	NULL code (00H) ^{*1} , 1 to 80 characters (ASCII) ^{*2*3}
+40 to 64	st25SlotIDList	SlotIDList	M+GEM300_SlotIDList(0..24)	☞ Page 106 M+GEM300_SlotIDList

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_SlotIDList

Offset	Label name	Name	Data type	Applicable range
0	uSlotID	SlotID	Word [Unsigned]	0 ^{*1} , 1 to 25

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

■M+GEM300_MtrlOutbyStatus

Offset	Label name	Name	Data type	Applicable range
0	uMaterialStatus	MaterialStatus	Word [Signed]	0 ^{*1} , 1 to 255
+1 to 65	stDestinationMap	DestinationMap	M+GEM300_DestinationMap	☞ Page 106 M+GEM300_DestinationMap

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

■M+GEM300_PauseEvent

Offset	Label name	Name	Data type	Applicable range
+0 to 1	udCEID	CEID	Double Word [Unsigned]	U1: 0 ^{*1} , 1 to 255 U2: 0 ^{*1} , 1 to 65535 U4: 0 ^{*1} , 1 to 4294967295

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

■M+GEM300_CurrentPRJob

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40PRJobID	PRJobID	Word [Signed] (0..39)	NULL code (00H) ^{*1} , 1 to 80 characters (ASCII) ^{*2*3}

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_PRJobStatusList

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40PRJobID	PRJobID	Word [Unsigned] (0..39)	NULL code (00H) ^{*1} , 1 to 80 characters (ASCII) ^{*2*3}
40	uPRJobState	PRJobState	Word [Signed]	<ul style="list-style-type: none"> • 0 = POOLED • 1 = SETTING UP • 2 = WAITING FOR START • 3 = PROCESSING • 4 = PROCESS COMPLETE • 5 = (Reserved) • 6 = PAUSING • 7 = PAUSED • 8 = STOPPING • 9 = ABORTING • 10 = STOPPED • 11 = ABORTED

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

8.3 CJM Service Messages

SECS/GEM communication software supports CJM service messages. Sent or received CJM service messages can be checked in the communication log.

Additionally, the software notifies the processing result of each service message to a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

 Page 304 10094: CITL to CPU

For messages supported by SECS/GEM communication software, refer to the following:

 Page 374 Service Messages

Point

Transaction of S14F9 and S14F11 of supported CJM service messages can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

8.4 CJM Service for a Control CPU

SECS/GEM communication software provides a CJM service interface for a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

 Page 294 00094: CPU to CITL

For the usage method of a CJM service for a control CPU, refer to the following:

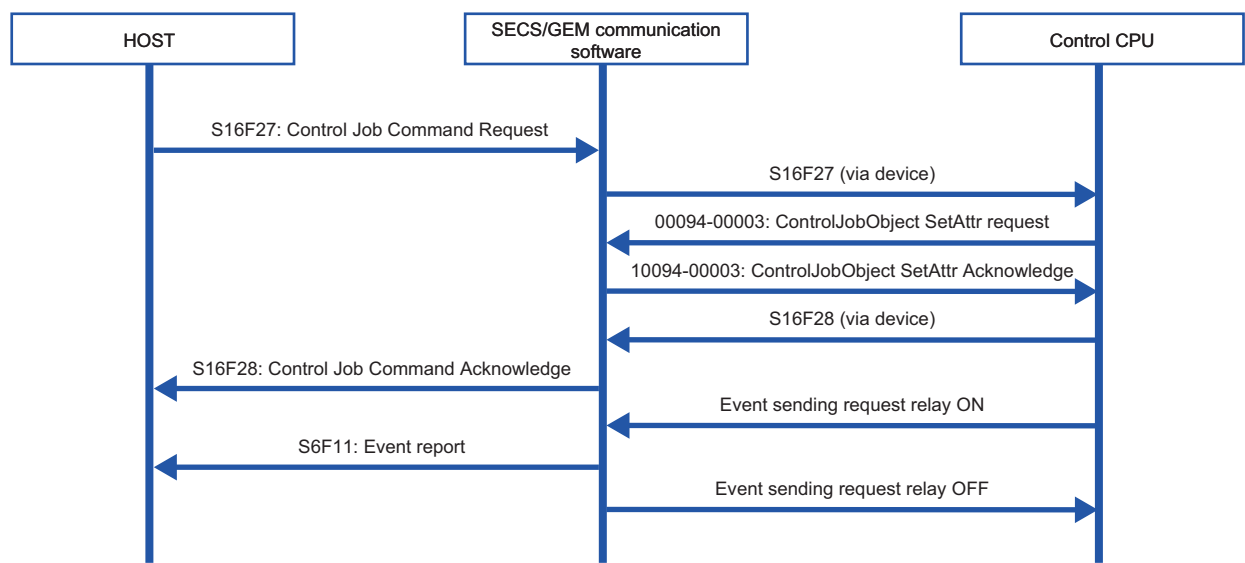
 Page 633 E94-CJM compliance

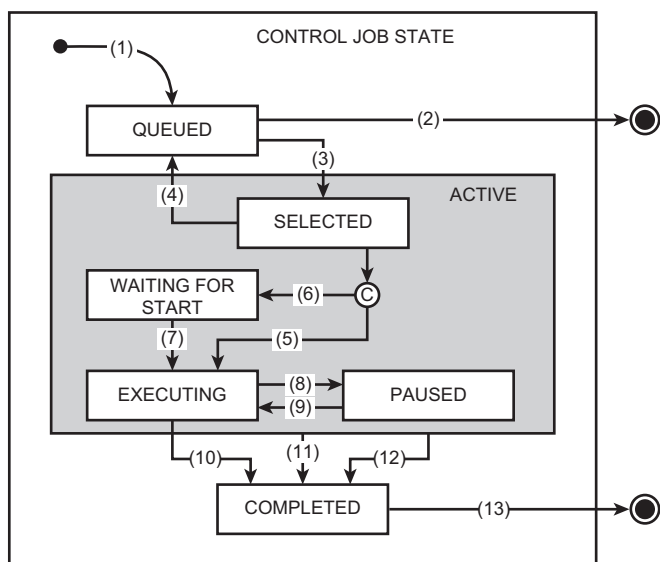
8.5 Control Job State Model Management

Enabling or disabling the control job queue management function determines whether SECS/GEM communication software manages the control job state model.

When not using the control job queue management function

The control job state model is not managed.
To manage the state model, use '00094-00003: ControlJobObject SetAttr request' from a control CPU to change the 'State' value.
For details on the event report (S6F11) that is sent when the state transition occurs, refer to the following:
📖 Page 514 CJM Report, 📖 Page 515 CJM Events
• Operation example





For the Harel notation used in the state model diagram, refer to 'R1-5 Harel Notation' in SEMI E30 (GEM).

State transition of a model diagram

The following table shows the state transition of the Control Job State Model diagram.

The behavior as equipment, as defined in SEMI E94, is as follows:

No.	Current state	Trigger	New state	Behavior as equipment	Comment
(1)	(NO STATE)	Receive 'Create' command from host or operator through operator console.	QUEUED	Create ControlJob and put it at the tail of a control job queue.	If job queue is full, 'Create' request is rejected.
(2)	QUEUED	Receive 'Cancel', 'Abort', or 'Stop' command from host or operator through operator console.	(NO STATE)	De-queue and terminate the job.	If other control jobs are waiting behind the canceled job in the queue, they are shifted forward to fill in the gap after the de-queuing of the canceled control job.
(3)	QUEUED	The processing resource has capacity to begin work on the next ControlJob.	SELECTED	Select and de-queue the job at the head of the queue.	Materials are not necessarily at the equipment.
(4)	SELECTED	Receive 'De-select' command from host or operator through operator console and materials for the control job have not arrived yet.	QUEUED	De-selected job moves to the head of the job queue and the job that was at the head becomes the SELECTED job.	The command shall be rejected if the resources for the job at the head of queue are not available. See the Queue Model.
(5)	SELECTED	Material for the first process job arrives or in the case where the first (or only) process job does not require material, this transition shall be taken as soon as the processing resource for that process job becomes available. 'StartMethod' attribute in the ControlJob is set for Auto.	EXECUTING	—	Process jobs associated with a carrier will not initiate until the identifier and substrate slot map for the carrier have been verified. Process jobs that don't use material can be initiated immediately.
(6)	SELECTED	Same as for transition 5 except that the 'StartMethod' attribute in the control job is set for user start.	WAITING FOR START	—	—
(7)	WAITING FOR START	User START command received.	EXECUTING	—	Same as for transition 5.
(8)	EXECUTING	The equipment received a 'Pause' command from the host or operator or a ControlJob PauseEvent has occurred.	PAUSED	—	—
(9)	PAUSED	The equipment received a 'Resume' command from the host or operator.	EXECUTING	Commence initiating process jobs.	—

No.	Current state	Trigger	New state	Behavior as equipment	Comment
(10)	EXECUTING	All the ProcessJobs specified for the ControlJob have completed.	COMPLETED	—	It may include post processing completion.
(11)	ACTIVE	The equipment received a CJStop command from the host or operator or generated a CJStop command internally, and all the process jobs under the ControlJob that were ACTIVE when the CJStop command was received have entered the POST ACTIVE state.	COMPLETED	—	—
(12)	ACTIVE	The equipment received a CJAbort command from the host or operator or generated a CJAbort command internally, and all the process jobs under the ControlJob that were ACTIVE when the CJAbort command was received have entered the POST ACTIVE state.	COMPLETED	—	—
(13)	COMPLETED	<p>Normal with material: Material associated with this ControlJob has been removed from the equipment.</p> <p>EXCEPTION: For equipment that requires reuse of specified material such as wafer 'fillers', departure of this type of material is not required for the ControlJob to be deleted.</p> <p>Normal without material: If the ControlJob does not have material associated with it the ControlJob is deleted automatically upon completion.</p> <p>By service: The host has requested the deletion of the ControlJob.</p>	(NO STATE)	Control Job is deleted.	NOTE: The material associated with a ControlJob is defined as the substrates specified by the process job(s) that are specified in the ControlJob.

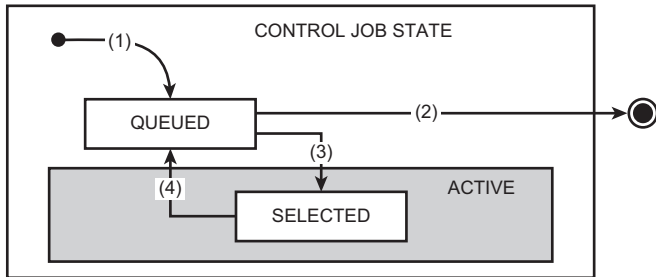
When using the control job queue management function

Only (1) to (4) of the control job state model is managed.

To manage the state model other than (1) to (4), use '00094-00003: ControlJobObject SetAttr request' from a control CPU to change the 'State' value.

For details on the event report (S6F11) that is sent when the state transition occurs, refer to the following:

📖 Page 514 CJM Report, 📖 Page 515 CJM Events



Point

For the Harel notation used in the state model diagram, refer to 'R1-5 Harel Notation' in SEMI E30 (GEM).

State transition of a model diagram

The following table shows the state transition of the Control Job State Model diagram.

No.	Current state	Trigger	New state	Action by SECS/GEM communication software
(1)	(NO STATE)	❶ 'S14F9: Create Object request' is received from the host. (📄 Page 451 S14F9 : Create Object Request) ❷ '00094-00001: ControlJobObject create request' is received from a control CPU. (📄 Page 294 00001: ControlJobObject create request)	QUEUED	■ Common action for ❶ and ❷ <ul style="list-style-type: none"> • Generating the instance of a control job object • Changing the State attribute value to '0 = QUEUED' • Adding the applicable CtrlJobID to the end of the queue ■ Action only for ❶ <ul style="list-style-type: none"> • Sending 'Create Object Acknowledge (S14F10)' to the host (📄 Page 464 S14F10: Create Object Acknowledge) • Sending '10094-01001: Create service (ControlJob) notification' to a control CPU (📄 Page 311 01001: Create service (ControlJob) notification) ■ Action only for ❷ <ul style="list-style-type: none"> • Sending '10094-00001: ControlJobObject create acknowledge' to a control CPU (📄 Page 304 00001: ControlJobObject create acknowledge)
(2)	QUEUED	❶ 'S14F11: Delete Object request' is received from the host. (📄 Page 466 S14F11: Delete Object Request) ❷ '00094-00002: ControlJobObject delete request' is received from a control CPU. (📄 Page 297 00002: ControlJobObject delete request)	(NO STATE)	■ Common action for ❶ and ❷ <ul style="list-style-type: none"> • Deleting an instance. • Removing the applicable CtrlJobID from the control job queue ■ Action only for ❶ <ul style="list-style-type: none"> • Sending 'Delete Object Acknowledge (S14F12)' to the host (📄 Page 468 S14F12: Delete Object Acknowledge) • Sending '10094-01002: Delete service (ControlJob) notification' to a control CPU (📄 Page 312 01002: Delete service (ControlJob) notification) ■ Action only for ❷ <ul style="list-style-type: none"> • Sending '10094-00002: ControlJobObject delete acknowledge' to a control CPU (📄 Page 305 00002: ControlJobObject delete acknowledge)
(3)	QUEUED	'00094-00101: ControlJob Selected request' is received from a control CPU. (📄 Page 301 00101: ControlJob Selected request)	SELECTED	<ul style="list-style-type: none"> • Removing CtrlJobID at the head of the control job queue • Sending '10094-00101: ControlJob Selected acknowledge' to a control CPU (📄 Page 308 00101: ControlJob Selected acknowledge)
(4)	SELECTED	'00094-00102: ControlJob Deselect request' is received from a control CPU. (📄 Page 302 00102: ControlJob Deselect request)	QUEUED	<ul style="list-style-type: none"> • Swapping 'DESELECT' target CtrlJobID and CtrlJobID at the head of the control job queue • Sending '10094-00102: ControlJob Deselect acknowledge' to a control CPU (📄 Page 309 00102: ControlJob Deselect acknowledge)

8.6 CJM Variables

SECS/GEM communication software provides variables required for E94-CJM.

A value of each variable whose class is DVVAL refers to the attributes of an object provided by SECS/GEM communication software.

○: Complied

VID	Class	Variable name	Format	Access from host	Target object	Description	E94 standard
30400	DVVAL	CarrierInputSpec	LIST [0..32]	Read Only	Control job	List of CarrierID of material used in a control job. LIST [0..32] CarrierID :	○
30401	DVVAL	CtrlJobID	ASCII [1..80]	Read Only	Control job	Control job ID (ObjID)	○
30402	DVVAL	CurrentPRJob	LIST [0..96]	Read Only	Control job	List of process jobs in the ACTIVE state under the management of this control job LIST [0..96] PRJobID :	○
30403	DVVAL	DataCollectionPlan	ASCII [1..80]	Read Only	Control job	Data collection plan used during the control job execution	○
30404	DVVAL	MtrlOutbyStatus	LIST [0..16]	Read Only	Control job	List for specifying collection destinations (carrier, slot) depending on the substrate (wafer) status LIST [0..16] LIST [2] MaterialStatus LIST [0 or 2] CarrierID LIST [1..25] SubstrateLocation : :	○
30405	DVVAL	MtrlOutSpec	LIST [0..32]	Read Only	Control job	List for specifying carriers and slots to collect substrates (wafers) after the processing LIST [0..32] LIST [2] LIST [0 or 2] CarrierID LIST [0..25] SubstrateLocation : LIST [0 or 2] CarrierID LIST [0..25] SubstrateLocation : :	○
30406	DVVAL	PauseEvent	LIST [0..512]	Read Only	Control job	List of events to pause a control job LIST [0..512] CEID :	○
30407	DVVAL	PRJobStatusList	LIST [1..96]	Read Only	Control job	State list of process jobs under the management of a control job LIST [1..96] LIST [2] PRJobID PRJobState :	○

VID	Class	Variable name	Format	Access from host	Target object	Description	E94 standard
30408	DVVAL	ProcessingCtrlSpec	LIST [1..96]	Read Only	Control job	Rule for process jobs to be executed in a control job and for executing each of them LIST [1..96] LIST [3] PRJobID LIST [0..16] LIST [2] RuleName RuleValue : LIST [0..16] LIST [2] MaterialStatus OutputRuleValue : :	○
30409	DVVAL	ProcessOrderMgmt	U1 [1]	Read Only	Control job	Specification for execution order rule of process jobs • 0 to 255 Initial definition: • 1 = ARRIVAL • 2 = OPTIMIZE • 3 = LIST	○
30410	SV	QueueAvailableSpace	U1 [1]	Read Only	—	Number of jobs that can be accepted by the queue • Using the control job queue management function: 0 to 30 Following 'Un\G28673 (7001H): QueueAvailableSpace' • Not using the control job queue management function: 0 to 32 In addition, GEM variables must be user-defined and controlled via the ladder.	○
30411	SV	QueuedControlJobs	LIST [0..32]	Read Only	—	List of queued control jobs • Using the control job queue management function LIST [0..30] CtrlJobID : Following 'Un\G28674 (7002H): QueuedControlJobs' • Not using the control job queue management function LIST [0..32] CtrlJobID : In addition, GEM variables must be user-defined and controlled via the ladder.	○
30412	ECV	SetupName	ASCII [0..80]	Read Write	—	Equipment operating conditions	○
30413	DVVAL	StartMethod	BOOL [1]	Read Only	Control job	Switching between 'starting a control job automatically' and 'waiting for a start instruction' • True = Auto • False = UserStart	○
30414	DVVAL	State	U1 [1]	Read Only	Control job	Current control job state • 0 = QUEUED • 1 = SELECTED • 2 = WAITINGFORSTART • 3 = EXECUTING • 4 = PAUSED • 5 = COMPLETED	—

8.7 CJM Events and Reports

SECS/GEM communication software supports state transition events and reports of the following state model:

 Page 109 Control Job State Model Management

Supported events and reports are subjected to the dynamic event report setting function, which is compliant with GEM (E30).

For the dynamic event report setting, refer to the "Dynamic Setting Change" of the following manual:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

For supported events and reports, refer to the following:

 Page 514 CJM Report,  Page 515 CJM Events

8.8 Control Job Queue Model

SECS/GEM communication software supports the control job queue model required for E94-CJM.
By using the control job queue management function, control job queues can be managed efficiently.

Setting method

When using the control job queue management function of SECS/GEM communication software, settings for the function is required.

For details, refer to the following:

📖 Page 34 Control Job Settings

Maximum number of control job queues

The maximum number of control job queues is inversely proportional to the number of concurrent control jobs.

When the control job queue management function of SECS/GEM communication software is enabled, the states of two control jobs per concurrent control job can be transitioned to other than QUEUED states (SELECTED: 1, Processing^{*1}: 1).

Note that the upper limits for the number of control jobs in each state are not managed if the control job queue management function is disabled

^{*1} Any of the following: 2 = WAITING FOR START, 3 = EXECUTING, 4 = PAUSED, 5 = COMPLETED

Number of concurrent control jobs	Maximum number of control jobs (fixed)	SELECTED control job limit	Processing control job limit	Maximum number of control job queues (QUEUED control jobs)
1	32	1	1	30
2	32	2	2	28
3	32	3	3	26
...	...	...	...	...
13	32	13	13	6
14	32	14	14	4
15	32	15	15	2

Control job queue management

SECS/GEM communication software manages control job queues as follows:

- Control jobs are added to the queue that is first-in, first out (FIFO) in the order they are instantiated.
 - Managing the available space of queues
 - Managing the number of SELECTED state control jobs
 - Managing the number of processing^{*1} state control jobs
 - Applying the queue state to the buffer memory
- A SELECTED state control job can be deselected.
- Insertion at the head of the queue (Head Of Queue) is allowed when a hot lot occurs.

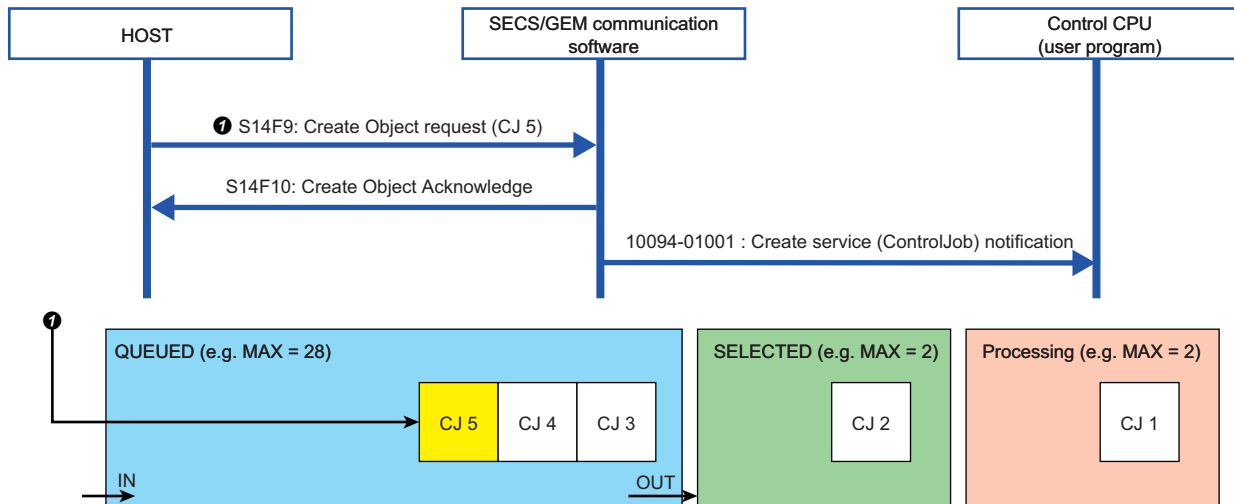
^{*1} Any of the following: 2 = WAITING FOR START, 3 = EXECUTING, 4 = PAUSED, 5 = COMPLETED

Control job queue operations

SECS/GEM communication software manages the processing of control job queue operations as follows:

No.	Case	Trigger
1	Page 119 Addition: Creating a control job object and adding it to the queue by an instruction from the host	S14F9: Create Object request (S14F9 : Create Object Request)
2	Page 119 Addition: Creating a control job object and adding it to the queue by an instruction from the control CPU	00094-00001: ControlJobObject create request (S14F9 : Create Object Request)
3	Page 120 Deletion: Deleting a control job object and removing it from the queue by an instruction from the host	S14F11: Delete Object request (S14F11: Delete Object Request)
4	Page 120 Deletion: Deleting a control job object and removing it from the queue by an instruction from the control CPU	(S16F27: CJCancel or CJAbort or CJStop) (S16F27: CJCancel, Page 503 S16F27: CJAbort, Page 502 S16F27: CJStop) 00094-00002: ControlJobObject delete request (S16F27: CJStop) ControlJobObject delete request)
5	Page 121 Deletion: Changing the state of a control job object at the head of the queue to 'SELECTED' and removing the control job object from the queue by an instruction from the control CPU	00094-00101: ControlJob Selected request (S16F27: CJSelect) ControlJob Selected request)
6	Page 122 Swap: Swapping a SELECTED state control job object and a control job object at the head of the queue by an instruction from the control CPU (that received the CJDeselect request from the host)	(S16F27: CJDeselect) (S16F27: CJDeselect) 00094-00102: ControlJob Deselect request (S16F27: CJDeselect) ControlJob Deselect request)
7	Page 123 Insertion: Moving a control job object to the head of the queue by an instruction from the control CPU (that received the CJHOQ request from the host)	(S16F27: CJHOQ) (S16F27: CJHOQ) 00094-00103: ControlJob HOQ request (S16F27: CJHOQ) ControlJob HOQ request)

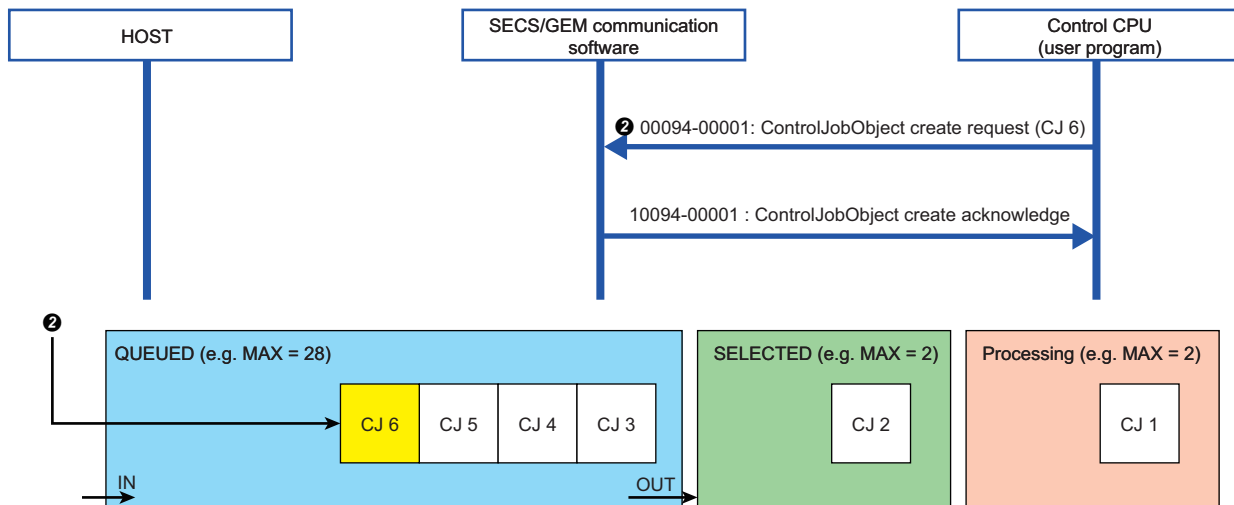
■ Addition: Creating a control job object and adding it to the queue by an instruction from the host



[Processing]

- A control job is created.
- The created control job object (example: CJ 5) is added to the end of the queue.
- The queue state is applied to 'QueuedCJobs' (Un\G28674 to 29873).
- Available space of queues is decreased by 1.
- The queue state is applied to 'QueueAvailableSpace' (Un\G28673).

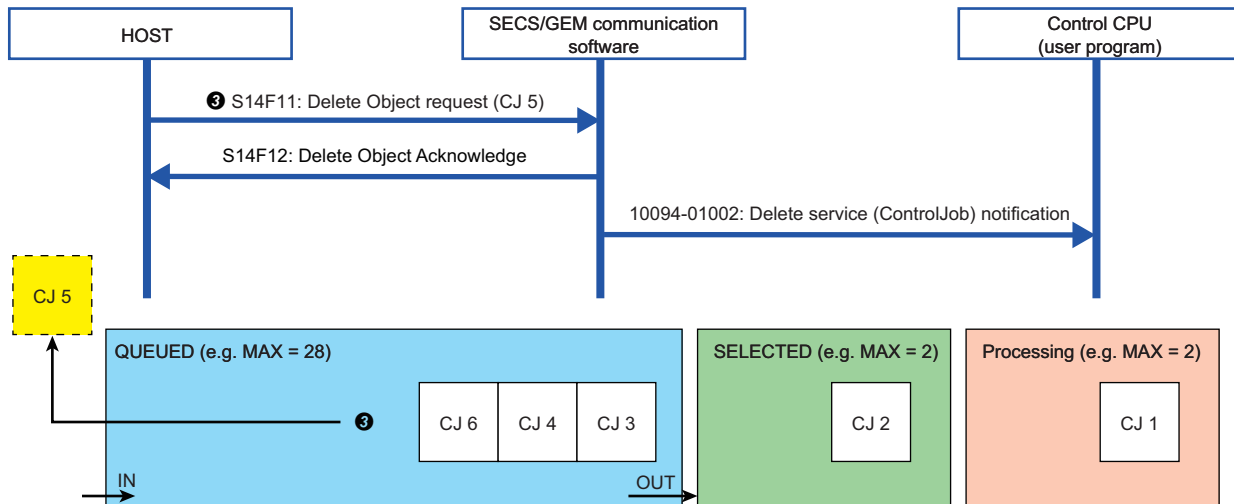
■ Addition: Creating a control job object and adding it to the queue by an instruction from the control CPU



[Processing]

- A control job is created.
- The created control job object (example: CJ 6) is added to the end of the queue.
- The queue state is applied to 'QueuedCJobs' (Un\G28674 to 29873).
- Available space of queues is decreased by 1.
- The queue state is applied to 'QueueAvailableSpace' (Un\G28673).

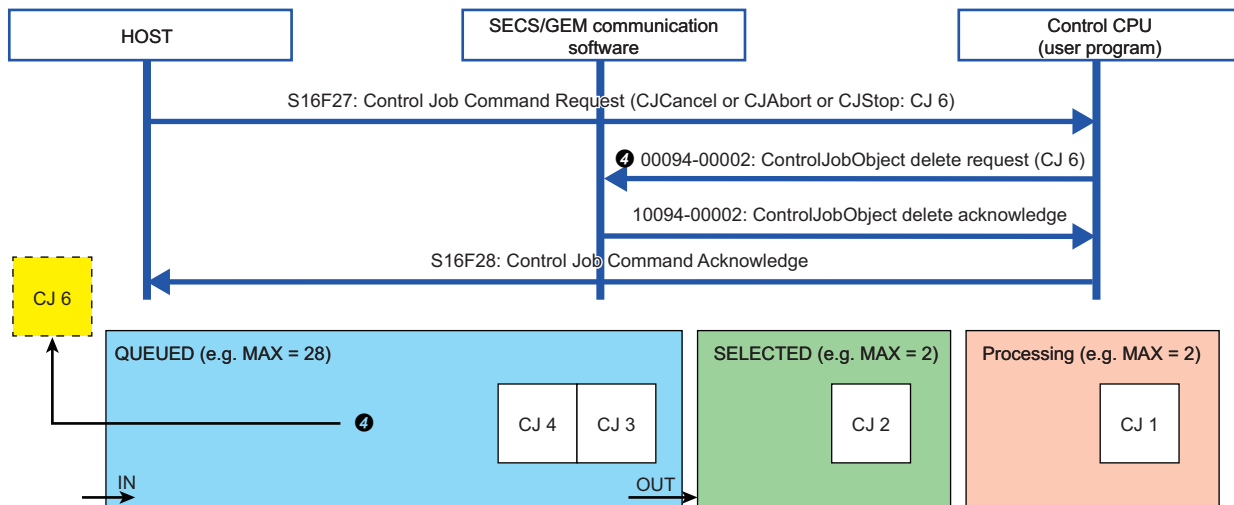
■ Deletion: Deleting a control job object and removing it from the queue by an instruction from the host



[Processing]

- A control job is deleted.
- If the deleted control job object (example: CJ 5) exists in the queue, it is removed from the queue.
- The queue state is applied to 'QueuedCJobs' (Un\G28674 to 29873).
- Available space of queues is increased by 1.
- The queue state is applied to 'QueueAvailableSpace' (Un\G28673).

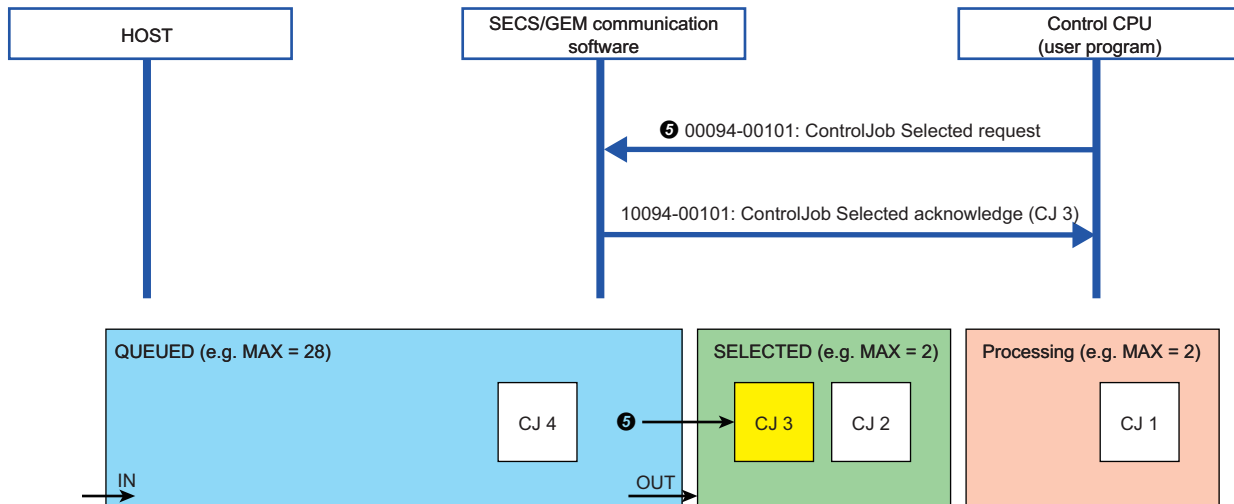
■ Deletion: Deleting a control job object and removing it from the queue by an instruction from the control CPU



[Processing]

- A control job is deleted.
- If the deleted control job object (example: CJ 6) exists in the queue, it is removed from the queue.
- The queue state is applied to 'QueuedCJobs' (Un\G28674 to 29873).
- Available space of queues is increased by 1.
- The queue state is applied to 'QueueAvailableSpace' (Un\G28673).

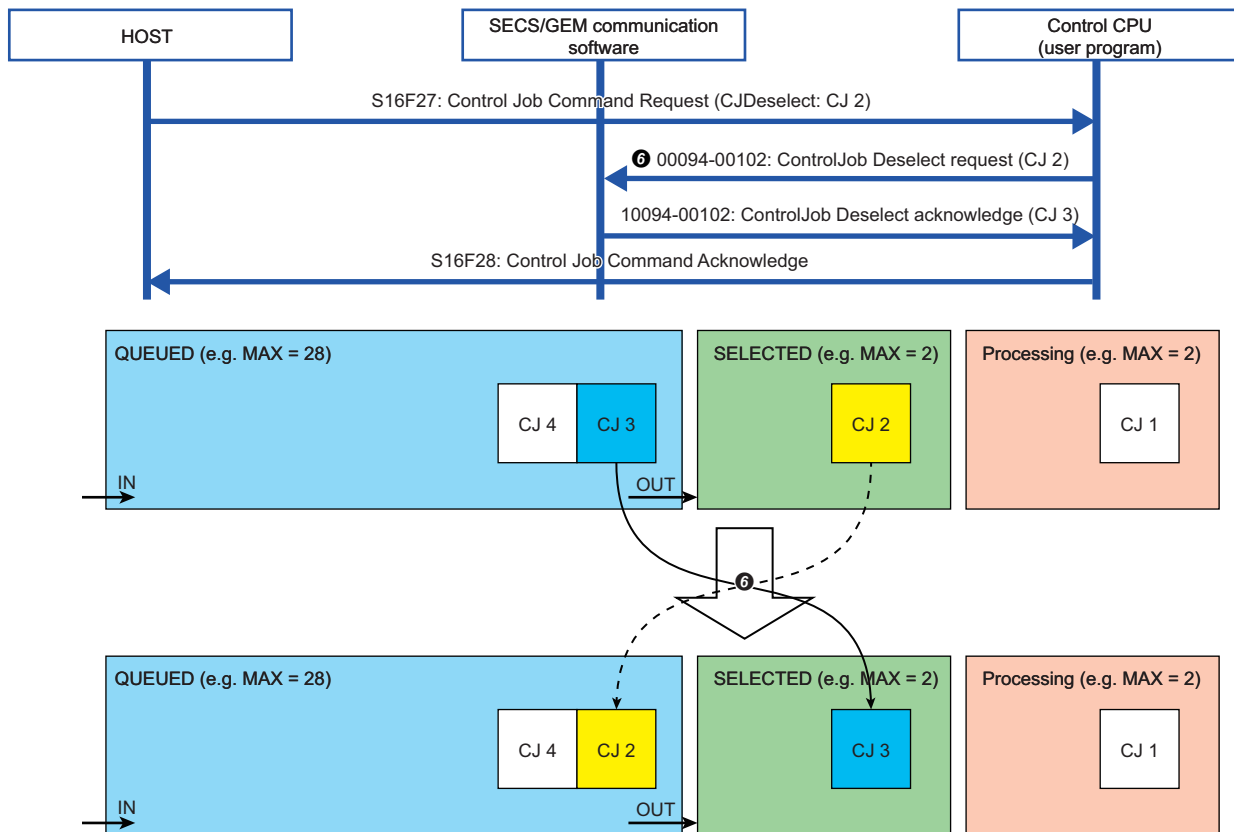
■ **Deletion: Changing the state of a control job object at the head of the queue to 'SELECTED' and removing the control job object from the queue by an instruction from the control CPU**



[Processing]

- The state of a control job object at the head of the queue (example: CJ 3) is set to 1= SELECTED, and the control job object is removed from the queue.
- The queue state is applied to 'QueuedCJobs' (Un\G28674 to 29873).
- Available space of queues is increased by 1.
- The queue state is applied to 'QueueAvailableSpace' (Un\G28673).

■ **Swap: Swapping a SELECTED state control job object and a control job object at the head of the queue by an instruction from the control CPU (that received the CJDeselect request from the host)**



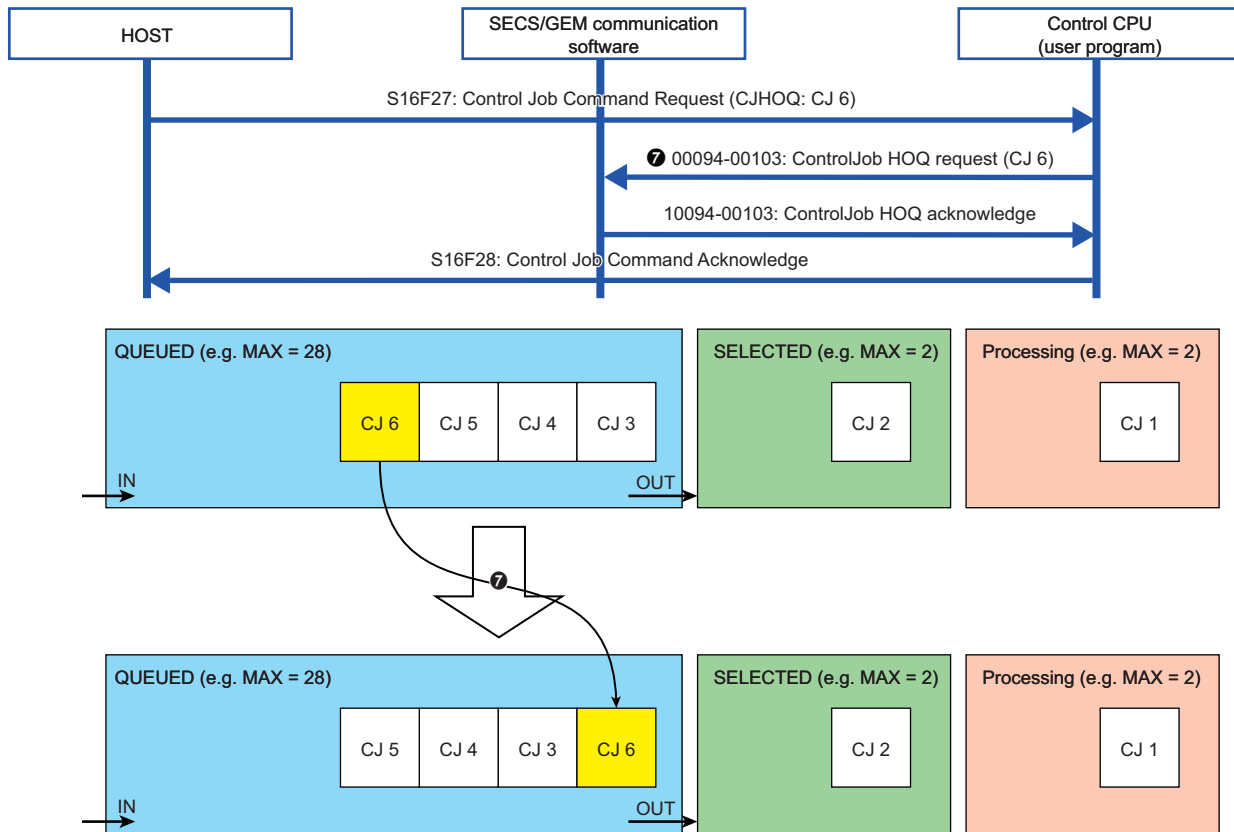
[Processing]

- The state of a specified control job object (example: CJ 2) is set to 0 = QUEUED.
- The state of a control job object at the head of the queue (example: CJ 3) is set to 1= SELECTED.
- CtrlJobID at the head of the queue is changed to the specified control job object (example: CJ 2).
- The queue state is applied to 'QueuedCJobs' (Un\G28674 to 29873).
- Available space of queues is not changed.
- The queue state is applied to 'QueueAvailableSpace' (Un\G28673).

Point

- When the resources for the job at the head of queue are not available in response to 'S16F27: CJDeselect,' the request shall be rejected by the control CPU using S16F28.
- If the resources for the job at the head of the queue are not available, '00094-00102: ControlJob Deselect request' must not be requested.
- SECS/GEM communication software is not aware of whether the resources for the job at the head of the control job queue are available.

■ **Insertion: Moving a control job object to the head of the queue by an instruction from the control CPU (that received the CJHOQ request from the host)**



[Processing]

- A specified control job object (example: CJ 6) is moved to the head of the queue.
- Other control jobs in the queue (example: CJ 3, 4, 5) are shifted one position toward the end of the queue.
- The queue state is applied to 'QueuedCJobs' (Un\G28674 to 29873).
- Available space of queues is not changed.
- The queue state is applied to 'QueueAvailableSpace' (Un\G28673).

This chapter explains the E40-PJM compliant function.

9.1 Usage Method

For the usage method of this function, refer to the following:

☞ Page 671 E40-PJM compliance

9.2 Process Job Objects

This section explains process job objects provided by SECS/GEM communication software.

SECS/GEM communication software instantiates process job-related information to an object and exchanges the information between the host and equipment using E39-OSS and E40-PJM services.

The number of instantiated process job objects is stored in 'Process job object count' (Un\G32768). (☞ Page 362 Buffer Memory)

Attributes

The following table shows the attributes of a process job object.

Name	Format	Access from host	Description
ObjType	ASCII [1..80] ^{*1}	Read Only	Object type "ProcessJob"
ObjID	ASCII [1..80] ^{*1}	Read Only	Process job identifier defined by the host (PRJobID)
PRMtlType	BIN [1]	Read Only	Processing material type (MF value) identification MF value: <ul style="list-style-type: none"> • 0(0x00): No material • 13(0x0d): Carrier (Example: FOUP, SMIF pod, cassette) • 14(0x0e): Substrate (Example: Wafer, mask, flat panel)
PRMtlNameList	LIST [0..(32, 1024)]	Read Only	List that specifies a target substrate <ul style="list-style-type: none"> • PRMtlType = 0 (No material): LIST [0] <ul style="list-style-type: none"> • PRMtlType = 13 (Carrier): LIST [0..32] (Number of carriers) LIST [2] <ul style="list-style-type: none"> ASCII [1..80] CarrierID^{*1*2} LIST [0..25] (Number of slots) U1[1] SlotID^{*2} : • PRMtlType = 14 (Substrate): LIST [0..1024] (Number of substrates) <ul style="list-style-type: none"> ASCII [1..80] MID (Substrate ID)^{*1*2} : • LIST maximum value changes between PRMtlType 13 and 14.
RecID	ASCII [1..80] ^{*1}	Read Only	Recipe identifier. 'RCPSPEC' or 'PPID' of SEMI-E5
PRRecipeMethod	U1 [1]	Read Only	Switch that specifies the recipe type. 'PRRECIPEMETHOD' of SEMI-E5 <ul style="list-style-type: none"> • 1 = Recipe only (STANDARD) • 2 = Recipe using variables for tuning (USETUNING)
RecVariableList	LIST [0..512]	Read Only	List of recipe variables LIST [0..512] (Number of recipe variables) LIST [2] <ul style="list-style-type: none"> ASCII [1..256] RCPPARNM RecipeVarName: Recipe parameter name^{*1*2} any RCPPARVAL^{*3} (RecipeVarValue: Recipe variable value) : <ul style="list-style-type: none"> • The LIST type cannot be used for 'RCPPARVAL.'

Name	Format	Access from host	Description
PRProcessStart	BOOL [1]	Read Only	Specification of whether to start automatically when the substrate to be processed arrives and processing resources are available <ul style="list-style-type: none"> • true = Automatic start • false = Manual start
PauseEvent	LIST [0..512]	Read Only	List of event to pause this process job LIST [0..512] U(1, 2, 4) [1] CEID*2 :
PRJobState	U1 [1]	Read Only	Current process job state <ul style="list-style-type: none"> • 0 = POOLED • 1 = SETTING UP • 2 = WAITING FOR START • 3 = PROCESSING • 4 = PROCESS COMPLETE • 5 = (Reserved) • 6 = PAUSING • 7 = PAUSED • 8 = STOPPING • 9 = ABORTING • 10 = STOPPED • 11 = ABORTED

*1 Excluding the control characters.

*2 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*3 Any of the following: BIN[1], BOOL[1], ASCII[1..80], I1[1], I2[1], I4[1], U1[1], U2[1], U4[1], F4[1], F8[1]

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to PJM.

📖 Page 314 00040: CPU to CITL, 📖 Page 320 10040: CITL to CPU

Structure labels defined in this product are provided in a sample library.

📖 Page 521 Sample Library

■M+GEM300_ProcessJobObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2
+40 to 79	u40ObjID	ObjID (PRJobID)	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2
+80	uPRMtlType	PRMtlType	Word [Unsigned]	<ul style="list-style-type: none"> • 00(0x00) = No material • 13(0x0d) = Carrier • 14(0x0e) = Substrate
+81 to 2160	st32PRMtlNameList_MF13	PRMtlNameList (MF13)	M+GEM300_PRMtlNameList_MF13(0..31)	📖 Page 127 M+GEM300_PRMtlNameList_MF13
+2161 to 43120	st1024PRMtlNameList_MF14	PRMtlNameList (MF14)	M+GEM300_PRMtlNameList_MF14(0..1023)	📖 Page 127 M+GEM300_PRMtlNameList_MF14
+43121 to 43160	u40RecID	RecID	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII)*1*2
+43161	uPRRecipeMethod	PRRecipeMethod	Word [Unsigned]	<ul style="list-style-type: none"> • 1 = STANDARD • 2 = USETUNING
+43162 to 129177	st512RecVariableList	RecVariableList	M+GEM300_RecVariableList (0..511)	📖 Page 127 M+GEM300_RecVariableList
+129178	bPRProcessStart	PRProcessStart	Word [Unsigned]	<ul style="list-style-type: none"> • 0 = false (Manual start) • 1 to 65535 = true (Automatic start)
+129179 to 130202	st512PauseEvent	PauseEvent	M+GEM300_PauseEvent(0..511)	📖 Page 107 M+GEM300_PauseEvent

Offset	Label name	Name	Data type	Applicable range
+130203	uPRJobState	PRJobState	Word [Unsigned]	<ul style="list-style-type: none"> • 0 = POOLED • 1 = SETTING UP • 2 = WAITING FOR START • 3 = PROCESSING • 4 = PROCESS COMPLETE • 5 = (Reserved) • 6 = PAUSING • 7 = PAUSED • 8 = STOPPING • 9 = ABORTING • 10 = STOPPED • 11 = ABORTED

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_PRMTNameList_MF13

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	NULL code (00H)* ¹ , 1 to 80 characters (ASCII)* ^{2,3}
+40 to 64	st25SlotIDList	SlotID	M+GEM300_SlotIDList(0..24)	☞ Page 106 M+GEM300_SlotIDList

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_PRMTNameList_MF14

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40SubstrateID	SubstrateID	Word [Unsigned] (0..39)	NULL code (00H)* ¹ , 1 to 80 characters (ASCII)* ^{2,3}

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_RecVariableList

Offset	Label name	Name	Data type	Applicable range
+0 to 127	u128RCPPARNM	RCPPARNM	Word [Unsigned] (0..127)	NULL code (00H)* ¹ , 1 to 256 characters (ASCII)* ^{2,3}
+128 to 167	u40RCPPARVAL	RCPPARVAL	Word [Unsigned] (0..39)	<ul style="list-style-type: none"> • According to the user setting of RecipeVariable. (☞ Page 45 RecipeVariable) • Handled as a binary dump in little-endian format due to the unspecified data type.

*1 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*2 Excluding the control characters.

*3 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

9.3 PJM Service Messages

SECS/GEM communication software supports PJM service messages. Sent or received PJM service messages can be checked in the communication log.

Additionally, the software notifies the processing result of each service message to a control CPU in the form of an event message via buffer memory. For details, refer to the following:

📖 Page 320 10040: CITL to CPU

For messages supported by SECS/GEM communication software, refer to the following:

📖 Page 374 Service Messages

Point

Transaction of S16F11, S16F15, S16F17, S16F19, S16F21, S16F23, S16F25, and S16F29 of supported PJM service messages can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

9.4 PJM Service for a Control CPU

SECS/GEM communication software provides a PJM service interface for a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

📖 Page 314 00040: CPU to CITL

For the usage method of a PJM service for a control CPU, refer to the following:

📖 Page 671 E40-PJM compliance

9.5 Process Job State Model Management

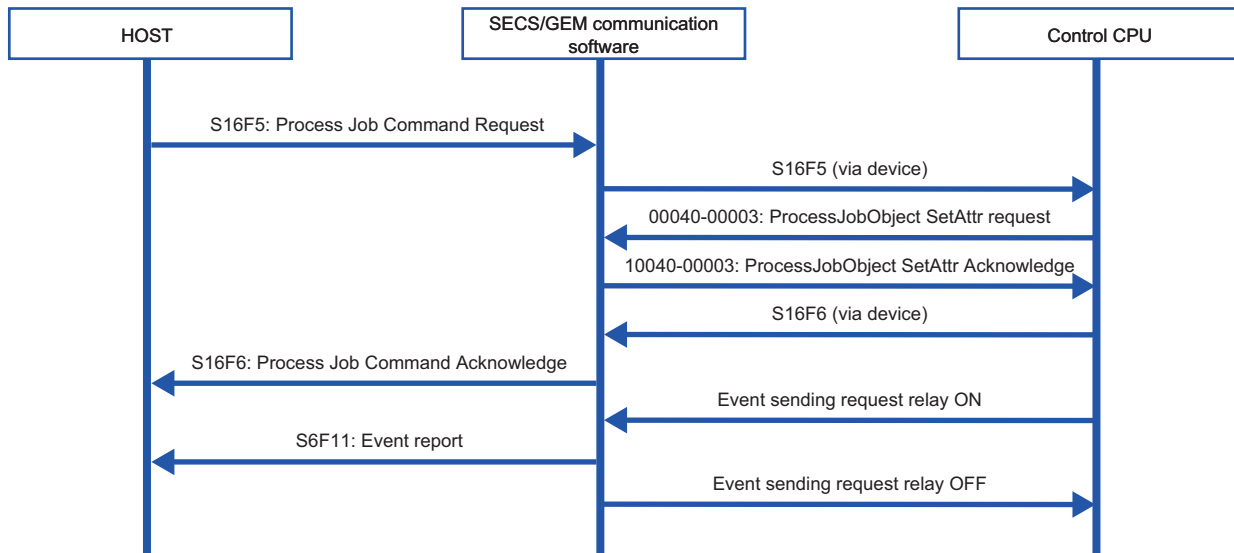
SECS/GEM communication software does not manage the process job state model.

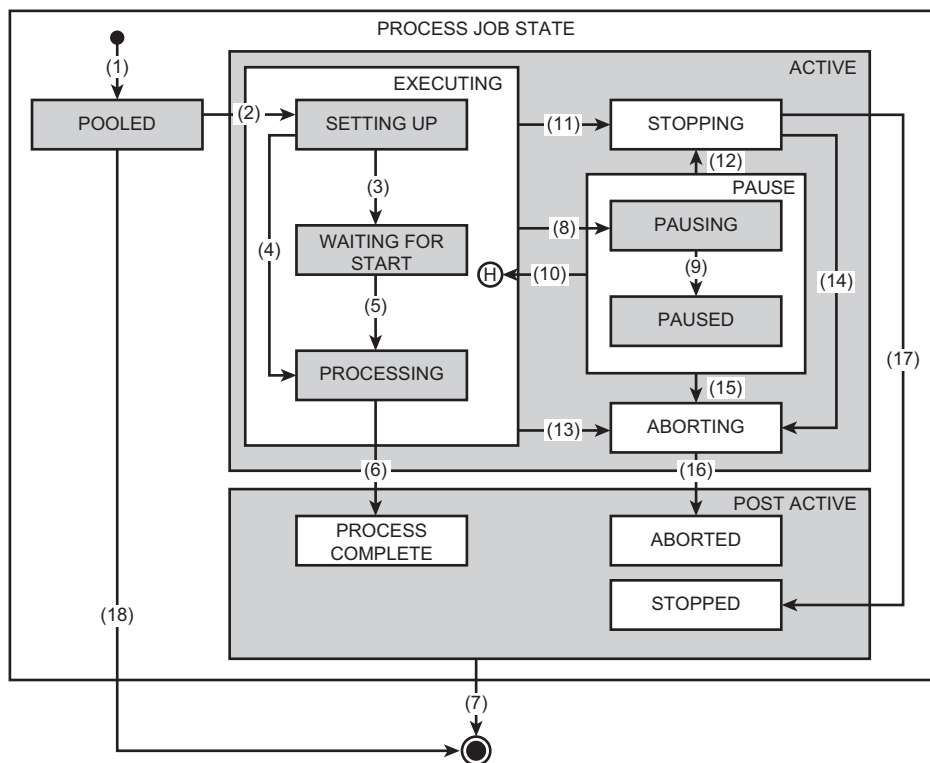
To manage the state model, use '00040-00003: ProcessJobObject SetAttr request' from a control CPU to change the 'PRJobState' value.

For details on the event report (S6F11) that is sent when the state transition occurs, refer to the following:

📖 Page 516 PJM Reports, 📖 Page 517 PJM Events

- Operation example





For the Harel notation used in the state model diagram, refer to 'R1-5 Harel Notation' in SEMI E30 (GEM).

State transition of a model diagram

The following table shows the state transition of the Process Job State Model diagram.

The behavior as equipment, as defined in SEMI E40, is as follows:

No.	Current state	Trigger	New state	Behavior as equipment
(1)	(NO STATE)	The processing resource accepts a Process Job create request.	POOLED	The job is placed the job queue/pool. Acknowledge the Process Job creation.
(2)	POOLED	The processing resource has been allocated to the Process Job.	SETTING UP	The job is removed from the queue/pool. PR Job Setup event is triggered. All required resource preconditioning is performed. When job material arrives all material preparation is performed.
(3)	SETTING UP	Job material is present AND the processing resource is ready to start the process job AND PRProcessStart attribute is not set.	WAITING FOR START	PR Job Waiting for Start event is triggered.
(4)	SETTING UP	Material is present and ready for processing. PRProcessStart attribute is set.	PROCESSING	PR Job Processing event is triggered. Material is processed.
(5)	WAITING FOR START	Job Start directive.	PROCESSING	PR Job Processing event is triggered. Material is processed.
(6)	PROCESSING	Material processing completed.	PROCESS COMPLETE	PR Job Processing Complete event is triggered. The processing resource performs all required resource post-conditioning. Await material departure.
(7)	Lower state of POST ACTIVE	Job material departs from the equipment OR the process job becomes extinct because the process job is replaced by another process job that specifies the same material when no control job is used.	(Extinction) (= NO STATE)	PR Job Complete event is triggered. The process job is deleted.
(8)	Lower state of EXECUTING	The processing resource initiated a process pause action. (it received a PAUSE command or initiated an internal pause)	PAUSING	The processing resource pauses at the first convenient time.
(9)	PAUSING	The processing resource paused the job.	PAUSED	None.

No.	Current state	Trigger	New state	Behavior as equipment
(10)	Lower state of PAUSE	The processing resource resumed the job.	Lower state of EXECUTING (History)	The processing resource resumes the activity that was paused.
(11)	Lower state of EXECUTING	The processing resource initiated a process stop action. (it received a STOP command or initiated an internal stop)	STOPPING	The processing resource stops the current execution activity at the first convenient time.
(12)	Lower state of PAUSE	The processing resource initiated a process stop action. (it received a STOP command or initiated an internal stop)	STOPPING	The processing resource stops the current execution activity at the first convenient time.
(13)	Lower state of EXECUTING	The processing resource initiated a process abort action. (it received an ABORT command or initiated an internal abort)	ABORTING	The processing resource terminates the current execution activity immediately.
(14)	STOPPING	The processing resource initiated a process abort action. (it received an ABORT command or initiated an internal abort)	ABORTING	The processing resource terminates the current execution activity immediately.
(15)	Lower state of PAUSE	The processing resource initiated a process abort action. (it received an ABORT command or initiated an internal abort)	ABORTING	The processing resource terminates the current execution activity immediately.
(16)	ABORTING	The abort procedure is completed. For some equipment, substrates are moved out into a safe location as part of the error recovery.	ABORTED	—
(17)	STOPPING	The stop procedure is completed and all material is in a safe condition.	STOPPED	—
(18)	POOLED	'CANCEL', 'ABORT', or 'STOP' command received.	(NO STATE)	Remove the process job from the queue/pool. PR Job Complete event is triggered. Delete the process job.

9.6 PJM Variables

SECS/GEM communication software provides variables required for E40-PJM. A value of each variable whose class is DVVAL refers to the attributes of an object provided by SECS/GEM communication software.

○: Complied

VID	Class	Variable name	Format	Access from host	Target object	Description	E40 standard
30500	DVVAL	PRJobID	ASCII [1..80]**1	Read Only	Process job	Process job ID (ObjID)	○
30501	DVVAL	PRMtlType	BIN [1]	Read Only	Process job	Processing material type (MF value) identification • 0(0x00) = No material • 13(0x0d) = Carrier • 14(0x0e) = Substrate	○
30502	DVVAL	PRMtlNameList	LIST [0..(32, 1024)]	Read Only	Process job	List that specifies a target substrate PRMtlType = 0 (No material): LIST [0] PRMtlType = 13 (Carrier): LIST [0..32] (Number of carriers) LIST [2] CarrierID LIST [0..25] (Number of slots) SlotID : : PRMtlType = 14 (Substrate): LIST [0..1024] (Number of substrates) MID : :	○
30503	DVVAL	RecID	ASCII [1..80]**1	Read Only	Process job	Recipe identifier	○
30504	DVVAL	PRRecipe Method	U1 [1]	Read Only	Process job	Switch that specifies the recipe type • 1 = STANDARD • 2 = USETUNING	○
30505	DVVAL	RecVariableList	LIST [0..512]	Read Only	Process job	List of recipe variables LIST [0..512] LIST [2] RCPPARNM RCPPARVAL : :	○
30506	DVVAL	PRProcessStart	BOOL [1]	Read Only	Process job	Specification of whether to start automatically when the substrate to be processed arrives and processing resources are available • true = Automatic start • false = Manual start	○
30507	DVVAL	PauseEvent	LIST [0..512]	Read Only	Process job	List of event to pause a process job LIST [0..512] CEID : :	○
30508	DVVAL	PRJobState	U1 [1]	Read Only	Process job	Current process job state • 0 = POOLED • 1 = SETTING UP • 2 = WAITING FOR START • 3 = PROCESSING • 4 = PROCESS COMPLETE • 5 = (Reserved) • 6 = PAUSING • 7 = PAUSED • 8 = STOPPING • 9 = ABORTING • 10 = STOPPED • 11 = ABORTED	○

VID	Class	Variable name	Format	Access from host	Target object	Description	E40 standard
30509	ECV	PRMtrlOrder	U1 [1]	Read Write	—	Processing order of materials in the material list of a process job is determined. <ul style="list-style-type: none"> • 1 = ARRIVAL: Processing in the order of material arrival • 2 = OPTIMIZE: Processing in the order that maximizes throughput • 3 = LIST: Processing in the order of the list 	—
30510	DVVAL	PRJobMilestone	U1 [1]	Read Only	—	Process job milestones <ul style="list-style-type: none"> • 1 = PR Job Setup • 2 = PR Job Processing • 3 = PR Job Processing Complete • 4 = PR Job Complete • 5 = PR Job Waiting for Start 	—
30511	DVVAL	PRAck	BOOL [1]	Read Only	—	Whether an operation has succeeded is indicated. <ul style="list-style-type: none"> • true = Success • false = Failure 	—

*1 Excluding the control characters.

9.7 PJM Events and Reports

SECS/GEM communication software supports 'Milestone report' (PRJobAlert) and 'Process job-related collection event' (PRJobEvent) by 'E30 style: S6F11.'

Supported events and reports are subjected to the dynamic event report setting function, which is compliant with GEM (E30).

For the dynamic event report setting, refer to the "Dynamic Setting Change" of the following manual:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

For supported events and reports, refer to the following:

 Page 516 PJM Reports,  Page 517 PJM Events

10 E90-STS COMPLIANT FUNCTION

This chapter explains the E90-STS compliant function.

10.1 Usage Method

For the usage method of this function, refer to the following:

☞ Page 686 E90-STS compliance

10.2 Substrate Objects

This section explains substrate objects provided by SECS/GEM communication software.

SECS/GEM communication software instantiates substrate-related information to an object and exchanges the information between the host and equipment using E39-OSS and E90-STS services. The number of instantiated substrate objects is stored in 'Substrate object count' (Un\G36864). (☞ Page 362 Buffer Memory)

Attributes

The following table shows the attributes of a substrate object.

Name	Format	Access from host	Description
ObjType	ASCII[1..80]* ¹	Read Only	Object type (Substrate)
ObjID	ASCII[1..80]* ¹	Read Only	Substrate ID (SubstID)
SubstState	U1[1]	Read Only	Substrate Transport • 0: AT SOURCE • 1: AT WORK • 2: AT DESTINATION
SubstProcState	U1[1]	Read Only	Substrate Processing • 0: NEEDS PROCESSING • 1: IN PROCESS • 2: PROCESSED • 3: ABORTED • 4: STOPPED • 5: REJECTED • 6: LOST • 7: SKIPPED
SubstLocID	ASCII[0..80]* ¹	Read Only	Substrate location (Location)* ²
SubstSource	ASCII[0..80]* ¹	Read Only	Substrate location where a substrate is initially stored
SubstDestination	ASCII[0..80]* ¹	Read Only	Substrate location where a substrate is finally collected* ³
SubstHistory	LIST [0..32]	Read Only	History of a location passed by a substrate LIST[0..32] LIST[3] ASCII* ¹ [1..80] SubstLocID or BatchLocID.SubstPosInBatch ASCII* ¹ [0, 12, 16] TimeIn* ⁴ ASCII* ¹ [0, 12, 16] TimeOut* ^{4,5}
BatchLocID	ASCII[0..80]* ¹	Read Only	Current batch location ID* ⁶
SubstPosInBatch	ASCII[0..80]* ¹	Read Only	Current location of a substrate in a batch location* ⁶
SubstIDStatus	U1[1]	Read Only	Substrate Reading Status • 0: NOT CONFIRMED • 1: WAITING FOR HOST • 2: CONFIRMED • 3: CONFIRMATION FAILED
AcquiredID	ASCII[0..80]* ¹	Read Only	ID read from a substrate* ⁷
LotID	ASCII[0..80]* ¹	Read Write	Lot ID specified by the host
MaterialStatus	U1[1]	Read Only	Substrate processing quality status* ⁸
SubstType	U1[1]	Read Write	Substrate type • 0: WAFER • 1: FLAT PANEL • 2: CD • 3: MASK

Name	Format	Access from host	Description
SubstUsage	U1[1]	Read Write	Intended use of a substrate <ul style="list-style-type: none"> • 0: PRODUCT • 1: TEST • 2: FILLER

- *1 Excluding the control characters.
- *2 A null character for batch process equipment
- *3 If it is a null character, it means that a substrate is collected at the same location as SubstSource.
- *4 The format of TimeIn and TimeOut follows "Clock Data Format" in [GEMFunction] ⇒ [Clock] ⇒ [Common] tab.
- *5 The format of TimeOut is ASCII [0] when there is any substrate in a location.
- *6 Used only for batch process equipment.
- *7 Used only for equipment with a substrate ID reader.
- *8 A value according to the equipment specifications

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to STS.

📖 Page 330 00090: CPU to CITL, Page 344 10090: CITL to CPU

Structure labels defined in this product are provided in a sample library.

📖 Page 521 Sample Library

■M+GEM300_SubstrateObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)* ¹ * ²
+40 to 79	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)* ¹ * ²
+80	uSubstState	SubstState	Word [Unsigned]	<ul style="list-style-type: none"> • 0: AT SOURCE • 1: AT WORK • 2: AT DESTINATION
+81	uSubstProcState	SubstProcState	Word [Unsigned]	<ul style="list-style-type: none"> • 0: NEEDS PROCESSING • 1: IN PROCESS • 2: PROCESSED • 3: ABORTED • 4: STOPPED • 5: REJECTED • 6: LOST • 7: SKIPPED
+82 to 121	u40SubstLocID	SubstLocID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)* ¹ * ²
+122 to 161	u40SubstSource	SubstSource	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)* ¹ * ²
+162 to 201	u40SubstDestination	SubstDestination	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)* ¹ * ²
+202 to 1993	st32SubstHistory	SubstHistory	M+GEM300_SubstHistory (0..31)	📖 Page 139 M+GEM300_SubstHistory
+1994 to 2033	u40BatchLocID	BatchLocID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)* ¹ * ²
+2034 to 2073	u40SubstPosInBatch	SubstPosInBatch	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)* ¹ * ²
+2074	uSubstIDStatus	SubstIDStatus	Word [Unsigned]	<ul style="list-style-type: none"> • 0: NOT CONFIRMED • 1: WAITING FOR HOST • 2: CONFIRMED • 3: CONFIRMATION FAILED
+2075 to 2114	u40AcquiredID	AcquiredID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)* ¹ * ²
+2115 to 2154	u40LotID	LotID	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII)* ¹ * ²
+2155	uMaterialStatus	MaterialStatus	Word [Unsigned]	0 to 255
+2156	uSubstType	SubstType	Word [Unsigned]	<ul style="list-style-type: none"> • 0: WAFER • 1: FLAT PANEL • 2: CD • 3: MASK
+2157	uSubstUsage	SubstUsage	Word [Unsigned]	<ul style="list-style-type: none"> • 0: PRODUCT • 1: TEST • 2: FILLER

*¹ Excluding the control characters.

*² If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_SubstHistory

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40SubstrateLocation	SubstrateLocation	Word [Unsigned] (0..39)	NULL code (00H), 1 to 80 characters (ASCII) ^{*1*2}
+40 to 47	w8TimeIn	TimeIn	Word [Signed] (0..7)	Offset
+48 to 55	w8TimeOut	TimeOut	Word [Signed] (0..7)	Offset

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

- Offset

The offsets for w8TimeIn and w8TimeOut are the same as the reading expansion clock data instruction (S(P).DATERD).

Offset	Description	Setting range of the reading expansion clock data instruction (S(P).DATERD)
+0	Year	1980 to 2079
+1	Month	1 to 12
+2	Day	1 to 31
+3	Hour (24-hour)	0 to 23
+4	Minute	0 to 59
+5	Second	0 to 59
+6	Day of the week	0 to 6 (0: Sun, 1: Mon, 2: Tue, 3: Wed, 4: Thu, 5: Fri, 6: Sat)
+7	1/1000 second	0 to 999

10.3 Substrate Location Objects

This section explains substrate location objects provided by SECS/GEM communication software.

SECS/GEM communication software instantiates substrate location-related information to an object and exchanges the information between the host and equipment using E39-OSS and E90-STs services. The number of instantiated substrate location objects is stored in 'Carrier substrate location object count' (Un\G36865). (Page 362 Buffer Memory)

There are two types of substrate locations: 'Equipment Substrate Location' and 'Carrier Substrate Location.' The following operations can be performed for them.

Item	Description
Equipment Substrate Location	An instance of Equipment Substrate Location is automatically generated by SECS/GEM communication software based on the setting contents in a setting tool when activating and initializing GEM300 functions. It cannot be generated or deleted dynamically from the host or a control CPU.
Carrier Substrate Location	An instance of Carrier Substrate Location can be generated and deleted dynamically from the host or a control CPU.

Attributes

The following table shows the attributes of a substrate location object.

Name	Format	Access from host	Description
ObjType	ASCII[1..80] ^{*1}	Read Only	Object type (SubstLoc)
ObjID	ASCII[1..80] ^{*1}	Read Only	Substrate location ID (SubstLocID)
SubstID	ASCII[0..80] ^{*1}	Read Only	ID of a substrate in a substrate location
SubstLocState	U1[1]	Read Only	Substrate location status • 0: UNOCCUPIED • 1: OCCUPIED
DisableEvents	BOOL[1] ^{*2}	Read Write	Whether to enable or disable state transition event reporting in a substrate location • true: Event disabled (event not reported) • false: Event enabled (event reported)

*1 Excluding the control characters.

*2 The byte value is '0' for false, and a value other than 0 for true' according to SEMI E5.

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to STS.

Page 330 00090: CPU to CITL, Page 344 10090: CITL to CPU

Structure labels defined in this product are provided in a sample library.

Page 521 Sample Library

■M+GEM300_SubstLocObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}
+40 to 79	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}
+80 to 119	u40SubstID	SubstID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII) ^{*1*2}
+120	uSubstLocState	SubstLocState	Word [Unsigned]	• 0: UNOCCUPIED • 1: OCCUPIED
+121	uDisableEvents	DisableEvents	Word [Unsigned]	• 0: false (event enabled: event reported) • 1 to 65535: true (event disabled: event not reported)

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

10.4 Batch Location Objects

This section explains batch location objects provided by SECS/GEM communication software.

SECS/GEM communication software instantiates batch location-related information to an object and exchanges the information between the host and equipment using E39-OSS and E90-STs services.

10

Attributes

The following table shows the attributes of a batch location object.

Name	Format	Access from host	Description
ObjType	ASCII[1..80] ^{*1}	Read Only	Object type (BatchLoc)
ObjID	ASCII[1..80] ^{*1}	Read Only	Batch location ID (BatchLocID)
BatchSubstIDMap	LIST[1..1024]	Read Only	List of substrate IDs that comprise a batch location LIST[1..1024] LIST[0..80] ^{*1} SubstID ⋮
BatchLocState	U1[1]	Read Only	Batch location status • 0: UNOCCUPIED • 1: OCCUPIED
DisableEvents	BOOL[1] ^{*2}	Read Write	Whether to enable or disable state transition event reporting in a batch location • true: Event disabled (event not reported) • false: Event enabled (event reported)

*1 Excluding the control characters.

*2 The byte value is '0' for false, and a value other than 0 for true' according to SEMI E5.

Format for interface with a control CPU (structure labels)

Structures are used for control CPU interfaces related to STS.

Page 330 00090: CPU to CCTL, Page 344 10090: CCTL to CPU

Structure labels defined in this product are provided in a sample library.

Page 521 Sample Library

■M+GEM300_BatchLocObject

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}
+40 to 79	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}
+80 to 41039	st1024BatchSubstIDMap	BatchSubstIDMap	M+GEM300_BatchSubstIDMap (0..1023)	Page 141 M+GEM300_BatchSubstIDMap
+41040	uBatchLocState	BatchLocState	Word [Unsigned]	• 0: UNOCCUPIED • 1: OCCUPIED
+41041	uDisableEvents	DisableEvents	Word [Unsigned]	• 0: false (event enabled: event reported) • 1 to 65535: true (event disabled: event not reported)

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■M+GEM300_BatchSubstIDMap

Offset	Label name	Name	Data type	Applicable range
+0 to 39	u40SubstID	SubstID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII) ^{*1*2}

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

10.5 STS Service Messages

SECS/GEM communication software supports STS service messages and automatically replies to the messages. Sent or received STS service messages can be checked in the communication log.

Additionally, the software notifies the processing result of each service message to a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

📖 Page 344 10090: CITL to CPU

For messages supported by SECS/GEM communication software, refer to the following:

📖 Page 374 Service Messages

Point

Transaction of all supported STS service messages can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

10.6 STS Service for a Control CPU

SECS/GEM communication software provides an STS service interface for a control CPU in the form of an event message via buffer memory.

For details, refer to the following:

📖 Page 330 00090: CPU to CITL

For the usage method of an STS service for a control CPU, refer to the following:

📖 Page 686 E90-STs compliance

10.7 STS Variables

SECS/GEM communication software provides variables required for E90-STs.

A value of each variable whose class is SV or DVVAL refers to the attributes of an object provided by SECS/GEM communication software.

○: Complied

VID	Class	Variable name	Format	Access from host	Target object	Description	E90 standard
31000	DVVAL	AcquiredID	ASCII[0..80] J ¹	Read Only	Substrate object	ID read from a substrate	○
31001	DVVAL	SubstID	ASCII[1..80] J ¹	Read Only	Substrate object	Substrate ID (attribute name: ObjID)	○
31002	DVVAL	SubstIDStatus	U1[1]	Read Only	Substrate object	Substrate Reading Status (Substrate ID reading status) • 0: NOT CONFIRMED • 1: WAITING FOR HOST • 2: CONFIRMED • 3: CONFIRMATION FAILED	○
31003	DVVAL	SubstBatchLocID	ASCII[0..80] J ¹	Read Only	Substrate object	Current batch location ID (attribute name: BatchLocID)	○
31004	DVVAL	SubstDestination	ASCII[0..80] J ¹	Read Only	Substrate object	Substrate location where a substrate is finally collected	○
31005	DVVAL	SubstHistory	LIST[0..32]	Read Only	Substrate object	History of a location passed by a substrate LIST[0..32] LIST[3] SubstLocID or BatchLocID.SubstPosInBatch TimeIn TimeOut :	○
31006	DVVAL	SubstSubstLocID	ASCII[0..80] J ¹	Read Only	Substrate object	Substrate location (Location) (attribute name: SubstLocID)	○
31007	DVVAL	SubstLotID	ASCII[0..80] J ¹	Read Only	Substrate object	Lot ID specified by the host (attribute name: LotID)	○
31008	DVVAL	SubstMtrlStatus	U1[1]	Read Only	Substrate object	Substrate processing quality status (attribute name: MaterialStatus) • 0 to 255	○
31009	DVVAL	SubstPosInBatch	ASCII[0..80] J ¹	Read Only	Substrate object	Current location of a substrate in a batch location	○
31010	DVVAL	SubstProcState	U1[1]	Read Only	Substrate object	Substrate Processing (Substrate processing status) • 0: NEEDS PROCESSING • 1: IN PROCESS • 2: PROCESSED • 3: ABORTED • 4: STOPPED • 5: REJECTED • 6: LOST • 7: SKIPPED	○
31011	DVVAL	SubstSource	ASCII[0..80] J ¹	Read Only	Substrate object	Substrate location where a substrate is initially stored	○
31012	DVVAL	SubstState	U1[1]	Read Only	Substrate object	Substrate Transport (Substrate transport status) • 0: AT SOURCE • 1: AT WORK • 2: AT DESTINATION	○
31013	DVVAL	SubstType	U1[1]	Read Only	Substrate object	Substrate type • 0: WAFER • 1: FLAT PANEL • 2: CD • 3: MASK	○

VID	Class	Variable name	Format	Access from host	Target object	Description	E90 standard
31014	DVVAL	SubstUsage	U1[1]	Read Only	Substrate object	Intended use of a substrate • 0: PRODUCT • 1: TEST • 2: FILLER	○
31030	ECV	SubstrateReaderEnabled	BIN[1]	• Read • Write	None	Whether to use a Substrate Reading Status state model • 0: Disabled (not used) • 1: Enabled (used)	○
31031	DVVAL	SubstLocID	ASCII[1..80] J ^{*1}	Read Only	Substrate location object	Substrate location ID (attribute name: ObjID)	○
31032	DVVAL	SubstLocState	U1[1]	Read Only	Substrate location object	Substrate location status • 0: UNOCCUPIED • 1: OCCUPIED	○
31033	DVVAL	SubstLocSubstID	ASCII[0..80] J ^{*1}	Read Only	Substrate location object	ID of a substrate in a substrate location (attribute name: SubstID)	○
31034	DVVAL	BatchLocID	ASCII[1..80] J ^{*1}	Read Only	Batch location object	Batch location ID (attribute name: ObjID)	○
31035	DVVAL	BatchLocState	U1[1]	Read Only	Batch location object	Batch location status • 0: UNOCCUPIED • 1: OCCUPIED	○
31036	DVVAL	BatchSubstIDMap	LIST[1..1024]	Read Only	Batch location object	List of substrate IDs that comprise a batch location LIST[1..1024] SubstID[0..80] ⋮	○
31037 to 31068	SV	SubstLocID_1 to SubstLocID_32	ASCII[1..80] J ^{*1}	Read Only	Substrate location object	Substrate location ID of substrate location 1 to 32 specific to equipment (attribute name: ObjID)	○
31069 to 31100	SV	SubstLocState_1 to SubstLocState_32	U1[1]	Read Only	Substrate location object	Substrate location status of substrate location 1 to 32 specific to equipment • 0: UNOCCUPIED • 1: OCCUPIED	○
31101 to 31132	SV	SubstLocSubstID_1 to SubstLocSubstID_32	ASCII[0..80] J ^{*1}	Read Only	Substrate location object	ID of a substrate in substrate location 1 to 32 specific to equipment (attribute name: SubstID)	○
31133 to 31164	SV	BatchLocID_1 to BatchLocID_32	ASCII[1..80] J ^{*1}	Read Only	Batch location object	Batch location ID of batch location 1 to 32 (attribute name: ObjID)	○
31165 to 31196	SV	BatchLocState_1 to BatchLocState_32	U1[1]	Read Only	Batch location object	Batch location status of batch location 1 to 32 • 0: UNOCCUPIED • 1: OCCUPIED	○
31197 to 31228	SV	BatchSubstIDMap_1 to BatchSubstIDMap_32	LIST[1..1024]	Read Only	Batch location object	List of substrate IDs that comprise batch locations 1 to 32 LIST[1..1024] SubstID[0..80] ⋮	○

*1 Excluding the control characters.

10.8 STS Events and Reports

SECS/GEM communication software supports events and reports required for E90-STs.

Supported events and reports are subjected to the dynamic event report setting function, which is compliant with GEM (E30).

For the dynamic event report setting, refer to the "Dynamic Setting Change" of the following manual:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

For supported events and reports, refer to the following:

 Page 519 STS Reports, Page 520 STS Events

11 TROUBLESHOOTING

This chapter shows the troubleshooting related to the supported GEM300 standards.

For the troubleshooting of SECS/GEM communication software, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

11.1 Checking error descriptions

For the checking method for descriptions of an error occurred in SECS/GEM communication software, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

For the error message output to the control CPU interface log, refer to 'Control CPU interface error message' of the log output function.

11.2 Troubleshooting by Symptom

This section shows the troubleshooting related to the supported GEM300 standards by the symptom.

Symptom	Check item	Corrective action
Fails to save a file.	Does a file of the open project exist?	When the file of the open project is deleted, the file cannot be saved. Create a project again.
GEM300 functions cannot be enabled.	Is a license file registered?	Register a license file. For details, refer to the following:  C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual
	Is RD55UP12-V (GEM300) selected as a target module?	For using GEM300 standard support functions, select "RD55UP12-V(GEM300)" for the target module.  C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual
When receiving a GEM300-related service message, S9F3 (undefined stream type) or S9F5 (undefined function type) is sent.	Is a license file registered?	Register a license file.  C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual
Even though '00000-00001: GEM300 Initial request' is written, '10000-00001: GEM300 Initial acknowledge' is not returned.	Is a license file registered?	Register a license file.  C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual
	Is "RD55UP12-V(GEM300)" selected for the target module?	For using GEM300 standard support functions, select "RD55UP12-V(GEM300)" for the target module.  C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

11.3 Error Code List

The following table shows the codes for errors that occur in GEM300 standards.

The error codes can be checked in the labels (error codes) included in 'acknowledge' from SECS/GEM communication software.

For details, refer to the following:

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Error code	Error name	Error description	Corrective action
0	No error	—	—
3	Unknown object instance	<ul style="list-style-type: none"> An instance that matches the specified ObjID does not exist. ObjID is not specified. 	Specify ObjID that exists.
6	Unknown object type	<ul style="list-style-type: none"> An object type that matches the specified ObjType does not exist. ObjType is not specified. 	Specify ObjType that exists.
7	Invalid attribute value	The specified attribute value is invalid.	<ul style="list-style-type: none"> An attribute value out of the applicable range is specified. Set a value within the applicable range.
9	Verification error	<ul style="list-style-type: none"> The reference target for information specified in ProcessingCtrlSpec is not user-defined. The reference target for information specified in PauseEvent is not user-defined. 	The reference target cannot be identified. Specify information that allows the reference target to be identified.
11	Object identifier in use	The specified ObjID already exists.	Specify ObjID that is not used.
12	Parameters improperly specified	<ul style="list-style-type: none"> The specified attribute value is invalid. The specified parameter is invalid. 	A value or parameter out of the applicable range is specified. Set a value within the applicable range.
13	Insufficient parameters specified	Not all parameters that need to be specified are specified.	For '10090-00001: SubstrateObject create acknowledge' and '10090-00003: SubstrateObject SetAttr acknowledge,' specify 'SubstLocID' only or 'BatchLocID' and 'SubstPosInBatch.'
15	Busy	<ul style="list-style-type: none"> The specified CarrierID is already verified. The control job queue is empty. 	<ul style="list-style-type: none"> For '10087-00501: CarrierID read successful response,' use '00087-00504: Duplicate CarrierID in process notification' and report 'Additional event: Duplicate CarrierID In Process Event' to the host. For '10094-00102: ControlJob Deselect acknowledge,' execute it when there is a control job object in the control job queue.
17	Command not valid for current state	<ul style="list-style-type: none"> The specified command is not executable. No more the specified object can be created. The control job queue is empty. 	<ul style="list-style-type: none"> Check the status of GEM300 functions. Check the status of the specified object. For '10094-00101: ControlJob Selected acknowledge,' execute it when there is a control job object in the control job queue.
48	Load port does not exist	The specified load port does not exist.	Specify PortID (PTN) that exists.
49	Load port already in use	The specified load port is in use.	For '10087-00413: Carrier move started to Load Port response,' specify PortID (PTN) PortTransferState of which is '3: READY TO LOAD.'
50	Missing Carrier	An instance of a carrier object CarrierID of which is associated with a load port does not exist.	Review the processing so that the instance is not deleted by mistake.
32770	Action failed due to errors	An error occurred in SECS/GEM communication software.	<p>Check the contents of the following error information in the event history of SECS/GEM communication software pre-installed model module.</p> <ul style="list-style-type: none"> An error information whose "Source" is "RD55UP12-V" and name starts with 'detail information: [CAS]' in "Detailed event log information"

APPENDIX

Appendix 1 Available Characters

This section shows the available characters for the equipment specification settings.

Screen		Item	Available/inhibited character	Reference
Equipment Setting	[General] tab	OBJSPEC	■Available character • ASCII character* ¹	☞ Page 27 General
	[Load Port] tab	Load Port Count	■Available character • Unsigned integer	☞ Page 28 Load port
		Load Port ID	■Available character • ASCII character* ¹	
	[Carrier Location] tab	Location Count	■Available character • Unsigned integer	☞ Page 29 Carrier location
		LocationID	■Available character • ASCII character* ¹	
	[Internal Buffer] tab	Partition Count	■Available character • Unsigned integer	☞ Page 30 Internal buffer
		PartitionID	■Available character • ASCII character* ¹	
		PartitionType	■Available character • ASCII character* ¹	
		PartitionCapacity	■Available character • Unsigned integer	
	[Substrate Location] tab	Equipment Substrate Location Count	■Available character • Unsigned integer	☞ Page 31 Substrate location
		Equipment Substrate LocationID	■Available character • ASCII character* ¹	
		Equipment Substrate Location DisableEvents	BOOL	
	[Batch Location] tab	Batch Location Count	■Available character • Unsigned integer	☞ Page 32 Batch location
		Batch LocationID	■Available character • ASCII character* ¹	
		Batch SubstID Map Count	■Available character • Unsigned integer	
		Batch Location DisableEvents	BOOL	
	[CPU Interface] tab	CPU Interface Timer[msec]	■Available character • Unsigned integer	☞ Page 33 CPU interface
Control Job Setting	[Control] tab	Supports Material Redirection Mode	BOOL	☞ Page 35 Control
		Supports Incomplete MtrlOutSpec	BOOL	
		Enable Control Job Queue Management Function	BOOL	
		Number Of Concurrent Control Jobs	■Available character • Unsigned integer	

Screen		Item	Available/inhibited character	Reference
Control Job Setting	"ControlRule Define" screen	Rule Name	<ul style="list-style-type: none"> Available character ASCII character*¹ 	 Page 37 ControlRule Define
		Range Check	BOOL	
		Minimum Value	<ul style="list-style-type: none"> Available character BIN: Unsigned integer I1, I2, I4: Signed integer U1, U2, U4: Unsigned integer F4, F8: Floating-point number (exponent notation is also possible) 	
		Maximum Value	<ul style="list-style-type: none"> Available character BIN: Unsigned integer I1, I2, I4: Signed integer U1, U2, U4: Unsigned integer F4, F8: Floating-point number (exponent notation is also possible) 	
		Matching Check	BOOL	
		Matching Pattern	<ul style="list-style-type: none"> Available character BIN: Unsigned integer ASCII: ASCII character*¹ I1, I2, I4: Signed integer U1, U2, U4: Unsigned integer F4, F8: Floating-point number (exponent notation is also possible) 	
		Rules That Require Specification From The Host	BOOL	
	"OutputRule Define" screen	Material Status	<ul style="list-style-type: none"> Available character Unsigned integer 	 Page 40 OutputRule Define
		Range Check	BOOL	
		Minimum Value	<ul style="list-style-type: none"> Available character BIN: Unsigned integer I1, I2, I4: Signed integer U1, U2, U4: Unsigned integer F4, F8: Floating-point number (exponent notation is also possible) 	
		Maximum Value	<ul style="list-style-type: none"> Available character BIN: Unsigned integer I1, I2, I4: Signed integer U1, U2, U4: Unsigned integer F4, F8: Floating-point number (exponent notation is also possible) 	
		Matching Check	BOOL	
		Matching Pattern	<ul style="list-style-type: none"> Available character BIN: Unsigned integer ASCII: ASCII character*¹ I1, I2, I4: Signed integer U1, U2, U4: Unsigned integer F4, F8: Floating-point number (exponent notation is also possible) 	
		Rules That Require Specification From The Host	BOOL	
	[ProcessOrderMgmt] tab	Enable	BOOL	 Page 42 ProcessOrderMgmt
		Comment	<ul style="list-style-type: none"> Available character ASCII character*¹ 	

Screen		Item	Available/inhibited character	Reference
Process Job Setting	"RecipeVariable Define" screen	RecipeVarName	■Available character • ASCII character* ¹	 Page 46 RecipeVariable Define
		Range Check	BOOL	
		Minimum Value	■Available character • BIN: Unsigned integer • I1, I2, I4: Signed integer • U1, U2, U4: Unsigned integer • F4, F8: Floating-point number (exponent notation is also possible)	
		Maximum Value	■Available character • BIN: Unsigned integer • I1, I2, I4: Signed integer • U1, U2, U4: Unsigned integer • F4, F8: Floating-point number (exponent notation is also possible)	
		Matching Check	BOOL	
		Matching Pattern	■Available character • BIN: Unsigned integer • ASCII: ASCII character* ¹ • I1, I2, I4: Signed integer • U1, U2, U4: Unsigned integer • F4, F8: Floating-point number (exponent notation is also possible)	
		Recipe Variables That Require Specification From The Host	BOOL	
SubstrateObject Setting	[MaterialStatus] tab	Enable	BOOL	 Page 49 MaterialStatus
		Comment	■Available character • ASCII character* ¹	
	[SubstType] tab	Enable	BOOL	 Page 50 SubstType
		Comment	■Available character • ASCII character* ¹	
	[SubstUsage] tab	Enable	BOOL	 Page 51 SubstUsage
		Comment	■Available character • ASCII character* ¹	

*¹ Excluding the control characters.

Appendix 2 Control CPU Interface Formats

This section shows the control CPU interface formats.

Interface format list

The following shows the interface format list.

General				
Information type (decimal)	Detail type (decimal)	Name	Description	Reference
00000	00001	GEM300 Initial request	Requests to activate and initialize GEM300 functions.	☞ Page 161 00001: GEM300 Initial request
	00002	LoadPort initial request	Requests to initialize a load port.	☞ Page 162 00002 : LoadPort initial request
10000	00001	GEM300 Initial acknowledge	Returns the processing result of 'GEM300 Initial request.'	☞ Page 163 00001: GEM300 Initial acknowledge
	00002	LoadPort initial acknowledge	Returns the processing result of 'LoadPort initial request.'	☞ Page 164 00002 : LoadPort initial acknowledge

OSS-related control CPU interfaces

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
00039	00006* ¹	Get AttrName List request	Requests to acquire the AttrName list of GEM300-related objects.	☞ Page 166 00006: Get AttrName List request
	00103* ¹	LoadPortObject SetAttr request	Requests to set all attribute values of a load port object.	☞ Page 167 00103: LoadPortObject SetAttr request
	00104* ¹	LoadPortObject GetAttr request	Requests to acquire all attribute values of a load port object.	☞ Page 169 00104: LoadPortObject GetAttr request
	00203* ¹	LocationObject SetAttr request	Requests to set all attribute values of a location object.	☞ Page 170 00203: LocationObject SetAttr request
	00204* ¹	LocationObject GetAttr request	Requests to acquire all attribute values of a location object.	☞ Page 171 00204: LocationObject GetAttr request
	00303* ¹	InternalBufferObject SetAttr request	Requests to set all attribute values of an internal buffer object.	☞ Page 172 00303: InternalBufferObject SetAttr request
	00304* ¹	InternalBufferObject GetAttr request	Requests to acquire all attribute values of an internal buffer object.	☞ Page 174 00304: InternalBufferObject GetAttr request
10039	00006* ¹	Get AttrName List acknowledge	Returns the processing result of 'Get AttrName List request.'	☞ Page 175 00006: Get AttrName List acknowledge
	00103* ¹	LoadPortObject SetAttr acknowledge	Returns the processing result of 'LoadPortObject SetAttr request.'	☞ Page 177 00103: LoadPortObject SetAttr acknowledge
	00104* ¹	LoadPortObject GetAttr acknowledge	Returns the processing result of 'LoadPortObject GetAttr request.'	☞ Page 178 00104: LoadPortObject GetAttr acknowledge
	00203* ¹	LocationObject SetAttr acknowledge	Returns the processing result of 'LocationObject SetAttr request.'	☞ Page 179 00203: LocationObject SetAttr acknowledge
	00204* ¹	LocationObject GetAttr acknowledge	Returns the processing result of 'LocationObject GetAttr request.'	☞ Page 180 00204: LocationObject GetAttr acknowledge
	00303* ¹	InternalBufferObject SetAttr acknowledge	Returns the processing result of 'InternalBufferObject SetAttr request.'	☞ Page 181 00303: InternalBufferObject SetAttr acknowledge
	00304* ¹	InternalBufferObject GetAttr acknowledge	Returns the processing result of 'InternalBufferObject GetAttr request.'	☞ Page 182 00304: InternalBufferObject GetAttr acknowledge

*¹ Supported only by SECS/GEM communication software with software version 1.40S or later.

CMS-related control CPU interfaces

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
00087	00001 ^{*1}	CarrierObject create request	Requests to create a carrier object.	☞ Page 183 00001: CarrierObject create request
	00002 ^{*1}	CarrierObject delete request	Requests to delete a carrier object.	☞ Page 185 00002: CarrierObject delete request
	00003 ^{*1}	CarrierObject SetAttr request	Requests to set all attribute values of a carrier object.	☞ Page 186 00003: CarrierObject SetAttr request
	00004 ^{*1}	CarrierObject GetAttr request	Requests to acquire all attribute values of a carrier object.	☞ Page 188 00004: CarrierObject GetAttr request
	00101 ^{*1}	AccessMode AUTO request	Requests to change mode to 'AUTO.'	☞ Page 189 00101: AccessMode AUTO request
	00102 ^{*1}	AccessMode MANUAL request	Requests to change mode to 'MANUAL.'	☞ Page 190 00102: AccessMode MANUAL request
	00111 ^{*1}	Load Port reservation request	Requests to reserve a load port.	☞ Page 191 00111: Load Port reservation request
	00112 ^{*1}	Load Port cancel reservation request	Requests to cancel the reservation of a load port.	☞ Page 192 00112: Load Port cancel reservation request
	00201	IN SERVICE request	Requests to change status to 'IN SERVICE.'	☞ Page 193 00201: IN SERVICE request
	00202	OUT OF SERVICE request	Requests to change status to 'OUT OF SERVICE.'	☞ Page 194 00202: OUT OF SERVICE request
	00203 ^{*1}	ID READER available notification	Notifies the completion of the preparation of a carrier ID reader.	☞ Page 195 00203: ID READER available notification
	00204 ^{*1}	ID READER unavailable notification	Notifies the unavailability of a carrier ID reader.	☞ Page 196 00204: ID READER unavailable notification
	00301	LOAD started notification	Notifies the start of loading a carrier.	☞ Page 197 00301: LOAD started notification
	00302	LOAD completed notification	Notifies the completion of loading a carrier.	☞ Page 198 00302: LOAD completed notification
	00303	UNLOAD available notification	Notifies that a carrier can be unloaded.	☞ Page 199 00303: UNLOAD available notification
	00304	UNLOAD started notification	Notifies the start of unloading a carrier.	☞ Page 200 00304: UNLOAD started notification
	00305	UNLOAD completed notification	Notifies the completion of unloading a carrier.	☞ Page 201 00305: UNLOAD completed notification
	00306	TRANSFER failed notification	Notifies that transferring a carrier is failed.	☞ Page 202 00306: TRANSFER failed notification
	00307 ^{*1}	Carrier clamped notification	Notifies the clamping of a carrier.	☞ Page 203 00307: Carrier clamped notification
	00308 ^{*1}	Carrier unclamped notification	Notifies the unclamping of a carrier.	☞ Page 204 00308: Carrier unclamped notification
	00309 ^{*1}	Carrier opened notification	Notifies the opening of the door of a carrier.	☞ Page 205 00309: Carrier opened notification
	00310 ^{*1}	Carrier closed notification	Notifies the closing of the door of a carrier.	☞ Page 206 00310: Carrier closed notification
	00311 ^{*1}	Carrier accessing started notification	Notifies the start of accessing a carrier.	☞ Page 207 00311: Carrier accessing started notification
	00312 ^{*1}	Carrier approaching complete notification	Notifies the approaching completion of accessing a carrier.	☞ Page 208 00312: Carrier approaching complete notification

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
00087	00313* ¹	Carrier accessing normally finished notification	Notifies the normal completion of accessing a carrier.	☞ Page 209 00313: Carrier accessing normally finished notification
	00314* ¹	Carrier accessing abnormally finished notification	Notifies the abnormal completion of accessing a carrier.	☞ Page 210 00314: Carrier accessing abnormally finished notification
	00401* ¹	Load Port Carrier association request	Requests to associate a load port with a carrier.	☞ Page 211 00401: Load Port Carrier association request
	00402* ¹	Load Port Carrier cancel association request	Requests to cancel the association of a load port with a carrier.	☞ Page 212 00402: Load Port Carrier cancel association request
	00403* ¹	Carrier Location change notification	Notifies the change of a carrier location.	☞ Page 213 00403: Carrier Location change notification
	00404* ¹	Buffer Capacity changed notification	Notifies the change of the internal buffer capacity.	☞ Page 214 00404: Buffer Capacity changed notification
	00411* ¹	Carrier move started to Internal Buffer notification	Notifies the start of moving a carrier to the internal buffer.	☞ Page 215 00411: Carrier move started to Internal Buffer notification
	00412* ¹	Carrier move completed to Internal Buffer notification	Notifies the completion of moving a carrier to the internal buffer.	☞ Page 216 00412: Carrier move completed to Internal Buffer notification
	00413* ¹	Carrier move started to Load Port notification	Notifies the start of moving a carrier to a load port.	☞ Page 217 00413: Carrier move started to Load Port notification
	00414* ¹	Carrier move completed to Load Port notification	Notifies the completion of moving a carrier to a load port.	☞ Page 218 00414: Carrier move completed to Load Port notification
	00415* ¹	UNLOAD completed and Carrier move started to Load Port notification	Notifies the completion of unloading carrier A and the start of moving carrier B to a load port by using the queued 'CarrierOut' service.	☞ Page 219 00415: UNLOAD completed and Carrier move started to Load Port notification
	00501* ¹	CarrierID read successful notification	Notifies the success of CarrierID reading.	☞ Page 220 00501: CarrierID read successful notification
	00502* ¹	CarrierID read fail notification	Notifies the failure of CarrierID reading.	☞ Page 221 00502: CarrierID read fail notification
	00503* ¹	Unknown CarrierID notification	Notifies the unavailability of a carrier ID reader and the arrival of a carrier at a load port in the NOT ASSOCIATED state.	☞ Page 222 00503: Unknown CarrierID notification
	00504* ¹	Duplicate CarrierID inprocess notification	Notifies the duplication of CarrierID of a received carrier.	☞ Page 223 00504: Duplicate CarrierID in process notification
	00601* ¹	SlotMap verification ok notification	Notifies the success of equipment verification of a slot map.	☞ Page 224 00601: SlotMap verification ok notification
	00602* ¹	SlotMap waiting for host verification notification	Notifies the waiting for the host verification of a slot map.	☞ Page 225 00602: SlotMap waiting for host verification notification
	00603* ¹	SlotMap verification fail notification	Notifies the failure of equipment verification of a slot map.	☞ Page 226 00603: SlotMap verification fail notification
	00604* ¹	SlotMap read fail notification	Notifies the failure of slot map reading.	☞ Page 227 00604: SlotMap read fail notification
	00605* ¹	SlotMap abnormal substrate position notification	Notifies the detection of an abnormal substrate position.	☞ Page 228 00605: SlotMap abnormal substrate position notification

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
10087	00001*1	CarrierObject create acknowledge	Returns the processing result of 'CarrierObject create request.'	☞ Page 229 00001: CarrierObject create acknowledge
	00002*1	CarrierObject delete acknowledge	Returns the processing result of 'CarrierObject delete request.'	☞ Page 230 00002: CarrierObject delete acknowledge
	00003*1	CarrierObject SetAttr acknowledge	Returns the processing result of 'CarrierObject SetAttr request.'	☞ Page 231 00003: CarrierObject SetAttr acknowledge
	00004*1	CarrierObject GetAttr acknowledge	Returns the processing result of 'CarrierObject GetAttr request.'	☞ Page 232 00004: CarrierObject GetAttr acknowledge
	00101*1	AccessMode AUTO acknowledge	Returns the processing result of 'AccessMode AUTO request.'	☞ Page 233 00101: AccessMode AUTO acknowledge
	00102*1	AccessMode MANUAL acknowledge	Returns the processing result of 'AccessMode MANUAL request.'	☞ Page 234 00102: AccessMode MANUAL acknowledge
	00111*1	Load Port reservation acknowledge	Returns the processing result of 'Load Port reservation request.'	☞ Page 235 00111: Load Port reservation acknowledge
	00112*1	Load Port cancel reservation acknowledge	Returns the processing result of 'Load Port cancel reservation request.'	☞ Page 236 00112: Load Port cancel reservation acknowledge
	00201	IN SERVICE acknowledge	Returns the processing result of 'IN SERVICE request.'	☞ Page 237 00201: IN SERVICE acknowledge
	00202	OUT OF SERVICE acknowledge	Returns the processing result of 'OUT OF SERVICE request.'	☞ Page 238 00202: OUT OF SERVICE acknowledge
	00203*1	ID READER available response	Returns the processing result of 'ID READER available notification.'	☞ Page 239 00203: ID READER available response
	00204*1	ID READER unavailable response	Returns the processing result of 'ID READER unavailable notification.'	☞ Page 240 00204: ID READER unavailable response
	00301*1	LOAD started response	Returns the processing result of 'LOAD started notification.'	☞ Page 241 00301: LOAD started response
	00302*1	LOAD completed response	Returns the processing result of 'LOAD completed notification.'	☞ Page 242 00302: LOAD completed response
	00303*1	UNLOAD available response	Returns the processing result of 'UNLOAD available notification.'	☞ Page 243 00303: UNLOAD available response
	00304*1	UNLOAD started response	Returns the processing result of 'UNLOAD started notification.'	☞ Page 244 00304: UNLOAD started response
	00305*1	UNLOAD completed response	Returns the processing result of 'UNLOAD completed notification.'	☞ Page 245 00305: UNLOAD completed response
	00306*1	TRANSFER failed response	Returns the processing result of 'TRANSFER failed notification.'	☞ Page 246 00306: TRANSFER failed response
	00307*1	Carrier clamped response	Returns the processing result of 'Carrier clamped notification.'	☞ Page 247 00307: Carrier clamped response
	00308*1	Carrier unclamped response	Returns the processing result of 'Carrier unclamped notification.'	☞ Page 248 00308: Carrier unclamped response
	00309*1	Carrier opened response	Returns the processing result of 'Carrier opened notification.'	☞ Page 249 00309: Carrier opened response

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
10087	00310* ¹	Carrier closed response	Returns the processing result of 'Carrier closed notification.'	☞ Page 250 00310: Carrier closed response
	00311* ¹	Carrier accessing started response	Returns the processing result of 'Carrier accessing started notification.'	☞ Page 251 00311: Carrier accessing started response
	00312* ¹	Carrier approaching complete response	Returns the processing result of 'Carrier approaching complete notification.'	☞ Page 252 00312: Carrier approaching complete response
	00313* ¹	Carrier accessing normally finished response	Returns the processing result of 'Carrier accessing normally finished notification.'	☞ Page 253 00313: Carrier accessing normally finished response
	00314* ¹	Carrier accessing abnormally finished response	Returns the processing result of 'Carrier accessing abnormally finished notification.'	☞ Page 254 00314: Carrier accessing abnormally finished response
	00401* ¹	Load Port Carrier association acknowledge	Returns the processing result of 'Load Port Carrier association request.'	☞ Page 255 00401: Load Port Carrier association acknowledge
	00402* ¹	Load Port Carrier cancel association acknowledge	Returns the processing result of 'Load Port Carrier cancel association request.'	☞ Page 256 00402: Load Port Carrier cancel association acknowledge
	00403* ¹	Carrier Location change response	Returns the processing result of 'Carrier Location change notification.'	☞ Page 257 00403: Carrier Location change response
	00404* ¹	Buffer Capacity changed response	Returns the processing result of 'Buffer Capacity changed notification.'	☞ Page 258 00404: Buffer Capacity changed response
	00411* ¹	Carrier move started to Internal Buffer response	Returns the processing result of 'Carrier move started to Internal Buffer notification.'	☞ Page 259 00411: Carrier move started to Internal Buffer response
	00412* ¹	Carrier move completed to Internal Buffer response	Returns the processing result of 'Carrier move completed to Internal Buffer notification.'	☞ Page 260 00412: Carrier move completed to Internal Buffer response
	00413* ¹	Carrier move started to Load Port response	Returns the processing result of 'Carrier move started to Load Port notification.'	☞ Page 261 00413: Carrier move started to Load Port response
	00414* ¹	Carrier move completed to Load Port response	Returns the processing result of 'Carrier move completed to Load Port notification.'	☞ Page 262 00414: Carrier move completed to Load Port response
	00415* ¹	UNLOAD completed and Carrier move started to Load Port response	Returns the processing result of 'UNLOAD completed and Carrier move started to Load Port notification.'	☞ Page 263 00415: UNLOAD completed and Carrier move started to Load Port response
	00501* ¹	CarrierID read successful response	Returns the processing result of 'CarrierID read successful notification.'	☞ Page 265 00501: CarrierID read successful response
	00502* ¹	CarrierID read fail response	Returns the processing result of 'CarrierID read fail notification.'	☞ Page 267 00502: CarrierID read fail response
	00503* ¹	Unknown CarrierID response	Returns the processing result of 'Unknown CarrierID notification.'	☞ Page 268 00503: Unknown CarrierID response
	00504* ¹	Duplicate CarrierID in process response	Returns the processing result of 'Duplicate CarrierID in process notification.'	☞ Page 269 00504: Duplicate CarrierID in process response

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
10087	00601 ^{*1}	SlotMap verification ok response	Returns the processing result of 'SlotMap verification ok notification.'	☞ Page 270 00601: SlotMap verification ok response
	00602 ^{*1}	SlotMap waiting for host verification response	Returns the processing result of 'SlotMap waiting for host verification notification.'	☞ Page 271 00602: SlotMap waiting for host verification response
	00603 ^{*1}	SlotMap verification fail response	Returns the processing result of 'SlotMap verification fail notification.'	☞ Page 272 00603: SlotMap verification fail response
	00604 ^{*1}	SlotMap read fail response	Returns the processing result of 'SlotMap read fail notification.'	☞ Page 273 00604: SlotMap read fail response
	00605 ^{*1}	SlotMap abnormal substrate position response	Returns the processing result of 'SlotMap abnormal substrate position notification.'	☞ Page 274 00605: SlotMap abnormal substrate position response
	00901	Bind service notification	Notifies the result of an automatic response to the 'Bind' service.	☞ Page 275 00901: Bind service notification
	00902 ^{*1}	CancelAllCarrierOut service notification	Notifies the result of an automatic response to the 'CancelAllCarrierOut' service.	☞ Page 276 00902: CancelAllCarrierOut service notification
	00903	CancelBind service notification	Notifies the result of an automatic response to the 'CancelBind' service.	☞ Page 277 00903: CancelBind service notification
	00904 ^{*1}	CancelCarrier service notification	Notifies the result of an automatic response to the 'CancelCarrier' service.	☞ Page 278 00904: CancelCarrier service notification
	00905 ^{*1}	CancelCarrierAtPort service notification	Notifies the result of an automatic response to the 'CancelCarrierAtPort' service.	☞ Page 279 00905: CancelCarrierAtPort service notification
	00906 ^{*1}	CancelCarrierNotification service notification	Notifies the result of an automatic response to the 'CancelCarrierNotification' service.	☞ Page 280 00906: CancelCarrierNotification service notification
	00907 ^{*1}	CancelCarrierOut service notification	Notifies the result of an automatic response to the 'CancelCarrierOut' service.	☞ Page 281 00907: CancelCarrierOut service notification
	00908 ^{*2}	CancelReservationAtPort service notification	Notifies the result of an automatic response to the 'CancelReservationAtPort' service.	☞ Page 282 00908: CancelReservationAtPort service notification
	00909 ^{*1}	CarrierIn service notification	Notifies the result of an automatic response to the 'CarrierIn' service.	☞ Page 283 00909: CarrierIn service notification
	00910 ^{*1}	CarrierNotification service notification	Notifies the result of an automatic response to the 'CarrierNotification' service.	☞ Page 284 00910: CarrierNotification service notification
	00911 ^{*1}	CarrierOut service notification	Notifies the result of an automatic response to the 'CarrierOut' service.	☞ Page 285 00911: CarrierOut service notification
	00912 ^{*1}	CarrierReCreate service notification	Notifies the result of an automatic response to the 'CarrierReCreate' service.	☞ Page 286 00912: CarrierReCreate service notification
	00913 ^{*1}	CarrierRelease service notification	Notifies the result of an automatic response to the 'CarrierRelease' service.	☞ Page 288 00913: CarrierRelease service notification
	00916 ^{*2}	ChangeAccess service notification	Notifies the result of an automatic response to the 'ChangeAccess' service.	☞ Page 289 00916 : ChangeAccess service notification
	00917	ChangeServiceStatus service notification	Notifies the result of an automatic response to the 'ChangeServiceStatus' service.	☞ Page 291 00917: ChangeServiceStatus service notification
	00918 ^{*1}	ProceedWithCarrier service notification	Notifies the result of an automatic response to the 'ProceedWithCarrier' service.	☞ Page 292 00918: ProceedWithCarrier service notification
	00919 ^{*2}	ReserveAtPort service notification	Notifies the result of an automatic response to the 'ReserveAtPort' service.	☞ Page 293 00919: ReserveAtPort service notification

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

*2 Supported only by SECS/GEM communication software with software version 1.43V or later.

CJM-related control CPU interfaces

The following control CPU interface formats are supported only by SECS/GEM communication software with software version 1.43V or later.

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
00094	00001	ControlJobObject create request	Requests to create a control job object.	Page 294 00001: ControlJobObject create request
	00002	ControlJobObject delete request	Requests to delete a control job object.	Page 297 00002: ControlJobObject delete request
	00003	ControlJobObject SetAttr request	Requests to set all attribute values of a control job object.	Page 298 00003: ControlJobObject SetAttr request
	00004	ControlJobObject GetAttr request	Requests to acquire all attribute values of a control job object.	Page 300 00004: ControlJobObject GetAttr request
	00101	ControlJob Selected request	Requests to change the state of a control job at the head of the queue to 'SELECTED.'	Page 301 00101: ControlJob Selected request
	00102	ControlJob Deselect request	Requests to swap a 'SELECTED' state control job object and a job at the head of the queue.	Page 302 00102: ControlJob Deselect request
	00103	ControlJob HOQ request	Requests to move a control job object to the head of the queue.	Page 303 00103: ControlJob HOQ request
10094	00001	ControlJobObject create acknowledge	The processing result of 'ControlJobObject create request' is returned.	Page 304 00001: ControlJobObject create acknowledge
	00002	ControlJobObject delete acknowledge	The processing result of 'ControlJobObject delete request' is returned.	Page 305 00002: ControlJobObject delete acknowledge
	00003	ControlJobObject SetAttr acknowledge	The processing result of 'ControlJobObject SetAttr request' is returned.	Page 306 00003: ControlJobObject SetAttr acknowledge
	00004	ControlJobObject GetAttr acknowledge	The processing result of 'ControlJobObject GetAttr request' is returned.	Page 307 00004: ControlJobObject GetAttr acknowledge
	00101	ControlJob Selected acknowledge	The processing result of 'ControlJob Selected request' is returned.	Page 308 00101: ControlJob Selected acknowledge
	00102	ControlJob Deselect acknowledge	The processing result of 'ControlJob Deselect request' is returned.	Page 309 00102: ControlJob Deselect acknowledge
	00103	ControlJob HOQ acknowledge	The processing result of 'ControlJob HOQ request' is returned.	Page 310 00103: ControlJob HOQ acknowledge
	01001	Create service (ControlJob) notification	Notifies the creation of an instance of a control job object by using the 'Create' service.	Page 311 01001: Create service (ControlJob) notification
	01002	Delete service (ControlJob) notification	Notifies the deletion of an instance of a control job object by using the 'Delete' service.	Page 312 01002: Delete service (ControlJob) notification
	01003	SetAttr service (ControlJob) notification	Notifies the change of an attribute value of a control job object by using the 'SetAttr' service.	Page 313 01003: SetAttr service (ControlJob) notification

PJM-related control CPU interfaces

The following control CPU interface formats are supported only by SECS/GEM communication software with software version 1.43V or later.

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
00040	00001	ProcessJobObject create request	Requests to create a process job object.	☞ Page 314 00001: ProcessJobObject create request
	00002	ProcessJobObject delete request	Requests to delete a process job object.	☞ Page 316 00002: ProcessJobObject delete request
	00003	ProcessJobObject SetAttr request	Requests to set all attribute values of a process job object.	☞ Page 317 00003: ProcessJobObject SetAttr request
	00004	ProcessJobObject GetAttr request	Requests to acquire all attribute values of a process job object.	☞ Page 319 00004: ProcessJobObject GetAttr request
10040	00001	ProcessJobObject create acknowledge	The processing result of 'ProcessJobObject create request' is returned.	☞ Page 320 00001: ProcessJobObject create acknowledge
	00002	ProcessJobObject delete acknowledge	The processing result of 'ProcessJobObject delete request' is returned.	☞ Page 321 00002: ProcessJobObject delete acknowledge
	00003	ProcessJobObject SetAttr acknowledge	The processing result of 'ProcessJobObject SetAttr request' is returned.	☞ Page 322 00003: ProcessJobObject SetAttr acknowledge
	00004	ProcessJobObject GetAttr acknowledge	The processing result of 'ProcessJobObject GetAttr request' is returned.	☞ Page 323 00004: ProcessJobObject GetAttr acknowledge
	00901	PRJobCreateEnh service notification	Notifies the processing result of the 'PRJobCreateEnh' service.	☞ Page 324 00901: PRJobCreateEnh service notification
	00902	PRSetMtrlOrder service notification	Notifies the processing result of the 'PRSetMtrlOrder' service.	☞ Page 325 00902: PRSetMtrlOrder service notification
	00903	PRJobMultiCreate service notification	Notifies the processing result of the 'PRJobMultiCreate' service.	☞ Page 326 00903: PRJobMultiCreate service notification
	00904	PRJobDequeue service notification	Notifies the processing result of the 'PRJobDequeue' service.	☞ Page 327 00904: PRJobDequeue service notification
	00905	PRJobSetRecipeVariable service notification	Notifies the processing result of the 'PRJobSetRecipeVariable' service.	☞ Page 328 00905: PRJobSetRecipeVariable service notification
	00906	PRJobSetStartMethod service notification	Notifies the processing result of the 'PRJobSetStartMethod' service.	☞ Page 329 00906: PRJobSetStartMethod service notification

STS-related control CPU interfaces

Information type (decimal)	Detail type (decimal)	Name	Description	Reference
00090	00001 ^{*1}	SubstrateObject create request	Requests to create a substrate object.	☞ Page 330 00001: SubstrateObject create request
	00002 ^{*1}	SubstrateObject delete request	Requests to delete a substrate object.	☞ Page 333 00002: SubstrateObject delete request
	00003 ^{*1}	SubstrateObject SetAttr request	Requests to set all attribute values of a substrate object.	☞ Page 334 00003: SubstrateObject SetAttr request
	00004 ^{*1}	SubstrateObject GetAttr request	Requests to acquire all attribute values of a substrate object.	☞ Page 336 00004: SubstrateObject GetAttr request
	00011 ^{*1}	CarrierSubstLocObject create request	Requests to create a substrate location object in a carrier.	☞ Page 337 00011: CarrierSubstLocObject create request
	00012 ^{*1}	CarrierSubstLocObject delete request	Requests to delete a substrate location object in a carrier.	☞ Page 338 00012: CarrierSubstLocObject delete request
	00013 ^{*1}	SubstLocObject SetAttr request	Requests to set all attribute values of a substrate location object specific to equipment or in a carrier.	☞ Page 339 00013: SubstLocObject SetAttr request
	00014 ^{*1}	SubstLocObject GetAttr request	Requests to acquire all attribute values of a substrate location object specific to equipment or in a carrier.	☞ Page 341 00014: SubstLocObject GetAttr request
	00023 ^{*1}	BatchLocObject SetAttr request	Requests to set all attribute values of a batch location object.	☞ Page 342 00023: BatchLocObject SetAttr request
	00024 ^{*1}	BatchLocObject GetAttr request	Requests to acquire all attribute values of a batch location object.	☞ Page 343 00024: BatchLocObject GetAttr request
10090	00001 ^{*1}	SubstrateObject create acknowledge	Returns the processing result of 'SubstrateObject create request.'	☞ Page 344 00001: SubstrateObject create acknowledge
	00002 ^{*1}	SubstrateObject delete acknowledge	Returns the processing result of 'SubstrateObject delete request.'	☞ Page 345 00002: SubstrateObject delete acknowledge
	00003 ^{*1}	SubstrateObject SetAttr acknowledge	Returns the processing result of 'SubstrateObject SetAttr request.'	☞ Page 346 00003: SubstrateObject SetAttr acknowledge
	00004 ^{*1}	SubstrateObject GetAttr acknowledge	Returns the processing result of 'SubstrateObject GetAttr request.'	☞ Page 347 00004: SubstrateObject GetAttr acknowledge
	00011 ^{*1}	CarrierSubstLocObject create acknowledge	Returns the processing result of 'CarrierSubstLocObject create request.'	☞ Page 348 00011 : CarrierSubstLocObject create acknowledge
	00012 ^{*1}	CarrierSubstLocObject delete acknowledge	Returns the processing result of 'CarrierSubstLocObject delete request.'	☞ Page 349 00012: CarrierSubstLocObject delete acknowledge
	00013 ^{*1}	SubstLocObject SetAttr acknowledge	Returns the processing result of 'SubstLocObject SetAttr request.'	☞ Page 350 00013: SubstLocObject SetAttr acknowledge
	00014 ^{*1}	SubstLocObject GetAttr acknowledge	Returns the processing result of 'SubstLocObject GetAttr request.'	☞ Page 351 00014: SubstLocObject GetAttr acknowledge
	00023 ^{*1}	BatchLocObject SetAttr acknowledge	Returns the processing result of 'BatchLocObject SetAttr request.'	☞ Page 352 00023: BatchLocObject SetAttr acknowledge
	00024 ^{*1}	BatchLocObject GetAttr acknowledge	Returns the processing result of 'BatchLocObject GetAttr request.'	☞ Page 353 00024: BatchLocObject GetAttr acknowledge
	01001 ^{*1}	Create service (Register substrate service) notification	Notifies the creation of an instance of a substrate object by using the 'Create (Register substrate)' service.	☞ Page 354 01001: Create service (Register substrate service) notification
	01002 ^{*1}	Delete service (Remove substrate service) notification	Notifies the deletion of an instance of a substrate object by using the 'Delete (Remove substrate)' service.	☞ Page 355 01002: Delete service (Remove substrate service) notification
	01003 ^{*1}	SetAttr service (Substrate) notification	Notifies the change of an attribute value of a substrate object by using the 'SetAttr' service.	☞ Page 356 01003: SetAttr service (Substrate) notification
	01013 ^{*1}	SetAttr service (SubstLoc) notification	Notifies the change of an attribute value of a substrate location object by using the 'SetAttr' service.	☞ Page 358 01013: SetAttr service (SubstLoc) notification
	01023 ^{*1}	SetAttr service (BatchLoc) notification	Notifies the change of an attribute value of a batch location object by using the 'SetAttr' service.	☞ Page 360 01023: SetAttr service (BatchLoc) notification

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

00000: CPU to CITL

The following shows the format of CPU to CITL.

00001: GEM300 Initial request

■Information type

00000

■Detail type

00001

■Data size of data area (Byte units)

0 byte

■Processing

Activating and initializing GEM300 functions is requested.

■Relevant state transition

None

■Data

None

■Relevant item

📄 Page 163 00001: GEM300 Initial acknowledge

A

00002 : LoadPort initial request

■Information type

00000

■Detail type

00002

■Data size of data area (Byte units)

34 byte

■Processing

Initializing all load ports is requested.

■Relevant state transition

- Load Port Transfer State Model state transition No.(1)
( Page 69 Load Port Transfer State Model)
- Load Port Reservation State Model state transition No.(1)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(1)
( Page 77 Load Port/Carrier Association State Model)
- Access Mode State Model state transition No.(1)
( Page 80 Access Mode State Model)

■Data

Structure label

- M+GEM300_00000-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0	uAccessModeHistory	AccessModeHistory	Bit String [16-bit]	• 0: MANUAL ^{*1} • 1: AUTO	Specify the initial value of AccessMode of each load port. ^{*2} <ul style="list-style-type: none">• b0: AccessMode of PortID (PTN) 1• b1: AccessMode of PortID (PTN) 2• b2: AccessMode of PortID (PTN) 3• b3: AccessMode of PortID (PTN) 4• b4: AccessMode of PortID (PTN) 5• b5: AccessMode of PortID (PTN) 6• b6 to b15: Ignored even if specified.
+1 to 16	u16PortTransferHistory	PortTransferHistory	Word [Unsigned] (0..15)	• 0: OUT OF SERVICE • 1: TRANSFERBLOCKED2: READY TO LOAD • 2: READY TO LOAD • 3: READY TO UNLOAD ^{*1}	Specify the initial value of PortTransferState of each load port. ^{*3} <ul style="list-style-type: none">• (+0): PortTransferState of PortID (PTN) 1• (+1): PortTransferState of PortID (PTN) 2• (+2): PortTransferState of PortID (PTN) 3• (+3): PortTransferState of PortID (PTN) 4• (+4): PortTransferState of PortID (PTN) 5• (+5): PortTransferState of PortID (PTN) 6• (+6 to 15): Ignored even if specified.

^{*1} Supported only by SECS/GEM communication software with software version 1.40S or later.

^{*2} When specifying the number of load ports, which is out of the range of what is set in the equipment specification setting, a value out of the applicable range is ignored. ( Page 28 Load port)

For example, when '4' is specified for the number of load ports, the following values are ignored:

- b4: AccessMode of PortID (PTN) 5
- b5: AccessMode of PortID (PTN) 6

^{*3} When specifying the number of load ports, which is out of the range of what is set in the equipment specification setting, a value out of the applicable range is ignored. ( Page 28 Load port)

For example, when '4' is specified for the number of load ports, the following values are ignored:

- (+4): PortTransferState of PortID (PTN) 5
- (+5): PortTransferState of PortID (PTN) 6

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

 Page 164 00002 : LoadPort initial acknowledge

10000: CITL to CPU

The following shows the format of CITL to CPU.

00001: GEM300 Initial acknowledge

■Information type

10000

■Detail type

00001

■Data size of data area (Byte units)

2 byte

■Processing

- The processing result of 'GEM300 Initial request' is returned.
- A processing result is reflected to 'GEM300 status' (b5) of 'CA-SECS status' (Un\G16384).

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10000-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0	uErrorCode	Error code	Word [Unsigned]	0 to 65535	The code for an error occurred for the request is returned.

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
17	Command not valid for current state

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 161 00001: GEM300 Initial request

00002 : LoadPort initial acknowledge

■Information type

10000

■Detail type

00002

■Data size of data area (Byte units)

32 byte

■Processing

The processing result of 'LoadPort initial request' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(1)
( Page 69 Load Port Transfer State Model)
- Load Port Reservation State Model state transition No.(1)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(1)
( Page 77 Load Port/Carrier Association State Model)
- Access Mode State Model state transition No.(1)
( Page 80 Access Mode State Model)

■Data

Structure label

- M+GEM300_10000-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 15	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred for the request is returned. <ul style="list-style-type: none">• (+0): Error code of PortID (PTN) 1• (+1): Error code of PortID (PTN) 2• (+2): Error code of PortID (PTN) 3• (+3): Error code of PortID (PTN) 4• (+4): Error code of PortID (PTN) 5• (+5): Error code of PortID (PTN) 6• (+6 to 15): Not used

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
12	Parameters improperly specified
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

Precautions

Outside the range of the number of load ports that can be set in "Load Port Count" in the [Load Port] tab is not used. An error code (48) is always sent. (👉 Page 28 Load port)

Example: When the number of load ports is 4, and the parameter of load port number (PTN) which is set to 3 is incorrect

- u16ErrorCode[0, 0, 12, 0, 48, 48, 48, 48, 48, 48, 48, 48, 48, 48]^{*1}

*1 If even one error code (12) exists, all load ports cannot be initialized.

Example: When the number of load ports is 4, and all load ports are initialized

- u16ErrorCode[17, 17, 17, 17, 48, 48, 48, 48, 48, 48, 48, 48, 48, 48]

■Relevant item

👉 Page 162 00002 : LoadPort initial request

00039: CPU to CITL

The following shows the format of CPU to CITL.

00006: Get AttrName List request

■Information type

00039

■Detail type

00006

■Data size of data area (Byte units)

80 byte

■Processing

Acquiring the AttrName list of GEM300-related objects specified in ObjType is requested.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_00039-00006

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify ObjType.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

 Page 175 00006: Get AttrName List acknowledge

00103: LoadPortObject SetAttr request

■Information type

00039

■Detail type

00103

■Data size of data area (Byte units)

178 byte

■Processing

Setting all attribute values of a load port object is requested.

■Relevant state transition

None

Point

- Even if the attribute value related to the load port object state model is changed by this request, 'Action by this product' is not taken. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the values of CMS variables 'DVVAL' and 'SV' corresponding to the attribute values of load port objects are changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the CMS variable values.

■Data

Structure label

- M+GEM300_00039-00103

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 88	stLoadPortObject	LoadPortObject	M+GEM300_LoadPortObject	Page 55 M+GEM300_LoadPortObject	Specify all attribute values of a load port object to be set.

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType ^{*1}	○	—	—	None	—
ObjID ^{*2}	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
PTN ^{*1}	○	—	—	None	—
AccessMode	○	—	—	Yes	7: Out of applicable range
PortAssociationState	○	—	—	Yes	7: Out of applicable range
LoadPortReservationState	○	—	—	Yes	7: Out of applicable range
PortTransferState	○	—	—	Yes	7: Out of applicable range
ServiceStatus	○	—	—	Yes	7: Out of applicable range
InServiceStatus	○	—	—	Yes	7: Out of applicable range
TransferReadyStatus	○	—	—	Yes	7: Out of applicable range
CarrierIDReaderStatus	○	—	—	Yes	7: Out of applicable range

*1 Cannot be changed. (Ignored even if provided.)

*2 Cannot be changed.



All attribute values of load port objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.

Structure labels defined in this product are provided in a sample library.

Page 521 Sample Library

■ Relevant item

Page 177 00103: LoadPortObject SetAttr acknowledge

00104: LoadPortObject GetAttr request

■Information type

00039

■Detail type

00104

■Data size of data area (Byte units)

80 byte

■Processing

Acquiring all attribute values of a load port object specified in ObjID is requested.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_00039-00104

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (load port ID)

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

 Page 178 00104: LoadPortObject GetAttr acknowledge

00203: LocationObject SetAttr request

■Information type

00039

■Detail type

00203

■Data size of data area (Byte units)

5280 byte

■Processing

Setting all attribute values of a location object is requested.

■Relevant state transition

None

Point

- Even if the attribute value related to the carrier location is changed by this request, the additional event 'Carrier Location Change Event' is not sent. Therefore, the carrier location can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the value of CMS variable 'SV' corresponding to the attribute value of a location object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the CMS variable value.

■Data

Structure label

- M+GEM300_00039-00203

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 2639	stLocationObject	LocationObject	M+GEM300_LocationObject	☞ Page 56 M+GEM300_LocationObject	Specify all attribute values of a location object to be set.

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType ^{*1}	○	—	—	None	—
ObjID ^{*2}	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
CarrierLocationMatrix ^{*3}	○	—	—	Yes	7: Other than ASCII ^{*4} (except for 0x00)

*1 Cannot be changed. (Ignored even if provided.)

*2 Cannot be changed.

*3 LocationID and CarrierID, the numbers of which exceed the number of locations set in a setting tool, are ignored.

*4 Excluding the control characters.

Point

All attribute values of location objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.

Structure labels defined in this product are provided in a sample library.

☞ Page 521 Sample Library

■Relevant item

☞ Page 179 00203: LocationObject SetAttr acknowledge

00204: LocationObject GetAttr request

Information type

00039

Detail type

00204

Data size of data area (Byte units)

80 byte

Processing

Acquiring all attribute values of a location object specified in ObjID is requested.

Relevant state transition

None

Data

Structure label

- M+GEM300_00039-00204

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (fixed with 'Matrix')

^{*1} Excluding the control characters.

^{*2} If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Relevant item

 Page 180 00204: LocationObject GetAttr acknowledge

00303: InternalBufferObject SetAttr request

■Information type

00039

■Detail type

00303

■Data size of data area (Byte units)

230 byte

■Processing

Setting all attribute values of an internal buffer object is requested.

■Relevant state transition

None

Point

- Even if the attribute value related to the partition capacity of an internal buffer object is changed by this request, the additional event 'Buffer Capacity Changed Event' is not sent. Therefore, the partition capacity can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the values of CMS variables 'DVVAL' and 'SV' corresponding to the attribute values of internal buffer objects are changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the CMS variable values.

■Data

Structure label

- M+GEM300_00039-00303

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 114	stInternalBufferObject	InternalBufferObject	M+GEM300_InternalBufferObject	 Page 57 M+GEM300_InternalBufferObject	Specify all attribute values of an internal buffer object to be set.

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType*1	○	—	—	None	—
ObjID*2	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
PartitionType	○	—	—	Yes	7: Other than ASCII*3
PartitionCapacity	○	—	—	Yes	7: Out of applicable range
AvailPartitionCapacity*4	○	—	—	Yes	7: Out of applicable range
UnallocatedPartitionCapacity*4	○	—	—	Yes	7: Out of applicable range

*1 Cannot be changed. (Ignored even if provided.)

*2 Cannot be changed.

*3 Excluding the control characters.

*4 Can be applied within the range of 'PartitionCapacity.'

All attribute values of internal buffer objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■ Relevant item

 Page 181 00303: InternalBufferObject SetAttr acknowledge

00304: InternalBufferObject GetAttr request

Information type
00039

Detail type
00304

Data size of data area (Byte units)
80 byte

Processing
Acquiring all attribute values of an internal buffer object specified in ObjID is requested.

Relevant state transition
None

Data
Structure label
• M+GEM300_00039-00304

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (PartitionID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Relevant item
 Page 182 00304: InternalBufferObject GetAttr acknowledge

10039: CITL to CPU

The following shows the format of CITL to CPU.

00006: Get AttrName List acknowledge

Information type

10039

Detail type

00006

Data size of data area (Byte units)

20596 byte

Processing

The processing result of 'Get AttrName List request' is returned.

Relevant state transition

None

Data

Structure label

- M+GEM300_10039-00006

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjType	ObjType	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjType is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57	uAttrCount	Number of attributes	Word [Unsigned]	0 to 256	The number of attributes of requested ObjType is returned.
+58 to 10297	st256AttrIDList	AttrIDList	M+GEM300_AttrID List (0..255)	 M+GEM300_AttrIDList	When an error code is '0' and the number of attributes is 1 or more, the attribute name (AttrID) of required ObjType is returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

- M+GEM300_AttrIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40AttrID	AttrID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Attribute name (AttrID) of required ObjType

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

A

Error code

Error code	Error name
0	No error
6	Unknown object type
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 166 00006: Get AttrName List request

00103: LoadPortObject SetAttr acknowledge

■Information type

10039

■Detail type

00103

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'LoadPortObject SetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10039-00103

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 167 00103: LoadPortObject SetAttr request

00104: LoadPortObject GetAttr acknowledge

■Information type

10039

■Detail type

00104

■Data size of data area (Byte units)

292 byte

■Processing

The processing result of 'LoadPortObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10039-00104

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 145	stLoadPortObject	LoadPortObject	M+GEM300_LoadPortObject	 Page 55 M+GEM300_LoadPortObject	When an error code is '0', all attribute values of a requested load port object are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 169 00104: LoadPortObject GetAttr request

00203: LocationObject SetAttr acknowledge

■Information type

10039

■Detail type

00203

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'LocationObject SetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10039-00203

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 170 00203: LocationObject SetAttr request

00204: LocationObject GetAttr acknowledge

■Information type

10039

■Detail type

00204

■Data size of data area (Byte units)

5394 byte

■Processing

The processing result of 'LocationObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10039-00204

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 2696	stLocationObject	LocationObject	M+GEM300_LocationObject	 Page 56 M+GEM300_LocationObject	When an error code is '0', all attribute values of a requested location object are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 171 00204: LocationObject GetAttr request

00303: InternalBufferObject SetAttr acknowledge

■Information type

10039

■Detail type

00303

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'InternalBufferObject SetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10039-00303

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 172 00303: InternalBufferObject SetAttr request

00304: InternalBufferObject GetAttr acknowledge

■Information type

10039

■Detail type

00304

■Data size of data area (Byte units)

344 byte

■Processing

The processing result of 'InternalBufferObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10039-00304

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 171	stInternalBufferObject	InternalBufferObject	M+GEM300_InternalBufferObject	 Page 57 M+GEM300_InternalBufferObject	When an error code is '0', all attribute values of a required internal buffer object are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 174 00304: InternalBufferObject GetAttr request

00087: CPU to CITL

The following shows the format of CPU to CITL.

00001: CarrierObject create request

■Information type

00087

■Detail type

00001

■Data size of data area (Byte units)

4382 byte

■Processing

Creating a carrier object specified in CarrierObject is requested.

■Relevant state transition

None

Point

- Even if a carrier object is created by this request, the state transition of Carrier State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
 - When this request ends normally, the value of CMS variable 'DVVAL' corresponding to the attribute value of a carrier object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the CMS variable value.
-

■Data

Structure label

- M+GEM300_00087-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 2190	stCarrierObject	CarrierObject	M+GEM300_Carrier Object	☞ Page 61 M+GEM300_CarrierObject	Specify the attribute value of a carrier object. (ObjID is required.)

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition	Initial value
ObjType* ¹	—	—	—	None	—	"Carrier"
ObjID* ²	○	—	—	Yes	<ul style="list-style-type: none"> • 12: Omitted (0x00) • 11: ID duplication • 12: Other than ASCII*³ • 17: Creation limit exceeded 	—
Capacity	—	○	—	Yes	7: Out of applicable range	25
SubstrateCount* ⁴	—	○	—	Yes	7: Out of applicable range	0
ContentMap* ⁵	—	○	—	Yes	<ul style="list-style-type: none"> • 7: Out of applicable range • 7: Other than ASCII*³ (except for 0x00) 	LIST[Capacity]
SlotMap* ⁵	—	○	—	Yes	7: Out of applicable range	LIST[Capacity]
Usage	—	○	—	Yes	7: Other than ASCII* ³ (except for 0x00)	(Null character)
CarrierIDStatus* ¹	—	—	—	None	—	0: ID NOT READ
CarrierAccessingStatus* ¹	—	—	—	None	—	0: NOT ACCESSED
SlotMapStatus* ¹	—	—	—	None	—	0: SLOT MAP NOT READ
LocationID* ¹	—	—	—	None	—	(Null character)
Reason* ¹	—	—	—	None	—	0: VERIFICATION NEEDED

*1 Not required. (Ignored even if provided.)

*2 When an error occurs, no carrier objects are created.

*3 Excluding the control characters.

*4 Can be applied within the range of 'Capacity.'

*5 Outside the range of 'Capacity' is ignored.

Structure labels defined in this product are provided in a sample library.

☞ Page 521 Sample Library

■Relevant item

☞ Page 229 00001: CarrierObject create acknowledge

00002: CarrierObject delete request

■Information type

00087

■Detail type

00002

■Data size of data area (Byte units)

80 byte

■Processing

Deleting a carrier object specified in ObjID is requested.

■Relevant state transition

None

Point

- Even if a carrier object is deleted by this request, the state transition of Carrier State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the value of CMS variable 'DVVAL' corresponding to the attribute value of a carrier object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the CMS variable value.

■Data

Structure label

- M+GEM300_00087-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)**2	Object ID (CarrierID)

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

 Page 230 00002: CarrierObject delete acknowledge

00003: CarrierObject SetAttr request

■Information type

00087

■Detail type

00003

■Data size of data area (Byte units)

4382 byte

■Processing

Setting all attribute values of a carrier object specified in CarrierObject is requested.

■Relevant state transition

None

Point

- Even if the attribute value of a carrier object is changed by this request, the state transition of Carrier State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the value of CMS variable 'DVVAL' corresponding to the attribute value of a carrier object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the CMS variable value.

■Data

Structure label

- M+GEM300_00087-00003

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 2190	stCarrierObject	CarrierObject	M+GEM300_Carrier Object	☞ Page 61 M+GEM300_CarrierObject	Specify all attribute values of a carrier object.

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType ^{*1}	○	—	—	None	—
ObjID ^{*2}	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
Capacity	○	—	—	Yes	7: Out of applicable range
SubstrateCount ^{*3}	○	—	—	Yes	7: Out of applicable range
ContentMap ^{*4}	○	—	—	Yes	• 7: Out of applicable range • 7: Other than ASCII ^{*5} (except for 0x00)
SlotMap ^{*4}	○	—	—	Yes	7: Out of applicable range
Usage	○	—	—	Yes	7: Other than ASCII ^{*5} (except for 0x00)
CarrierIDStatus	○	—	—	Yes	7: Out of applicable range
CarrierAccessingStatus	○	—	—	Yes	7: Out of applicable range
SlotMapStatus	○	—	—	Yes	7: Out of applicable range

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
LocationID	○	—	—	Yes	7: Other than ASCII ^{*5} (except for 0x00)
Reason	○	—	—	Yes	7: Out of applicable range

*1 Cannot be changed. (Ignored even if provided.)

*2 Cannot be changed.

*3 Can be applied within the range of 'Capacity.'

*4 Outside the range of 'Capacity' is ignored.

*5 Excluding the control characters.

Point

All attribute values of carrier objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.

Structure labels defined in this product are provided in a sample library.

📖 Page 521 Sample Library

■Relevant item

📖 Page 231 00003: CarrierObject SetAttr acknowledge

00004: CarrierObject GetAttr request

Information type
00087

Detail type
00004

Data size of data area (Byte units)
80 byte

Processing
Acquiring all attribute values of a carrier object specified in ObjID is requested.

Relevant state transition
None

Data
Structure label
• M+GEM300_00087-00004

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (CarrierID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Relevant item
 Page 232 00004: CarrierObject GetAttr acknowledge

00101: AccessMode AUTO request

Information type
00087

Detail type
00101

Data size of data area (Byte units)
2 byte

Processing
Changing 'AccessMode' which is an attribute of a load port specified in PortID (PTN) to the 'AUTO' mode is requested.

Relevant state transition
• Access Mode State Model state transition No.(2)
( Page 80 Access Mode State Model)

Point

When a load port is already reserved or transferring, 'AccessMode' cannot be changed to AUTO. (When the value of 'LoadPortReservationState' or 'PortTransferState' of a load port specified in PortID (PTN) is '1: RESERVED' or '1: TRANSFER BLOCKED,' respectively)

Data
Structure label
• M+GEM300_00087-00101

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 233 00101: AccessMode AUTO acknowledge

00102: AccessMode MANUAL request

■Information type

00087

■Detail type

00102

■Data size of data area (Byte units)

2 byte

■Processing

Changing 'AccessMode' which is an attribute of a load port specified in PortID (PTN) to the 'MANUAL' mode is requested.

■Relevant state transition

- Access Mode State Model state transition No.(3)
( Page 80 Access Mode State Model)

Point

When a load port is already reserved or transferring, 'AccessMode' cannot be changed to MANUAL. (When the value of 'LoadPortReservationState' or 'PortTransferState' of a load port specified in PortID (PTN) is '1: RESERVED' or '1: TRANSFER BLOCKED,' respectively)

■Data

Structure label

- M+GEM300_00087-00102

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 234 00102: AccessMode MANUAL acknowledge)

00111: Load Port reservation request

Information type
00087

Detail type
00111

Data size of data area (Byte units)
2 byte

Processing
Changing 'LoadPortReservationState' which is an attribute of a load port specified in PortID (PTN) to 'RESERVED' is requested.

Relevant state transition
• Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

Point
'LoadPortReservationState' can be changed to 'RESERVED' only when the 'PortTransferState' attribute of a load port is '2: READY TO LOAD.'

Data
Structure label
• M+GEM300_00087-00111

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 235 00111: Load Port reservation acknowledge

00112: Load Port cancel reservation request

Information type
00087

Detail type
00112

Data size of data area (Byte units)
2 byte

Processing
Changing 'LoadPortReservationState' which is an attribute of a load port specified in PortID (PTN) to 'NOT RESERVED' is requested.

Relevant state transition
• Load Port Reservation State Model state transition No.(3)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

Data
Structure label
• M+GEM300_00087-00112

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 236 00112: Load Port cancel reservation acknowledge

00201: IN SERVICE request

Information type
00087

Detail type
00201

Data size of data area (Byte units)
2 byte

Processing
Changing 'PortTransferState' which is an attribute of a load port specified in PortID (PTN) to 'IN SERVICE' is requested.

Relevant state transition

- Load Port Transfer State Model state transition No.(2)
( Page 69 Load Port Transfer State Model)

Data

Structure label

- M+GEM300_00087-00201

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 237 00201: IN SERVICE acknowledge

00202: OUT OF SERVICE request

■Information type

00087

■Detail type

00202

■Data size of data area (Byte units)

2 byte

■Processing

Changing 'PortTransferState' which is an attribute of a load port specified in PortID (PTN) to 'OUT OF SERVICE' is requested.

■Relevant state transition

- Load Port Transfer State Model state transition No.(3)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_00087-00202

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 238 00202: OUT OF SERVICE acknowledge)

00203: ID READER available notification

■Information type
00087

■Detail type
00203

■Data size of data area (Byte units)
2 byte

■Processing
The completion of the preparation of a carrier ID reader for a load port specified in PortID (PTN) is notified.

■Relevant state transition
• Additional event: ID Reader Available Event
( Page 512 Additional events)

■Data
Structure label
• M+GEM300_00087-00203

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

■Relevant item
 Page 239 00203: ID READER available response

00204: ID READER unavailable notification

Information type
00087

Detail type
00204

Data size of data area (Byte units)
2 byte

Processing
The unavailability of a carrier ID reader for a load port specified in PortID (PTN) is notified.

Relevant state transition
• Additional event: ID Reader Unavailable Event
( Page 512 Additional events)

Data
Structure label
• M+GEM300_00087-00204

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 240 00204: ID READER unavailable response

00301: LOAD started notification

Information type
00087

Detail type
00301

Data size of data area (Byte units)
2 byte

Processing
The start of loading a carrier in a load port specified in PortID (PTN) is notified.

Relevant state transition
• Load Port Transfer State Model state transition No.(6)
(Page 69 Load Port Transfer State Model)

Data
Structure label
• M+GEM300_00087-00301

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
(Page 521 Sample Library)

Relevant item
(Page 241 00301: LOAD started response)

00302: LOAD completed notification

■Information type

00087

■Detail type

00302

■Data size of data area (Byte units)

2 byte

■Processing

The completion of loading a carrier in a load port specified in PortID (PTN) is notified.

■Relevant state transition

- Load Port Reservation State Model state transition No.(3)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

Point

When the loading of a carrier is completed in a load port not reserved, the Load Port Reservation State Model state transition No.(3) does not occur and a response is sent normally. (When the 'LoadPortReservationState' value of a load port specified in PortID (PTN) is '0: NOT RESERVED')

■Data

Structure label

- M+GEM300_00087-00302

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 242 00302: LOAD completed response)

00303: UNLOAD available notification

■Information type

00087

■Detail type

00303

■Data size of data area (Byte units)

2 byte

■Processing

The completion of the preparation for unloading a carrier in a load port specified in PortID (PTN) is notified.

■Relevant state transition

- Load Port Transfer State Model state transition No.(9)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_00087-00303

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 243 00303: UNLOAD available response)

00304: UNLOAD started notification

Information type
00087

Detail type
00304

Data size of data area (Byte units)
2 byte

Processing
The start of unloading a carrier in a load port specified in PortID (PTN) is notified.

Relevant state transition

- Load Port Transfer State Model state transition No.(7)
( Page 69 Load Port Transfer State Model)

Data

Structure label

- M+GEM300_00087-00304

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item

 Page 244 00304: UNLOAD started response

00305: UNLOAD completed notification

■Information type

00087

■Detail type

00305

■Data size of data area (Byte units)

2 byte

■Processing

The completion of unloading a carrier in a load port specified in PortID (PTN) is notified.

■Relevant state transition

When CarrierID is associated with a load port specified in PortID (PTN)

- Carrier State Model state transition No.(21)
( Page 63 Carrier State Model)
- Load Port Transfer State Model state transition No.(8)
( Page 69 Load Port Transfer State Model)
- Load Port/Carrier Association State Model state transition No.(3)
( Page 77 Load Port/Carrier Association State Model)

When CarrierID is not associated with a load port specified in PortID (PTN)

- Load Port Transfer State Model state transition No.(8)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_00087-00305

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 245 00305: UNLOAD completed response)

00306: TRANSFER failed notification

Information type
00087

Detail type
00306

Data size of data area (Byte units)
2 byte

Processing
The failure of the transfer of a carrier in a load port specified in PortID (PTN) is notified.

Relevant state transition

- Load Port Transfer State Model state transition No.(10)
( Page 69 Load Port Transfer State Model)

Data

Structure label

- M+GEM300_00087-00306

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 246 00306: TRANSFER failed response

00307: Carrier clamped notification

■Information type

00087

■Detail type

00307

■Data size of data area (Byte units)

162 byte

■Processing

Clamping of a carrier at the delivery position in a load port specified in PortID (PTN) is notified.

■Relevant state transition

- Additional event: Carrier Clamped Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_00087-00307

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID of a clamped carrier. When a carrier object of the clamped carrier has not been created, specify '0x00.'
+41 to 80	u40LocationID	LocationID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII) ^{*1*2}	Specify LocationID in which a carrier has been clamped. When LocationID does not need to be notified, specify '0x00.'

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

A

Point

LocationID specified with this request is applied to 'VID 30049: LocationID (DVVAL)' only, and not applied to the attribute of an object. To change the carrier location, use '00087-00402: Carrier Location change notification.'

■Relevant item

( Page 247 00307: Carrier clamped response)

00308: Carrier unclamped notification

■Information type

00087

■Detail type

00308

■Data size of data area (Byte units)

162 byte

■Processing

Unclamping of a carrier at the delivery position in a load port specified in PortID (PTN) is notified.

■Relevant state transition

- Additional event: Carrier Unclamped Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_00087-00308

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)*1*2	Specify CarrierID of a unclamped carrier. When a carrier object of the unclamped carrier has not been created, specify '0x00.'
+41 to 80	u40LocationID	LocationID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)*1*2	Specify LocationID in which a carrier has been unclamped. When not notifying LocationID to the host, specify '0x00.'

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)



LocationID specified with this request is applied to 'VID 30049: LocationID (DVVAL)' only, and not applied to the attribute of an object. To change the carrier location, use '00087-00402: Carrier Location change notification.'

■Relevant item

( Page 248 00308: Carrier unclamped response)

00309: Carrier opened notification

■Information type

00087

■Detail type

00309

■Data size of data area (Byte units)

80 byte

■Processing

Opening of the door of a carrier specified in CarrierID is notified.

■Relevant state transition

- Additional event: Carrier Opened Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_00087-00309

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 249 00309: Carrier opened response)

A

00310: Carrier closed notification

Information type
00087

Detail type
00310

Data size of data area (Byte units)
80 byte

Processing
Closing of the door of a carrier specified in CarrierID is notified.

Relevant state transition

- Additional event: Carrier Closed Event
( Page 512 Additional events)

Data

Structure label

- M+GEM300_00087-00310

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

^{*1} Excluding the control characters.

^{*2} If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Relevant item

( Page 250 00310: Carrier closed response)

00311: Carrier accessing started notification

■Information type

00087

■Detail type

00311

■Data size of data area (Byte units)

80 byte

■Processing

The start of accessing a carrier specified in CarrierID is notified.

■Relevant state transition

- Carrier State Model state transition No.(18)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_00087-00311

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 251 00311: Carrier accessing started response)

A

00312: Carrier approaching complete notification

Information type
00087

Detail type
00312

Data size of data area (Byte units)
80 byte

Processing
The approaching completion of accessing a carrier specified in CarrierID is notified.

Relevant state transition
• Additional event: Carrier Approaching Complete Event
(Page 512 Additional events)

Data
Structure label
• M+GEM300_00087-00312

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

^{*1} Excluding the control characters.
^{*2} If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.
(Page 521 Sample Library)

Relevant item
(Page 252 00312: Carrier approaching complete response)

00313: Carrier accessing normally finished notification

Information type
00087

Detail type
00313

Data size of data area (Byte units)
80 byte

Processing
The normal completion of accessing a carrier specified in CarrierID is notified.

Relevant state transition
• Carrier State Model state transition No.(19)
(Page 63 Carrier State Model)

Data
Structure label
• M+GEM300_00087-00313

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.
(Page 521 Sample Library)

Relevant item
(Page 253 00313: Carrier accessing normally finished response)



00314: Carrier accessing abnormally finished notification

Information type
00087

Detail type
00314

Data size of data area (Byte units)
80 byte

Processing
The abnormal completion of accessing a carrier specified in CarrierID is notified.

Relevant state transition
• Carrier State Model state transition No.(20)
( Page 63 Carrier State Model)

Data
Structure label
• M+GEM300_00087-00314

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 254 00314: Carrier accessing abnormally finished response

00401: Load Port Carrier association request

■Information type

00087

■Detail type

00401

■Data size of data area (Byte units)

82 byte

■Processing

Associating a load port specified in PortID (PTN) with a carrier specified in CarrierID is requested.

■Relevant state transition

- Load Port/Carrier Association State Model state transition No.(2), (4)
( Page 77 Load Port/Carrier Association State Model)

Point

- When the 'PortTransferState' value of a load port specified in PortID (PTN) is '0: OUT OF SERVICE,' the specified load port and carrier cannot be associated.
- When a carrier specified in CarrierID is already associated with an load port, the specified load port and carrier cannot be associated. Cancel the association by '00087-00402: Load Port Carrier cancel association request' in advance.

■Data

Structure label

- M+GEM300_00087-00401

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 255 00401: Load Port Carrier association acknowledge)

00402: Load Port Carrier cancel association request

Information type
00087

Detail type
00402

Data size of data area (Byte units)
2 byte

Processing
Changing 'PortAssociationState' which is an attribute of a load port specified in PortID (PTN) to 'NOT ASSOCIATED' is requested.

Relevant state transition
• Load Port/Carrier Association State Model state transition No.(3)
( Page 77 Load Port/Carrier Association State Model)

Data
Structure label
• M+GEM300_00087-00402

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 256 00402: Load Port Carrier cancel association acknowledge

00403: Carrier Location change notification

■Information type
00087

■Detail type
00403

■Data size of data area (Byte units)
160 byte

■Processing
Changing the location of a carrier specified in CarrierID to the one specified in LocationID is notified.

■Relevant state transition
• Additional event: Carrier Location Change Event
( Page 512 Additional events)

■Data
Structure label
• M+GEM300_00087-00403

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)*1*2	Specify CarrierID.
+40 to 79	u40LocationID	LocationID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify LocationID.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Point

- LocationID, the attribute of a carrier object specified in CarrierID, is changed to the location specified in LocationID. In addition, CarrierLocationMatrix, the attribute of a location object, is updated.
- When CarrierID cannot be read, specify a unique ASCII character (such as "UNKNOWN") for it. CarrierID of the location specified in LocationID is changed to the ASCII character specified in CarrierID. (Only 'CarrierLocationMatrix,' the attribute of a location object, is updated.)
- After unloading a carrier, CarrierID of a location specified in LocationID is deleted by 'not specifying (0x00)' CarrierID. (Only 'CarrierLocationMatrix,' the attribute of a location object, is updated.)

A

Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

■Relevant item
 Page 257 00403: Carrier Location change response

00404: Buffer Capacity changed notification

■Information type

00087

■Detail type

00404

■Data size of data area (Byte units)

84 byte

■Processing

The change of the buffer capacity of a logical partition specified in PartitionID is notified.

■Relevant state transition

- Additional event: Buffer Capacity Changed Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_00087-00404

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40PartitionID	PartitionID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify the partition ID of a logical partition.
+40	uAvailPartitionCapacity	AvailPartitionCapacity	Word [Unsigned]	0 to 32	Specify the free space (remaining amount) of a logical partition.
+41	uUnallocatedPartitionCapacity	UnallocatedPartitionCapacity	Word [Unsigned]	0 to 32	Specify the unassigned space (remaining amount) of a logical partition.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 258 00404: Buffer Capacity changed response)

00411: Carrier move started to Internal Buffer notification

Information type
00087

Detail type
00411

Data size of data area (Byte units)
82 byte

Processing
The start of moving a carrier specified in CarrierID, in a load port specified in PortID (PTN), to the internal buffer, is notified.

Relevant state transition
• Load Port Transfer State Model state transition No.(7)
( Page 69 Load Port Transfer State Model)

Point

When a load port specified in PortID (PTN) and a carrier specified in CarrierID are associated

- When the loading of a carrier is completed and transferring the carrier to the internal buffer, the Load Port Transfer State Model state transition No.(7) does not occur and a response is sent normally. (When the 'PortTransferState' value of a load port specified in PortID (PTN) is '1: TRANSFER BLOCKED')
- When transferring a carrier that can be unloaded to the internal buffer, the Load Port Transfer State Model state transition No.(7) occurs. (When the 'CarrierIn' service is instructed by the host to a carrier for which the 'CarrierOut' service is completed, and the 'PortTransferState' value of a load port specified in PortID (PTN) is '3: READY TO UNLOAD')

When a load port specified in PortID (PTN) and a carrier specified in CarrierID are not associated

- Load Port Transfer State Model state transition No.(7) does not occur, and an error response is sent.

Data
Structure label
• M+GEM300_00087-00411

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 259 00411: Carrier move started to Internal Buffer response

A

00412: Carrier move completed to Internal Buffer notification

■Information type

00087

■Detail type

00412

■Data size of data area (Byte units)

82 byte

■Processing

The completion of moving a carrier specified in CarrierID, in a load port specified in PortID (PTN), to the internal buffer, is notified.

■Relevant state transition

- Load Port Transfer State Model state transition No.(8)
( Page 69 Load Port Transfer State Model)
- Load Port/Carrier Association State Model state transition No.(3)
( Page 77 Load Port/Carrier Association State Model)

Point

When a load port specified in PortID (PTN) and a carrier specified in CarrierID are not associated, no state transitions occur and an error response is sent.

■Data

Structure label

- M+GEM300_00087-00412

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Point

For the change of buffer capacity notification, use '00087-00404: Buffer Capacity changed notification.'

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 260 00412: Carrier move completed to Internal Buffer response)

00413: Carrier move started to Load Port notification

Information type
00087

Detail type
00413

Data size of data area (Byte units)
82 byte

Processing
The start of moving a carrier specified in CarrierID to a load port specified in PortID (PTN) is notified.

- Relevant state transition
- Load Port Transfer State Model state transition No.(6)
( Page 69 Load Port Transfer State Model)
 - Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
 - Load Port/Carrier Association State Model state transition No.(2)
( Page 77 Load Port/Carrier Association State Model)

Point  When a carrier specified in CarrierID is already associated with an load port, no state transitions occur and an error response is sent.

Data
Structure label
• M+GEM300_00087-00413

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Relevant item
 Page 261 00413: Carrier move started to Load Port response

00414: Carrier move completed to Load Port notification

■Information type

00087

■Detail type

00414

■Data size of data area (Byte units)

82 byte

■Processing

The completion of moving a carrier specified in CarrierID to a load port specified in PortID (PTN) is notified.

■Relevant state transition

- Load Port Reservation State Model state transition No.(3)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

Point

When a load port specified in PortID (PTN) and a carrier specified in CarrierID are not associated, no state transitions occur and an error response is sent.

■Data

Structure label

- M+GEM300_00087-00414

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 262 00414: Carrier move completed to Load Port response)

00415: UNLOAD completed and Carrier move started to Load Port notification

■Information type

00087

■Detail type

00415

■Data size of data area (Byte units)

82 byte

■Processing

The start of moving a carrier specified in CarrierID, from the internal buffer to a load port specified in PortID (PTN), is notified via a carrier unloading completion notification and the 'CarrierOut' service. (Refer to 'Carrier-out queuing' in the use case. ( Page 535 Use Cases))

■Relevant state transition

When CarrierID is associated with a load port specified in PortID (PTN)

- Carrier State Model state transition No.(21)
( Page 63 Carrier State Model)
- Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(4)
( Page 77 Load Port/Carrier Association State Model)

When CarrierID is not associated with a load port specified in PortID (PTN)

- Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(2)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_00087-00415

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)**2	Specify CarrierID that has started moving.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 263 00415: UNLOAD completed and Carrier move started to Load Port response)

00501: CarrierID read successful notification

■Information type

00087

■Detail type

00501

■Data size of data area (Byte units)

82 byte

■Processing

The completion of reading CarrierID successfully in a load port specified in PortID (PTN) is notified.



SECS/GEM communication software performs the carrier ID verification. (Page 86 Carrier ID Verification)

■Relevant state transition

- Carrier State Model state transition No.(3), (6), (7), (21)
(Page 63 Carrier State Model)
- Load Port Reservation State Model state transition No.(3)
(Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(2), (3), (4)
(Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_00087-00501

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID that has been read successfully.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

Page 521 Sample Library

■Relevant item

Page 265 00501: CarrierID read successful response

00502: CarrierID read fail notification

Information type
00087

Detail type
00502

Data size of data area (Byte units)
2 byte

Processing
The failure of reading CarrierID in a load port specified in PortID (PTN) is notified.

Point

SECS/GEM communication software performs the following processing:

- When a carrier is ASSOCIATED with a load port specified in PortID (PTN), the carrier ID verification is performed. (Page 86 Carrier ID Verification)
- When a carrier is NOT ASSOCIATED with a load port specified in PortID (PTN), CarrierID Read Fail Event is sent.

- Relevant state transition
- Carrier State Model state transition No.(7)
(Page 63 Carrier State Model)
 - Additional event: CarrierID Read Fail Event
(Page 512 Additional events)

Data
Structure label
• M+GEM300_00087-00502

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.
Page 521 Sample Library

Relevant item
Page 267 00502: CarrierID read fail response

A

00503: Unknown CarrierID notification

■Information type

00087

■Detail type

00503

■Data size of data area (Byte units)

2 byte

■Processing

The arrival of a carrier at a load port for which a carrier ID reader cannot be used is notified.

Point

SECS/GEM communication software performs the following processing only when the 'CarrierIDReaderStatus' value of a load port specified in PortID (PTN) is '0: UNAVAILABLE.'

- When a carrier is ASSOCIATED with a load port specified in PortID (PTN), the carrier ID verification is performed. ( Page 86 Carrier ID Verification)
- When a carrier is NOT ASSOCIATED with a load port specified in PortID (PTN), UnknownCarrierID Event is sent.

■Relevant state transition

- Carrier State Model state transition No.(10), (11)
( Page 63 Carrier State Model)
- Additional event: UnknownCarrierID Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_00087-00503

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	Specify PortID (PTN).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 268 00503: Unknown CarrierID response)

00504: Duplicate CarrierID in process notification

■Information type

00087

■Detail type

00504

■Data size of data area (Byte units)

80 byte

■Processing

The start of processing a carrier with the same CarrierID as the one already specified is notified.

■Relevant state transition

- Additional event: Duplicate CarrierID In Process Event
( Page 512 Additional events)

Point

For the alarm notification (sending S5F1) when CarrierID is duplicated, use the alarm notification definition (GEM/GEM advanced version) function of SEMI E30(GEM). ( IC Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual)

■Data

Structure label

- M+GEM300_00087-00504

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Point

CarrierID specified with this request is applied to 'VID 30014: CarrierID (DVVAL)' only.

■Relevant item

( Page 269 00504: Duplicate CarrierID in process response)

00601: SlotMap verification ok notification

Information type
00087

Detail type
00601

Data size of data area (Byte units)
80 byte

Processing
The completion of equipment verification of a slot map for a carrier specified in CarrierID is notified.

Relevant state transition

- Carrier State Model state transition No.(13)
( Page 63 Carrier State Model)

Data

Structure label

- M+GEM300_00087-00601

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item

 Page 270 00601: SlotMap verification ok response

00602: SlotMap waiting for host verification notification

■Information type

00087

■Detail type

00602

■Data size of data area (Byte units)

130 byte

■Processing

Waiting for the host verification of a slot map of a carrier specified in CarrierID is notified.

■Relevant state transition

- Carrier State Model state transition No.(14)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_00087-00602

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID.
+40 to 64	st25SlotMap	SlotMap	M+GEM300_SlotMap (0..24)	 Page 61 M+GEM300_SlotMap	A read slot map is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 271 00602: SlotMap waiting for host verification response)

00603: SlotMap verification fail notification

Information type
00087

Detail type
00603

Data size of data area (Byte units)
130 byte

Processing
The failure of equipment verification of a slot map for a carrier specified in CarrierID is notified.

Relevant state transition
• Carrier State Model state transition No.(14)
( Page 63 Carrier State Model)

Data
Structure label
• M+GEM300_00087-00603

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID.
+40 to 64	st25SlotMap	SlotMap	M+GEM300_SlotMap (0..24)	 Page 61 M+GEM300_SlotMap	A read slot map is notified.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.
 Page 521 Sample Library

Relevant item
 Page 272 00603: SlotMap verification fail response

00604: SlotMap read fail notification

■Information type

00087

■Detail type

00604

■Data size of data area (Byte units)

80 byte

■Processing

The failure of reading a slot map for a carrier specified in CarrierID is notified.

■Relevant state transition

- Carrier State Model state transition No.(14)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_00087-00604

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify CarrierID.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

( Page 273 00604: SlotMap read fail response)

A

00605: SlotMap abnormal substrate position notification

Information type
00087

Detail type
00605

Data size of data area (Byte units)
80 byte

Processing
Abnormal substrate position found in a carrier specified in CarrierID is notified.

Relevant state transition
• Carrier State Model state transition No.(14)
(Page 63 Carrier State Model)

Data
Structure label
• M+GEM300_00087-00605

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify CarrierID.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).
Structure labels defined in this product are provided in a sample library.
(Page 521 Sample Library)

Relevant item
(Page 274 00605: SlotMap abnormal substrate position response)

10087: CITL to CPU

The following shows the format of CITL to CPU.

00001: CarrierObject create acknowledge

Information type

10087

Detail type

00001

Data size of data area (Byte units)

114 byte

Processing

The processing result of 'CarrierObject create request' is returned.

Relevant state transition

None

Data

Structure label

- M+GEM300_10087-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
7	Invalid attribute value
11	Object identifier in use
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

Relevant item

 Page 183 00001: CarrierObject create request

00002: CarrierObject delete acknowledge

■Information type

10087

■Detail type

00002

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'CarrierObject delete request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10087-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 185 00002: CarrierObject delete request

00003: CarrierObject SetAttr acknowledge

■Information type

10087

■Detail type

00003

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'CarrierObject SetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10087-00003

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 186 00003: CarrierObject SetAttr request

00004: CarrierObject GetAttr acknowledge

■Information type

10087

■Detail type

00004

■Data size of data area (Byte units)

4496 byte

■Processing

The processing result of 'CarrierObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10087-00004

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 2247	stCarrierObject	CarrierObject	M+GEM300_CarrierObject	 Page 61 M+GEM300_CarrierObject	When an error code is '0', all attribute values of a required carrier object are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 188 00004: CarrierObject GetAttr request

00101: AccessMode AUTO acknowledge

■Information type

10087

■Detail type

00101

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'AccessMode AUTO request' is returned.

■Relevant state transition

- Access Mode State Model state transition No.(2)
( Page 80 Access Mode State Model)

■Data

Structure label

- M+GEM300_10087-00101

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 189 00101: AccessMode AUTO request)

A

00102: AccessMode MANUAL acknowledge

■Information type

10087

■Detail type

00102

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'AccessMode MANUAL request' is returned.

■Relevant state transition

- Access Mode State Model state transition No.(3)
( Page 80 Access Mode State Model)

■Data

Structure label

- M+GEM300_10087-00102

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 190 00102: AccessMode MANUAL request)

00111: Load Port reservation acknowledge

■Information type

10087

■Detail type

00111

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'Load Port reservation request' is returned.

■Relevant state transition

- Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

■Data

Structure label

- M+GEM300_10087-00111

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 191 00111: Load Port reservation request)

00112: Load Port cancel reservation acknowledge

■Information type

10087

■Detail type

00112

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'Load Port cancel reservation request' is returned.

■Relevant state transition

- Load Port Reservation State Model state transition No.(3)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

■Data

Structure label

- M+GEM300_10087-00112

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 192 00112: Load Port cancel reservation request)

00201: IN SERVICE acknowledge

■Information type

10087

■Detail type

00201

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'IN SERVICE request' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(2)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_10087-00201

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 193 00201: IN SERVICE request)

A

00202: OUT OF SERVICE acknowledge

■Information type

10087

■Detail type

00202

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'OUT OF SERVICE request' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(3)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_10087-00202

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 194 00202: OUT OF SERVICE request)

00203: ID READER available response

■Information type

10087

■Detail type

00203

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'ID READER available notification' is returned.

■Relevant state transition

- Additional event: ID Reader Available Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00203

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 195 00203: ID READER available notification)

A

00204: ID READER unavailable response

■Information type

10087

■Detail type

00204

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'ID READER unavailable notification' is returned.

■Relevant state transition

- Additional event: ID Reader Unavailable Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00204

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 196 00204: ID READER unavailable notification)

00301: LOAD started response

■Information type

10087

■Detail type

00301

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'LOAD started notification' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(6)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_10087-00301

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 197 00301: LOAD started notification)

A

00302: LOAD completed response

■Information type

10087

■Detail type

00302

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'LOAD completed notification' is returned.

■Relevant state transition

- Load Port Reservation State Model state transition No.(3)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

■Data

Structure label

- M+GEM300_10087-00302

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 198 00302: LOAD completed notification)

00303: UNLOAD available response

■Information type

10087

■Detail type

00303

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'UNLOAD available notification' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(9)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_10087-00303

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 199 00303: UNLOAD available notification)

A

00304: UNLOAD started response

■Information type

10087

■Detail type

00304

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'UNLOAD started notification' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(7)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_10087-00304

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 200 00304: UNLOAD started notification)

00305: UNLOAD completed response

■Information type

10087

■Detail type

00305

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'UNLOAD completed notification' is returned.

■Relevant state transition

When CarrierID is associated with a load port specified in PortID (PTN)

- Carrier State Model state transition No.(21)
( Page 63 Carrier State Model)
- Load Port Transfer State Model state transition No.(8)
( Page 69 Load Port Transfer State Model)
- Load Port/Carrier Association State Model state transition No.(3)
( Page 77 Load Port/Carrier Association State Model)

When CarrierID is not associated with a load port specified in PortID (PTN)

- Load Port Transfer State Model state transition No.(8)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_10087-00305

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCo unt	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
50	Missing Carrier
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 201 00305: UNLOAD completed notification)

00306: TRANSFER failed response

■Information type

10087

■Detail type

00306

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'TRANSFER failed notification' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(10)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_10087-00306

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 202 00306: TRANSFER failed notification)

00307: Carrier clamped response

■Information type

10087

■Detail type

00307

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'Carrier clamped notification' is returned.

■Relevant state transition

- Additional event: Carrier Clamped Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00307

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)**2	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
12	Parameters improperly specified
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 203 00307: Carrier clamped notification)

00308: Carrier unclamped response

■Information type

10087

■Detail type

00308

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'Carrier unclamped notification' is returned.

■Relevant state transition

- Additional event: Carrier Unclamped Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00308

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)**2	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
12	Parameters improperly specified
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 204 00308: Carrier unclamped notification)

00309: Carrier opened response

■Information type

10087

■Detail type

00309

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'Carrier opened notification' is returned.

■Relevant state transition

- Additional event: Carrier Opened Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00309

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 205 00309: Carrier opened notification)

00310: Carrier closed response

■Information type

10087

■Detail type

00310

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'Carrier closed notification' is returned.

■Relevant state transition

- Additional event: Carrier Closed Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00310

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 206 00310: Carrier closed notification)

00311: Carrier accessing started response

■Information type

10087

■Detail type

00311

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'Carrier accessing started notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(18)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00311

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 207 00311: Carrier accessing started notification)

00312: Carrier approaching complete response

■Information type

10087

■Detail type

00312

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'Carrier approaching complete notification' is returned.

■Relevant state transition

- Additional event: Carrier Approaching Complete Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00312

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 208 00312: Carrier approaching complete notification)

00313: Carrier accessing normally finished response

■Information type

10087

■Detail type

00313

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'Carrier accessing normally finished notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(19)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00313

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 209 00313: Carrier accessing normally finished notification)

00314: Carrier accessing abnormally finished response

■Information type

10087

■Detail type

00314

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'Carrier accessing abnormally finished notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(20)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00314

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 210 00314: Carrier accessing abnormally finished notification)

00401: Load Port Carrier association acknowledge

■Information type

10087

■Detail type

00401

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'CarrierID change request' is returned.

■Relevant state transition

- Load Port/Carrier Association State Model state transition No.(2), (4)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00401

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 211 00401: Load Port Carrier association request)

00402: Load Port Carrier cancel association acknowledge

■Information type

10087

■Detail type

00402

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'Load Port Carrier cancel association request' is returned.

■Relevant state transition

- Load Port/Carrier Association State Model state transition No.(3)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00402

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A required PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+18 to 57	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)**2	When an error code is '0', a CarrierID with the association canceled is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
50	Missing Carrier
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 212 00402: Load Port Carrier cancel association request)

00403: Carrier Location change response

■Information type

10087

■Detail type

00403

■Data size of data area (Byte units)

194 byte

■Processing

The processing result of 'Carrier Location change notification' is returned.

■Relevant state transition

- Additional event: Carrier Location Change Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00403

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+40 to 79	u40LocationID	LocationID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified LocationID is returned.
+80	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+81 to 96	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 213 00403: Carrier Location change notification)

00404: Buffer Capacity changed response

■Information type

10087

■Detail type

00404

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'Buffer Capacity changed notification' is returned.

■Relevant state transition

- Additional event: Buffer Capacity Changed Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00404

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40PartitionID	PartitionID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified PartitionID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 214 00404: Buffer Capacity changed notification)

00411: Carrier move started to Internal Buffer response

■Information type

10087

■Detail type

00411

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'Carrier move started to Internal Buffer notification' is returned.

■Relevant state transition

- Load Port/Carrier Association State Model state transition No.(7)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00411

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A notified PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 215 00411: Carrier move started to Internal Buffer notification)

00412: Carrier move completed to Internal Buffer response

■Information type

10087

■Detail type

00412

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'Carrier move complete to Internal Buffer notification' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(8)
( Page 69 Load Port Transfer State Model)
- Load Port/Carrier Association State Model state transition No.(3)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00412

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A notified PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 216 00412: Carrier move completed to Internal Buffer notification)

00413: Carrier move started to Load Port response

■Information type

10087

■Detail type

00413

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'Carrier move started to Load Port notification' is returned.

■Relevant state transition

- Load Port Transfer State Model state transition No.(6)
( Page 69 Load Port Transfer State Model)
- Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(2)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00413

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A notified PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
48	Load port does not exist
49	Load port already in use
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 217 00413: Carrier move started to Load Port notification)

A

00414: Carrier move completed to Load Port response

■Information type

10087

■Detail type

00414

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'Carrier move completed to Load Port notification' is returned.

■Relevant state transition

- Load Port Reservation State Model state transition No.(3)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

■Data

Structure label

- M+GEM300_10087-00414

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A notified PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)**2	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
48	Load port does not exist
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 218 00414: Carrier move completed to Load Port notification)

00415: UNLOAD completed and Carrier move started to Load Port response

■Information type

10087

■Detail type

00415

■Data size of data area (Byte units)

116 byte

■Processing

The processing result of 'UNLOAD completed and Carrier move started to Load Port notification' is returned.

■Relevant state transition

When CarrierID is associated with a load port specified in PortID (PTN)

- Carrier State Model state transition No.(21)
( Page 63 Carrier State Model)
- Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(4)
( Page 77 Load Port/Carrier Association State Model)

When CarrierID is not associated with a load port specified in PortID (PTN)

- Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(2)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00415

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A notified PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
48	Load port does not exist
50	Missing Carrier
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 219 00415: UNLOAD completed and Carrier move started to Load Port notification

00501: CarrierID read successful response

■Information type

10087

■Detail type

00501

■Data size of data area (Byte units)

202 byte

■Processing

The processing result of 'CarrierID read successful notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(3), (6), (7), (21)
( Page 63 Carrier State Model)
- Load Port Reservation State Model state transition No.(3)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(2), (3), (4)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00501

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A notified PortID (PTN) is returned.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+41	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+42 to 57	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+58	uCarrierIDStatus	CarrierIDStatus	Word [Unsigned]	0 to 3	Enabled when an error code is '0' or '50.' The equipment verification result for a notified CarrierID is notified. • 0: ID NOT READ • 1: WAITING FOR HOST • 2: ID VERIFICATION OK • 3: ID VERIFICATION FAILED
+59	uAllPortAssociationState	AllPortAssociationState	Bit String [16-bit]	• 0: NOT ASSOCIATED • 1: ASSOCIATED	Enabled when an error code is '0' or '50'.*3 A snapshot of 'PortAssociationState' of all load ports for the equipment verification result of a notified CarrierID is notified. (Same as 'Port association state' (Un\G24596)) • b0: PortAssociationState of PortID (PTN) 1 • b1: PortAssociationState of PortID (PTN) 2 • b2: PortAssociationState of PortID (PTN) 3 • b3: PortAssociationState of PortID (PTN) 4 • b4: PortAssociationState of PortID (PTN) 5 • b5: PortAssociationState of PortID (PTN) 6 • b6 to b15: Not used

A

Offset	Label name	Name	Data type	Applicable range	Description
+60	uAllLoadPortReservationState	AllLoadPortReservationState	Bit String [16-bit]	<ul style="list-style-type: none"> • 0: NOT RESERVED • 1: RESERVED 	<p>Enabled when an error code is '0' or '50'.^{*1}</p> <p>A snapshot of 'LoadPortReservationState' of all load ports for the equipment verification result of a notified CarrierID is notified. (Same as 'Port reservation state' (Un\G24597))</p> <ul style="list-style-type: none"> • b0: LoadPortReservationState of PortID (PTN) 1 • b1: LoadPortReservationState of PortID (PTN) 2 • b2: LoadPortReservationState of PortID (PTN) 3 • b3: LoadPortReservationState of PortID (PTN) 4 • b4: LoadPortReservationState of PortID (PTN) 5 • b5: LoadPortReservationState of PortID (PTN) 6 • b6 to b15: Not used
+61 to 100	u40DeleteCarrierID	DeleteCarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII) ^{*1} ^{*2}	<p>Enabled when an error code is '0' or '50.'</p> <p>CarrierID deleted after the equipment verification of a notified CarrierID is notified.</p> <p>If not deleted, '0x00' is notified.</p>

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

*3 When specifying the number of load ports, which is out of the range of what is set in the equipment specification setting, a value out of the applicable range is not used. ( Page 28 Load port)

For example, when '4' is specified for the number of load ports, the following values are not used:

- b4: PortAssociationState of PortID (PTN) 5
- b5: PortAssociationState of PortID (PTN) 6

*4 When specifying the number of load ports, which is out of the range of what is set in the equipment specification setting, a value out of the applicable range is not used. ( Page 28 Load port)

For example, when '4' is specified for the number of load ports, the following values are not used:

- b4: LoadPortReservationState of PortID (PTN) 5
- b5: LoadPortReservationState of PortID (PTN) 6

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
12	Parameters improperly specified
15	Busy
17	Command not valid for current state
48	Load port does not exist
50	Missing Carrier
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 220 00501: CarrierID read successful notification

00502: CarrierID read fail response

■Information type

10087

■Detail type

00502

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'CarrierID read fail notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(7)
( Page 63 Carrier State Model)
- Additional event: CarrierID Read Fail Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00502

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A notified PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
50	Missing Carrier
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 221 00502: CarrierID read fail notification)

00503: Unknown CarrierID response

■Information type

10087

■Detail type

00503

■Data size of data area (Byte units)

36 byte

■Processing

The processing result of 'Unknown CarrierID notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(10), (11)
( Page 63 Carrier State Model)
- Additional event: UnknownCarrierID Event
( Page 512 Additional events)

■Data

Structure label

- M+GEM300_10087-00503

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	A notified PortID (PTN) is returned.
+1	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+2 to 17	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
17	Command not valid for current state
48	Load port does not exist
50	Missing Carrier
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 222 00503: Unknown CarrierID notification)

00504: Duplicate CarrierID in process response

■Information type

10087

■Detail type

00504

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'Duplicate CarrierID in process notification' is returned.

■Relevant state transition

- Additional event: Duplicate CarrierID In Process Event
( Page 512 Additional events)

Point

For the alarm notification (sending S5F1) when CarrierID is duplicated, use the alarm notification definition (GEM/GEM advanced version) function of SEMI E30(GEM). ( IC Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual)

■Data

Structure label

- M+GEM300_10087-00504

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 223 00504: Duplicate CarrierID in process notification)

A

00601: SlotMap verification ok response

■Information type

10087

■Detail type

00601

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SlotMap verification ok notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(13)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00601

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 224 00601: SlotMap verification ok notification)

00602: SlotMap waiting for host verification response

■Information type

10087

■Detail type

00602

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SlotMap waiting for host verification notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(14)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00602

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 225 00602: SlotMap waiting for host verification notification)

00603: SlotMap verification fail response

■Information type

10087

■Detail type

00603

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SlotMap verification fail notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(14)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00603

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 226 00603: SlotMap verification fail notification)

00604: SlotMap read fail response

■Information type

10087

■Detail type

00604

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SlotMap read fail notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(14)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00604

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 227 00604: SlotMap read fail notification)

00605: SlotMap abnormal substrate position response

■Information type

10087

■Detail type

00605

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SlotMap abnormal substrate position notification' is returned.

■Relevant state transition

- Carrier State Model state transition No.(14)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00605

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A notified CarrierID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 228 00605: SlotMap abnormal substrate position notification)

00901: Bind service notification

■Information type

10087

■Detail type

00901

■Data size of data area (Byte units)

4466 byte

■Processing

The result of an automatic response to the 'Bind' service is notified.

■Relevant state transition

- Carrier State Model state transition No.(1), (2), (12), and (17)
( Page 63 Carrier State Model)
- Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(2)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00901

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	PortID (PTN) requested by the host is notified.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	CarrierID requested by the host is notified.
+41	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.
+42 to 2232	stCarrierObject	CarrierObject	M+GEM300_Carrier Object	 Page 61 M+GEM300_CarrierObject	All attribute values of a created carrier object are notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

None

A

00902: CancelAllCarrierOut service notification

■Information type

10087

■Detail type

00902

■Data size of data area (Byte units)

2 byte

■Processing

The result of an automatic response to the 'CancelAllCarrierOut' service is notified.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10087-00902

Offset	Label name	Name	Data type	Applicable range	Description
+0	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command.• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

None

00903: CancelBind service notification

■Information type

10087

■Detail type

00903

■Data size of data area (Byte units)

84 byte

■Processing

The result of an automatic response to the 'CancelBind' service is notified.

■Relevant state transition

- Carrier State Model state transition No.(21)
( Page 63 Carrier State Model)
- Load Port Reservation State Model state transition No.(3)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))
- Load Port/Carrier Association State Model state transition No.(3)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00903

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	0 to 6	PortID (PTN) requested by the host is notified. When there are no requests, '0' is notified.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)**2	CarrierID requested by the host is notified. When there are no requests, '0x00' is notified.
+41	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

None

A

00904: CancelCarrier service notification

■Information type

10087

■Detail type

00904

■Data size of data area (Byte units)

84 byte

■Processing

The result of an automatic response to the 'CancelCarrier' service is notified.

■Relevant state transition

- Carrier State Model state transition No.(1), (5), (9), (12), (16), (17)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00904

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	CarrierID requested by the host is notified.
+40	uPortID	PortID (PTN)	Word [Unsigned]	0 to 6	PortID (PTN) requested by the host is notified. When there are no requests, '0' is notified.
+41	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">0: Acknowledge, command has been performed.1: Invalid command2: Can not perform now.3: Invalid data or argument.4: Acknowledge, request will be performed with completion signaled later by an event.5: Rejected. Invalid state.6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

None

00905: CancelCarrierAtPort service notification

Information type
10087

Detail type
00905

Data size of data area (Byte units)
4 byte

Processing
The result of an automatic response to the 'CancelCarrierAtPort' service is notified.

Relevant state transition
None

Data
Structure label
• M+GEM300_10087-00905

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	PortID (PTN) requested by the host is notified.
+1	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

Structure labels defined in this product are provided in a sample library.
Page 521 Sample Library

Relevant item
None



00906: CancelCarrierNotification service notification

■Information type

10087

■Detail type

00906

■Data size of data area (Byte units)

82 byte

■Processing

The result of an automatic response to the 'CancelCarrierNotification' service is notified.

■Relevant state transition

- Carrier State Model state transition No.(21)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00906

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	CarrierID requested by the host is notified.
+40	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">0: Acknowledge, command has been performed.1: Invalid command2: Can not perform now.3: Invalid data or argument.4: Acknowledge, request will be performed with completion signaled later by an event.5: Rejected. Invalid state.6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

None

00907: CancelCarrierOut service notification

■Information type

10087

■Detail type

00907

■Data size of data area (Byte units)

82 byte

■Processing

The result of an automatic response to the 'CancelCarrierOut' service is notified.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10087-00907

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	CarrierID requested by the host is notified.
+40	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

None

00908: CancelReservationAtPort service notification

■Information type

10087

■Detail type

00908

■Data size of data area (Byte units)

6 byte

■Processing

The result of an automatic response to the 'CancelReservationAtPort' service is notified.

■Relevant state transition

- Load Port Reservation State Model state transition No.(3)

( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

■Data

M+GEM300_10087-00908

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	PortID (PTN) requested by the host is notified.
+1	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.
+2	uAllLoadPortReservationState	AllLoadPortReservationState	Bit String [16-bit]	<ul style="list-style-type: none">• 0: NOT RESERVED• 1: RESERVED	A snapshot of LoadPortReservationState of all load ports right after the service execution is notified.*1 (Same as 'Port reservation state' (Un\G24597)) <ul style="list-style-type: none">• b0: LoadPortReservationState of PortID (PTN) 1• b1: LoadPortReservationState of PortID (PTN) 2• b2: LoadPortReservationState of PortID (PTN) 3• b3: LoadPortReservationState of PortID (PTN) 4• b4: LoadPortReservationState of PortID (PTN) 5• b5: LoadPortReservationState of PortID (PTN) 6• b6 to b15: Not used

*1 When specifying the number of load ports, which is out of the range of what is set in the equipment specification setting, a value out of the applicable range is not used. ( Page 28 Load port)

For example, when '4' is specified for the number of load ports, the following values are not used:

- b4: LoadPortReservationState of PortID (PTN) 5

- b5: LoadPortReservationState of PortID (PTN) 6

■Relevant item

None

00909: CarrierIn service notification

■Information type

10087

■Detail type

00909

■Data size of data area (Byte units)

82 byte

■Processing

The result of an automatic response to the 'CarrierIn' service is notified.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10087-00909

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	CarrierID requested by the host is notified.
+40	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

None

00910: CarrierNotification service notification

■Information type

10087

■Detail type

00910

■Data size of data area (Byte units)

4464 byte

■Processing

The result of an automatic response to the 'CarrierNotification' service is notified.

■Relevant state transition

- Carrier State Model state transition No.(1), (2), (12), and (17)
( Page 63 Carrier State Model)

■Data

Structure label

- M+GEM300_10087-00910

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	CarrierID requested by the host is notified.
+40	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.
+41 to 2231	stCarrierObject	CarrierObject	M+GEM300_Carrier Object	 Page 61 M+GEM300_CarrierObject	All attribute values of a created carrier object are notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

None

00911: CarrierOut service notification

■Information type

10087

■Detail type

00911

■Data size of data area (Byte units)

84 byte

■Processing

The result of an automatic response to the 'CarrierOut' service is notified.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10087-00911

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	CarrierID requested by the host is notified.
+40	uPortID	PortID (PTN)	Word [Unsigned]	0 to 6	PortID (PTN) requested by the host is notified. When there are no requests, '0' is notified.
+41	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

None

00912: CarrierReCreate service notification

■Information type

10087

■Detail type

00912

■Data size of data area (Byte units)

24948 byte

■Processing

The result of an automatic response to the 'CarrierReCreate' service is notified.

■Relevant state transition

- Carrier State Model state transition No.(3), (4), (21)
( Page 63 Carrier State Model)
- Load Port Transfer State Model state transition No.(7)
( Page 69 Load Port Transfer State Model)

■Data

Structure label

- M+GEM300_10087-00912

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	CarrierID requested by the host is notified.
+40	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	PortID (PTN) the target carrier of which is READY TO UNLOAD is notified.
+41	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.
+42	uAttrCount	Number of attributes	Word [Unsigned]	0 to 256	The number of attributes specified in PropertiesList is notified. ('0' when PropertiesList is not provided)
+43 to 10282	st256AttrIDList	AttrIDList	M+GEM300_AttrID List (0..255)	 M+GEM300_AttrIDList	An attribute name (AttrID) with the changed value is notified.
+10283 to 12473	stCarrierObject	CarrierObject	M+GEM300_Carrier Object	 Page 61 M+GEM300_CarrierObject	When PropertiesList is provided (the number of attributes is 1 or more), all attribute values of created carrier objects are notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

• M+GEM300_AttrIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40AttrID	AttrID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Attribute name (AttrID) with the value changed

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

None

00913: CarrierRelease service notification

■Information type

10087

■Detail type

00913

■Data size of data area (Byte units)

84 byte

■Processing

The result of an automatic response to the 'CarrierRelease' service is notified.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10087-00913

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	0 to 6	PortID (PTN) requested by the host is notified. When there are no requests, '0' is notified.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	0 to 80 characters (ASCII)*1*2	CarrierID requested by the host is notified. When there are no requests, '0x00' is notified.
+41	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

None

00916 : ChangeAccess service notification

■Information type

10087

■Detail type

00916

■Data size of data area (Byte units)

40 byte

■Processing

The result of an automatic response to the 'ChangeAccess' service is notified.

■Relevant state transition

- Access Mode State Model state transition No.(2), (3)
( Page 80 Access Mode State Model)

■Data

Structure label

- M+GEM300_10087-00916

Offset	Label name	Name	Data type	Applicable range	Description
+0	uAccessMode	AccessMode	Word [Unsigned]	<ul style="list-style-type: none"> • 0: MANUAL • 1: AUTO 	AccessMode requested by the host is notified.
+1	uPortIDCount	PortIDCount	Word [Unsigned]	1 to 6	The number of PortID (PTN) whose AccessMode change is requested by the host is notified.
+2	st16PortIDList	PortIDList	M+GEM300_PortID List(0..15)	 M+GEM300_PortIDList	PortID (PTN) whose AccessMode change is requested by the host is notified.
+18	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none"> • 0: Acknowledge, command has been performed. • 1: Invalid command • 2: Can not perform now. • 3: Invalid data or argument. • 4: Acknowledge, request will be performed with completion signaled later by an event. • 5: Rejected. Invalid state. • 6: Command performed with errors. 	A confirmation code of carrier action responses to the host is notified.
+19	uPortAccessMode	PortAccessMode	Bit String [16-bit]	<ul style="list-style-type: none"> • 0: MANUAL • 1: AUTO 	A snapshot of AccessMode of all load ports right after the service execution is notified. ^{*1} (Same as 'Port access mode' (Un\G24576)) <ul style="list-style-type: none"> • b0: AccessMode of PortID (PTN) 1 • b1: AccessMode of PortID (PTN) 2 • b2: AccessMode of PortID (PTN) 3 • b3: AccessMode of PortID (PTN) 4 • b4: AccessMode of PortID (PTN) 5 • b5: AccessMode of PortID (PTN) 6 • b6 to b15: Not used

*1 When specifying the number of load ports, which is out of the range of what is set in the equipment specification setting, a value out of the applicable range is not used. ( Page 28 Load port)

For example, when '4' is specified for the number of load ports, the following values are not used:

- b4: AccessMode of PortID (PTN) 5
- b5: AccessMode of PortID (PTN) 6

- M+GEM300_PortIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID	Word [Unsigned]	1 to 255	PortID (PTN) ^{*2} whose AccessMode change is requested by the host

*2 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

■ **Relevant item**

None

00917: ChangeServiceStatus service notification

■Information type

10087

■Detail type

00917

■Data size of data area (Byte units)

8 byte

■Processing

The result of an automatic response to the 'ChangeServiceStatus' service is notified.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10087-00917

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	PortID (PTN) requested by the host is notified.
+1	uServiceStatus	ServiceStatus	Word [Unsigned]	• 0: OUT OF SERVICE • 1: IN SERVICE	ServiceStatus requested by the host is notified.
+2	uCAACK	CAACK	Word [Unsigned]	• 0: Acknowledge, command has been performed. • 1: Invalid command. • 2: Can not perform now. • 3: Invalid data or argument. • 4: Acknowledge, request will be performed with completion signaled later by an event. • 5: Rejected. Invalid state. • 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.
+3	uAllServiceStatus	AllServiceStatus	Bit String [16-bit]	• 0: OUT OF SERVICE • 1: IN SERVICE	A snapshot of ServiceStatus of all load ports right after the service execution is notified. (Same as 'Service status' (Un\G24593)) ^{*1} • b0: ServiceStatus of PortID (PTN) 1 • b1: ServiceStatus of PortID (PTN) 2 • b2: ServiceStatus of PortID (PTN) 3 • b3: ServiceStatus of PortID (PTN) 4 • b4: ServiceStatus of PortID (PTN) 5 • b5: ServiceStatus of PortID (PTN) 6 • b6 to b15: Not used

^{*1} When specifying the number of load ports, which is out of the range of what is set in the equipment specification setting, a value out of the applicable range is not used. (Page 28 Load port)

For example, when specifying '4' for the number of load ports, the following values are not used.

- b4: ServiceStatus of PortID (PTN) 5

- b5: ServiceStatus of PortID (PTN) 6

Structure labels defined in this product are provided in a sample library.

Page 521 Sample Library

■Relevant item

None

A

00918: ProceedWithCarrier service notification

■Information type

10087

■Detail type

00918

■Data size of data area (Byte units)

4466 byte

■Processing

The result of an automatic response to the 'ProceedWithCarrier' service is notified.

■Relevant state transition

- Carrier State Model state transition No.(1), (4), (8), (12), (15), (17)
( Page 63 Carrier State Model)
- Load Port/Carrier Association State Model state transition No.(2)
( Page 77 Load Port/Carrier Association State Model)

■Data

Structure label

- M+GEM300_10087-00918

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	0 to 6	PortID (PTN) requested by the host is notified. When there are no requests, '0' is notified.
+1 to 40	u40CarrierID	CarrierID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	CarrierID requested by the host is notified.
+41	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command.• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.
+42 to 2232	stCarrierObject	CarrierObject	M+GEM300_Carrier Object	 Page 61 M+GEM300_CarrierObject	All attribute values of target carrier objects are notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

( Page 521 Sample Library)

■Relevant item

None

00919: ReserveAtPort service notification

■Information type

10087

■Detail type

00919

■Data size of data area (Byte units)

6 byte

■Processing

The result of an automatic response to the 'ReserveAtPort' service is notified.

■Relevant state transition

- Load Port Reservation State Model state transition No.(2)
( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))

■Data

Structure label

- M+GEM300_10087-00919

Offset	Label name	Name	Data type	Applicable range	Description
+0	uPortID	PortID (PTN)	Word [Unsigned]	1 to 6	PortID (PTN) requested by the host is notified.
+1	uCAACK	CAACK	Word [Unsigned]	<ul style="list-style-type: none">• 0: Acknowledge, command has been performed.• 1: Invalid command.• 2: Can not perform now.• 3: Invalid data or argument.• 4: Acknowledge, request will be performed with completion signaled later by an event.• 5: Rejected. Invalid state.• 6: Command performed with errors.	A confirmation code of carrier action responses to the host is notified.
+2	uAllLoadPortReservationState	AllLoadPortReservationState	Bit String [16-bit]	<ul style="list-style-type: none">• 0: NOT RESERVED• 1: RESERVED	A snapshot of LoadPortReservationState of all load ports right after the service execution is notified.*1 (Same as 'Port reservation state' (Un\G24597)) <ul style="list-style-type: none">• b0: LoadPortReservationState of PortID (PTN) 1• b1: LoadPortReservationState of PortID (PTN) 2• b2: LoadPortReservationState of PortID (PTN) 3• b3: LoadPortReservationState of PortID (PTN) 4• b4: LoadPortReservationState of PortID (PTN) 5• b5: LoadPortReservationState of PortID (PTN) 6• b6 to b15: Not used

- *1 When specifying the number of load ports, which is out of the range of what is set in the equipment specification setting, a value out of the applicable range is not used. ( Page 28 Load port)
For example, when '4' is specified for the number of load ports, the following values are not used:
- b4: LoadPortReservationState of PortID (PTN) 5
 - b5: LoadPortReservationState of PortID (PTN) 6

■Relevant item

None

A

00094: CPU to CITL

The following shows the format of CPU to CITL.

00001: ControlJobObject create request

■Information type

00094

■Detail type

00001

■Data size of data area (Byte units)

410230 byte

■Processing

Creating a control job object specified in ControlJobObject is requested.
When using the control job queue management function, a control job object created by this request is added to the end of the queue.

■Relevant state transition

None

Point



- Even if a control job object is created by this request, the state transition of Control Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- When this request ends normally, the value of CJM variable 'DVVAL' corresponding to the attribute value of a control job object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

■Data

Structure label

- M+GEM300_00094-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 205114	stControlJobObject	ControlJobObject	M+GEM300_ControlJobObject	 Page 105 M+GEM300_ControlJobObject	Specify the attribute value of a control job object. (ObjID is required.)

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition	Initial value
ObjType* ¹	—	—	—	None	—	"ControlJob"
ObjID* ²	○	—	—	Yes	<ul style="list-style-type: none"> • 12: Omitted (0x00) • 11: ID duplication • 12: Other than ASCII*³ • 17: Creation limit exceeded • 17: Control job queue limit exceeded*⁴ 	—
ProcessingCtrlSpec* 5	○	—	—	Yes	PRJobID: <ul style="list-style-type: none"> • 7: Other than ASCII*³ RuleName: <ul style="list-style-type: none"> • 9: Unknown (Not applicable to user-defined ControlRule*⁶) RuleValue: ■When the data type is ASCII <ul style="list-style-type: none"> • 7: Other than ASCII*³ (except for 0x00) ■When the data type is other than ASCII <ul style="list-style-type: none"> • No error judgment MaterialStatus: <ul style="list-style-type: none"> • 9: Unknown (Not applicable to user-defined OutputRule) OutputRuleValue: ■When the data type is ASCII <ul style="list-style-type: none"> • 7: Other than ASCII*³ (except for 0x00) ■When the data type is other than ASCII <ul style="list-style-type: none"> • No error judgment 	LIST[0]
CarrierInputSpec	○	—	—	Yes	<ul style="list-style-type: none"> • 7: Other than ASCII*³ 	LIST[0]
MtrlOutSpec	○	—	—	Yes	CarrierID: <ul style="list-style-type: none"> • 7: Other than ASCII SlotID: <ul style="list-style-type: none"> • 7: Out of applicable range 	LIST[0]
MtrlOutbyStatus	—	○	—	Yes	MaterialStatus: <ul style="list-style-type: none"> • No error judgment CarrierID: <ul style="list-style-type: none"> • 7: Other than ASCII*³ SlotID: <ul style="list-style-type: none"> • 7: Out of applicable range 	LIST[0]

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition	Initial value
ProcessOrderMgmt	○	—	—	Yes	• 7: Unknown (Not applicable to user-defined ProcessOrderMgmt)	0
StartMethod	○	—	—	Yes	• 7: Out of applicable range	false=UserStart
PauseEvent* ⁷	—	○	—	Yes	• 9: Unknown CEID	LIST[0]
DataCollectionPlan	—	○	—	Yes	• 7: Other than ASCII* ³	(Null character)
State* ¹	—	—	—	None	—	0 = QUEUED
CurrentPRJob* ¹ * ⁸	—	—	—	None	—	LIST[0]
PRJobStatusList* ¹ * ⁸	—	—	—	None	—	LIST[0]

*¹ Not required. (Ignored even if provided.)

*² When an error occurs, no control job objects are created.

*³ Excluding the control characters.

*⁴ When using the control job queue management function

*⁵ "RuleValue" and "OutputRuleValue"

Data type is ASCII: If the number of characters is less than the maximum, characters after the NULL code (0x00) are ignored.

Data type is other than ASCII: Data that exceeds the byte size according to the data type is ignored.

*⁶ Including data types other than ASCII.

*⁷ The enable/disable code (CEED) of CEID is ignored.

*⁸ LIST is created by this product from PRJobID provided in ProcessingCtrlSpec.

PRJobID whose instance does not exist is treated as out of management; therefore, it is not added to LIST.

Point

- For an attribute value specified with an error using 'S14F9: Create Object Request,' its initial value may be notified by 'S14F1: GetAttr Request.' It can be acquired as specified by '00094-00004: ControlJobObject GetAttr request.'

Relevant item

Page 304 00001: ControlJobObject create acknowledge

00002: ControlJobObject delete request

Information type
00094

Detail type
00002

Data size of data area (Byte units)
80 byte

Processing
Deleting a control job object specified in ObjID is requested.
When using the control job queue management function, a deletion target control job object is removed from the queue if it exists.

Relevant state transition
None

Point

- Even if a control job object is deleted by this request, the state transition of Control Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- When this request ends normally, the value of CJM variable 'DVVAL' corresponding to the attribute value of a control job object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

Data
Structure label
• M+GEM300_00094-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Object ID (CtrlJobID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
Page 305 00002: ControlJobObject delete acknowledge

00003: ControlJobObject SetAttr request

■Information type

00094

■Detail type

00003

■Data size of data area (Byte units)

410230 byte

■Processing

Setting all attribute values of a control job object specified in ControlJobObject is requested.

■Relevant state transition

None

Point

- Even if the attribute value of a control job object is changed by this request, the state transition of Control Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- When this request ends normally, the value of CJM variable 'DVVAL' corresponding to the attribute value of a control job object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

■Data

Structure label

- M+GEM300_00094-00003

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 205114	stControlJobObject	ControlJobObject	M+GEM300_ControlJobObject	Page 105 M+GEM300_ControlJobObject	Specify the attribute value of a control job object. (ObjID is required.)

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType* ¹	—	—	—	None	—
ObjID* ²	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
ProcessingCtrlSpec* ³	○	—	—	Yes	PRJobID: • 7: Other than ASCII* ⁴ RuleName: • 9: Unknown (Not applicable to user-defined ControlRule* ⁵) RuleValue: ■When the data type is ASCII • 7: Other than ASCII* ⁴ (except for 0x00) ■When the data type is other than ASCII • No error judgment MaterialStatus: • 9: Unknown (Not applicable to user-defined OutputRule) OutputRuleValue: ■When the data type is ASCII • 7: Other than ASCII* ⁴ (except for 0x00) ■When the data type is other than ASCII • No error judgment
CarrierInputSpec	○	—	—	Yes	• 7: Other than ASCII* ⁴

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
MtrlOutSpec	○	—	—	Yes	CarrierID: • 7: Other than ASCII*4 SlotID: • 7: Out of applicable range
MtrlOutby Status	○	—	—	Yes	MaterialStatus: • No error judgment CarrierID: • 7: Other than ASCII*4 SlotID: • 7: Out of applicable range
ProcessOrderMgmt	○	—	—	Yes	• 7: Unknown (Not applicable to user-defined ProcessOrderMgmt)
StartMethod	○	—	—	Yes	• 7: Out of applicable range
PauseEvent*6	○	—	—	Yes	• 9: Unknown CEID
DataCollectionPlan	○	—	—	Yes	• 7: Other than ASCII*4 • 7: Out of applicable range
State	○	—	—	Yes	• 7: Out of applicable range ■ When the control job queue management function is enabled • 17: Instruction for transition from QUEUED (0) to other than QUEUED (1) to (5) • 17: Instruction for transition from other than QUEUED (1) to (5) to QUEUED (0) • 17: SELECTED state limit exceeded*7 • 17: Processing*8 state limit exceeded*7
CurrentPR Job*1*9	—	—	—	None	—
PRJobStatusList*1*9	—	—	—	None	—

*1 Not required. (Ignored even if provided.)

*2 Cannot be changed.

*3 "RuleValue" and "OutputRuleValue"

Data type is ASCII: If the number of characters is less than the maximum, characters after the NULL code (0x00) are ignored.

Data type is other than ASCII: Data that exceeds the byte size according to the data type is ignored.

*4 Excluding the control characters.

*5 Including data types other than ASCII.

*6 The enable/disable code (CEED) of CEID is ignored.

*7 When using the control job queue management function

*8 Any of the following states: 2 = WAITING FOR START, 3 = EXECUTING, 4 = PAUSED, 5 = COMPLETED

*9 LIST is created by this product from PRJobID provided in ProcessingCtrlSpec.

PRJobID whose instance does not exist is treated as out of management; therefore, it is not added to LIST.

Point

- All attribute values of control job objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.
- For an attribute value specified with an error using 'S14F3: SetAttr Request,' its initial value may be notified by 'S14F1: GetAttr Request.' It can be acquired as specified by '00094-00004: ControlJobObject GetAttr request.'

■ Relevant item

Page 306 00003: ControlJobObject SetAttr acknowledge

A

00004: ControlJobObject GetAttr request

Information type
00094

Detail type
00004

Data size of data area (Byte units)
80 byte

Processing
Acquiring all attribute values of a control job object specified in ObjID is requested.

Relevant state transition
None

Data
Structure label
• M+GEM300_00094-00004

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (CtrlJobID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
 Page 307 00004: ControlJobObject GetAttr acknowledge

00101: ControlJob Selected request

■Information type

00094

■Detail type

00101

■Data size of data area (Byte units)

0 byte

■Processing

Changing the state of a control job object at the head of the control job queue to 'SELECTED' is requested.

■Relevant state transition

- Control Job State Model state transition No.(3)
( Page 112 When using the control job queue management function)

Point

When this request ends normally, the value of CJM variable 'DVVAL' corresponding to the attribute value of a control job object is changed in accordance with the state transition No.(3).

■Data

None

■Relevant item

 Page 308 00101: ControlJob Selected acknowledge

00102: ControlJob Deselect request

■Information type

00094

■Detail type

00102

■Data size of data area (Byte units)

80 byte

■Processing

Swapping a SELECTED state control job specified in CtrlJobID and a control job at the head of the control job queue is requested.

■Relevant state transition

- Control Job State Model state transition No.(4)
( Page 112 When using the control job queue management function)
- Control Job State Model state transition No.(3)
( Page 112 When using the control job queue management function)

Point

- SECS/GEM communication software is not aware of whether 'Resources for the job at the head of the control job queue' are available.
- When this request ends normally, the value of CJM variable 'DVVAL' corresponding to the attribute value of a control job object is changed in accordance with the state transition No.(3). It is not changed for state transition No.(4); therefore, when sending the state transition No.(4) event, execute '00094-00004: ControlJobObject GetAttr request' and '00094-00003: ControlJobObject SetAttr request' together to update DVVAL.

■Data

Structure label

- M+GEM300_00094-00102

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CtrlJobID	CtrlJobID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Specify SELECTED state CtrlJobID.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■Relevant item

 Page 309 00102: ControlJob Deselect acknowledge

00103: ControlJob HOQ request

Information type
00094

Detail type
00103

Data size of data area (Byte units)
80 byte

Processing
Moving a QUEUED state control job object specified in CtrlJobID to the head of the control job queue is requested.

Relevant state transition
None

Data
Structure label
• M+GEM300_00094-00103

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CtrlJobID	CtrlJobID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Specify QUEUED state CtrlJobID.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
 Page 310 00103: ControlJob HOQ acknowledge

10094: CITL to CPU

The following shows the format of CITL to CPU.

00001: ControlJobObject create acknowledge

Information type

10094

Detail type

00001

Data size of data area (Byte units)

114 byte

Processing

The processing result of 'ControlJobObject create request' is returned.

Relevant state transition

None

Data

Structure label

- M+GEM300_10094-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
7	Invalid attribute value
9	Verification error
11	Object identifier in use
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

Relevant item

 Page 294 00001: ControlJobObject create request

00002: ControlJobObject delete acknowledge

■Information type

10094

■Detail type

00002

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'ControlJobObject delete request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10094-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*} 2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

📖 Page 147 Error Code List

■Relevant item

📖 Page 297 00002: ControlJobObject delete request

A

00003: ControlJobObject SetAttr acknowledge

■Information type

10094

■Detail type

00003

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'ControlJobObject SetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10094-00003

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
9	Verification error
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 298 00003: ControlJobObject SetAttr request

00004: ControlJobObject GetAttr acknowledge

■Information type

10094

■Detail type

00004

■Data size of data area (Byte units)

410344 byte

■Processing

The processing result of 'ControlJobObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10094-00004

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 205171	stControlJobObject	ControlJobObject	M+GEM300_ControlJobObject	📖 Page 105 M+GEM300_ControlJobObject	When an error code is '0' (No error), all attribute values of a required control job object are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

📖 Page 147 Error Code List

■Relevant item

📖 Page 300 00004: ControlJobObject GetAttr request

A

00101: ControlJob Selected acknowledge

■Information type

10094

■Detail type

00101

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'ControlJob Selected request' is returned.

■Relevant state transition

- Control Job State Model state transition No.(3)
( Page 112 When using the control job queue management function)

■Data

Structure label

- M+GEM300_10094-00101

Offset	Label name	Name	Data type	Applicable range	Description
+0	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+1 to 16	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+17 to 56	u40SelectedCtrlJobID	CtrlJobID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	When an error code is '0' (No error), CtrlJobID of a control job whose state has transitioned to 'SELECTED' is returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 301 00101: ControlJob Selected request)

00102: ControlJob Deselect acknowledge

■Information type

10094

■Detail type

00102

■Data size of data area (Byte units)

194 byte

■Processing

The processing result of 'ControlJob Deselect request' is returned.

■Relevant state transition

- Control Job State Model state transition No.(3), (4)
( Page 112 When using the control job queue management function)

■Data

Structure label

- M+GEM300_10094-00102

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CtrlJobID	CtrlJobID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required CtrlJobID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 96	u40SelectedCtrlJobID	CtrlJobID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	When an error code is '0' (No error), CtrlJobID of a control job whose state has transitioned to 'SELECTED' is returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
3	Unknown object instance
15	Busy
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

( Page 147 Error Code List)

■Relevant item

( Page 302 00102: ControlJob Deselect request)

00103: ControlJob HOQ acknowledge

■Information type

10094

■Detail type

00103

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'ControlJob HOQ request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10094-00103

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40CtrlJobID	CtrlJobID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required CtrlJobID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

📖 Page 147 Error Code List

■Relevant item

📖 Page 303 00103: ControlJob HOQ request

01001: Create service (ControlJob) notification

Information type

10094

Detail type

01001

Data size of data area (Byte units)

410230 byte

Processing

Creating an instance of a control job object by using the 'Create' service (S14F9) is notified.

Relevant state transition

None



- Even if a control job object is created by using the 'Create' service (S14F9), the state transition of Control Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- Even if the 'Create' service ends normally, the value of CJM variable 'DVVAL' corresponding to the attribute value of a control job object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

Data

Structure label

- M+GEM300_10094-01001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 205114	stControlJobObject	ControlJobObject	M+GEM300_ControlJobObject	Page 105 M+GEM300_ControlJobObject	A created control job object is notified.

Relevant item

None

01002: Delete service (ControlJob) notification

■Information type

10094

■Detail type

01002

■Data size of data area (Byte units)

410230 byte

■Processing

Deleting an instance of a control job object by using the 'Delete' service (S14F11) is notified.

■Relevant state transition

None

Point

- Even if a control job object is deleted by using the 'Delete' service (S14F11), the state transition of Control Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- Even if the 'Delete' service ends normally, the value of CJM variable 'DVVAL' corresponding to the attribute value of a control job object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

■Data

Structure label

- M+GEM300_10094-01002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 205114	stControlJobObject	ControlJobObject	M+GEM300_ControlJobObject	 Page 105 M+GEM300_ControlJobObject	A deleted control job object is notified.

■Relevant item

None

01003: SetAttr service (ControlJob) notification

■Information type

10094

■Detail type

01003

■Data size of data area (Byte units)

512634 byte

■Processing

Changing the attribute value of a control job object by using the 'SetAttr' service (S14F3) is notified.

■Relevant state transition

None

Point

- Even if the attribute value of a control job object is changed by using the 'SetAttr' service (S14F3), the state transition of Control Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- Even if the 'SetAttr' service ends normally, the value of CJM variable 'DVVAL' corresponding to the attribute value of a control job object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing at which the DVVAL value is changed.

■Data

Structure label

- M+GEM300_10094-01003

Offset	Label name	Name	Data type	Applicable range	Description
+0	uObjIDCount	Number of objects	Word [Unsigned]	1 to 1024	The number of substrate objects with changed attribute values is notified.
+1	uAttrCount	Number of attributes	Word [Unsigned]	1 to 256	The number of attributes with changed values is notified.
+2 to 40961	st1024ObjIDList	ObjIDList	M+GEM300_ObjID List (0..1023)	☞ M+GEM300_ObjIDList	ObjID with the changed attribute value is notified.
+40962 to 51201	st256AttrIDList	AttrIDList	M+GEM300_AttrID List (0..255)	☞ M+GEM300_AttrIDList	An attribute name (AttrID) with the changed value is notified.
+51202 to 256316	stControlJobObject	ControlJobObject	M+GEM300_ControlJobObject	☞ Page 105 M+GEM300_ControlJobObject	A changed attribute value is notified. For the value of an attribute not included in AttrIDList, '0x00' is notified.

- M+GEM300_ObjIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	ObjID with the attribute value changed

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

- M+GEM300_AttrIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40AttrID	AttrID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*3*4	Attribute name (AttrID) with the value changed

*3 Excluding the control characters.

*4 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■Relevant item

None

A

00040: CPU to CITL

The following shows the format of CPU to CITL.

00001: ProcessJobObject create request

■Information type

00040

■Detail type

00001

■Data size of data area (Byte units)

260408 byte

■Processing

Creating a process job object specified in ProcessJobObject is requested.

■Relevant state transition

None

Point

- Even if a process job object is created by this request, the state transition of Process Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- When this request ends normally, the value of PJM variable 'DVVAL' corresponding to the attribute value of a process job object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

■Data

Structure label

- M+GEM300_00040-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 130203	stProcessJobObject	ProcessJobObject	M+GEM300_ProcessJobObject	Page 126 M+GEM300_ProcessJobObject	Specify the attribute value of a process job object. ObjID is required.

Error judgment of the attribute value

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition	Initial value
ObjType ^{*1}	—	—	—	None	—	"ProcessJob"
ObjID ^{*2}	○	—	—	Yes	• 12: Omitted (0x00) • 11: ID duplication • 12: Other than ASCII ^{*3} • 17: Creation limit exceeded	—
PRMtiType	○	—	—	None	—	0
PRMtiNameList	○	—	—	Yes	CarrierID: • 7: Other than ASCII ^{*3} SlotID: • 7: Out of applicable range SubstrateID: • 7: Other than ASCII ^{*3}	LIST [0]
RecID	○	—	—	Yes	• 7: Other than ASCII ^{*3}	(Null character)
PRRecipeMethod	○	—	—	None	—	0

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition	Initial value
RecVariableList ^{*4}	—	○	—	Yes	RCPPARNM: • 7: Unknown RCPPARNM (Not applicable to user-defined RecipeVariable ^{*5}) RCPPARVAL: ■ When the data type is ASCII • 7: Other than ASCII ^{*3} (except for 0x00) ■ When the data type is other than ASCII • No error judgment	LIST [0]
PRProcessStart	○	—	—	Yes	• 7: Out of applicable range	false = Manual start
PauseEvent ^{*6*7}	○	—	—	Yes	• 7: Unknown CEID	LIST [0]
PRJobState	—	—	—	Yes	• 7: Out of applicable range	0 = POOLED

*1 Not required. (Ignored even if provided.)

*2 When an error occurs, no process job objects are created.

*3 Excluding the control characters.

*4 "RCPPARVAL"

Data type is ASCII: If the number of characters is less than the maximum, characters after the NULL code (0x00) are ignored.

Data type is other than ASCII: Data that exceeds the byte size according to the data type is ignored.

*5 Including data types other than ASCII.

*6 It is 'Mandatory (Required),' however, LIST [0] is allowed.

*7 The enable/disable code (CEED) of CEID is ignored.



- For an attribute value specified with an error using 'S1611: PRJobCreateEnh' or 'S16F15: PRJobMultiCreate,' its initial value may be notified by 'S14F1: GetAttr Request.' It can be acquired as specified by '00040-00004: ProcessJobObject GetAttr request.'

■ Relevant item

Page 320 00001: ProcessJobObject create acknowledge

00002: ProcessJobObject delete request

■Information type

00040

■Detail type

00002

■Data size of data area (Byte units)

80 byte

■Processing

Deleting a process job object specified in ObjID is requested.

■Relevant state transition

None

Point

- Even if a process job object is deleted by this request, the state transition of Process Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- When this request ends normally, the value of PJM variable 'DVVAL' corresponding to the attribute value of a process job object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

■Data

Structure label

- M+GEM300_00040-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Object ID (PRJobID)

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■Relevant item

 Page 321 00002: ProcessJobObject delete acknowledge

00003: ProcessJobObject SetAttr request

■Information type

00040

■Detail type

00003

■Data size of data area (Byte units)

260408 byte

■Processing

Setting all attribute values of a process job object specified in ProcessJobObject is requested.

■Relevant state transition

None

Point

- Even if the attribute value of a process job object is changed by this request, the state transition of ProcessJob State Model does not occur. Therefore, take action in the control CPU accordingly.
- When this request ends normally, the value of PJM variable 'DVVAL' corresponding to the attribute value of a process job object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

■Data

Structure label

- M+GEM300_00040-00003

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 130203	stProcessJobObject	ProcessJobObject	M+GEM300_ProcessJobObject	Page 126 M+GEM300_ProcessJobObject	Specify the attribute value of a process job object. (ObjID is required.)

Error judgment of the attribute value

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType ^{*1}	—	—	—	None	—
ObjID ^{*2}	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
PRMtlType	○	—	—	None	—
PRMtlNameList	○	—	—	Yes	CarrierID: • 7: Other than ASCII ^{*3} SlotID: • 7: Out of applicable range SubstrateID: • 7: Other than ASCII ^{*3}
RecID	○	—	—	Yes	• 7: Other than ASCII ^{*3}
PRRecipeMethod	○	—	—	None	—
RecipeVariableList ^{*4}	○	—	—	Yes	RCPARM: • 7: Unknown RCPARM (Not applicable to user-defined RecipeVariable ^{*5}) RCPARVAL: ■When the data type is ASCII • 7: Other than ASCII ^{*3} (except for 0x00) ■When the data type is other than ASCII • No error judgment
PRProcessStart	○	—	—	Yes	• 7: Out of applicable range
PauseEvent ^{*6*7}	○	—	—	Yes	• 7: Unknown CEID

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
PRJobState	○	—	—	Yes	• 7: Out of applicable range

*1 Not required. (Ignored even if provided.)

*2 Cannot be changed.

*3 Excluding the control characters.

*4 "RCPPARVAL"

Data type is ASCII: If the number of characters is less than the maximum, characters after the NULL code (0x00) are ignored.

Data type is other than ASCII: Data that exceeds the byte size according to the data type is ignored.

*5 Including data types other than ASCII.

*6 It is 'Mandatory (Required),' however, LIST [0] is allowed.

*7 The enable/disable code (CEED) of CEID is ignored.

Point

- All attribute values of process job objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.
- For an attribute value specified with an error using 'S1611: PRJobCreateEnh' or 'S16F15: PRJobMultiCreate,' its initial value may be notified by 'S14F1: GetAttr Request.' It can be acquired as specified by '00040-00004: ProcessJobObject GetAttr request.'

■Relevant item

Page 322 00003: ProcessJobObject SetAttr acknowledge

00004: ProcessJobObject GetAttr request

Information type
00040

Detail type
00004

Data size of data area (Byte units)
80 byte

Processing
Acquiring all attribute values of a process job object specified in ObjID is requested.

Relevant state transition
None

Data
Structure label
• M+GEM300_00040-00004

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (PRJobID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
Page 323 00004: ProcessJobObject GetAttr acknowledge

10040: CITL to CPU

The following shows the format of CITL to CPU.

00001: ProcessJobObject create acknowledge

Information type

10040

Detail type

00001

Data size of data area (Byte units)

114 byte

Processing

The processing result of 'ProcessJobObject create request' is returned.

Relevant state transition

None

Data

Structure label

- M+GEM300_10040-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
7	Invalid attribute value
11	Object identifier in use
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

Relevant item

 Page 314 00001: ProcessJobObject create request

00002: ProcessJobObject delete acknowledge

■Information type

10040

■Detail type

00002

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'ProcessJobObject delete request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10040-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

📖 Page 147 Error Code List

■Relevant item

📖 Page 316 00002: ProcessJobObject delete request

A

00003: ProcessJobObject SetAttr acknowledge

Information type
10040

Detail type
00003

Data size of data area (Byte units)
114 byte

Processing
The processing result of 'ProcessJobObject SetAttr request' is returned.

Relevant state transition
None

Data
Structure label
• M+GEM300_10040-00003

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:
Page 147 Error Code List

Relevant item
Page 317 00003: ProcessJobObject SetAttr request

00004: ProcessJobObject GetAttr acknowledge

■Information type

10040

■Detail type

00004

■Data size of data area (Byte units)

260522 byte

■Processing

The processing result of 'ProcessJobObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10040-00004

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 130260	stProcessJobObject	ProcessJobObject	M+GEM300_ProcessJobObject	 Page 126 M+GEM300_ProcessJobObject	When an error code is '0' (No error), all attribute values of a required process job object are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 319 00004: ProcessJobObject GetAttr request

A

00901: PRJobCreateEnh service notification

■Information type

10040

■Detail type

00901

■Data size of data area (Byte units)

260408 byte

■Processing

The result of an automatic response to the 'PRJobCreateEnh' service is notified.

■Relevant state transition

None

Point

- Even if a process job object is created by using the 'PRJobCreateEnh' service (S16F11), the state transition of Process Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- Even if the 'PRJobCreateEnh' service ends normally, the value of PJM variable 'DVVAL' corresponding to the attribute value of a process job object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

■Data

Structure label

- M+GEM300_10040-00901

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 130203	stProcessJobObject	ProcessJobObject	M+GEM300_ProcessJobObject	 Page 126 M+GEM300_ProcessJobObject	A created process job object is notified.

■Relevant item

None

00902: PRSetMtrlOrder service notification

Information type
10040

Detail type
00902

Data size of data area (Byte units)
2 byte

Processing
The result of an automatic response to the 'PRSetMtrlOrder' service is notified.

Relevant state transition
None

Data
Structure label
• M+GEM300_10040-00902

Offset	Label name	Name	Data type	Applicable range	Description
0	uPRMtrlOrder	PRMtrlOrder	Word [Unsigned]	• 1 = ARRIVAL • 2 = OPTIMIZE • 3 = LIST	A value of PRMtrlOrder requested by the host is notified.

Relevant item
None

00903: PRJobMultiCreate service notification

■Information type

10040

■Detail type

00903

■Data size of data area (Byte units)

12802 byte

■Processing

The result of an automatic response to the 'PRJobMultiCreate' service is notified.

Point

Only PRJobID of a created process job object is notified.

Acquire attribute values by '00040-00004: ProcessJobObject GetAttr request' as necessary.

■Relevant state transition

None

Point

- Even if a process job object is created by using the 'PRJobMultiCreate' service (S16F15), the state transition of Process Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- Even if the 'PRJobMultiCreate' service ends normally, the value of PJM variable 'DVVAL' corresponding to the attribute value of a process job object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the DVVAL value.

■Data

Structure label

- M+GEM300_10040-00903

Offset	Label name	Name	Data type	Applicable range	Description
0	uObjIDCount	Number of objects	Word [Unsigned]	0 to 160	The number of created process job objects is notified.
+1 to 6400	st160ObjIDList	ObjIDList	M+GEM300_ObjID List (0..159)	 M+GEM300_ObjIDList	PRJobID of a created process job object is notified.

- M+GEM300_ObjIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	PRJobID of a created process job object

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■Relevant item

None

00904: PRJobDequeue service notification

Information type
10040

Detail type
00904

Data size of data area (Byte units)
12802 byte

Processing
The result of an automatic response to the 'PRJobDequeue' service is notified.

Relevant state transition
None

Point

- Even if a process job object is deleted by using the 'PRJobDequeue' service (S16F17), the state transition of Process Job State Model does not occur. Therefore, take action in the control CPU accordingly.
- Even if the 'PRJobDequeue' service ends normally, the value of PJM variable 'DVVAL' corresponding to the attribute value of a process job object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing at which the DVVAL value is changed.

Data

Structure label

- M+GEM300_10040-00904

Offset	Label name	Name	Data type	Applicable range	Description
0	uObjIDCount	Number of objects	Word [Unsigned]	0 to 160	The number of deleted process job objects is notified.
+1 to 6400	st160ObjIDList	ObjIDList	M+GEM300_ObjID List (0..159)	M+GEM300_ObjIDList	PRJobID of a deleted process job object is notified.

- M+GEM300_ObjIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*} 2	PRJobID of a deleted process job object

^{*1} Excluding the control characters.
^{*2} If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
None

00905: PRJobSetRecipeVariable service notification

■Information type

10040

■Detail type

00905

■Data size of data area (Byte units)

432522 byte

■Processing

The result of an automatic response to the 'PRJobSetRecipeVariable' service is notified.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10040-00905

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	PRJobID specified by the host is notified.
+40	uRecVariableCount	Number of recipe variables	Word [Unsigned]	0 to 512	The number of changed recipe variables is notified.
+41 to 86056	st512RecVariableList	RecVariableList	M+GEM300_RecVariableList (0..511)	☞ M+GEM300_RecVariableList	A changed recipe variable is notified.
+86057 to 216260	stProcessJobObject	ProcessJobObject	M+GEM300_ProcessJobObject	☞ Page 126 M+GEM300_ProcessJobObject	A process job object with the changed recipe variable is notified.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

- M+GEM300_RecVariableList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 127	u128RCPPARNM	RCPPARNM	Word [Unsigned] (0..127)	NULL code (00H) ^{*3} , 1 to 256 characters (ASCII) ^{*4*5}	Changed recipe variable name
+128 to 167	u40RCPPARVAL	RCPPARVAL	Word [Unsigned] (0..39)	<ul style="list-style-type: none">• According to the user setting of RecipeVariable. (☞ Page 45 RecipeVariable)• Handled as a binary dump in little-endian format due to the unspecified data type.	Changed recipe variable value

*3 Regarded as the end of the list when the attribute value is '0' or '0x00' (NULL code) only.

*4 Excluding the control characters.

*5 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■Relevant item

None

00906: PRJobSetStartMethod service notification

■Information type

10040

■Detail type

00906

■Data size of data area (Byte units)

12804 byte

■Processing

The result of an automatic response to the 'PRJobSetStartMethod' service is notified.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10040-00906

Offset	Label name	Name	Data type	Applicable range	Description
0	bPRProcessStart	PRProcessStart	Word [Unsigned]	<ul style="list-style-type: none">• 0 = false (Manual start)• 1 to 65535 = true (Automatic start)	A value of PRProcessStart specified by the host is notified.
+1	uObjIDCount	Number of objects	Word [Unsigned]	0 to 160	The number of process job objects with changed PRProcessStart values is notified.
+2 to 6401	st160ObjIDList	ObjIDList	M+GEM300_ObjID List (0..159)	 M+GEM300_ObjIDList	PRJobID of a process job object with changed PRProcessStart value is notified.

• M+GEM300_ObjIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	PRJobID of a process job object with changed PRProcessStart value

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■Relevant item

None

00090: CPU to CITL

The following shows the format of CPU to CITL.

00001: SubstrateObject create request

■Information type

00090

■Detail type

00001

■Data size of data area (Byte units)

4316 byte

■Processing

Creating a substrate object specified in SubstrateObject is requested.

■Relevant state transition

None

Point

- Even if a substrate object is created by this request, the state transition of Substrate Object State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

■Data

Structure label

- M+GEM300_00090-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 2157	stSubstrateObject	SubstrateObject	M+GEM300_SubstrateObject	☞ Page 138 M+GEM300_SubstrateObject	Specify the attribute value of a substrate object. (ObjID is required.)

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition	Initial value
ObjType* ¹	—	—	—	None	—	"Substrate"
ObjID* ²	○	—	—	Yes	• 12: Omitted (0x00) • 11: ID duplication • 12: Other than ASCII* ³ • 17: Creation limit exceeded	—
SubstState	—	○	—	Yes	7: Out of applicable range	0: AT SOURCE
SubstProcState	—	○	—	Yes	7: Out of applicable range	0: NEEDS PROCESSING
SubstLocID* ⁴	—	—	○	Yes	• 7: Other than ASCII* ³ (except for 0x00) • Refer to 'Other error judgment.'	(Null character)

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition	Initial value
SubstSource	—	○	—	Yes	7: Other than ASCII* ³ (except for 0x00)	(Null character)
SubstDestination	—	○	—	Yes	7: Other than ASCII* ³ (except for 0x00)	(Null character)
SubstHistory	—	○	—	Yes* ⁵	7: Other than ASCII* ³ (except for 0x00)	LIST[0]
BatchLocID* ⁶	—	—	○	Yes	<ul style="list-style-type: none"> 7: Other than ASCII*³ (except for 0x00) Refer to 'Other error judgment.' 	(Null character)
SubstPosInBatch* ⁶	—	—	○	Yes	<ul style="list-style-type: none"> 7: Other than ASCII*³ (except for 0x00) Refer to 'Other error judgment.' 	(Null character)
SubstIDStatus	—	—	—	Yes	7: Out of applicable range	0: NOT CONFIRMED
AcquiredID	—	—	—	Yes	7: Other than ASCII* ³ (except for 0x00)	(Null character)
LotID	—	○	—	Yes	7: Other than ASCII* ³ (except for 0x00)	(Null character)
MaterialStatus	—	○	—	None	—	0
SubstType	—	○	—	Yes	7: Unknown (Not applicable to user-defined SubstType)	0: WAFER
SubstUsage	—	○	—	Yes	7: Unknown (Not applicable to user-defined SubstUsage)	0: PRODUCT

*1 Not required. (Ignored even if provided.)

*2 When an error occurs, no substrate objects are created.

*3 Excluding the control characters.

*4 Required when instantiating a substrate object on the substrate location.

*5 Only errors for SubstrateLocation are determined, not for TimeIn and TimeOut.

*6 Required when instantiating a substrate object on the batch location.

• Other error judgment

The following table shows the combinations of 'Conditional' attributes (SubstLocID, BatchLocID, SubstPosInBatch).

When the judgment result for the combination is 'NG,' a substrate object is not created.

○: Provided, —: Not provided

SubstLocID	BatchLocID	SubstPosInBatch	Judgment result	Error code
○	—	—	OK	—
○	○	○	NG	12
○	○	—	NG	12
○	—	○	NG	12
—	○	○	OK	—
—	○	—	OK* ⁷	—* ⁷
—	—	○	NG	13
—	—	—	NG	13

*7 Supported only by SECS/GEM communication software with software version 1.43V or later.

■ Relevant item

📄 Page 344 00001: SubstrateObject create acknowledge

00002: SubstrateObject delete request

Information type
00090

Detail type
00002

Data size of data area (Byte units)
80 byte

Processing
Deleting a substrate object specified in ObjID is requested.

Relevant state transition
None

Point

- Even if a substrate object is deleted by this request, the state transition of Substrate Object State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

Data
Structure label

- M+GEM300_00090-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)**1*2	Object ID (SubstID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
Page 345 00002: SubstrateObject delete acknowledge

00003: SubstrateObject SetAttr request

■Information type

00090

■Detail type

00003

■Data size of data area (Byte units)

4316 byte

■Processing

Setting all attribute values of a substrate object specified in SubstrateObject is requested.

■Relevant state transition

None

Point

- Even if the attribute value of a substrate object is changed by this request, the state transition of Substrate Object State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate object is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

■Data

Structure label

- M+GEM300_00090-00003

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 2157	stSubstrateObject	SubstrateObject	M+GEM300_SubstrateObject	Page 138 M+GEM300_SubstrateObject	Specify all attribute values of a substrate object to be set.

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType ^{*1}	—	—	—	None	—
ObjID ^{*2}	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
SubstState	○	—	—	Yes	7: Out of applicable range
SubstProcState	○	—	—	Yes	7: Out of applicable range
SubstLocID	○	—	—	Yes	• 7: Other than ASCII ^{*3} (except for 0x00) • Refer to 'Other error judgment.'
SubstSource	○	—	—	Yes	7: Other than ASCII ^{*3} (except for 0x00)
SubstDestination	○	—	—	Yes	7: Other than ASCII ^{*3} (except for 0x00)
SubstHistory	○	—	—	Yes ^{*4}	7: Other than ASCII ^{*3} (except for 0x00)
BatchLocID	○	—	—	Yes	• 7: Other than ASCII ^{*3} (except for 0x00) • Refer to 'Other error judgment.'

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
SubstPosInBatch	○	—	—	Yes	<ul style="list-style-type: none"> • 7: Other than ASCII^{*3} (except for 0x00) • Refer to 'Other error judgment.'
SubstIDStatus	○	—	—	Yes	7: Out of applicable range
AcquiredID	○	—	—	Yes	7: Other than ASCII ^{*3} (except for 0x00)
LotID	○	—	—	Yes	7: Other than ASCII ^{*3} (except for 0x00)
MaterialStatus	○	—	—	None	—
SubstType	○	—	—	Yes ^{*5}	• 7: Unknown (Not applicable to user-defined SubstType)
SubstUsage	○	—	—	Yes ^{*5}	• 7: Unknown (Not applicable to user-defined SubstUsage)

*1 Cannot be changed. (Ignored even if provided.)

*2 Cannot be changed.

*3 Excluding the control characters.

*4 Only errors for SubstrateLocation are determined, not for Timeln and TimeOut.

*5 Supported only by SECS/GEM communication software with software version 1.43V or later.

• Other error judgment

The following table shows the combinations of 'Conditional' attributes (SubstLocID, BatchLocID, SubstPosInBatch).

When the judgment result for the combination is 'NG,' a substrate object is not created.

○: Provided, —: Not provided

SubstLocID	BatchLocID	SubstPosInBatch	Judgment result	Error code
○	—	—	OK	—
○	○	○	NG	12
○	○	—	NG	12
○	—	○	NG	12
—	○	○	OK	—
—	○	—	NG	13
—	—	○	NG	13
—	—	—	NG	13

A

Point

All attribute values of location objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.

Relevant item

Page 346 00003: SubstrateObject SetAttr acknowledge

00004: SubstrateObject GetAttr request

Information type
00090

Detail type
00004

Data size of data area (Byte units)
80 byte

Processing
Acquiring all attribute values of a substrate object specified in ObjID is requested.

Relevant state transition
None

Data
Structure label
• M+GEM300_00090-00004

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (SubstID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
 Page 347 00004: SubstrateObject GetAttr acknowledge

00011: CarrierSubstLocObject create request

■Information type

00090

■Detail type

00011

■Data size of data area (Byte units)

244 byte

■Processing

Creating a substrate location object in a carrier specified in SubstLocObject is requested.

■Relevant state transition

None

Point

- Even if a substrate location object in a carrier is created by this request, the state transition of Dynamic Behavior Model of Substrate Location does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate location object in a carrier is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

■Data

Structure label

- M+GEM300_00090-00011

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 122	stSubstLocObject	SubstLocObject	M+GEM300_SubstLocObject	☞ Page 140 M+GEM300_SubstLocObject	Specify the attribute value of a substrate location object in a carrier. (ObjID is required.)

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition	Initial value
ObjType ^{*1}	—	—	—	None	—	"SubstLoc"
ObjID ^{*2}	○	—	—	Yes	• 12: Omitted (0x00) • 11: ID duplication • 12: Other than ASCII ^{*3} • 17: Creation limit exceeded	—
SubstID	—	○	—	Yes	7: Other than ASCII ^{*3} (except for 0x00)	(Null character)
SubstLocState	—	○	—	Yes	7: Out of applicable range	0: UNOCCUPIED
DisableEvents	—	○	—	Yes	7: Out of applicable range	0: false (event enabled: event reported)

*1 Not required. (Ignored even if provided.)

*2 When an error occurs, no substrate location objects are created.

*3 Excluding the control characters.

■Relevant item

☞ Page 348 00011 : CarrierSubstLocObject create acknowledge

00012: CarrierSubstLocObject delete request

■Information type

00090

■Detail type

00012

■Data size of data area (Byte units)

80 byte

■Processing

Deleting a substrate location object in a carrier specified in ObjID is requested.

■Relevant state transition

None

Point

- Even if a substrate location object in a carrier is deleted by this request, the state transition of Dynamic Behavior Model of Substrate Location does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate location object in a carrier is changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

■Data

Structure label

- M+GEM300_00090-00012

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)**2	Object ID (SubstLocID)

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■Relevant item

 Page 349 00012: CarrierSubstLocObject delete acknowledge

00013: SubstLocObject SetAttr request

■Information type

00090

■Detail type

00013

■Data size of data area (Byte units)

244 byte

■Processing

Setting all attribute values of a substrate location object specific to equipment or in a carrier specified in SubstLocObject is requested.

■Relevant state transition

None

Point

- Even if the attribute value of a substrate location object specific to equipment or one in a carrier is changed by this request, the state transition of Dynamic Behavior Model of Substrate Location does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the values of STS variables 'DVVAL' and 'SV' corresponding to the attribute values of substrate location objects specific to equipment, or the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate location object in a carrier are changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable values.

■Data

Structure label

- M+GEM300_00090-00013

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 122	stSubstLocObject	SubstLocObject	M+GEM300_SubstLocObject	 Page 140 M+GEM300_SubstLocObject	Specify all attribute values of a substrate location object specific to equipment or in a carrier to be set.

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType ^{*1}	—	—	—	None	—
ObjID ^{*2}	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
SubstID	○	—	—	Yes	7: Other than ASCII ^{*3} (except for 0x00)
SubstLocState	○	—	—	Yes	7: Out of applicable range
DisableEvents	○	—	—	Yes	7: Out of applicable range

*1 Cannot be changed. (Ignored even if provided.)

*2 Cannot be changed.

*3 Excluding the control characters.

Point

All attribute values of location objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.

A

■ Relevant item

📄 Page 350 00013: SubstLocObject SetAttr acknowledge

00014: SubstLocObject GetAttr request

Information type
00090

Detail type
00014

Data size of data area (Byte units)
80 byte

Processing
Acquiring all attribute values of a substrate location object specific to equipment or in a carrier specified in ObjID is requested.

Relevant state transition
None

Data
Structure label
• M+GEM300_00090-00014

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (SubstLocID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
Page 351 00014: SubstLocObject GetAttr acknowledge

00023: BatchLocObject SetAttr request

■Information type

00090

■Detail type

00023

■Data size of data area (Byte units)

82084 byte

■Processing

Setting all attribute values of a batch location object specified in BatchLocObject is requested.

■Relevant state transition

None

Point

- Even if the attribute value of a batch location object is changed by this request, the state transition of Dynamic Behavior Model of Batch Location does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When this request ends normally, the values of STS variables 'DVVAL' and 'SV' corresponding to the attribute values of batch location objects are changed accordingly. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable values.

■Data

Structure label

- M+GEM300_00090-00023

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 41041	stBatchLocObject	BatchLocObject	M+GEM300_BatchLocObject	 Page 141 M+GEM300_BatchLocObject	Specify all attribute values of a batch location object to be set.

- Error judgment of the attribute value

○: Applicable, —: Not applicable

Attribute name	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Error judgment presence	Error code and error judgment condition
ObjType* ¹	—	—	—	None	—
ObjID* ²	○	—	—	Yes	• 12: Omitted (0x00) • 3: Unknown
BatchSubstIDMap* ³	○	—	—	Yes	7: Other than ASCII* ⁴ (except for 0x00)
BatchLocState	○	—	—	Yes	7: Out of applicable range
DisableEvents	○	—	—	Yes	7: Out of applicable range

*1 Cannot be changed. (Ignored even if provided.)

*2 Cannot be changed.

*3 Substrate ID, the number of which exceeds the number of batch configuration substrates of batch location objects with matching ObjID, is ignored.

*4 Excluding the control characters.

Point

All attribute values of batch location objects with matching ObjID are overwritten. Therefore, attribute values cannot be partially set. However, an attribute value with an error is not overwritten.

■Relevant item

 Page 352 00023: BatchLocObject SetAttr acknowledge

00024: BatchLocObject GetAttr request

Information type
00090

Detail type
00024

Data size of data area (Byte units)
80 byte

Processing
Acquiring all attribute values of a batch location object specified in ObjID is requested.

Relevant state transition
None

Data
Structure label
• M+GEM300_00090-00024

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Object ID (BatchLocID)

*1 Excluding the control characters.
*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Relevant item
Page 353 00024: BatchLocObject GetAttr acknowledge

10090: CITL to CPU

The following shows the format of CITL to CPU.

00001: SubstrateObject create acknowledge

■Information type

10090

■Detail type

00001

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SubstrateObject create request' is returned.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10090-00001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
7	Invalid attribute value
11	Object identifier in use
12	Parameters improperly specified
13	Insufficient parameters specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 330 00001: SubstrateObject create request

00002: SubstrateObject delete acknowledge

■Information type

10090

■Detail type

00002

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SubstrateObject delete request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10090-00002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 333 00002: SubstrateObject delete request

00003: SubstrateObject SetAttr acknowledge

■Information type

10090

■Detail type

00003

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SubstrateObject SetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10090-00003

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
12	Parameters improperly specified
13	Insufficient parameters specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 334 00003: SubstrateObject SetAttr request

00004: SubstrateObject GetAttr acknowledge

■Information type

10090

■Detail type

00004

■Data size of data area (Byte units)

4430 byte

■Processing

The processing result of 'SubstrateObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10090-00004

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 2214	stSubstrateObject	SubstrateObject	M+GEM300_SubstrateObject	Page 138 M+GEM300_SubstrateObject	When an error code is '0', all attribute values of a required substrate object are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

Page 147 Error Code List

■Relevant item

Page 336 00004: SubstrateObject GetAttr request

00011 : CarrierSubstLocObject create acknowledge

■Information type

10090

■Detail type

00011

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'CarrierSubstLocObject create request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10090-00011

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
7	Invalid attribute value
11	Object identifier in use
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 337 00011: CarrierSubstLocObject create request

00012: CarrierSubstLocObject delete acknowledge

■Information type

10090

■Detail type

00012

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'CarrierSubstLocObject delete request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10090-00012

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 338 00012: CarrierSubstLocObject delete request

00013: SubstLocObject SetAttr acknowledge

■Information type

10090

■Detail type

00013

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'SubstLocObject SetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10090-00013

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 339 00013: SubstLocObject SetAttr request

00014: SubstLocObject GetAttr acknowledge

■Information type

10090

■Detail type

00014

■Data size of data area (Byte units)

358 byte

■Processing

The processing result of 'SubstLocObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

- M+GEM300_10090-00014

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 178	stSubstLocObject	SubstLocObject	M+GEM300_SubstLocObject	☞ Page 140 M+GEM300_SubstLocObject	When an error code is '0', all attribute values of a requested substrate location object specific to equipment or in a carrier are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

☞ Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

☞ Page 147 Error Code List

■Relevant item

☞ Page 341 00014: SubstLocObject GetAttr request

A

00023: BatchLocObject SetAttr acknowledge

■Information type

10090

■Detail type

00023

■Data size of data area (Byte units)

114 byte

■Processing

The processing result of 'BatchLocObject SetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10090-00023

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
7	Invalid attribute value
12	Parameters improperly specified
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 342 00023: BatchLocObject SetAttr request

00024: BatchLocObject GetAttr acknowledge

■Information type

10090

■Detail type

00024

■Data size of data area (Byte units)

82198 byte

■Processing

The processing result of 'SubstLocObject GetAttr request' is returned.

■Relevant state transition

None

■Data

Structure label

• M+GEM300_10090-00024

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	A required ObjID is returned.
+40	uErrorCodeCount	Number of error codes	Word [Unsigned]	0 to 16	The number of codes for errors occurred is notified.
+41 to 56	u16ErrorCode	Error code array	Word [Unsigned] (0..15)	0 to 65535	The code for an error occurred is notified. If there are multiple error codes, they are notified in ascending order.
+57 to 41098	stBatchLocObject	BatchLocObject	M+GEM300_BatchLocObject	 Page 141 M+GEM300_BatchLocObject	When an error code is '0', all attribute values of a requested batch location object are returned.

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

Error code

Error code	Error name
0	No error
3	Unknown object instance
17	Command not valid for current state
32770	Action failed due to errors

For details on the error codes, refer to the following:

 Page 147 Error Code List

■Relevant item

 Page 343 00024: BatchLocObject GetAttr request

01001: Create service (Register substrate service) notification

Information type
10090

Detail type
01001

Data size of data area (Byte units)
4316 byte

Processing
Creating an instance of a substrate object by using the 'Register substrate' service (S14F9) is notified.

Relevant state transition
None

Point

- Even if a substrate object is created by using the 'Register substrate' service (S14F9), the state transition of Substrate Object State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- Even if the 'Register substrate' service ends normally, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

Data

Structure label

- M+GEM300_10090-01001

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 2157	stSubstrateObject	SubstrateObject	M+GEM300_SubstrateObject	Page 138 M+GEM300_SubstrateObject	A created substrate object is notified.

Structure labels defined in this product are provided in a sample library.
Page 521 Sample Library

Relevant item
None

01002: Delete service (Remove substrate service) notification

Information type
10090

Detail type
01002

Data size of data area (Byte units)
4316 byte

Processing
Deleting an instance of a substrate object by using the 'Remove substrate' service (S14F11) is notified.

Relevant state transition
None

Point

- Even if a substrate object is deleted by using the 'Remove substrate' service (S14F11), the state transition of Substrate Object State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- Even if the 'Remove substrate' service ends normally, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

Data
Structure label

- M+GEM300_10090-01002

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 2157	stSubstrateObject	SubstrateObject	M+GEM300_SubstrateObject	Page 138 M+GEM300_SubstrateObject	A deleted substrate object is notified.

Structure labels defined in this product are provided in a sample library.
Page 521 Sample Library

Relevant item
None

01003: SetAttr service (Substrate) notification

■Information type

10090

■Detail type

01003

■Data size of data area (Byte units)

106720 byte

■Processing

Changing the attribute value of a substrate object by using the 'SetAttr' service (S14F3) is notified.

■Relevant state transition

None

Point

- Even if the attribute value of a substrate object is changed by using the 'SetAttr' service (S14F3), the state transition of Substrate Object State Model does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- Even if the 'SetAttr' service ends normally, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

■Data

Structure label

- M+GEM300_10090-01003

Offset	Label name	Name	Data type	Applicable range	Description
+0	uObjIDCount	Number of objects	Word [Unsigned]	1 to 1024	The number of substrate objects with changed attribute values is notified.
+1	uAttrCount	Number of attributes	Word [Unsigned]	1 to 256	The number of attributes with changed values is notified.
+2 to 40961	st1024ObjIDList	ObjIDList	M+GEM300_ObjID List (0..1023)	☞ M+GEM300_ObjIDList	ObjID with the changed attribute value is notified.
+40962 to 51201	st256AttrIDList	AttrIDList	M+GEM300_AttrID List (0..255)	☞ M+GEM300_AttrIDList	An attribute name (AttrID) with the changed value is notified.
+51202 to 53359	stSubstrateObject	SubstrateObject	M+GEM300_SubstrateObject	☞ Page 138 M+GEM300_SubstrateObject	A changed attribute value is notified. For the value of an attribute not included in AttrIDList, '0x00' is notified.

- M+GEM300_ObjIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	ObjID (SubstID) with the attribute value changed

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

- M+GEM300_AttrIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40AttrID	AttrID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Attribute name (AttrID) with the value changed

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■ **Relevant item**

None

A

01013: SetAttr service (SubstLoc) notification

■Information type

10090

■Detail type

01013

■Data size of data area (Byte units)

102648 byte

■Processing

Changing the attribute value of a substrate location object specific to equipment or one in a carrier by using the 'SetAttr' service (S14F3) is notified.

■Relevant state transition

None

Point

- Even if the attribute value of a substrate location object specific to equipment or one in a carrier is changed by using the 'SetAttr' service (S14F3), the state transition of Dynamic Behavior Model of Substrate Location does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When the 'SetAttr' service ends normally, the value of STS variable 'SV' corresponding to the attribute value of a substrate location object specific to equipment is changed accordingly. However, the value of STS variable 'DVVAL' corresponding to the attribute value of a substrate location object in a carrier is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

■Data

Structure label

- M+GEM300_10090-01013

Offset	Label name	Name	Data type	Applicable range	Description
+0	uObjIDCount	Number of objects	Word [Unsigned]	1 to 1024	The number of substrate location objects specific to equipment or ones in a carrier with changed attribute values is notified.
+1	uAttrCount	Number of attributes	Word [Unsigned]	1 to 32	The number of attributes with changed values is notified.
+2 to 40961	st1024ObjIDList	ObjIDList	M+GEM300_ObjIDList (0..1023)	☞ M+GEM300_ObjIDList	ObjID with the changed attribute value is notified.
+40962 to 51201	st256AttrIDList	AttrIDList	M+GEM300_AttrIDList (0..255)	☞ M+GEM300_AttrIDList	An attribute name (AttrID) with the changed value is notified.
+51202 to 51323	stSubstLocObject	SubstLocObject	M+GEM300_SubstLocObject	☞ Page 140 M+GEM300_SubstLocObject	A changed attribute value is notified. For the value of an attribute not included in AttrIDList, '0x00' is notified.

- M+GEM300_ObjIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)**2	ObjID (SubstLocID) with the attribute value changed

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

- M+GEM300_AttrIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40AttrID	AttrID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII) ^{*1*2}	Attribute name (AttrID) with the value changed

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■Relevant item

None

01023: SetAttr service (BatchLoc) notification

■Information type

10090

■Detail type

01023

■Data size of data area (Byte units)

184488 byte

■Processing

Changing the attribute value of a batch location object by using the 'SetAttr' service (S14F3) is notified.

■Relevant state transition

None

Point

- Even if the attribute value of a batch location object is changed by using the 'SetAttr' service (S14F3), the state transition of Dynamic Behavior Model of Batch Location does not occur. Therefore, the state model can be managed by the control CPU. In this case, take action in the control CPU accordingly.
- When the 'SetAttr' service ends normally, the value of STS variable 'SV' corresponding to the attribute value of a batch location object is changed accordingly. However, the value of STS variable 'DVVAL' corresponding to the attribute value of a batch location object is not changed. When taking action and sending the event report (S6F11) in the control CPU, pay attention to the timing to change the STS variable value.

■Data

Structure label

- M+GEM300_10090-01023

Offset	Label name	Name	Data type	Applicable range	Description
+0	uObjIDCount	Number of objects	Word [Unsigned]	1 to 1024	The number of batch location objects with changed attribute values is notified.
+1	uAttrCount	Number of attributes	Word [Unsigned]	1 to 32	The number of attributes with changed values is notified.
+2 to 40961	st1024ObjIDList	ObjIDList	M+GEM300_ObjIDList (0..1023)	☞ M+GEM300_ObjIDList	ObjID with the changed attribute value is notified.
+40962 to 51201	st256AttrIDList	AttrIDList	M+GEM300_AttrIDList (0..255)	☞ M+GEM300_AttrIDList	An attribute name (AttrID) with the changed value is notified.
+51202 to 92243	stBatchLocObject	BatchLocObject	M+GEM300_BatchLocObject	☞ Page 141 M+GEM300_BatchLocObject	A changed attribute value is notified. For the value of an attribute not included in AttrIDList, '0x00' is notified.

- M+GEM300_ObjIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40ObjID	ObjID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	ObjID (SubstLocID) with the attribute value changed

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

- M+GEM300_AttrIDList

Offset	Label name	Name	Data type	Applicable range	Description
+0 to 39	u40AttrID	AttrID	Word [Unsigned] (0..39)	1 to 80 characters (ASCII)*1*2	Attribute name (AttrID) with the value changed

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Structure labels defined in this product are provided in a sample library.

 Page 521 Sample Library

■ **Relevant item**

None

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Appendix 3 Buffer Memory

This section shows the buffer memory list and its detailed information.

Buffer memory list

The following table shows the buffer memory list.

R: Read-only, W: Write-only

Address decimal (hexadecimal)	Application	Name	Initial value	R/W
16384 (4000H)	CA-SECS status	CA-SECS status information	0	R
16385 (4001H)		CA-SECS error-detected information	0	R
16386 to 20431 (4002H to 4FCFH)	System area	—	—	—
20432 (4FD0H)	CPU to CITL I/F error- detected information	Latest CPU to CITL I/F error-detected information	0	R
20433 (4FD1H)		Information type at latest error detection	0	R
20434 (4FD2H)		Detail type at latest error detection	0	R
20435 to 20436 (4FD3H to 4FD4H)		Data size at latest error detection	0	R
20437 to 20447 (4FD5H to 4FDFH)	System area	—	—	—
20448 (4FE0H)	CITL to CPU I/F	Write status flag	0	R
20449 (4FE1H)		Read status flag	0	W
20450 (4FE2H)		Information type	0	R
20451 (4FE3H)		Detail type	0	R
20452 to 20453 (4FE4H to 4FE5H)		Start address of data area	1572864 (180000H)	R
20454 to 20455 (4FE6H to 4FE7H)		Data size of data area	0	R
20456 to 20463 (4FE8H to 4FEFH)	System area	—	—	—
20464 (4FF0H)	CPU to CITL I/F	Write status flag	0	W
20465 (4FF1H)		Read status flag	0	R
20466 (4FF2H)		Information type	0	W
20467 (4FF3H)		Detail type	0	W
20468 to 20469 (4FF4H to 4FF5H)		Start address of data area	1835008 (1C0000H)	R
20470 to 20471 (4FF6H to 4FF7H)		Data size of data area	0	W
20472 to 24575 (4FF8H to 5FFFH)	System area	—	—	—

Address decimal (hexadecimal)	Application	Name	Initial value	R/W
24576 (6000H)	Load port status	Port access mode	0	R
24577 to 24592 (6001H to 6010H)		Port transfer state	0	R
24593 (6011H)		Service status	0	R
24594 (6012H)		In service status	0	R
24595 (6013H)		Transfer ready status	0	R
24596 (6014H)		Port association state	0	R
24597 (6015H)		Port reservation state	0	R
24598 (6016H)	Carrier	Carrier object count	0	R
24599 (6017H)	Carrier ID reader status* ¹	Carrier ID reader status	0	R
24600 to 24831 (6018H to 60FFH)	System area	—	—	—
24832 to 24871 (6100H to 6127H)	Load port/carrier association status* ¹	CarrierID associated with PortID (PTN) 1	0	R
24872 to 24911 (6128H to 614FH)		CarrierID associated with PortID (PTN) 2	0	R
24912 to 24951 (6150H to 6177H)		CarrierID associated with PortID (PTN) 3	0	R
24952 to 24991 (6178H to 619FH)		CarrierID associated with PortID (PTN) 4	0	R
24992 to 25031 (61A0H to 61C7H)		CarrierID associated with PortID (PTN) 5	0	R
25032 to 25071 (61C8H to 61EFH)		CarrierID associated with PortID (PTN) 6	0	R
25072 to 28671 (61F0H to 6FFFH)	System area	—	—	—
28672 (7000H)	Control job object* ²	Control job object count	0	R
28673 (7001H)	Control job queue* ²	QueueAvailableSpace	0	R
28674 to 29873 (7002H to 74B1H)		QueuedCJobs	0	R
29874 to 32721 (74B2H to 7801H)	System area	—	—	—
30722 (7802H)	Control job queue* ^{2,3}	QUEUED state control job count	0	R
30723 (7803H)		SELECTED state control job count	0	R
30724 (7804H)		Processing* ⁴ state control job count	0	R
30725 to 32767 (7805H to 7FFFH)	System area	—	—	—
32768 (8000H)	Process job object* ²	Process job object count	0	R
32769 to 36863 (8001H to 8FFFH)	System area	—	—	—
36864 (9000H)	Substrate object* ¹	Substrate object count	0	R
36865 (9001H)	Substrate location object* ¹	Carrier substrate location object count	0	R
36866 to 1572863 (9002H to 17FFFFH)	System area	—	—	—

Address decimal (hexadecimal)	Application	Name	Initial value	R/W
1572864 to 1835007 (180000H to 1BFFFFH)	CITL to CPU I/F	Data reading area	0	R
1835008 to 2097151 (1C0000H to 1FFFFFH)	CPU to CITL I/F	Data writing area	0	W

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

*2 Supported only by SECS/GEM communication software with software version 1.43V or later.

*3 When the control job queue management function is enabled

*4 Any of the following states: 2 = WAITING FOR START, 3 = EXECUTING, 4 = PAUSED, 5 = COMPLETED

Buffer memory details

The following shows the details of buffer memories.

CA-SECS status

■CA-SECS status (Un\G16384)

Name	Address	Bit	Description
CA-SECS status	Un\G16384	0 to 15	The CA-SECS status is stored. <ul style="list-style-type: none">• b0: CIM control READY (0: NOT READY, 1: READY)• b1: HSMS line communication status (0: Disconnected, 1: Connected)• b2: HSMS reconnection retry (0: Retried, 1: Retrying)• b3: GEM communication establishment status (0: Not established, 1: Establishing)• b4: GEM online status (0: Offline, 1: Online)• b5: GEM300 status (0: Invalid, 1: Valid)• b6: Transaction queue full for PLC Transmission (0: Queue is not full, 1: Queue is full)• b7: Queue full of control CPU interfaces for CPU to CITL (0: Queue is not full, 1: Queue is full)• b8: Queue full of control CPU interfaces for CITL to CPU (0: Queue is not full, 1: Queue is full)• b9 to b15: System area

■CA-SECS error-detected information (Un\G16385)

Name	Address	Bit	Description
CA-SECS status	Un\G16385	0 to 15	CA-SECS error-detected information is stored. <ul style="list-style-type: none">• b0: System area• b1: SD memory card file access error detection (0: Normal, 1: Error detected)• b2 to b15: System area

CPU to CITL I/F error-detected information

■Latest CPU to CITL I/F error-detected information (Un\G20432)

Name	Address	Bit	Description
Latest CPU to CITL I/F error-detected information	Un\G20432	0 to 15	The latest error-detected information of CPU to CITL I/F is stored. <ul style="list-style-type: none">• b0: Information type error detection (0: Normal, 1: Error detected)• b1: Detail type error detection (0: Normal, 1: Error detected)• b2: Data size error detection (0: Normal, 1: Error detected)• b3 to b15: System area

■Information type at latest error detection (Un\G20433)

Name	Address	Bit	Description
Information type at latest error detection	Un\G20433	0 to 15	The information type at the latest error detection is stored. For details on the information type, refer to the following:  Page 151 Control CPU Interface Formats

■Detail type at latest error detection (Un\G20434)

Name	Address	Bit	Description
Detail type at latest error detection	Un\G20434	0 to 15	The detail type at the latest error detection is stored. For details on the detail type, refer to the following:  Page 151 Control CPU Interface Formats

■Data size at latest error detection (Un\G20435 to 20436)

Name	Address	Bit	Description
Data size at latest error detection	Un\G20435 to 20436	0 to 31	The data size at the latest error detection is stored in byte units. <ul style="list-style-type: none">• Data size: 0 to 4294967295 (0H to FFFFFFFFH)

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CITL to CPU I/F

■Write status flag (Un\G20448)

Name	Address	Bit	Description
Write status flag	Un\G20448	0 to 15	A write status flag is stored. <ul style="list-style-type: none">• b0: In-use flag (0: Not used, 1: In use)• b1: Write completion flag (0: Writing, 1: Writing completed)• b2 to b15: System area

Point

When 'Write completion flag' (b1) turns ON, the timer monitoring for a control CPU interface starts. The write status flag clears (3→0 control) when a timeout occurs.

Due to timeout, missing data may occur. ( Page 33 CPU interface)

■Read status flag (Un\G20449)

Name	Address	Bit	Description
Read status flag	Un\G20449	0 to 15	Store a read status flag. <ul style="list-style-type: none">• b0: In-use flag (0: Not used, 1: In use)• b1: Read completion flag (0: Reading, 1: Reading completed)• b2 to b15: System area

Point

Read the data from 'Data reading area' (Un\G1572864 to 1835007) within the time set for "CPU Interface Timer" and turn ON 'Read completion flag' (b1).

Due to timeout, missing data may occur. ( Page 33 CPU interface)

■Information type (Un\G20450)

Name	Address	Bit	Description
Information type	Un\G20450	0 to 15	An information type is stored. For details on the information type, refer to the following:  Page 151 Control CPU Interface Formats

■Detail type (Un\G20451)

Name	Address	Bit	Description
Detail type	Un\G20451	0 to 15	A detail type is stored. For details on the detail type, refer to the following:  Page 151 Control CPU Interface Formats

■Start address of data area (Un\G20452 to 20453)

Name	Address	Bit	Description
Start address of data area	Un\G20452 to 20453	0 to 31	The start address of the data area is stored. Start address: Fixed to 1572864 (180000H)

■Data size of data area (Un\G20454 to 20455)

Name	Address	Bit	Description
Data size of data area	Un\G20454 to 20455	0 to 31	The data size of the data area is stored in byte units. Data size: 0 to 262144 (0H to 40000H) (maximum 256 KB)

CPU to CITL I/F

■Write status flag (Un\G20464)

Name	Address	Bit	Description
Write status flag	Un\G20464	0 to 15	Store a write status flag. <ul style="list-style-type: none">• b0: In-use flag (0: Not used, 1: In use)• b1: Write completion flag (0: Writing, 1: Writing completed)• b2 to b15: System area

■Read status flag (Un\G20465)

Name	Address	Bit	Description
Read status flag	Un\G20465	0 to 15	A read status flag is stored. <ul style="list-style-type: none">• b0: In-use flag (0: Not used, 1: In use)• b1: Read completion flag (0: Reading, 1: Reading completed)• b2 to b15: System area

■Information type (Un\G20466)

Name	Address	Bit	Description
Information type	Un\G20466	0 to 15	Store an information type. For details on the information type, refer to the following:  Page 151 Control CPU Interface Formats

■Detail type (Un\G20467)

Name	Address	Bit	Description
Detail type	Un\G20467	0 to 15	Store a detail type. For details on the detail type, refer to the following:  Page 151 Control CPU Interface Formats

■Start address of data area (Un\G20468 to 20469)

Name	Address	Bit	Description
Start address of data area	Un\G20468 to 20469	0 to 31	The start address of the data area is stored. Start address: Fixed to 1835008 (1C0000H)

■Data size of data area (Un\G20470 to 20471)

Name	Address	Bit	Description
Data size of data area	Un\G20470 to 20471	0 to 31	Store the data size of the data area in byte units. Data size: 0 to 262144 (0H to 40000H) (maximum 256 KB)

Load port status

■Port access mode (Un\G24576)

Name	Address	Bit	Description
Port access mode	Un\G24576	0 to 15	<p>The access mode of a load port is stored.</p> <ul style="list-style-type: none"> • b0: AccessMode of PortID (PTN) 1 (0: MANUAL, 1: AUTO) • b1: AccessMode of PortID (PTN) 2 (0: MANUAL, 1: AUTO) • b2: AccessMode of PortID (PTN) 3 (0: MANUAL, 1: AUTO) • b3: AccessMode of PortID (PTN) 4 (0: MANUAL, 1: AUTO) • b4: AccessMode of PortID (PTN) 5 (0: MANUAL, 1: AUTO) • b5: AccessMode of PortID (PTN) 6 (0: MANUAL, 1: AUTO) • b6 to b15: System area

■Port transfer state (Un\G24577 to 24592)

Name	Address	Bit	Description
PortTransferState of PortID (PTN) 1	Un\G24577	0 to 15	<p>The transfer status of a load port is stored.</p> <ul style="list-style-type: none"> • 0: OUT OF SERVICE • 1: TRANSFER BLOCKED • 2: READY TO LOAD • 3: READY TO UNLOAD
PortTransferState of PortID (PTN) 2	Un\G24578	0 to 15	
PortTransferState of PortID (PTN) 3	Un\G24579	0 to 15	
PortTransferState of PortID (PTN) 4	Un\G24580	0 to 15	
PortTransferState of PortID (PTN) 5	Un\G24581	0 to 15	
PortTransferState of PortID (PTN) 6	Un\G24582	0 to 15	
System area	Un\G24583 to 24592	—	

■Service status (Un\G24593)

Name	Address	Bit	Description
Service status	Un\G24593	0 to 15	<p>The service status of a load port is stored.</p> <ul style="list-style-type: none"> • b0: ServiceStatus of PortID (PTN) 1 (0: OUT OF SERVICE, 1: IN SERVICE) • b1: ServiceStatus of PortID (PTN) 2 (0: OUT OF SERVICE, 1: IN SERVICE) • b2: ServiceStatus of PortID (PTN) 3 (0: OUT OF SERVICE, 1: IN SERVICE) • b3: ServiceStatus of PortID (PTN) 4 (0: OUT OF SERVICE, 1: IN SERVICE) • b4: ServiceStatus of PortID (PTN) 5 (0: OUT OF SERVICE, 1: IN SERVICE) • b5: ServiceStatus of PortID (PTN) 6 (0: OUT OF SERVICE, 1: IN SERVICE) • b6 to b15: System area

■In service status (Un\G24594)

Name	Address	Bit	Description
In service status	Un\G24594	0 to 15	<p>The lower state of IN SERVICE is stored.</p> <ul style="list-style-type: none"> • b0: InServiceStatus of PortID (PTN) 1 (0: TRANSFER READY, 1: TRANSFER BLOCKED) • b1: InServiceStatus of PortID (PTN) 2 (0: TRANSFER READY, 1: TRANSFER BLOCKED) • b2: InServiceStatus of PortID (PTN) 3 (0: TRANSFER READY, 1: TRANSFER BLOCKED) • b3: InServiceStatus of PortID (PTN) 4 (0: TRANSFER READY, 1: TRANSFER BLOCKED) • b4: InServiceStatus of PortID (PTN) 5 (0: TRANSFER READY, 1: TRANSFER BLOCKED) • b5: InServiceStatus of PortID (PTN) 6 (0: TRANSFER READY, 1: TRANSFER BLOCKED) • b6 to b15: System area

■Transfer ready status (Un\G24595)

Name	Address	Bit	Description
Transfer ready status	Un\G24595	0 to 15	<p>The lower state of TRANSFER READY is stored.</p> <ul style="list-style-type: none"> • b0: TransferReadyStatus of PortID (PTN) 1 (0: READY TO LOAD, 1: READY TO UNLOAD) • b1: TransferReadyStatus of PortID (PTN) 2 (0: READY TO LOAD, 1: READY TO UNLOAD) • b2: TransferReadyStatus of PortID (PTN) 3 (0: READY TO LOAD, 1: READY TO UNLOAD) • b3: TransferReadyStatus of PortID (PTN) 4 (0: READY TO LOAD, 1: READY TO UNLOAD) • b4: TransferReadyStatus of PortID (PTN) 5 (0: READY TO LOAD, 1: READY TO UNLOAD) • b5: TransferReadyStatus of PortID (PTN) 6 (0: READY TO LOAD, 1: READY TO UNLOAD) • b6 to b15: System area

■Port association state (Un\G24596)

Name	Address	Bit	Description
Port association state	Un\G24596	0 to 15	<p>The port association status is stored.</p> <ul style="list-style-type: none"> • b0: PortAssociationState of PortID (PTN) 1 (0: NOT ASSOCIATED, 1: ASSOCIATED) • b1: PortAssociationState of PortID (PTN) 2 (0: NOT ASSOCIATED, 1: ASSOCIATED) • b2: PortAssociationState of PortID (PTN) 3 (0: NOT ASSOCIATED, 1: ASSOCIATED) • b3: PortAssociationState of PortID (PTN) 4 (0: NOT ASSOCIATED, 1: ASSOCIATED) • b4: PortAssociationState of PortID (PTN) 5 (0: NOT ASSOCIATED, 1: ASSOCIATED) • b5: PortAssociationState of PortID (PTN) 6 (0: NOT ASSOCIATED, 1: ASSOCIATED) • b6 to b15: System area

■Port reservation state (Un\G24597)

Name	Address	Bit	Description
Port reservation state	Un\G24597	0 to 15	<p>The port reservation status is stored.</p> <ul style="list-style-type: none"> • b0: LoadPortReservationState of PortID (PTN) 1 (0: NOT RESERVED, 1: RESERVED) • b1: LoadPortReservationState of PortID (PTN) 2 (0: NOT RESERVED, 1: RESERVED) • b2: LoadPortReservationState of PortID (PTN) 3 (0: NOT RESERVED, 1: RESERVED) • b3: LoadPortReservationState of PortID (PTN) 4 (0: NOT RESERVED, 1: RESERVED) • b4: LoadPortReservationState of PortID (PTN) 5 (0: NOT RESERVED, 1: RESERVED) • b5: LoadPortReservationState of PortID (PTN) 6 (0: NOT RESERVED, 1: RESERVED) • b6 to b15: System area

Carrier

■Carrier object count (Un\G24598)

Name	Address	Bit	Description
Carrier object count	Un\G24598	0 to 15	<p>The number of carrier objects is stored.</p> <ul style="list-style-type: none"> • Number of objects: 0 to 6

Carrier ID reader status

■Carrier ID reader status (Un\G24599)

Name	Address	Bit	Description
Carrier ID reader status	Un\G24599	0 to 15	The availability of an ID reader is stored. <ul style="list-style-type: none">• b0: Carrier ID reader status of PortID (PTN) 1 (0: UNAVAILABLE, 1: AVAILABLE)• b1: Carrier ID reader status of PortID (PTN) 2 (0: UNAVAILABLE, 1: AVAILABLE)• b2: Carrier ID reader status of PortID (PTN) 3 (0: UNAVAILABLE, 1: AVAILABLE)• b3: Carrier ID reader status of PortID (PTN) 4 (0: UNAVAILABLE, 1: AVAILABLE)• b4: Carrier ID reader status of PortID (PTN) 5 (0: UNAVAILABLE, 1: AVAILABLE)• b5: Carrier ID reader status of PortID (PTN) 6 (0: UNAVAILABLE, 1: AVAILABLE)• b6 to b15: System area

Load port/carrier association status

■CarrierID associated with PortID (PTN) 1 (Un\G24832 to 24871)

Name	Address	Bit	Description
CarrierID associated with PortID (PTN) 1	Un\G24832 to 24871	0 to 15	CarrierID associated with PortID (PTN) 1 is stored. CarrierID: 0 to 80 characters (ASCII)*1*2

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■CarrierID associated with PortID (PTN) 2 (Un\G24872 to 24911)

Name	Address	Bit	Description
CarrierID associated with PortID (PTN) 2	Un\G24872 to 24911	0 to 15	CarrierID associated with PortID (PTN) 2 is stored. CarrierID: 0 to 80 characters (ASCII)*1*2

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■CarrierID associated with PortID (PTN) 3 (Un\G24912 to 24951)

Name	Address	Bit	Description
CarrierID associated with PortID (PTN) 3	Un\G24912 to 24951	0 to 15	CarrierID associated with PortID (PTN) 3 is stored. CarrierID: 0 to 80 characters (ASCII)*1*2

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■CarrierID associated with PortID (PTN) 4 (Un\G24952 to 24991)

Name	Address	Bit	Description
CarrierID associated with PortID (PTN) 4	Un\G24952 to 24991	0 to 15	CarrierID associated with PortID (PTN) 4 is stored. CarrierID: 0 to 80 characters (ASCII)*1*2

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■CarrierID associated with PortID (PTN) 5 (Un\G24992 to 25031)

Name	Address	Bit	Description
CarrierID associated with PortID (PTN) 5	Un\G24992 to 25031	0 to 15	CarrierID associated with PortID (PTN) 5 is stored. CarrierID: 0 to 80 characters (ASCII)*1*2

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

■CarrierID associated with PortID (PTN) 6 (Un\G25032 to 25071)

Name	Address	Bit	Description
CarrierID associated with PortID (PTN) 6	Un\G25032 to 25071	0 to 15	CarrierID associated with PortID (PTN) 6 is stored. CarrierID: 0 to 80 characters (ASCII)*1*2

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).

Control job object

■Control job object count (Un\G28672)

Name	Address	Bit	Description
Control job object count	Un\G28672	0 to 15	The number of control job objects is stored. Number of control job objects: 0 to 32

Control job queue

■QueueAvailableSpace (Un\G28673)

Name	Address	Bit	Description
QueueAvailableSpace	Un\G28673	0 to 15	When using the control job queue management function, the number of control jobs that can be accepted by the control job queue is stored. Number of control job queues: 0 to 30

A



When not using the control job queue management function, GEM variables must be user-defined and controlled via the ladder, additionally.

■QueuedCJobs (Un\G28674 to 29873)

Name	Address	Bit	Description
CtrlJobID at the head of the control job queue	Un\G28674 to 28713	0 to 15	When using the control job queue management function, the CtrlJobID list in the control job queue is stored. CtrlJobID: ASCII[0..80]*1*2
(...)			
CtrlJobID at the 30th position of the control job queue	Un\G29834 to 29873	0 to 15	

*1 Excluding the control characters.

*2 If the number of characters is less than the maximum, ensure that a character string ends with the NULL code (00H).



When not using the control job queue management function, GEM variables must be user-defined and controlled via the ladder, additionally.

■QUEUED state control job count (Un\G30722)

Name	Address	Bit	Description
QUEUED state control job count	Un\G30722	0 to 15	When using the control job queue management function, the number of QUEUED state control jobs is stored. Number of control jobs: 0 to 30

■SELECTED state control job count (Un\G30723)

Name	Address	Bit	Description
SELECTED state control job count	Un\G30723	0 to 15	When using the control job queue management function, the number of SELECTED state control jobs is stored.* ¹ Number of control jobs: 0 to 15

*1 When the control job queue management function is enabled

■Processing state control job count (Un\G30724)

Name	Address	Bit	Description
Processing state control job count	Un\G30724	0 to 15	When using the control job queue management function, the number of processing* ¹ state control jobs is stored.* ² Number of control jobs: 0 to 15

*1 Any of the following states: 2 = WAITING FOR START, 3 = EXECUTING, 4 = PAUSED, 5 = COMPLETED

*2 When the control job queue management function is enabled

Process job object

■Process job object count (Un\G32768)

Name	Address	Bit	Description
Process job object count	Un\G32768	0 to 15	The number of process job objects is stored. Number of process job objects: 0 to 160

Substrate object

■Substrate object count (Un\G36864)

Name	Address	Bit	Description
Substrate object count	Un\G36864	0 to 15	The number of substrate objects is stored. Number of substrate objects: 0 to 1024

Substrate location object

■Carrier substrate location object count (Un\G36865)

Name	Address	Bit	Description
Carrier substrate location object count	Un\G36865	0 to 15	The number of substrate location objects in a carrier is stored. Number of substrate objects: 0 to 800

CITL to CPU I/F

■Data reading area (Un\G1572864 to 1835007)

Name	Address	Bit	Description
Data reading area	Un\G1572864 to 1835007	0 to 31	Data is stored in the data structure of the control CPU interface format. ( Page 151 Control CPU Interface Formats)

CPU to CITL I/F

■Data writing area (Un\G1835008 to 2097151)

Name	Address	Bit	Description
Data writing area	Un\G1835008 to 2097151	0 to 31	Store data in the data structure of the control CPU interface format. ( Page 151 Control CPU Interface Formats)

Appendix 4 Service Messages

This section shows the lists and details of service messages.

All primary messages in the service message lists have secondary messages.

OSS service message list

Service name	Target primary message	Name	Description
GetAttr ^{*1}	S14F1	GetAttr Request ( Page 433 S14F1: GetAttr Request)	Acquiring an attribute value specified by the specified object is requested. ^{*2}
SetAttr ^{*1}	S14F3	SetAttr Request ( Page 438 S14F3: SetAttr Request)	Setting an attribute value specified by the specified object is requested.
GetType ^{*1}	S14F5	GetType Request ( Page 446 S14F5: GetType Request)	Acquiring the ObjType list is requested.
GetAttrName ^{*1}	S14F7	GetAttrName Request ( Page 448 S14F7: GetAttrName Request)	Acquiring the attribute name list of the specified object is requested. ^{*3}
Create ^{*1}	S14F9	Create Object Request ( Page 451 S14F9 : Create Object Request)	Creating the specified object and setting the specified attribute value is requested.
Delete ^{*1}	S14F11	Delete Object Request ( Page 466 S14F11: Delete Object Request)	Deleting the specified object is requested.

^{*1} Supported only by SECS/GEM communication software with software version 1.40S or later.

^{*2} SECS/GEM communication software does not support AttrFilter.

^{*3} SECS/GEM communication software does not support wild card characters (* and ?).

CMS service message list

Service name	Target primary message	Name	Description
Bind	S3F17	Carrier Action Request ( Page 380 S3F17: Bind)	Reserving a load port and associating CarrierID with the load port is requested. This is enabled only when PortTransferState of the target load port is '2: READY TO LOAD.'
CancelAllCarrierOut ^{*1}	S3F19	Cancel All Carrier Out Request ( Page 422 S3F19: CancelAllCarrierOut)	Deleting all queues for the 'CarrierOut' service is requested. ^{*3}
CancelBind	S3F17	Carrier Action Request ( Page 384 S3F17: CancelBind)	Canceling the reservation of a load port and canceling the association of CarrierID with the load port is requested. This is enabled only when PortTransferState of the target load port is '2: READY TO LOAD.'
CancelCarrier ^{*1}	S3F17	Carrier Action Request ( Page 387 S3F17: CancelCarrier)	Canceling the operation of the specified carrier and enabling unloading is requested.
CancelCarrierAtPort ^{*1}	S3F17	Carrier Action Request ( Page 393 S3F17: CancelCarrierAtPort)	Canceling the operation of a carrier on the specified load port and enabling unloading is requested.
CancelCarrierNotification ^{*1}	S3F17	Carrier Action Request ( Page 395 S3F17: CancelCarrierNotification)	Canceling the 'CarrierNotification' service is requested.
CancelCarrierOut ^{*1}	S3F17	Carrier Action Request ( Page 397 S3F17: CancelCarrierOut)	Deleting a specific 'CarrierOut' service from the queue for the 'CarrierOut' service is requested. ^{*3}
CancelReservationAtPort ^{*2}	S3F25	Port Action Request ( Page 427 S3F25: CancelReservationAtPort)	Canceling the reservation of the specified load port is requested. • PORTACTION: "CancelReservationAtPort"
CarrierIn ^{*1}	S3F17	Carrier Action Request ( Page 398 S3F17: CarrierIn)	Moving a carrier moved from the internal buffer to a load port by using the 'CarrierOut' service back to the internal buffer is requested.
CarrierNotification ^{*1}	S3F17	Carrier Action Request ( Page 400 S3F17: CarrierNotification)	Registering a carrier load schedule in advance without reserving a load port is requested.
CarrierOut ^{*1}	S3F17	Carrier Action Request ( Page 403 S3F17: CarrierOut)	Moving a carrier from the internal buffer to a load port is requested. ^{*3}
CarrierReCreate ^{*1}	S3F17	Carrier Action Request ( Page 407 S3F17: CarrierReCreate)	Reinstantiating a carrier is requested.
CarrierRelease ^{*1}	S3F17	Carrier Action Request ( Page 403 S3F17: CarrierOut)	Releasing a carrier from the hold state is requested.
ChangeAccess ^{*2}	S3F27	Change Access ( Page 430 S3F27: Change Access)	Changing the access mode of the specified load port is requested.
ChangeServiceStatus	S3F25	Port Action Request ( Page 424 S3F25: Port Action Request)	Switching the service status of the specified load port is requested. • PORTACTION: "ChangeServiceStatus"
ProceedWithCarrier ^{*1}	S3F17	Carrier Action Request ( Page 411 S3F17: ProceedWithCarrier)	Advancing the specified carrier to the next state is requested.
ReserveAtPort ^{*2}	S3F25	Port Action Request ( Page 426 S3F25: ReserveAtPort)	Reserving the specified load port is requested. • PORTACTION: "ReserveAtPort"

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

*2 Supported only by SECS/GEM communication software with software version 1.43V or later.

*3 SECS/GEM communication software does not queue the 'CarrierOut' service.

CJM service message list

Service name	Target primary message	Name	Description
Create Object	S14F9	Create Object Request ( Page 454 Control job object)	Creating the specified object and setting the specified attribute value are requested.
Delete Object	S14F11	Delete Object Request ( Page 466 S14F11: Delete Object Request)	Deleting the specified object is requested.
CJStart ^{*1}	S16F27	Control Job Command Request ( Page 499 S16F27: Control Job Command Request)	CTLJOBCMD = 1: CJStart Starting the control job is requested. This is enabled only for the 'WAITING FOR START' state control job.
CJPause ^{*1}	S16F27		CTLJOBCMD = 2: CJPause Transitioning the control job state from 'EXECUTING' to 'PAUSED' is requested. This is enabled only for the 'EXECUTING' state control job.
CJResume ^{*1}	S16F27		CTLJOBCMD = 3: CJResume Transitioning the control job state from 'PAUSED' to 'EXECUTING' is requested. This is enabled only for the 'PAUSED' state control job.
CJCancel ^{*1}	S16F27		CTLJOBCMD = 4: CJCancel Removing the control job from the queue is requested. This is enabled only for the 'QUEUED' state control job. By setting CPNAME to "Action," '0' (SAVEJOBS) or '1' (REMOVEJOBS) can be specified for CPVAL.
CJDeselect ^{*1}	S16F27		CTLJOBCMD = 5: CJDeselect Swapping the SELECTED state control job and a job at the head of the queue is requested. This is enabled only for the 'SELECTED' state control job.
CJStop ^{*1}	S16F27		CTLJOBCMD = 6: CJStop Stopping the control job is requested. This is enabled only for the 'ACTIVE' or 'QUEUED' state control job. By setting CPNAME to "Action," '0' (SAVEJOBS) or '1' (REMOVEJOBS) can be specified for CPVAL.
CJAbort ^{*1}	S16F27		CTLJOBCMD = 7: CJAbort Aborting the control job is requested. This is enabled only for the 'ACTIVE' or 'QUEUED' state control job. By setting CPNAME to "Action," '0' (SAVEJOBS) or '1' (REMOVEJOBS) can be specified for CPVAL.
CJHOQ ^{*1}	S16F27		CTLJOBCMD = 8: CJHOQ Moving the specified control job to the head of the queue is requested. This is enabled only for the 'QUEUED' state control job.

^{*1} Transaction must be user-defined and controlled via the ladder.

PJM service message list

Service name	Target primary message	Name	Description
PRJobCreateEnh	S16F11	PRJobCreateEnh ( Page 477 S16F11: PRJobCreateEnh)	Creating the process job is requested. Unique process job ID is assigned by the host.
PRJobCommand ^{*1}	S16F5	Process Job Command Request ( Page 469 S16F5: Process Job Command Request)	The command that affects process jobs is requested. Command example: "START," "STOP," "PAUSE," "RESUME," "ABORT," "CANCEL"
PRSetMtrlOrder	S16F29	PRSetMtrlOrder ( Page 506 S16F29: PRSetMtrlOrder)	Changing the material processing order is requested.
PRJobMultiCreate	S16F15	PRJobMultiCreate ( Page 481 S16F15: PRJobMultiCreate)	Creating multiple process jobs is requested. Unique process job IDs are assigned by the host.
PRJobDequeue	S16F17	PRJobDequeue ( Page 487 S16F17: PRJobDequeue)	Deleting the unprocessed process job is requested.
PRGetAllJobs	S16F19	PRGetAllJobs ( Page 490 S16F19: PRGetAllJobs)	Acquiring the identifiers and states of all uncompleted process jobs is requested.
PRGetSpace	S16F21	PRGetSpace ( Page 492 S16F21: PRGetSpace)	Acquiring the number of process jobs that can be created is requested.
PRJobSetRecipeVariable	S16F23	PRJobSetRecipeVariable ( Page 494 S16F23: PRJobSetRecipeVariable)	Updating the recipe variable value is requested.
PRJobSetStartMethod	S16F25	PRJobSetStartMethod ( Page 496 S16F25: PRJobSetStartMethod)	Changing the process job start method is requested.
PRJobAlert	E30 style: S6F11	—	An event message sent by SECS/GEM communication software to notify the host of 'Milestone report'
PRJobEvent	E30 style: S6F11	—	An event message sent by SECS/GEM communication software to notify the host of 'Process job-related collection event'

*1 Transaction must be user-defined and controlled via the ladder.

STS service message list

Service name	Target primary message	Name	Description
register substrate ^{*1}	S14F9	Create Object Request ( Page 451 Substrate object (register substrate))	Creating the specified object and setting the specified attribute value is requested.
remove substrate ^{*1}	S14F11	Delete Object Request ( Page 466 S14F11: Delete Object Request)	Deleting the specified object is requested.

^{*1} Supported only by SECS/GEM communication software with software version 1.40S or later.

Stream 3 Material Status details

The following shows the details on the service messages.

S3F17: Carrier Action Request

Message format

S3F17

- 1. L[5]
 - 1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
 - 2. A[1..80] // CARRIERACTION
 - 3. A[0..80] // CarrierID (ObjID)
 - 4. U1[0..1] // PortID (PTN)
 - 5. L[0..256] // PropertiesList
 - 1. L[2]
 - 1. A[1..80] // AttrID
 - 2. any // AttrData
- :

Processing during automatic response

Refer to each carrier action.



Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	A supported carrier action ^{*1}	Yes	12: Unknown
CarrierID (ObjID)	—	○	Refer to each carrier action.		
PortID (PTN)	—	○	Refer to each carrier action.		
PropertiesList	—	○	Refer to each carrier action.		

^{*1} Note that characters are case-sensitive.

A

■S3F17: Bind

Message format

S3F17

1. L[5]
 1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
 2. A[4] // CARRIERACTION "Bind"
 3. A[1..80] // CarrierID (ObjID)
 4. U1[1] // PortID (PTN)
 5. L[0..256] // PropertiesList
 1. L[2]
 1. A[1..80] // AttrID
 2. any // AttrData
- ⋮

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'Bind' service but also for all S3F17 services.

For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters and attributes are determined.

Refer to 'Parameters' and 'Attribute setting' for this carrier action.

2. When all of the following conditions are satisfied, a carrier object is created.

- The maximum number of carrier objects that can be created has not been reached.
- PortID and CarrierID are provided.
- A carrier can be loaded to the specified load port.
- There is no error in parameters and attributes.

3. The following relevant state transitions are performed.

Refer to 'State transition examples' for this carrier action.

- Carrier State Model state transition No.(1), (2), (12), and (17)
- Load Port Reservation State Model state transition No.(2)
- Load Port/Carrier Association State Model state transition No.(2)

4. 'S3F18: Carrier Action Acknowledge' is sent to the host.

5. When CAACK is '0', '10087-00901: Bind service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"Bind"	Yes	12: Unknown
CarrierID (ObjID)	○	—	—	Yes	<ul style="list-style-type: none"> • 13: Omitted (zero length) • 11: ID duplication • 12: Invalid value • 17: Creation limit exceeded
PortID (PTN)	○	—	—	Yes	<ul style="list-style-type: none"> • 13: Omitted (zero length) • 48: Out of applicable range Refer to 'Other error judgment' and 'Combinations of load port statuses.'

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PropertiesList	—	○	An attribute of a carrier object to be set for the created instance. Can be omitted (zero length).	Yes (if provided)	• 4: Attribute name unknown Refer to 'Attribute setting.'

Attribute setting

○: Applicable, —: Not applicable

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
ObjType	—	—	—	Not required. Ignored even if provided.	None	—	"Carrier"
ObjID	—	—	—	Not required. Ignored even if provided.	None	—	—
Capacity	—	○	—	—	Yes	7: Out of applicable range	25
SubstrateCount	—	○	—	Values within the range of 'Capacity' are valid.	Yes	7: Out of applicable range	0
ContentMap	—	○	—	The same number as 'Capacity' is valid.	Yes	7: Out of applicable range	LIST [Capacity]
SlotMap	—	○	—	The same number as 'Capacity' is valid.	Yes	7: Out of applicable range	LIST [Capacity]
Usage	—	○	—	—	Yes	7: Other than ASCII*1	(Null character)
CarrierIDStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: ID NOT READ
CarrierAccessingStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: NOT ACCESSED
SlotMapStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: SLOT MAP NOT READ
LocationID	—	—	—	Not required. Ignored even if provided.	None	—	(Null character)
Reason	—	—	—	Not required. Ignored even if provided.	None	—	0: VERIFICATION NEEDED

*1 Excluding the control characters.

For the attributes of a carrier object, refer to the following:

 Page 59 Carrier Objects



No attributes are required to be provided by the 'Bind' service.

Other error judgment

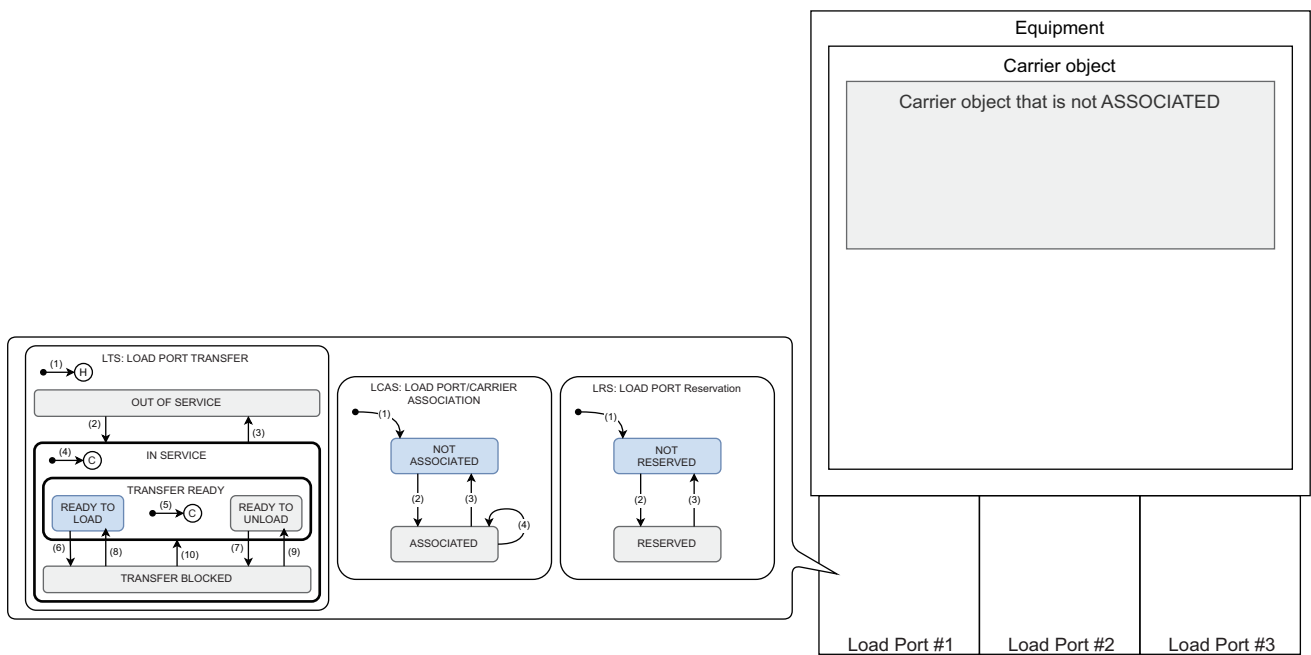
Combinations of load port statuses

Load Port Transfer StateModel	Load Port/Carrier Association State Model	Load Port Reservation StateModel	Judgment result	Error code
0: OUT OF SERVICE	Not concerned	Not concerned	NG	17
1: TRANSFER BLOCKED	Not concerned	Not concerned	NG	49
2: READY TO LOAD	0: NOT ASSOCIATED	0: NOT RESERVE	OK	—
		1: RESERVED	NG	49
	1: ASSOCIATED	0: NOT RESERVE	NG	49
		1: RESERVED	NG	49
3: READY TO UNLOAD	Not concerned	Not concerned	NG	49

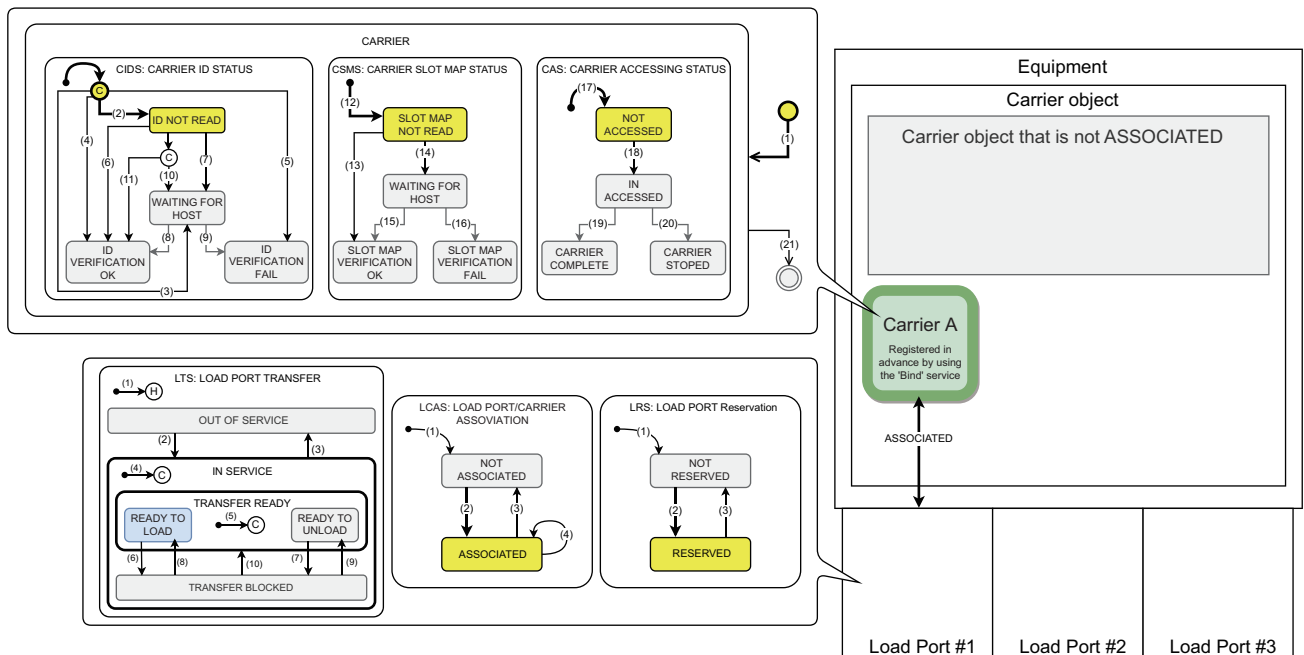
State transition examples

Example: When Load Port#1 is reserved and associated with carrier A

- Before transition



- After transition



A

■S3F17: CancelBind

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[10] // CARRIERACTION "CancelBind"
3. A[0..80] // CarrierID (ObjID)
4. U1[0..1] // PortID (PTN)
5. L[0] // PropertiesList

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CancelBind' service but also for all S3F17 services. For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. The following relevant state transitions are performed.

Refer to 'State transition examples' for this carrier action.

- Carrier State Model state transition No.(21)
- Load Port Reservation State Model state transition No.(3)
- Load Port/Carrier Association State Model state transition No.(3)

3. 'S3F18: Carrier Action Acknowledge' is sent to the host.

4. When CAACK is '0', '10087-00903: CancelBind service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CancelBind"	Yes	12: Unknown
CarrierID (ObjID)	—	○	Can be omitted (zero length) if PortID (PTN) is provided.	Yes (if provided)	• 3: Unknown (N/A) • Refer to 'Combinations of Conditional parameters 'CarrierID (ObjID)' and 'PortID (PTN)' in 'Other error judgment' and 'Combinations of load port statuses.'
PortID (PTN)	—	○	• Can be omitted (zero length) if CarrierID (ObjID) is provided. • Ignored if both CarrierID (ObjID) and PortID (PTN) are provided.	Yes (if only PortID (PTN) is provided)	• 48: Out of applicable range • Refer to 'Combinations of Conditional parameters 'CarrierID (ObjID)' and 'PortID (PTN)' in 'Other error judgment' and 'Combinations of load port statuses.'
PropertiesList	—	—	Not required (zero length). Ignored even if provided.	None	—

Attribute setting

None

Other error judgment

- Combinations of Conditional parameters 'CarrierID (ObjID)' and 'PortID (PTN)'

○: Provided, —: Not provided

CarrierID (ObjID)	PortID (PTN)	Error judgment target parameter
○	—	CarrierID (ObjID)
—	○	PortID (PTN)
○	○	CarrierID (ObjID) (PortID (PTN) is ignored.)
—	—	Error code: 13 (Due to no target parameters)

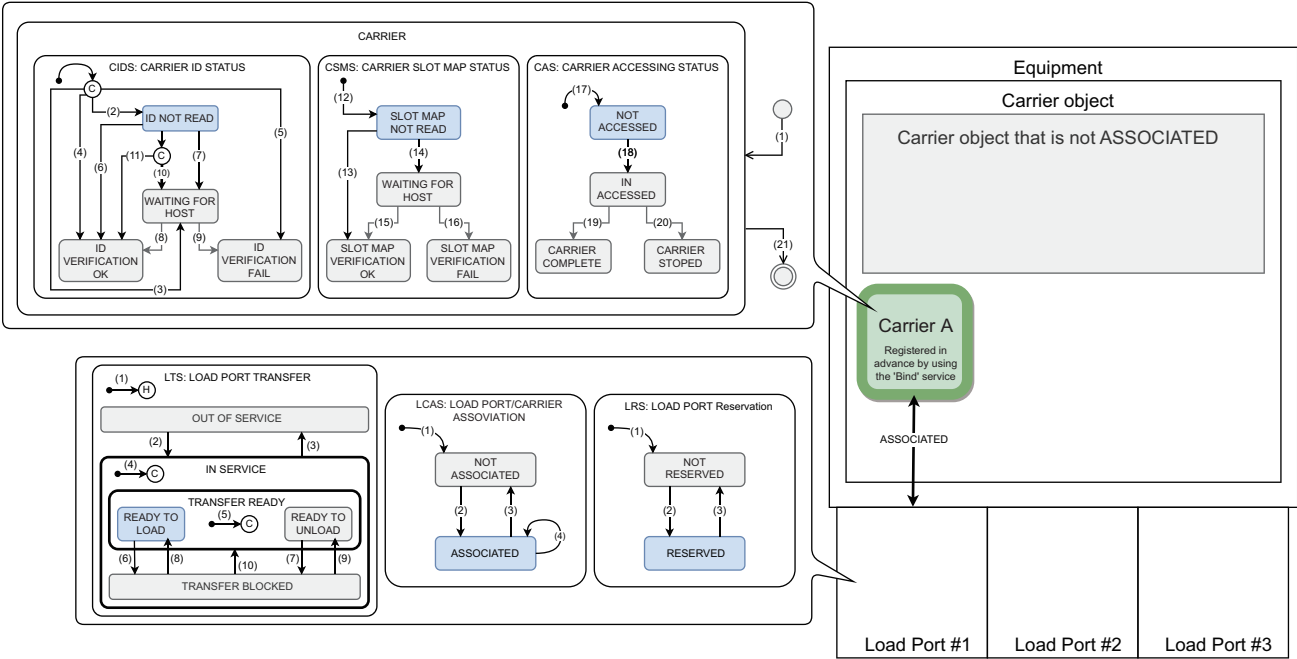
- Combinations of load port statuses

Load Port/Carrier Association State Model	Load Port Reservation StateModel	Load Port Transfer StateModel	Judgment result	Error code
0: NOT ASSOCIATED	Not concerned	Not concerned	NG	17
1: ASSOCIATED	0: NOT RESERVED	Not concerned	NG	17
	1: RESERVED	0: OUT OF SERVICE	NG	17
		1: TRANSFER BLOCKED	NG	49
		2: READY TO LOAD	OK	—
		3: READY TO UNLOAD	NG	49

State transition examples

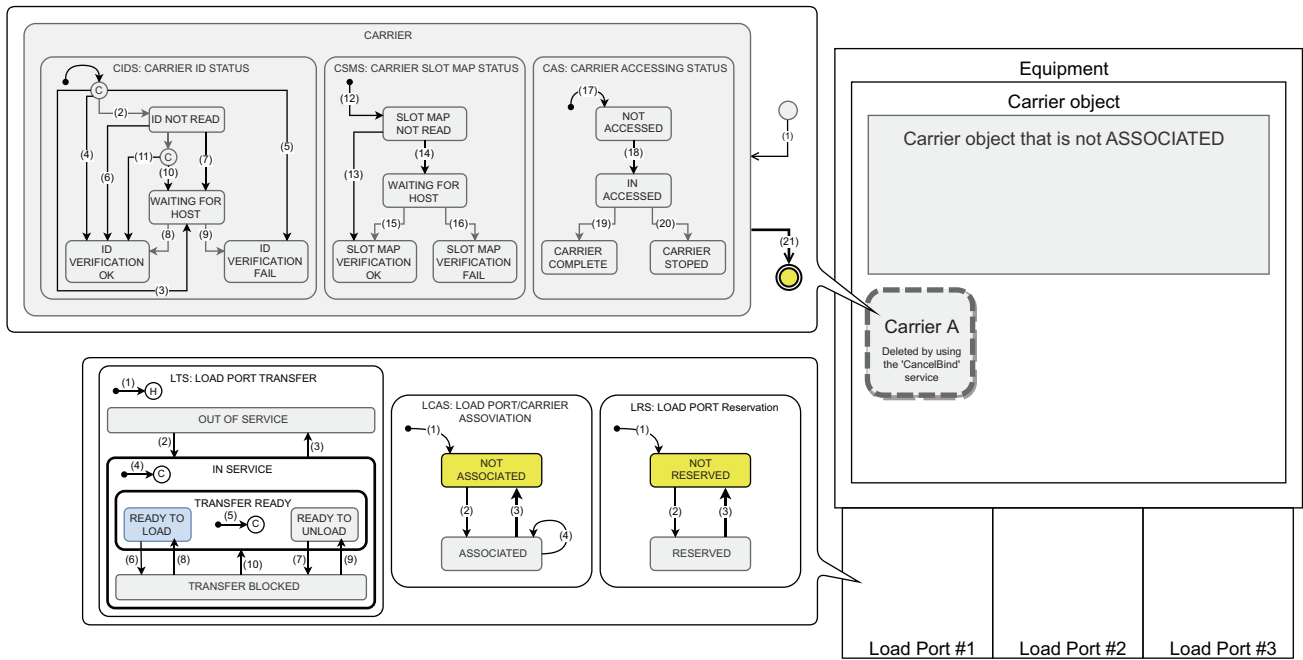
Example: When the reservation of Load Port#1 is canceled and the association of Load Port#1 with a carrier is canceled

- Before transition



A

- After transition



■S3F17: CancelCarrier

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[13] // CARRIERACTION "CancelCarrier"
3. A[1..80] // CarrierID (ObjID)
4. U1[0..1] // PortID (PTN)
5. L[0] // PropertiesList

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CancelCarrier' service but also for all S3F17 services. For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. The following relevant state transitions are performed.

Refer to 'State transition examples' for this carrier action.

- When the host instructs cancellation by using the 'CancelCarrier' service (S3F17) in response to an 'ID NOT READ to WAITING FOR HOST event report (S6F11)' or 'NO STATE to WAITING FOR HOST event report (S6F11)' from equipment
 - Carrier State Model state transition No.(9)

Refer to 'Example (1)' in 'State transition examples' for this carrier action.

- When the host instructs cancellation by using the 'CancelCarrier' service (S3F17) in response to a 'CarrierID read fail event report (S6F11)' or 'Unknown CarrierID event report (S6F11)' from equipment
 - Carrier State Model state transition No.(1), (5), (12), (17)
 - Load Port/Carrier Association State Model state transition No.(2)

Refer to 'Example (2)' and 'Example (3)' in 'State transition examples' for this carrier action.

- When the host instructs cancellation by using the 'CancelCarrier' service (S3F17) in response to a 'SLOT MAP NOT READ to WAITING FOR HOST event report (S6F11)' from equipment
 - Carrier State Model state transition No.(16)

Refer to 'Example (4)' in 'State transition examples' for this carrier action.

3. 'S3F18: Carrier Action Acknowledge' is sent to the host.

Point

The 'CancelCarrier' service is a deferred completion event target service.

If no error occurs in error judgment by using the 'CancelCarrier' service, SECS/GEM communication software notifies CM-Acknowledge (CAACK) '4: Acknowledge, request will be performed with completion signaled later by an event.'

('0: Acknowledge, command has been performed.' is not notified.)

4. When CAACK is '4,' '10087-00904: CancelCarrier service notification' is sent to a control CPU.

Point

Execute the scenario to unload a carrier in response to '10087-00904: CancelCarrier service notification' in the control CPU.

For this scenario, refer to the following:

 Page 537 E87-CMS compliance

A

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CancelCarrier"	Yes	12: Unknown
CarrierID (ObjID)	○	—	—	Yes	<ul style="list-style-type: none"> 13: Omitted (zero length) 3: Unknown (N/A) 11: ID duplication 17: Creation limit exceeded
PortID (PTN)	—	○	<ul style="list-style-type: none"> Can be omitted (zero length) when the host instructs cancellation in response to events including 'to WAITING FOR HOST' from equipment. Ignored even if provided. Required when the host instructs cancellation in response to 'CarrierID read fail event' and 'Unknown CarrierID event' from equipment. 	Yes (if required)	<ul style="list-style-type: none"> 13: Omitted (zero length) 48: Out of applicable range Refer to 'Combinations of load port statuses' in 'Other error judgment.'
PropertiesList	—	—	Not required (zero length). Ignored even if provided.	None	—

Attribute setting

None

Other error judgment

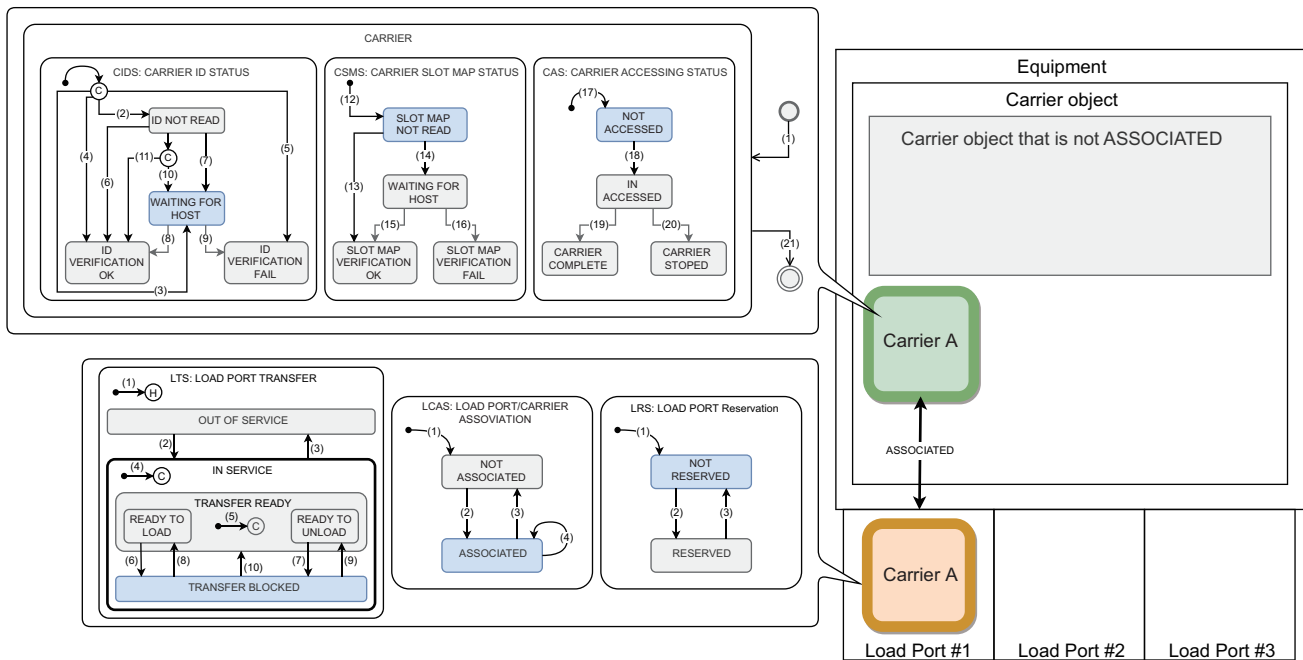
Combinations of load port statuses

Load Port Transfer StateModel	Load Port/Carrier Association State Model	Load Port Reservation StateModel	Judgment result	Error code
0: OUT OF SERVICE	Not concerned	Not concerned	NG	17
1: TRANSFER BLOCKED	0: NOT ASSOCIATED	0: NOT RESERVED	OK	—
		1: RESERVED	NG	49
	1: ASSOCIATED	Not concerned	NG	49
2: READY TO LOAD	Not concerned	Not concerned	NG	17
3: READY TO UNLOAD	Not concerned	Not concerned	NG	17

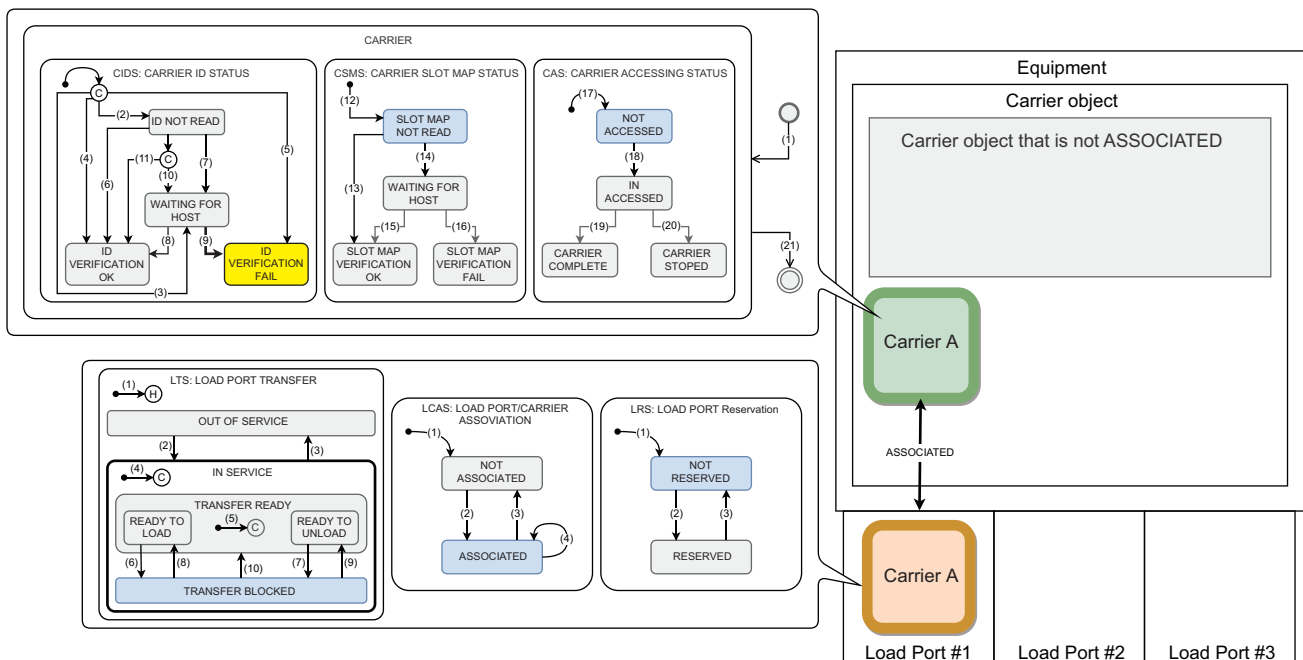
State transition examples

Example (1): When the host instructs cancellation by using the 'CancelCarrier' service (S3F17) in response to an 'ID NOT READ' to WAITING FOR HOST event report (S6F11)' or 'NO STATE to WAITING FOR HOST event report (S6F11)' for the registered carrier A from equipment

• Before transition



• After transition

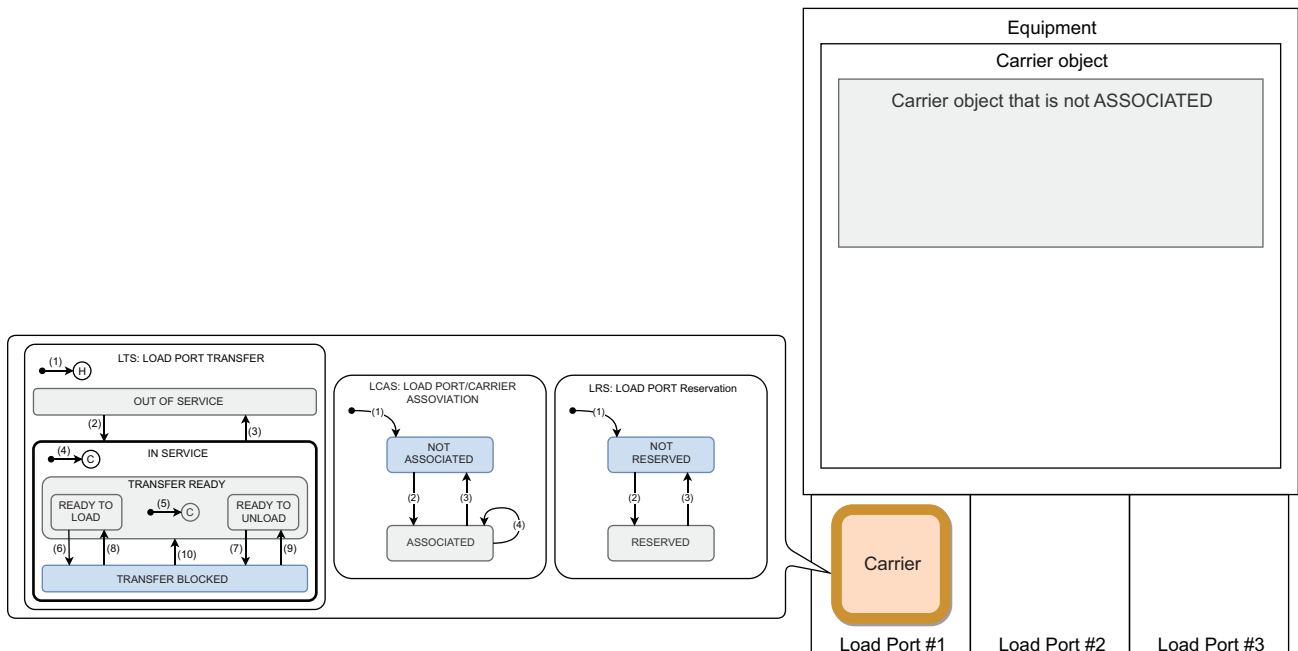


A

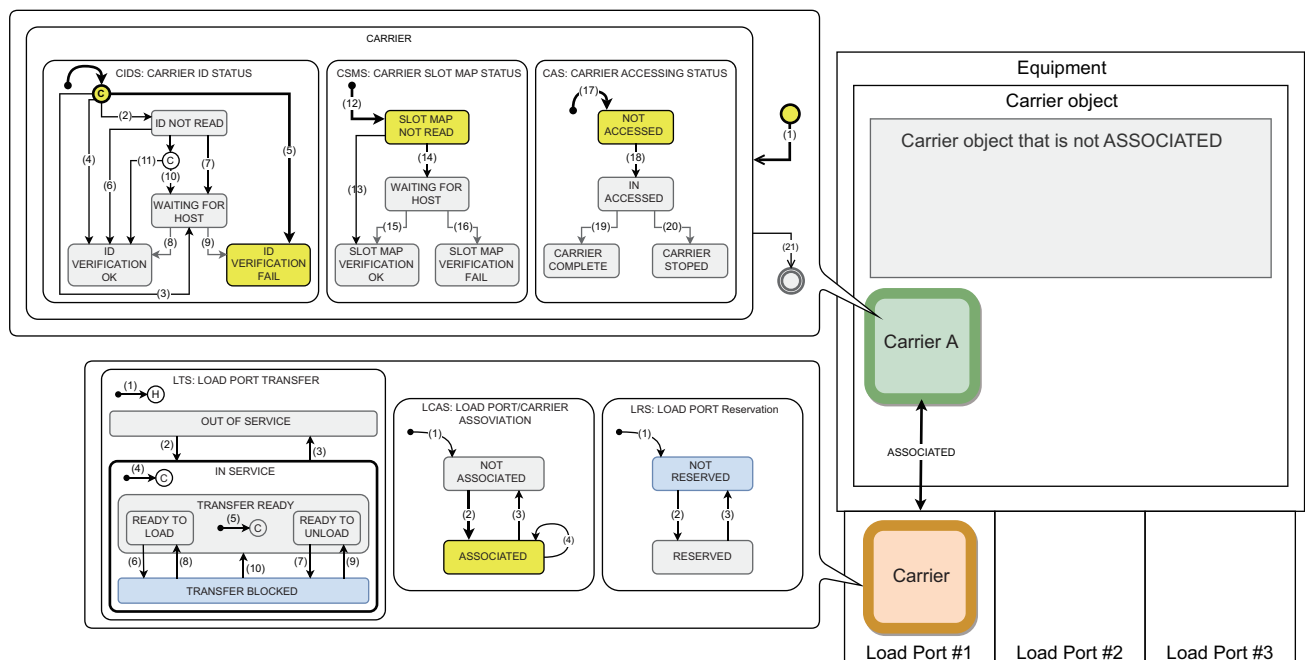
Example (2): When the host instructs cancellation of the unregistered carrier A by using the 'CancelCarrier' service (S3F17) in response to a 'CarrierID read fail event report (S6F11)' or 'UnKnown CarrierID event report (S6F11)' for a carrier with the carrier ID unknown from equipment

Point The parameters 'CarrierID (ObjID)' and 'PortID (PTN)' are required to be provided from the host.

- Before transition

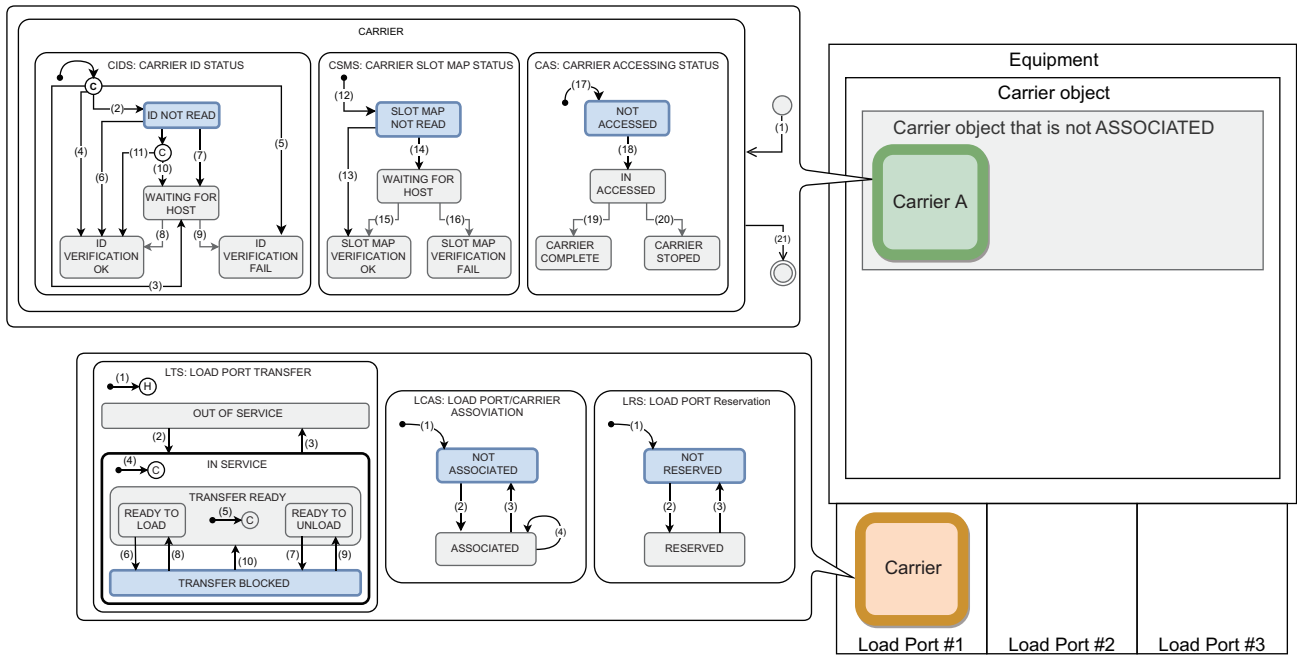


- After transition



Example (3): When the host instructs cancellation of the registered carrier A by using the 'CancelCarrier' service (S3F17)' in response to a 'CarrierID read fail event report (S6F11)' or 'UnKnown CarrierID event report (S6F11)' for a carrier with the carrier ID unknown from equipment

- Before transition



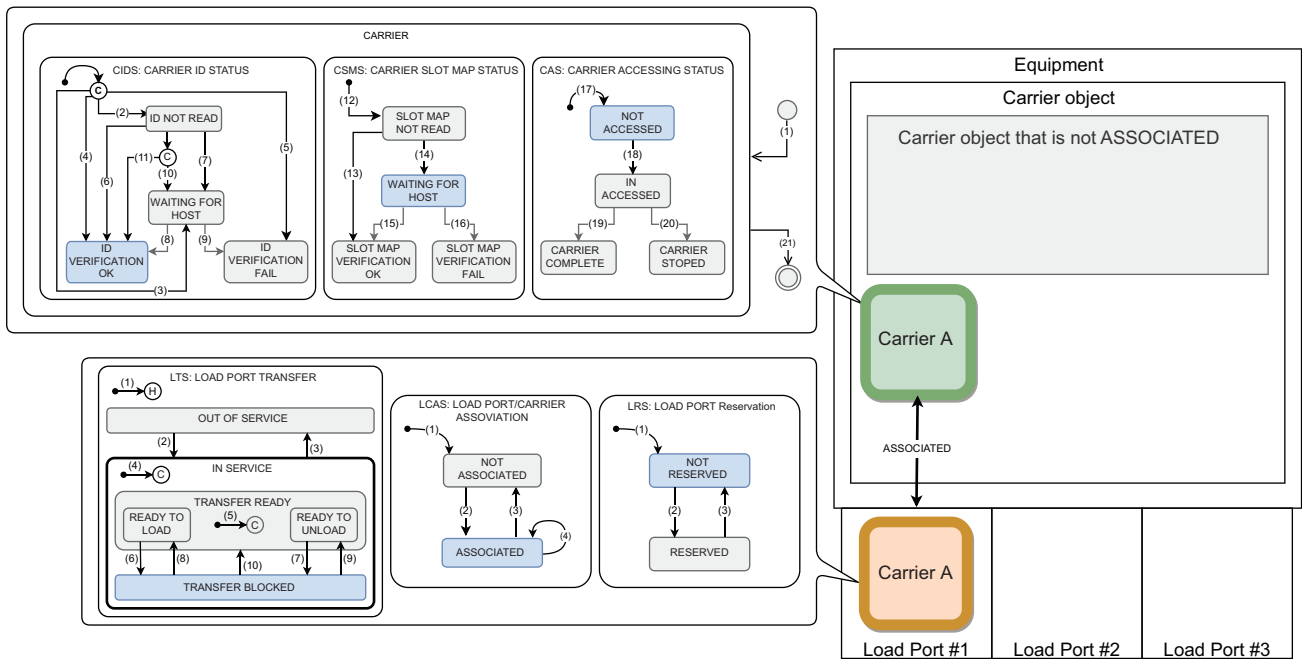
- After transition

The request is denied, and error code 11 is returned.

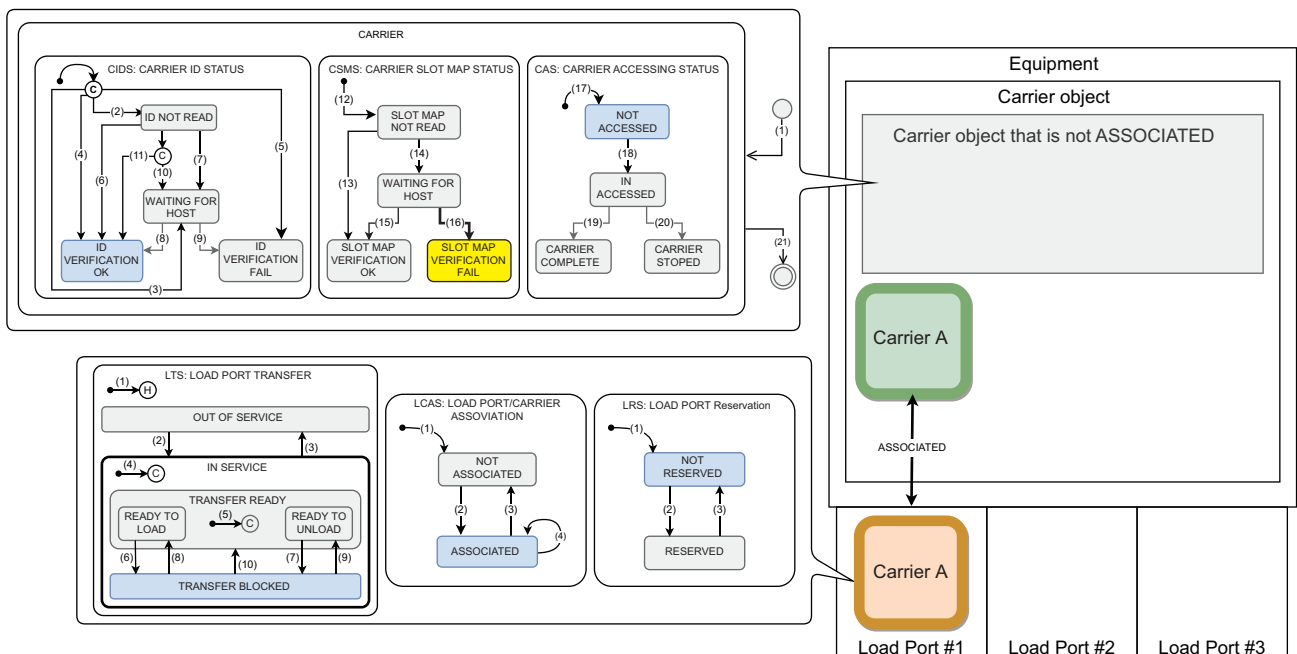
The host must delete an existing instance of carrier A by using the 'CancelCarrierNotification' service, then create a new instance of carrier A by using the 'CancelCarrier' service.

Example (4): When the host instructs cancellation by using the 'CancelCarrier' service (S3F17) in response to a 'SLOT MAP NOT READ to WAITING FOR HOST event report (S6F11)' for carrier A from equipment

- Before transition



- After transition



■S3F17: CancelCarrierAtPort

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[19] // CARRIERACTION "CancelCarrierAtPort"
3. A[0] // CarrierID (ObjID)
4. U1[1] // PortID (PTN)
5. L[0] // PropertiesList

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CancelCarrierAtPort' service but also for all S3F17 services.

For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S3F18: Carrier Action Acknowledge' is sent to the host.

Point

The 'CancelCarrierAtPort' service is a deferred completion event target service.

If no error occurs in error judgment by using the 'CancelCarrierAtPort' service, SECS/GEM communication software notifies CM-Acknowledge (CAACK) '4: Acknowledge, request will be performed with completion signaled later by an event.'

('0: Acknowledge, command has been performed.' is not notified.)

3. When CAACK is '4,' '10087-00905: CancelCarrierAtPort service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandator y (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CancelCarrierAtPort"	Yes	12: Unknown
CarrierID (ObjID)	—	—	Not required (zero length). Ignored even if provided.	None	—
PortID (PTN)	○	—	—	Yes	<ul style="list-style-type: none">• 13: Omitted (zero length)• 48: Out of applicable range• Refer to 'Combinations of load port statuses and carrier statuses' in 'Other error judgment.'
PropertiesList	—	—	Not required (zero length). Ignored even if provided.	None	—

Attribute setting

None

A

Other error judgment

Combinations of load port statuses and carrier statuses

Load Port Transfer StateModel	Load Port/Carrier Association State Model	Load Port Reservation StateModel	Carrier Accessing Status of a carrier ASSOCIATED with a load port	Judgment result	Error code
0: OUT OF SERVICE	Not concerned	Not concerned	Not concerned	NG	17
1: TRANSFER BLOCKED	0: NOT ASSOCIATED	Not concerned	Not concerned	NG	50
	1: ASSOCIATED	0: NOT RESERVE	0: NOT ACCESSED	OK	—
			1: IN ACCESS	NG	17
			2: CARRIER COMPLETE	OK	—
			3: CARRIER STOPED	OK	—
		1: RESERVED	Not concerned	NG	17
2: READY TO LOAD	Not concerned	Not concerned	Not concerned	NG	50
3: READY TO UNLOAD	Not concerned	Not concerned	Not concerned	NG	17

■S3F17: CancelCarrierNotification

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[25] // CARRIERACTION "CancelCarrierNotification"
3. A[1..80] // CarrierID (ObjID)
4. U1[0] // PortID (PTN)
5. L[0] // PropertiesList

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CancelCarrierNotification' service but also for all S3F17 services.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. The following relevant state transition is performed.

Refer to 'State transition examples' for this carrier action.

- Carrier State Model state transition No.(21)

3. 'S3F18: Carrier Action Acknowledge' is sent to the host.

4. When CAACK is '0', '10087-00906: CancelCarrierNotification service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CancelCarrierNotification"	Yes	12: Unknown
CarrierID (ObjID)	○	—	—	Yes	• 13: Omitted (zero length) • 3: Unknown (N/A) • 17: Associated with a load port
PortID (PTN)	—	—	Not required (zero length). Ignored even if provided.	None	—
PropertiesList	—	—	Not required (zero length). Ignored even if provided.	None	—

Attribute setting

None

Other error judgment

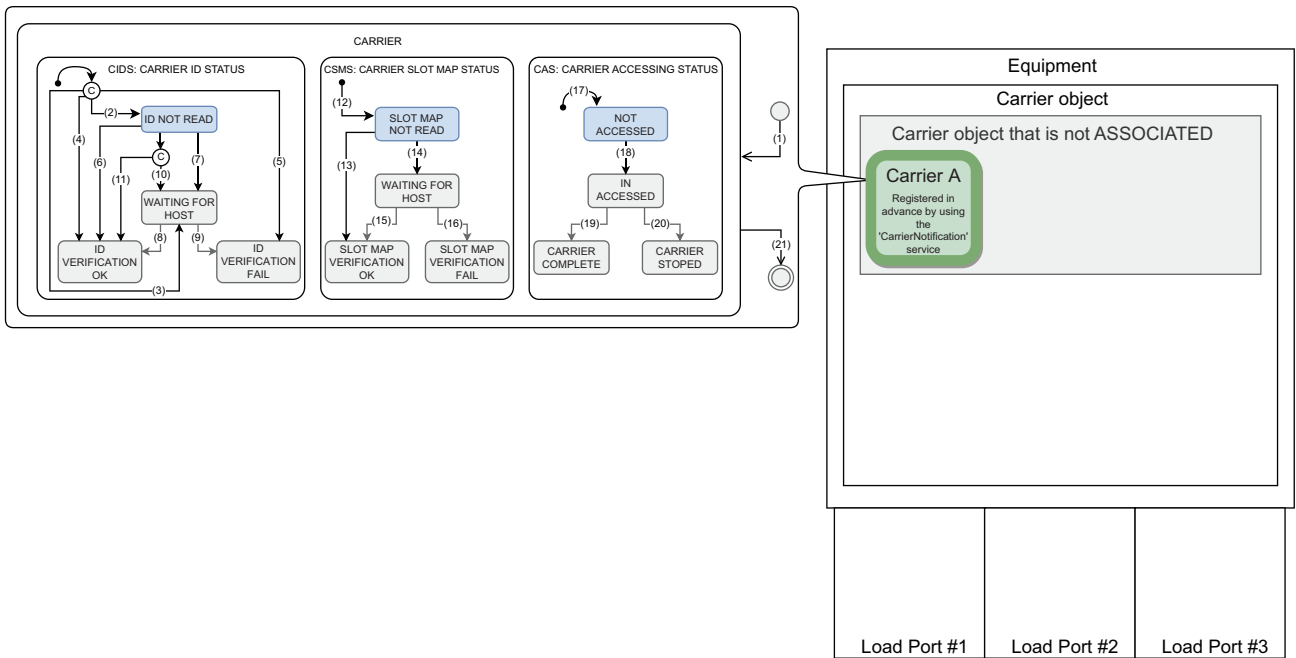
None

A

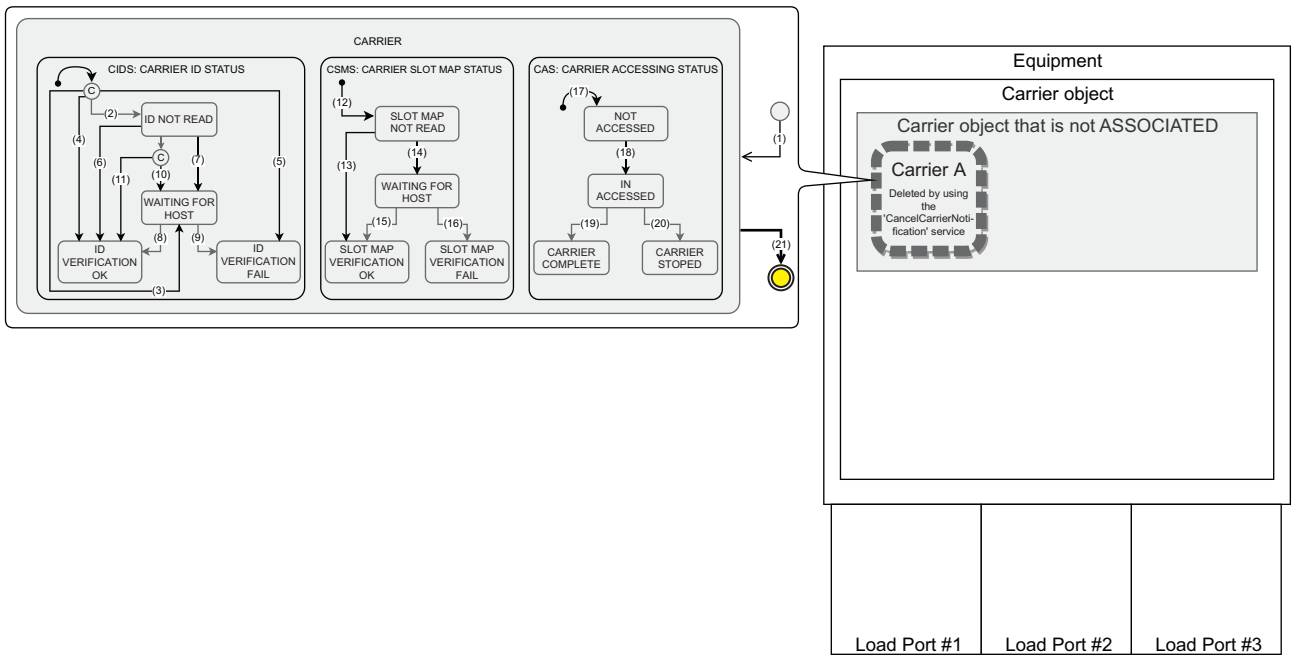
State transition examples

Example: When deleting carrier A, which is registered in advance by using the 'CarrierNotification' service, by using the 'CancelCarrierNotification' service

- Before transition



- After transition



■S3F17: CancelCarrierOut

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[16] // CARRIERACTION "CancelCarrierOut"
3. A[1..80] // CarrierID (ObjID)
4. U1[0] // PortID (PTN)
5. L[0] // PropertiesList

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CancelCarrierOut' service but also for all S3F17 services.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S3F18: Carrier Action Acknowledge' is sent to the host.

Point

SECS/GEM communication software does not queue the 'CarrierOut' service. Therefore, if no parameter error occurs, the software notifies CM-Acknowledge (CAACK) '0: Acknowledge, command has been performed.'

3. When CAACK is '0', '10087-00907: CancelCarrierOut service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandator y (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CancelCarrierOut"	Yes	• 12: Unknown • 17: Fixed buffer equipment
CarrierID (ObjID)	○	—	—	Yes	• 13: Omitted (zero length) • 3: Unknown (N/A)
PortID (PTN)	—	—	Not required (zero length). Ignored even if provided.	None	—
PropertiesList	—	—	Not required (zero length). Ignored even if provided.	None	—

Attribute setting

None

Other error judgment

None

A

■S3F17: CarrierIn

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[9] // CARRIERACTION "CarrierIn"
3. A[1..80] // CarrierID (ObjID)
4. U1[0] // PortID (PTN)
5. L[0] // PropertiesList

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CarrierIn' service but also for all S3F17 services. For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S3F18: Carrier Action Acknowledge' is sent to the host.

Point

The 'CarrierIn' service is a deferred completion event target service.

If no error occurs in error judgment by using the 'CarrierIn' service, SECS/GEM communication software notifies CM-Acknowledge (CAACK) '4: Acknowledge, request will be performed with completion signaled later by an event.'

('0: Acknowledge, command has been performed.' is not notified.)

3. When CAACK is '4,' '10087-00909: CarrierIn service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CarrierIn"	Yes	• 12: Unknown • 17: Fixed buffer equipment
CarrierID (ObjID)	○	—	—	Yes	• 13: Omitted (zero length) • 3: Unknown (N/A) • Refer to 'Combinations of carrier and load port statuses' in 'Other error judgment.'
PortID (PTN)	—	—	Not required (zero length). Ignored even if provided.	None	—
PropertiesList	—	—	Not required (zero length). Ignored even if provided.	None	—

Attribute setting

None

Other error judgment

Combinations of carrier and load port statuses

Presence of a load port ASSOCIATED with the specified carrier	Load Port Transfer StateModel	Load Port Reservation StateModel	Whether to move the specified carrier by using the 'CarrierOut' service	Judgment result	Error code
None	Not concerned	Not concerned	Not concerned	NG	17
Yes	0: OUT OF SERVICE	Not concerned	Not concerned	NG	17
	1: TRANSFER BLOCKED	Not concerned	Not concerned	NG	17
	2: READY TO LOAD	Not concerned	Not concerned	NG	17
	3: READY TO UNLOAD	0: NOT RESERVE	Yes (moved)	OK	—
			None (not moved)	NG	17
		1: RESERVED	Not concerned	NG	17

Point

When moving a carrier, notify '00087-00414: Carrier move completed to Load Port notification.' This allows the carrier to be recognized as one moved by using the 'CarrierOut' service.

■S3F17: CarrierNotification

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[19] // CARRIERACTION "CarrierNotification"
3. A[1..80] // CarrierID (ObjID)
4. U1[0] // PortID (PTN)
5. L[0..256] // PropertiesList
 1. L[2]
 1. A[1..80] // AttrID
 2. any // AttrData

⋮

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CarrierNotification' service but also for all S3F17 services.

For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters and attributes are determined.

Refer to 'Parameters' and 'Attribute setting' for this carrier action.

2. When all of the following conditions are satisfied, a carrier object is created.

- The maximum number of carrier objects that can be created has not been reached.
- CarrierID is provided.
- There is no error in parameters and attributes.

3. The following state transition is performed.

Refer to 'State transition examples' for this carrier action.

- Carrier State Model state transition No.(1), (2), (12), and (17)

4. 'S3F18: Carrier Action Acknowledge' is sent to the host.

5. When CAACK is '0', '10087-00910: CarrierNotification service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CarrierNotification"	Yes	12: Unknown
CarrierID (ObjID)	○	—	—	Yes	• 13: Omitted (zero length) • 11: ID duplication • 12: Invalid value • 17: Creation limit exceeded
PortID (PTN)	—	—	Not required (zero length). Ignored even if provided.	None	—
PropertiesList	—	○	An attribute of a carrier object to be set for the created instance. Can be omitted (zero length).	Yes (if provided)	• 4: Attribute name unknown • Refer to 'Attribute setting.'

Attribute setting

○: Applicable, —: Not applicable

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
ObjType	—	—	—	Not required. Ignored even if provided.	None	—	"Carrier"
ObjID	—	—	—	Not required. Ignored even if provided.	None	—	—
Capacity	—	○	—	—	Yes	7: Out of applicable range	25
SubstrateCount	—	○	—	Values within the range of 'Capacity' are valid.	Yes	7: Out of applicable range	0
ContentMap	—	○	—	The same number as 'Capacity' is valid.	Yes	7: Out of applicable range	LIST [Capacity]
SlotMap	—	○	—	The same number as 'Capacity' is valid.	Yes	7: Out of applicable range	LIST [Capacity]
Usage	—	○	—	—	Yes	7: Other than ASCII ^{*1}	(Null character)
CarrierIDStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: ID NOT READ
CarrierAccessingStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: NOT ACCESSED
SlotMapStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: SLOT MAP NOT READ
LocationID	—	—	—	Not required. Ignored even if provided.	None	—	(Null character)
Reason	—	—	—	Not required. Ignored even if provided.	None	—	0: VERIFICATION NEEDED

*1 Excluding the control characters.

For the attributes of a carrier object, refer to the following:

📖 Page 59 Carrier Objects

A



No attributes are required to be provided by the 'CarrierNotification' service.

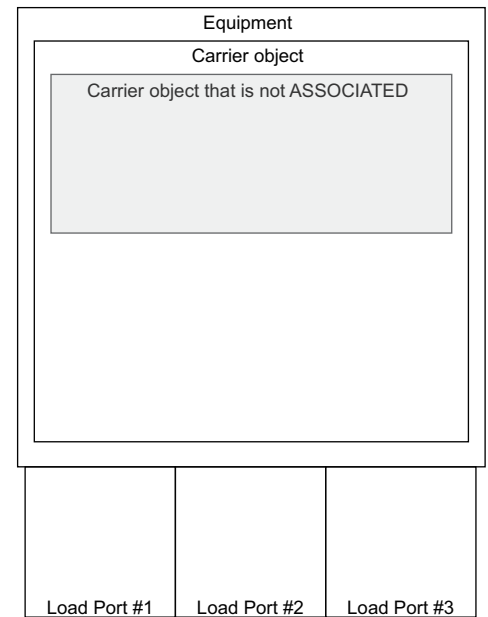
Other error judgment

None

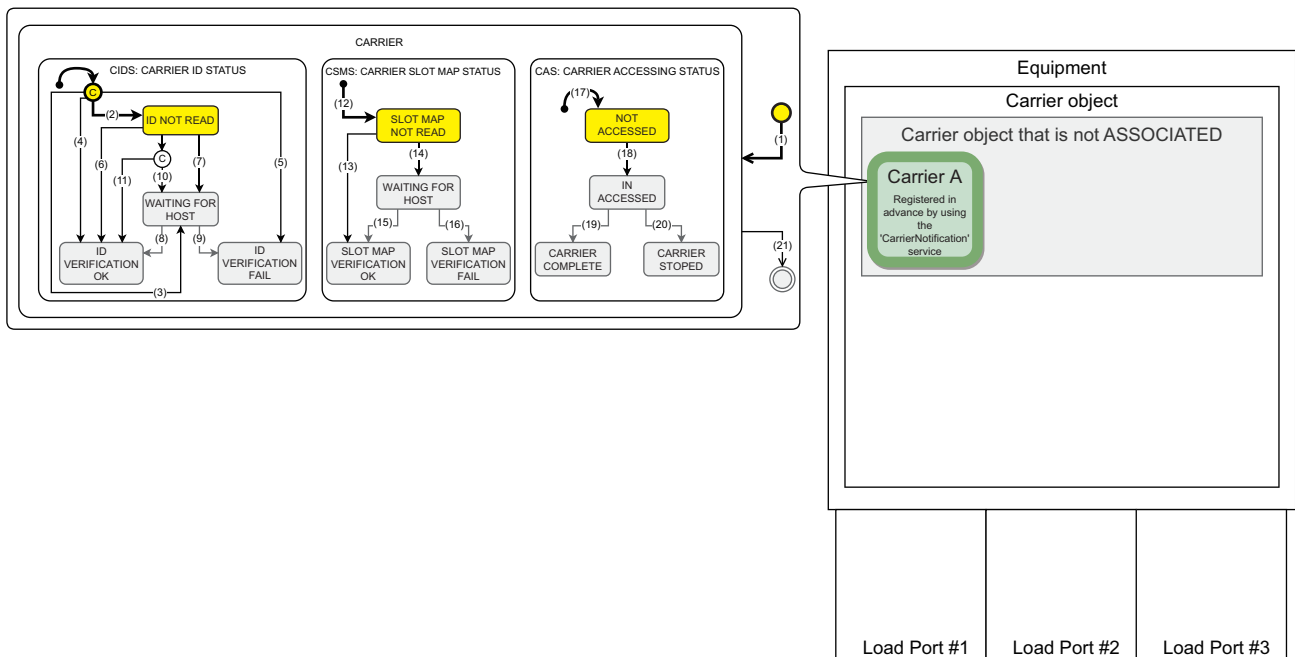
State transition examples

Example: When registering carrier A in advance by using the 'CarrierNotification' service

- Before transition



- After transition



■S3F17: CarrierOut

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[10] // CARRIERACTION "CarrierOut"
3. A[1..80] // CarrierID (ObjID)
4. U1[0..1] // PortID (PTN)
5. L[0] // PropertiesList

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CarrierOut' service but also for all S3F17 services. For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S3F18: Carrier Action Acknowledge' is sent to the host.

Point

The 'CarrierOut' service is a deferred completion event target service.

If no error occurs in error judgment by using the 'CarrierOut' service, SECS/GEM communication software notifies CM-Acknowledge (CAACK) '4: Acknowledge, request will be performed with completion signaled later by an event.'

('0: Acknowledge, command has been performed.' is not notified.)

3. When CAACK is '4,' '10087-00911: CarrierOut service notification' is sent to a control CPU.

Point

SECS/GEM communication software does not queue the 'CarrierOut' service.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CarrierOut"	Yes	• 12: Unknown • 17: Fixed buffer equipment
CarrierID (ObjID)	○	—	—	Yes	• 13: Omitted (zero length) • 3: Unknown (N/A)
PortID (PTN)	—	○	—	Yes (if provided)	• 48: Out of applicable range • Refer to 'Combinations of load port statuses' in 'Other error judgment.'
PropertiesList	—	—	Not required (zero length). Ignored even if provided.	None	—

Attribute setting

None

Other error judgment

A

Combinations of carrier and load port statuses

Load Port Transfer StateModel	Load Port/Carrier Association State Model	Load Port Reservation StateModel	Judgment result	Error code
0: OUT OF SERVICE	Not concerned	Not concerned	NG	17
1: TRANSFER BLOCKED	Not concerned	Not concerned	OK	—
2: READY TO LOAD	Not concerned	Not concerned	OK	—
3: READY TO UNLOAD	Not concerned	Not concerned	OK	—

■S3F17: CarrierRelease

Message format

S3F17

1. L[5]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
2. A[14] // CARRIERACTION "CarrierRelease"
3. A[0..80] // CarrierID (ObjID)
4. U1[0..1] // PortID (PTN)
5. L[0] // PropertiesList

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CarrierRelease' service but also for all S3F17 services. For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.
Refer to 'Parameters' shown below.
2. 'S3F18: Carrier Action Acknowledge' is sent to the host.
3. When CAACK is '0', '10087-00913: CarrierRelease service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CarrierRelease"	Yes	12: Unknown
CarrierID (ObjID)	—	○	Can be omitted (zero length) if only PortID (PTN) is provided.	Yes (if provided)	• 3: Unknown (N/A) • Refer to 'Combinations of CarrierID and PortID' in 'Other error judgment.'
PortID (PTN)	—	○	Can be omitted (zero length) if only CarrierID (ObjID) is provided.	Yes (if provided)	• 48: Out of applicable range • Refer to 'Combinations of CarrierID and PortID' in 'Other error judgment.'
PropertiesList	—	—	Not required. Ignored even if provided.	None	—

Attribute setting

None

Other error judgment

Combinations of CarrierID and PortID

○: Provided (no parameter error), —: Not provided

CarrierID	PortID	Association between the specified CarrierID and PortID	Judgment result	Error code
○	—	Not concerned	OK	—
—	○	Not concerned	OK	—
○	○	ASSOCIATED	OK	—
○	○	NOT ASSOCIATED	NG	17
—	—	Not concerned	NG	13



SECS/GEM communication software is not aware of whether a carrier exists in a location where a tag is read or written.

■S3F17: CarrierReCreate

Message format

S3F17

1. L[5]
 1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
 2. A[15] // CARRIERACTION "CarrierReCreate"
 3. A[1..80] // CarrierID (ObjID)
 4. U1[0] // PortID (PTN)
 5. L[0..256] // PropertiesList
 1. L[2]
 1. A[1..80] // AttrID
 2. any // AttrData
- ⋮

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CarrierReCreate' service but also for all S3F17 services. For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters and attributes are determined.

Refer to 'Parameters,' 'Attribute setting,' and 'Other error judgment' for this carrier action.

2. When all of the following conditions are satisfied, a carrier object is created.

- The maximum number of carrier objects that can be created has not been reached.
- CarrierID is provided.
- The transfer status of a load port ASSOCIATED with the provided CarrierID is 'READY TO UNLOAD.'
- There is no error in parameters and attributes.

3. The following state transitions are performed.

Refer to 'State transition examples' for this carrier action.

- When PropertiesList is provided
 - Carrier State Model state transition No.(21)&(1), (2), (12), and (17)
 - Load Port Transfer State Model state transition No.(7)
 - Load Port/Carrier Association State Model state transition No.(4)
- When PropertiesList is not provided
 - Carrier State Model state transition No.(21)
 - Load Port Transfer State Model state transition No.(7)
 - Load Port/Carrier Association State Model state transition No.(3)

4. 'S3F18: Carrier Action Acknowledge' is sent to the host.

5. When CAACK is '0', '10087-00912: CarrierReCreate service notification' is sent to a control CPU.

Point

Execute the carrier ID verification scenario by using any of the following in response to '10087-00912: CarrierReCreate service notification' in the control CPU.

- 00087-00501: CarrierID read successful notification
- 00087-00502: CarrierID read fail notification
- 00087-00503: Unknown CarrierID notification

For carrier ID verification, refer to the following:

 Page 86 Carrier ID Verification

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"CarrierReCreate"	Yes	12: Unknown
CarrierID (ObjID)	○	—	—	Yes	<ul style="list-style-type: none"> • 13: Omitted (zero length) • 3: Unknown (N/A)
PortID (PTN)	—	—	Not required (zero length). Ignored even if provided.	None	—
PropertiesList	—	○	An attribute of a carrier object to be set for the recreated instance. Can be omitted (zero length).	Yes (if provided)	<ul style="list-style-type: none"> • 4: Attribute name unknown • Refer to 'Attribute setting.'

Attribute setting

○: Applicable, —: Not applicable

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
ObjType	—	—	—	Not required. Ignored even if provided.	None	—	"Carrier"
ObjID	—	—	—	Not required. Ignored even if provided.	None	—	—
Capacity	—	○	—	—	Yes	7: Out of applicable range	25
SubstrateCount	—	○	—	Values within the range of 'Capacity' are valid.	Yes	7: Out of applicable range	0
ContentMap	—	○	—	The same number as 'Capacity' is valid.	Yes	7: Out of applicable range	LIST [Capacity]
SlotMap	—	○	—	The same number as 'Capacity' is valid.	Yes	7: Out of applicable range	LIST [Capacity]
Usage	—	○	—	—	Yes	7: Other than ASCII ^{*1}	(Null character)
CarrierIDStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: ID NOT READ
CarrierAccessingStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: NOT ACCESSED
SlotMapStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: SLOT MAP NOT READ
LocationID	—	—	—	Not required. Ignored even if provided.	None	—	(Null character)
Reason	—	—	—	Not required. Ignored even if provided.	None	—	0: VERIFICATION NEEDED

*1 Excluding the control characters.

For the attributes of a carrier object, refer to the following:

📖 Page 59 Carrier Objects



No attributes are required to be provided by the 'CarrierReCreate' service.

Other error judgment

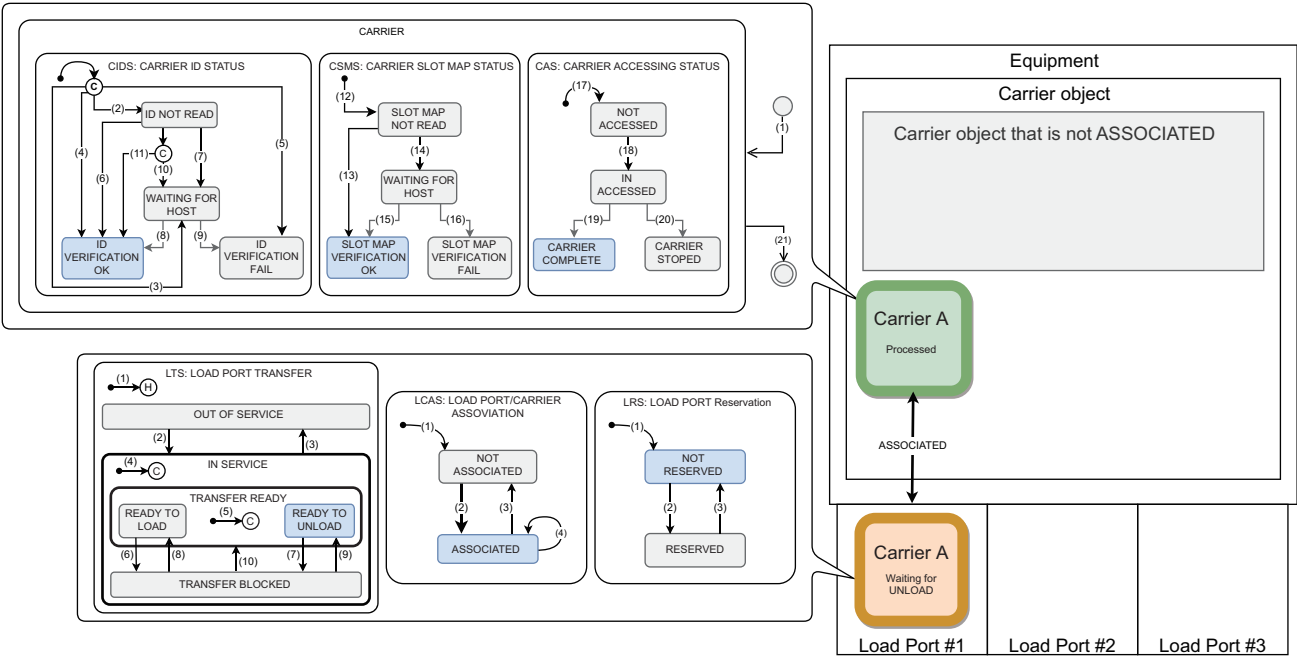
Combinations of load port statuses

Presence of a load port ASSOCIATED with the specified carrier	Load Port Transfer StateModel	Load Port Reservation StateModel	Judgment result	Error code
None	Not concerned	Not concerned	NG	17
Yes	0: OUT OF SERVICE	Not concerned	NG	17
	1: TRANSFER BLOCKED	Not concerned	NG	49
	2: READY TO LOAD	Not concerned	NG	49
	3: READY TO UNLOAD	0: NOT RESERVE	OK	—
		1: RESERVED	NG	49

State transition examples

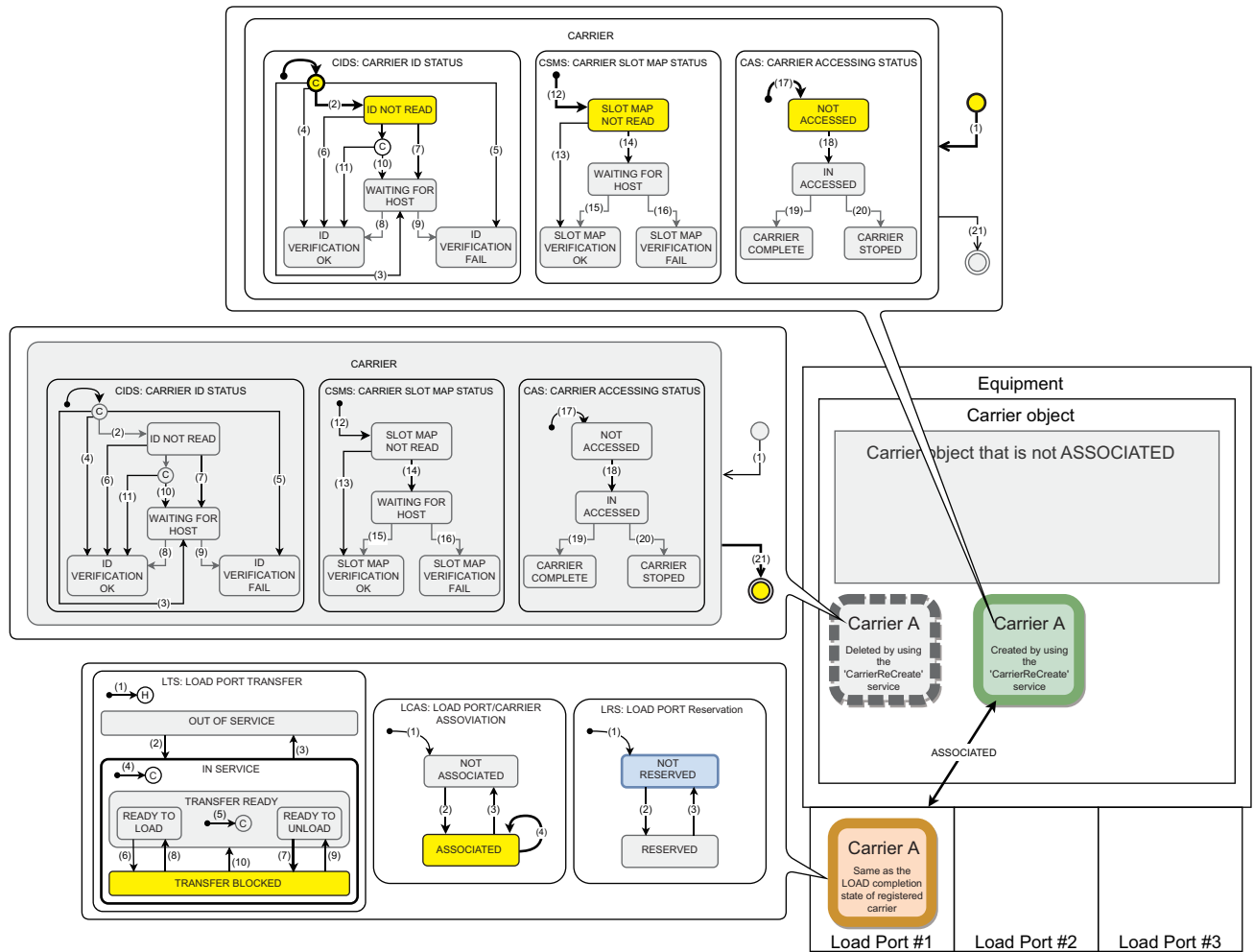
Example: When reinstantiating carrier A that is waiting for UNLOAD in Load Port#1 by using the 'CarrierReCreate' service

- Before transition

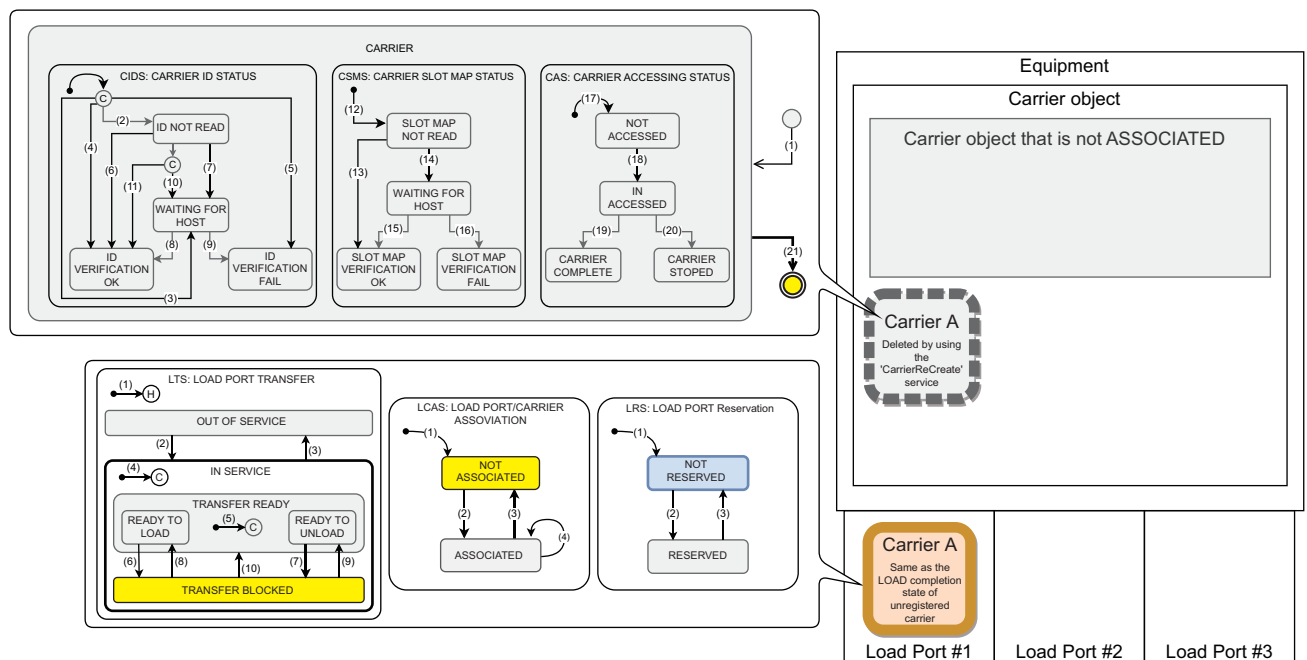


A

- After transition (when PropertiesList is provided)



- After transition (when PropertiesList is not provided)



■S3F17: ProceedWithCarrier

Message format

S3F17

1. L[5]
 1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
 2. A[18] // CARRIERACTION "ProceedWithCarrier"
 3. A[1..80] // CarrierID (ObjID)
 4. U1[0..1] // PortID (PTN)
 5. L[0..256] // PropertiesList
1. L[2]
 1. A[1..80] // AttrID
 2. any // AttrData
- :

Point

Transaction of S3F17 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'ProceedWithCarrier' service but also for all S3F17 services.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters and attributes are determined.

Refer to 'Parameters' and 'Attribute setting' for this carrier action.

2. The following state transitions are performed.

- When the host instructs continuation by using the 'ProceedWithCarrier' service (S3F17) in response to an 'ID NOT READ to WAITING FOR HOST event report (S6F11)' or 'NO STATE to WAITING FOR HOST event report (S6F11)' from equipment
 - Carrier State Model state transition No.(8)

Refer to 'Example (1)' in 'State transition examples' for this carrier action.

- When the host instructs continuation by using the 'ProceedWithCarrier' service (S3F17) in response to a 'CarrierID read fail event report (S6F11)' or 'UnKnown CarrierID event report (S6F11)' from equipment
 - Carrier State Model state transition No.(1), (4), (12), and (17)
 - Load Port/Carrier Association State Model state transition No.(2)

Refer to 'Example (2)' and 'Example (3)' in 'State transition examples' for this carrier action.

- When the host instructs continuation by using the 'ProceedWithCarrier' service (S3F17) in response to 'SLOT MAP NOT READ to WAITING FOR HOST event report (S6F11)' from equipment
 - Carrier State Model state transition No.(15)

Refer to 'Example (4)' in 'State transition examples' for this carrier action.

3. 'S3F18: Carrier Action Acknowledge' is sent to the host.

4. When CAACK is '0', '10087-00918: ProceedWithCarrier service notification' is sent to a control CPU.

A

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
DATAID	—	—	Not required. Ignored even if provided.	None	—
CARRIERACTION	○	—	"ProceedWithCarrier"	Yes	12: Unknown
CarrierID (ObjID)	○	—	—	Yes	<ul style="list-style-type: none"> • 13: Omitted • 3: Unknown (N/A) • 11: ID duplication • 17: Creation limit exceeded
PortID (PTN)	—	○	<ul style="list-style-type: none"> • Can be omitted (zero length) when the host instructs continuation in response to events including 'to WAITING FOR HOST' from equipment. Ignored even if provided. • Required when the host instructs continuation in response to 'CarrierID read fail event' and 'UnKnown CarrierID event' from equipment. 	Yes (if required)	<ul style="list-style-type: none"> • 13: Omitted • 48: Out of applicable range • Refer to 'Combinations of load port statuses' in 'Other error judgment.'
PropertiesList	—	○	An attribute of a carrier object to be set for the instance already created or created by a user. Can be omitted (zero length).	Yes (if provided)	<ul style="list-style-type: none"> • 4: Attribute name unknown • Refer to 'Attribute setting.'

Attribute setting

○: Applicable, —: Not applicable

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
ObjType	—	—	—	Not required. Ignored even if provided.	None	—	"Carrier"
ObjID	—	—	—	Not required. Ignored even if provided.	None	—	—
Capacity	—	○	—	—	Yes	7: Out of applicable range	25
SubstrateCount	—	○	—	Values within the range of 'Capacity' are valid.	Yes	7: Out of applicable range	0
ContentMap	—	○	—	The same number as 'Capacity' is valid.	Yes	7: Out of applicable range	LIST [Capacity]
SlotMap	—	○	—	The same number as 'Capacity' is valid.	Yes	7: Out of applicable range	LIST [Capacity]
Usage	—	○	—	—	Yes	7: Other than ASCII ^{*1}	(Null character)
CarrierIDStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: ID NOT READ
CarrierAccessingStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: NOT ACCESSED

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
SlotMapStatus	—	—	—	Not required. Ignored even if provided.	None	—	0: SLOT MAP NOT READ
LocationID	—	—	—	Not required. Ignored even if provided.	None	—	(Null character)
Reason	—	—	—	Not required. Ignored even if provided.	None	—	0: VERIFICATION NEEDED

*1 Excluding the control characters.

For the attributes of a carrier object, refer to the following:

 Page 59 Carrier Objects

Point

No attributes are required to be provided by the 'ProceedWithCarrier' service.

Other error judgment

Combinations of load port statuses

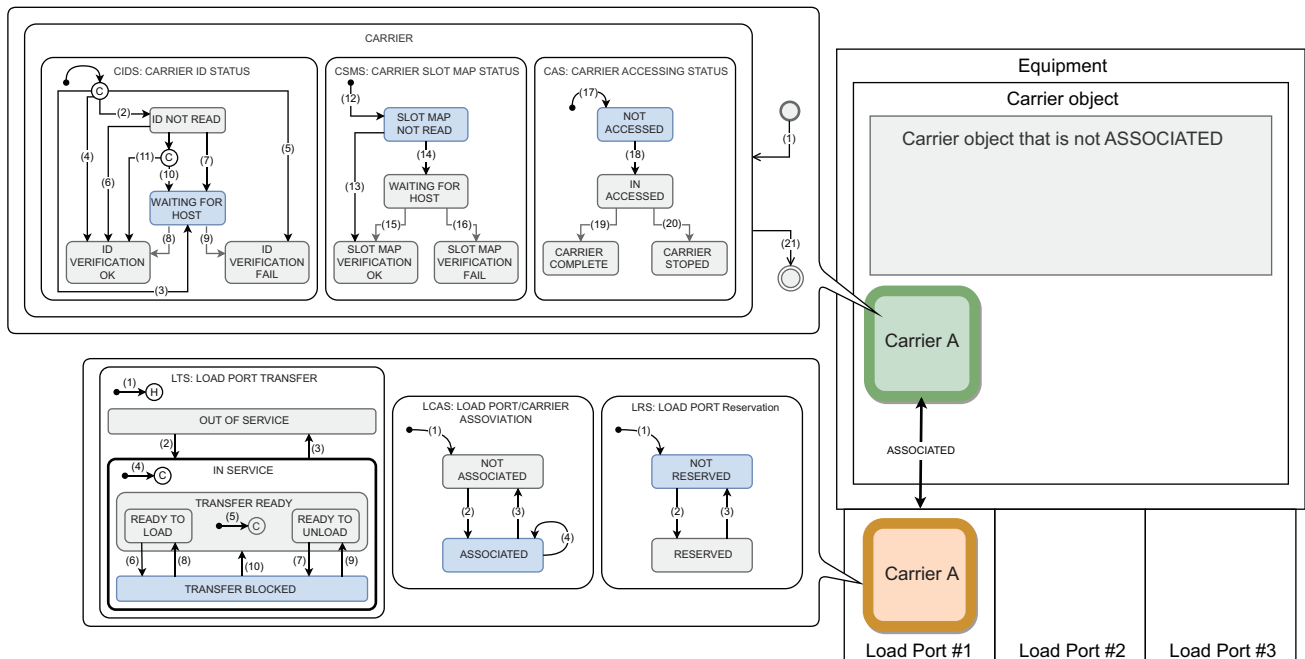
Load Port Transfer StateModel	Load Port/Carrier Association State Model	Load Port Reservation StateModel	Judgment result	Error code
0: OUT OF SERVICE	Not concerned	Not concerned	NG	17
1: TRANSFER BLOCKED	0: NOT ASSOCIATED	0: NOT RESERVE	OK	—
		1: RESERVED	NG	49
	1: ASSOCIATED	Not concerned	NG	49
2: READY TO LOAD	Not concerned	Not concerned	NG	17
3: READY TO UNLOAD	Not concerned	Not concerned	NG	17

A

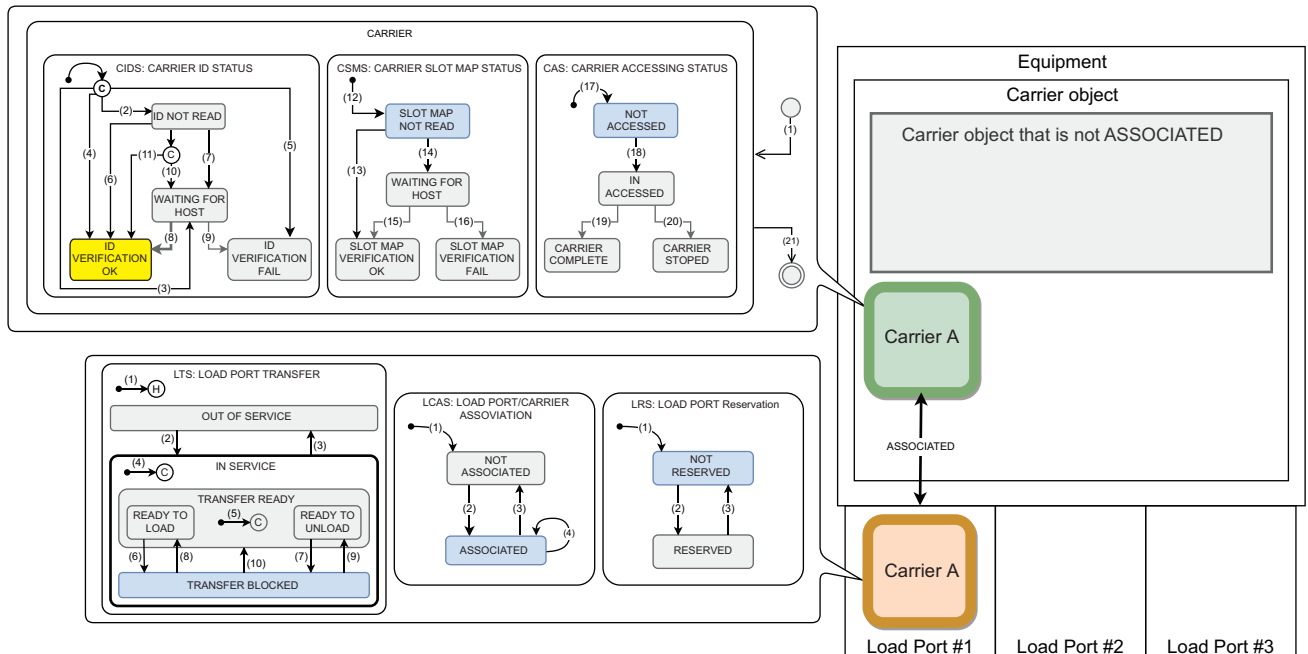
State transition examples

Example (1): When the host instructs continuation by using the 'ProceedWithCarrier' service (S3F17) in response to an 'ID NOT READ' to WAITING FOR HOST event report (S6F11)' or 'NO STATE to WAITING FOR HOST event report (S6F11)' for the registered carrier A from equipment

• Before transition



• After transition

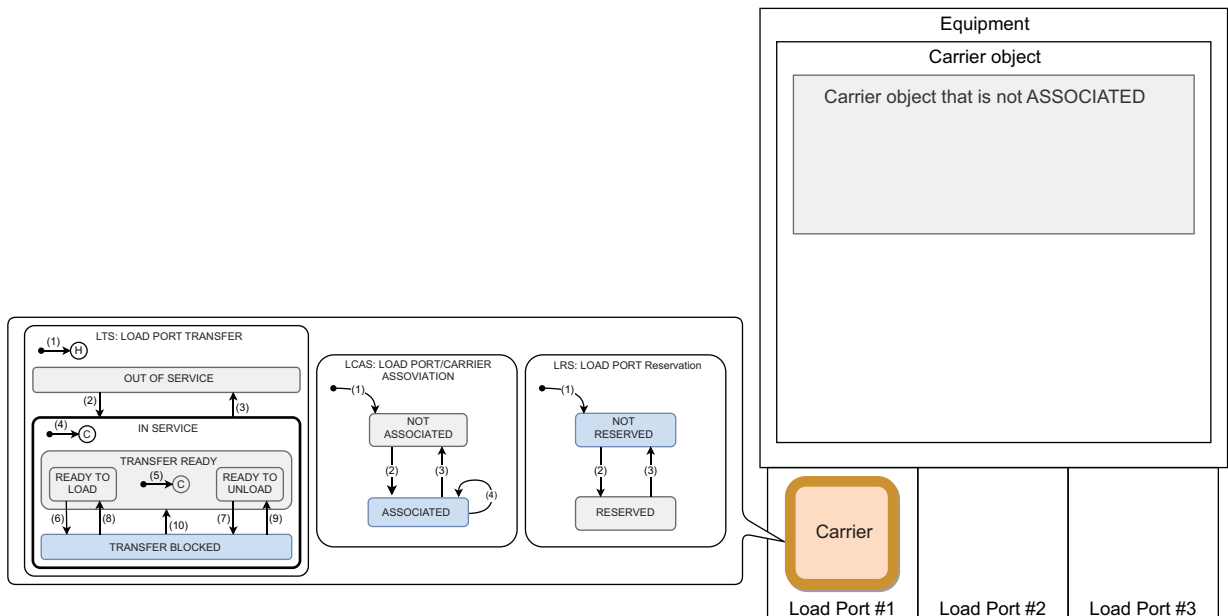


Example (2): When the host instructs continuation of the unregistered carrier A by using the 'ProceedWithCarrier' service (S3F17) in response to a 'CarrierID read fail event report (S6F11)' or 'UnKnown CarrierID event report (S6F11)' for a carrier with the carrier ID unknown from equipment

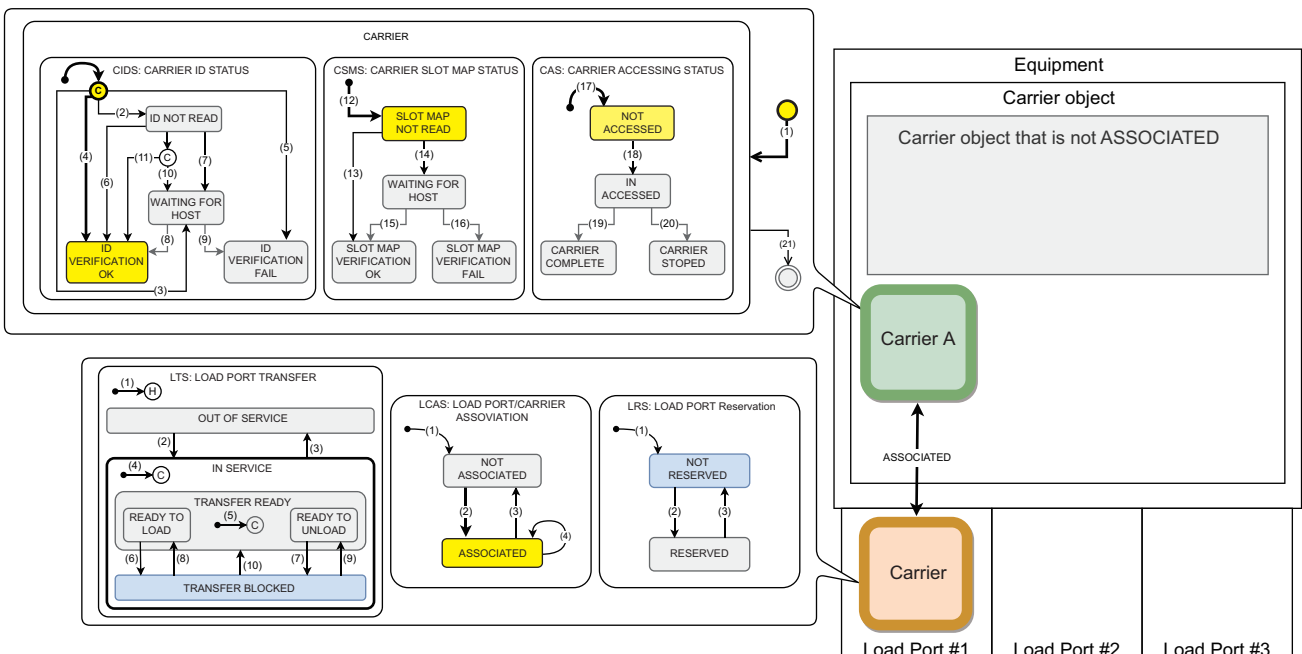
Point

The parameters 'CarrierID (ObjID),' 'PortID (PTN),' and 'PropertiesList' are required to be provided from the host.

- Before transition



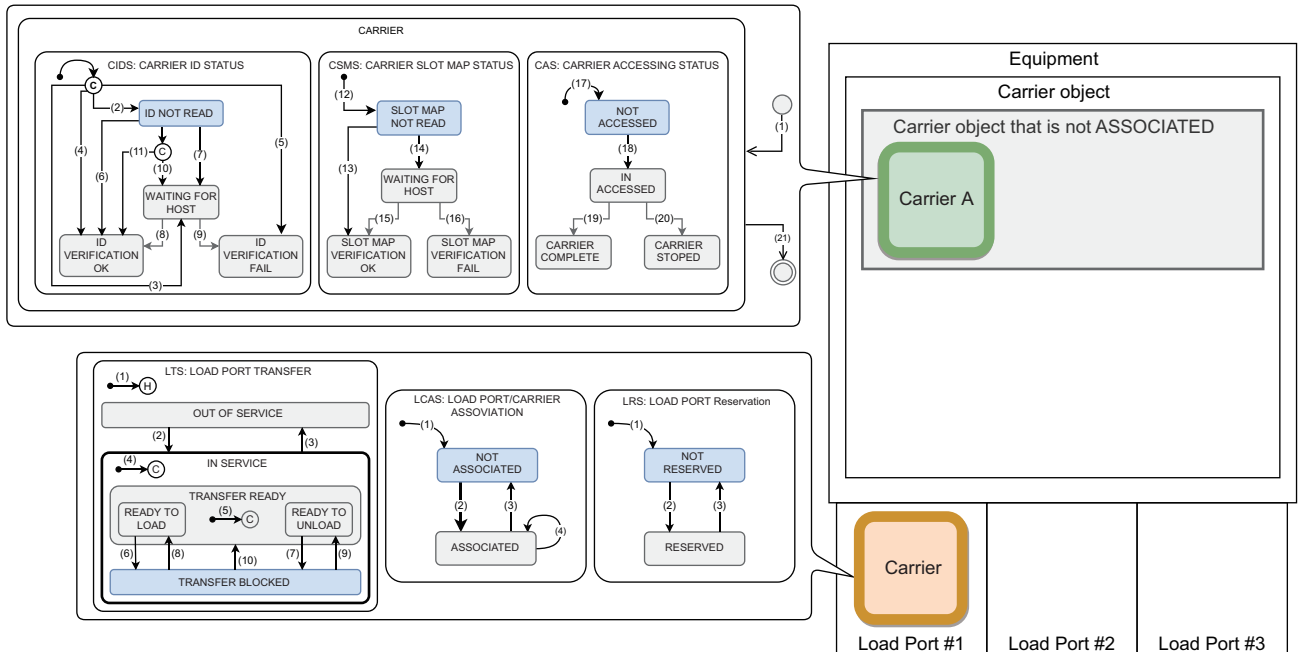
- After transition



A

Example (3): When the host instructs continuation of the registered carrier A by using the 'ProceedWithCarrier' service (S3F17) in response to a 'CarrierID read fail event report (S6F11)' or 'UnKnown CarrierID event report (S6F11)' for a carrier with the carrier ID unknown from equipment

- Before transition



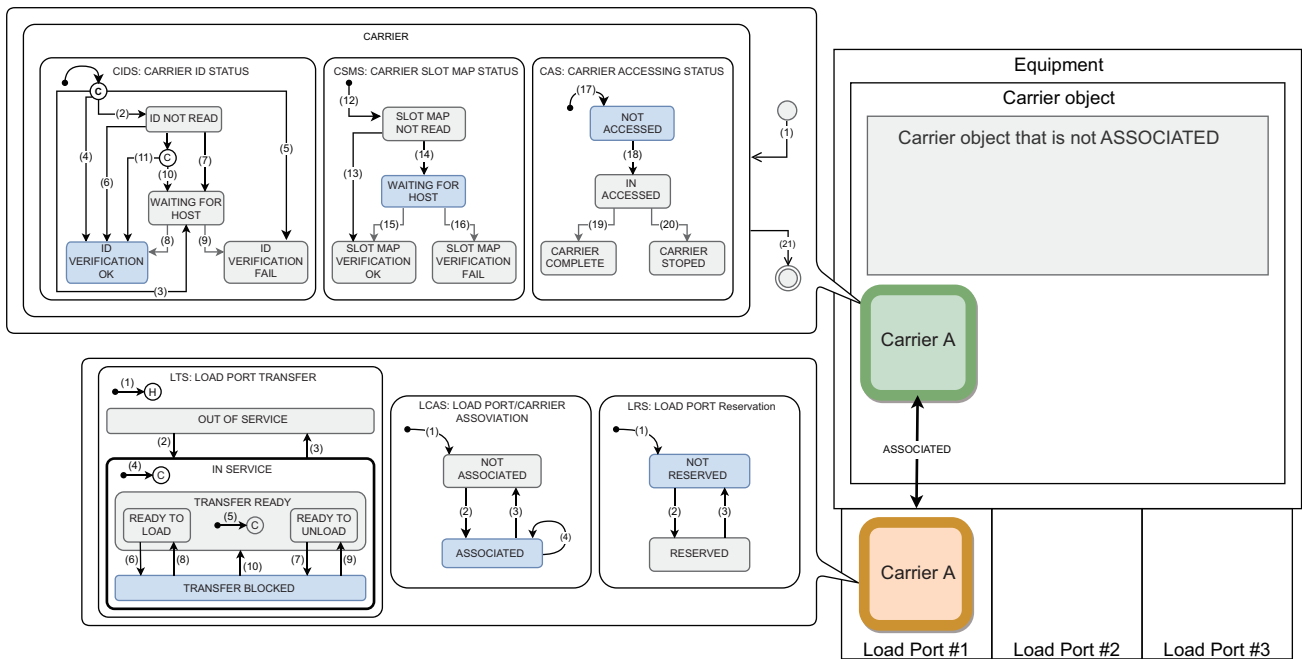
- After transition

The request is denied, and error code 11 is returned.

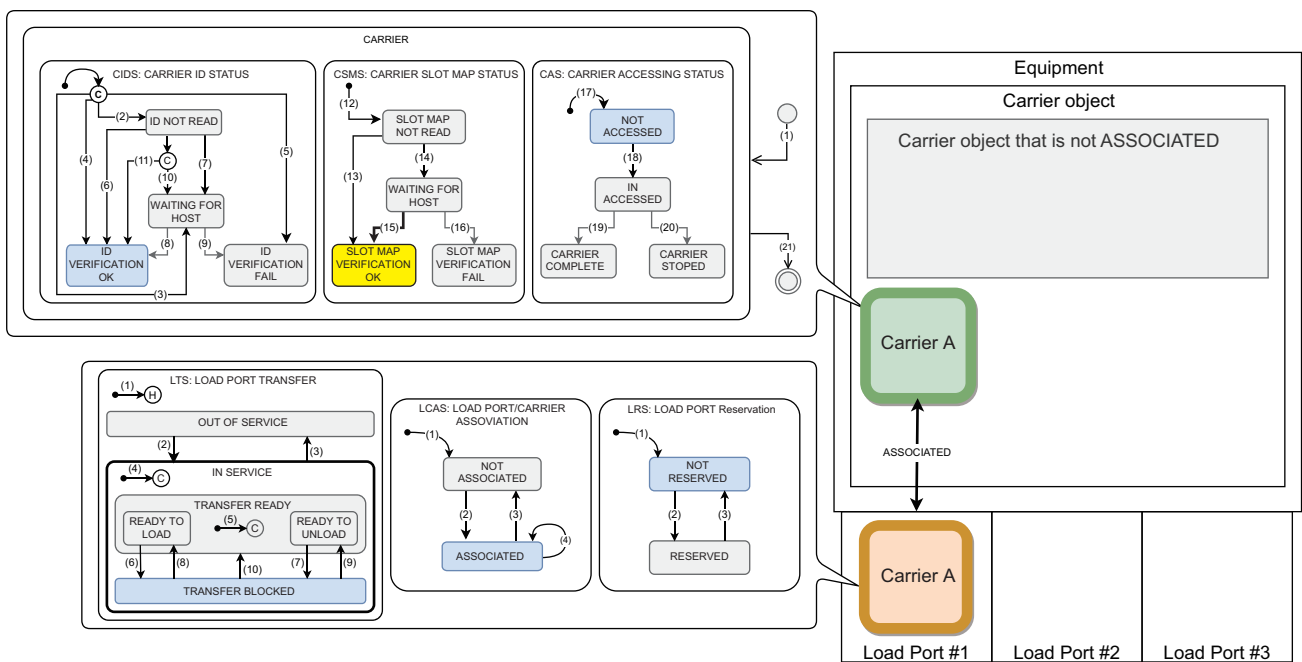
The host must delete an existing instance of carrier A by using the 'CancelCarrierNotification' service, then create a new instance of carrier A by using the 'ProceedWithCarrier' service.

Example (4): When the host instructs continuation by using the 'ProceedWithCarrier' service (S3F17) in response to a 'SLOT MAP NOT READ to WAITING FOR HOST' event report (S6F11)' for carrier A from equipment

• Before transition



• After transition



A

S3F18: Carrier Action Acknowledge

Message format

S3F18

```
1. L[2]          // CMStatus
  1. U1[1]       // CAACK
  2. L[0..256]   // Status
    1. L[2]
      1. U2[1]    // ErrorCode
      2. A[1..120] // ErrorText
    :
  :
```

Point

Transaction of S3F18 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

'S3F18: Carrier Action Acknowledge' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CMStatus	○	—	Refer to 'Combinations of CMStatus.'

Combinations of CMStatus

Point

- Only one CAACK can be notified; therefore, the smallest number is notified.
- If an error with the same ErrorCode occurs multiple times, it is reported only once.

• Bind

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	4	Unknown attribute name	The attribute name is unknown.
	7	Invalid attribute value	The attribute value is invalid.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	11	Object identifier in use	The object identifier is in use.
	48	Load port does not exist	The load port does not exist.
	49	Load port already in use	The load port is already in use.
	32770	Action failed due to errors	The action failed due to errors.

- CancelBind

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	3	Unknown object instance	The object instance is unknown.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	48	Load port does not exist	The load port does not exist.
	49	Load port already in use	The load port is already in use.
	32770	Action failed due to errors	The action failed due to errors.

- CancelCarrier

CAACK	ErrorCode	ErrorText	Remarks
4: Acknowledge, request will be performed with completion signaled later by an event.	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	3	Unknown object instance	The object instance is unknown.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	11	Object identifier in use	The object identifier is in use.
	48	Load port does not exist	The load port does not exist.
	49	Load port already in use	The load port is already in use.
	32770	Action failed due to errors	The action failed due to errors.

- CancelCarrierAtPort

CAACK	ErrorCode	ErrorText	Remarks
4: Acknowledge, request will be performed with completion signaled later by an event.	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	48	Load port does not exist	The load port does not exist.
	50	Missing Carrier	The carrier is unknown.
	32770	Action failed due to errors	The action failed due to errors.

- CancelCarrierNotification

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	3	Unknown object instance	The object instance is unknown.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	32770	Action failed due to errors	The action failed due to errors.

- CancelCarrierOut

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	3	Unknown object instance	The object instance is unknown.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	32770	Action failed due to errors	The action failed due to errors.

- CarrierIn

CAACK	ErrorCode	ErrorText	Remarks
4: Acknowledge, request will be performed with completion signaled later by an event.	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	3	Unknown object instance	The object instance is unknown.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	32770	Action failed due to errors	The action failed due to errors.

- CarrierNotification

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	4	Unknown attribute name	The attribute name is unknown.
	7	Invalid attribute value	The attribute value is invalid.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	11	Object identifier in use	The object identifier is in use.
	32770	Action failed due to errors	The action failed due to errors.

- CarrierOut

CAACK	ErrorCode	ErrorText	Remarks
4: Acknowledge, request will be performed with completion signaled later by an event.	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	3	Unknown object instance	The object instance is unknown.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	48	Load port does not exist	The load port does not exist.
	32770	Action failed due to errors	The action failed due to errors.

- CarrierRelease

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	3	Unknown object instance	The object instance is unknown.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	48	Load port does not exist	The load port does not exist.
	32770	Action failed due to errors	The action failed due to errors.

- CarrierReCreate

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	3	Unknown object instance	The object instance is unknown.
	4	Unknown attribute name	The attribute name is unknown.
	7	Invalid attribute value	The attribute value is invalid.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	49	Load port already in use	The load port is already in use.
	32770	Action failed due to errors	The action failed due to errors.

- ProceedWithCarrier

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	4	Unknown attribute name	The attribute name is unknown.
	7	Invalid attribute value	The attribute value is invalid.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	11	Object identifier in use	The object identifier is in use.
	48	Load port does not exist	The load port does not exist.
	49	Load port already in use	The load port is already in use.
	32770	Action failed due to errors	The action failed due to errors.

S3F19: CancelAllCarrierOut

Message format

S3F19

(Header only)

Point

Transaction of S3F19 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S3F20: Cancel All Carrier Out Acknowledge' is sent to the host.

Point

SECS/GEM communication software does not queue the 'CarrierOut' service. Therefore, the software notifies CM-Acknowledge (CAACK) '0: Acknowledge, command has been performed.'

2. '10087-00902: CancelAllCarrierOut service notification' is sent to a control CPU.

Parameters

None

Attribute setting

None

Other error judgment

None

S3F20: Cancel All Carrier Out Acknowledge

Message format

S3F20

1. L[2] // CMStatus
 1. U1[1] // CAACK
2. L[0..256] // Status
 1. L[2]
 1. U2[1] // ErrorCode
 2. A[1..120] // ErrorText
- ⋮

Point

Transaction of S3F20 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

'S3F20: Cancel All Carrier Out Acknowledge' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CMStatus	○	—	Refer to 'Combinations of CMStatus.'

Combinations of CMStatus

Point

- Only one CAACK can be notified; therefore, the smallest number is notified.
- If an error with the same ErrorCode occurs multiple times, it is reported only once.

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	<ul style="list-style-type: none">• The command is invalid for the current status.• For fixed buffer equipment
5: Rejected. Invalid state.	32770	Action failed due to errors	The action failed due to errors.

A

S3F25: Port Action Request

Message format

S3F25

1. L[3]

1. A[1..80] // PORTACTION
2. U1[0..1] // PortID (PTN)
3. L[0..256] // ParametersList
 1. L[2]
 1. A[1..80] // ParameterName
 2. any // ParameterValue

:



Transaction of S3F25 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

Refer to each port action.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PORTACTION	○	—	A supported port action*1 <ul style="list-style-type: none">• "ChangeServiceStatus"• "ReserveAtPort"• "CancelReservationAtPort"	Yes	12: Unknown
PortID (PTN)	—	○	Refer to each port action.		
PropertiesList	—	○	Refer to each port action.		

*1 Note that characters are case-sensitive.

■S3F25: ChangeServiceStatus

Message format

S3F25

1. L[3]

1. A[19] // PORTACTION "ChangeServiceStatus"

2. U1[1] // PortID (PTN)

3. L[1] // ParametersList

1. L[2]

1. A[13] // ParameterName "ServiceStatus"

2. U1[1] // ParameterValue "0" or "1"

Point

Transaction of S3F25 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'ChangeServiceStatus' service but also for all S3F25 services.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S3F26: Port Action Acknowledge' is sent to the host.

Point

The 'ChangeServiceStatus' service is a deferred completion event target service.

If no error occurs in error judgment by using the 'ChangeServiceStatus' service, SECS/GEM communication software notifies CM-Acknowledge (CAACK) '4: Acknowledge, request will be performed with completion signaled later by an event.'

('0: Acknowledge, command has been performed.' is not notified.)

3. '10087-00917: ChangeServiceStatus service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PORTACTION	○	—	"ChangeServiceStatus"	Yes	12: Unknown
PortID (PTN)	○	—	—	Yes	• 13: Omitted (zero length) • 48: Out of applicable range
ServiceStatus (ParametersList)	○	—	ParameterName: "ServiceStatus" ParameterValue: 0 (OUT OF SERVICE) or 1 (IN SERVICE) ( Page 54 Load port object)	Yes	• 13: Omitted (zero length list) • 13: ServiceStatus not provided • 12: Parameter name unknown • 12: Out of applicable range

A

■S3F25: ReserveAtPort

Message format

S3F25

1. L[3]

1. A[13] // PORTACTION "ReserveAtPort"

2. U1[1] // PortID (PTN)

3. L[0] // ParametersList

Point

Transaction of S3F25 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'ReserveAtPort' service but also for all S3F25 services. For details on the transaction definition, refer to the following:

IC Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S3F26: Port Action Acknowledge' is sent to the host.

3. When CAACK is '0,' '10087-00919: ReserveAtPort service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PORTACTION	○	—	"ReserveAtPort"	Yes	12: Unknown
PortID (PTN)	○	—	—	Yes	<ul style="list-style-type: none"> • 13: Omitted (zero length) • 48: Out of applicable range • Refer to 'Combinations of load port statuses' in 'Other error judgment.'
ServiceStatus (ParametersList)	—	—	Not required (zero length). Ignored even if provided.	None	—

Other error judgment

Combinations of load port statuses

Load Port Transfer State Model	Load Port/Carrier Association State Model	Load Port Reservation State Model	Judgment result	Error code
0 = OUT OF SERVICE	Not concerned	Not concerned	NG	17
1 = TRANSFER BLOCKED	Not concerned	Not concerned	NG	49
2 = READY TO LOAD	0 = NOT ASSOCIATED	0 = NOT RESERVED	OK	—
		1 = RESERVED	NG	49
	1 = ASSOCIATED	Not concerned	NG	49
3 = READY TO UNLOAD	Not concerned	Not concerned	NG	49

■S3F25: CancelReservationAtPort

Message format

S3F25

1. L[3]

1. A[23] // PORTACTION "CancelReservationAtPort"
2. U1[1] // PortID (PTN)
3. L[0] // ParametersList

Point

Transaction of S3F25 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for the 'CancelReservationAtPort' service but also for all S3F25 services.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S3F26: Port Action Acknowledge' is sent to the host.

3. When CAACK is '0,' '10087-00908: CancelReservationAtPort service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PORTACTION	○	—	"CancelReservationAtPort"	Yes	12: Unknown
PortID (PTN)	○	—	—	Yes	• 13: Omitted (zero length) • 48: Out of applicable range • Refer to 'Combinations of load port statuses' in 'Other error judgment.'
ServiceStatus (ParametersList)	—	—	Not required (zero length). Ignored even if provided.	None	—

Other error judgment

Combinations of load port statuses

Load Port Transfer State Model	Load Port/Carrier Association State Model	Load Port Reservation State Model	Judgment result	Error code
0 = OUT OF SERVICE	Not concerned	Not concerned	NG	17
1 = TRANSFER BLOCKED	Not concerned	Not concerned	NG	17
2 = READY TO LOAD	0 = NOT ASSOCIATED	0 = NOT RESERVED	NG	17
		1 = RESERVED	OK	—
	1 = ASSOCIATED	Not concerned	NG	17
3 = READY TO UNLOAD	Not concerned	Not concerned	NG	17

S3F26: Port Action Acknowledge

Message format

S3F26

1. L[2] // CMStatus
 1. U1[1] // CAACK
2. L[0..256] // Status
 1. L[2]
 1. U2[1] // ErrorCode
 2. A[1..120] // ErrorText
- ⋮

Point

Transaction of S3F26 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

'S3F26: Port Action Acknowledge' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CMStatus	○	—	Refer to 'Combinations of CMStatus.'

Combinations of CMStatus

Point

- Only one CAACK can be notified; therefore, the smallest number is notified.
- If an error with the same ErrorCode occurs multiple times, it is reported only once.

• CancelCarrierAtPort

CAACK	ErrorCode	ErrorText	Remarks
4: Acknowledge, request will be performed with completion signaled later by an event.	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	48	Load port does not exist	The load port does not exist.
	32770	Action failed due to errors	The action failed due to errors.

• ReserveAtPort

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	48	Load port does not exist	The load port does not exist.
	49	Load port already in use	The load port is already in use.
	32770	Action failed due to errors	The action failed due to errors.

- CancelReservationAtPort

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	—
2: Cannot perform now.	17	Command not valid for current state	The command is invalid for the current status.
3: Invalid data or argument.	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
5: Rejected. Invalid state.	48	Load port does not exist	The load port does not exist.
	32770	Action failed due to errors	The action failed due to errors.

S3F27: Change Access

Message format

S3F27

1. L[2]

1. U1[1] // AccessMode

2. L[0..6] // PortList

1. U1[1] // PortID (PTN)

⋮

Point

Transaction of S3F27 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S3F28: Change Access Acknowledge' is sent to the host.

3. When the access mode is changed, '10087-00916: ChangeAccess service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
AccessMode	○	—	0 = MANUAL, 1 = AUTO The following change instructions are also allowed: MANUAL → MANUAL, AUTO → AUTO	Yes	12: Invalid value
PortList	○	—	When it is L[0], all load ports are targeted.	Yes	48: Out of applicable range Refer to 'Combinations of load port statuses' in 'Other error judgment.'

Other error judgment

Combinations of load port statuses

Load Port Reservation State Model	Load Port Transfer State Model	Judgment result	Error code
0 = NOT RESERVED	0 = OUT OF SERVICE	OK	—
	1 = TRANSFER BLOCKED	NG	17
	2 = READY TO LOAD	OK	—
	3 = READY TO UNLOAD	OK	—
1 = RESERVED	Not concerned	NG	17

S3F28: Change Access Acknowledge

Message format

S3F28

1. L[2] // CMStatus
 1. U1[1] // CAACK
 2. L[0..256] // Status
 1. L[3]
 1. U1[1] // PortID (PTN)
 2. U2[1] // ErrorCode
 3. A[1..120] // ErrorText
- ⋮

Point

Transaction of S3F28 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:
 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S3F28: Change Access Acknowledge' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CMStatus	○	—	<ul style="list-style-type: none">• When there is no error: CAACK = 0, Status = L[0]• PortID (PTN) indicates the load port number for which the access mode change failed• Refer to 'Combinations of CMStatus.'

Combinations of CMStatus

CAACK	ErrorCode	ErrorText	Remarks
0: Execution completed	—	—	Specified access mode has been set for each load port specified.
2: Cannot perform now.	17	Command not valid for current state	<ul style="list-style-type: none">• Invalid command for the current equipment state• Specified access mode cannot be set for any load ports specified.
3: Invalid data or argument.	12	Parameters improperly specified	Parameters are not properly specified.
5: Rejected. Invalid state.	48	Load port does not exist	None of the specified load ports exist.
	32770	Action failed due to errors	The action failed due to errors.
6: Command performed with errors.	17	Command not valid for current state	A load port whose access mode has been changed or cannot be changed is specified.
	48	Load port does not exist	A load port whose access mode has been changed or a load port that does not exist is specified.

Point

Only one CAACK can be notified; therefore, the smallest number is notified.
If an error with the same ErrorCode occurs multiple times, it is reported only once.

Example when an error (ErrorCode 17) occurs

S3F27

1. L[2]
 1. <AccessMode> 0 (MANUAL)
 2. L[0] (All load ports are targeted.)

1) When GEM300 functions are not enabled

S3F28

1. L[2]
 1. <CAACK> 2 (Cannot perform now.)
2. L[1]
 1. L[3]
 1. <PTN> 0 (No load port number because the equipment is targeted)
 2. <ErrorCode> 17
 3. <ErrorText> "Command not valid for current state"

2) When only AccessMode of the load port 1 cannot be changed

S3F28

1. L[2]
 1. <CAACK> 6 (Command performed with errors.)
2. L[1]
 1. L[3]
 1. <PTN> 1 (Load port 1 is targeted.)
 2. <ErrorCode> 17
 3. <ErrorText> "Command not valid for current state"

Stream 14 Object Service

The following shows the details on the service messages.

S14F1: GetAttr Request

Message format

S14F1

1. L[5]

1. A[0..80] // OBJSPEC

2. A[1..80] // ObjType

3. L[0..1024] // ObjID list

1. A[1..80] // ObjID

:

4. L[0] // AttrFilter is not supported.

5. L[0..256] // AttrID list

1. A[1..80] // AttrID

:



Transaction of S14F1 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S14F2: GetAttr Data' is sent to the host.

A



A control CPU is not notified of anything.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
OBJSPEC	—	○	Can be omitted (zero length). Ignored even if provided.	None	—
ObjType	○	—	ObjType of the target object*1 • "Carrier" • "LoadPort" • "Location" • "InternalBuffer" • "Substrate" • "SubstLoc" • "BatchLoc" • "ControlJob" • "ProcessJob" For the target GEM300-related objects, refer to the following: Page 53 GEM300-Related Object List	Yes	6: Unknown (When omitted, 'S9F7: Illegal Data' is returned.)
ObjID list	—	○	Up to 1024 ObjIDs can be specified. When specifying '0', all objects of the target ObjType are targeted.	Yes	3: Unknown

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
AttrFilter	—	○	Not supported by SECS/GEM communication software. Ignored even if provided.	None	—
AttrID list	—	○	Up to 256 AttrIDs can be specified. When specifying '0', all attributes of the target object are targeted.	Yes	4: Attribute name unknown

*1 Note that characters are case-sensitive.

For AttrID (attribute name), refer to the following:

☞ Page 54 Load port object

☞ Page 56 Location object

☞ Page 57 Internal buffer object

☞ Page 59 Carrier Objects

☞ Page 136 Substrate Objects

☞ Page 140 Substrate Location Objects

☞ Page 141 Batch Location Objects

☞ Page 103 Control Job Object

☞ Page 125 Process Job Objects

Attribute setting

None

Other error judgment

None

S14F2: GetAttr Data

Message format

S14F2

1. L[2]

1. L[0..1024] // ObjSetting list

1. L[2]

1. A[1..80] // ObjID

2. L[0..256] // AttrID list

1. L[2]

1. A[1..80] // AttrID

2. any // AttrData

⋮

⋮

⋮

2. L[2] // ObjStatus

1. U1[1] // OBJACK

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

⋮

Point

Transaction of S14F2 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

A

Processing during automatic response

'S14F2: GetAttr Data' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
ObjSetting	○	—	An attribute of an object acquired by using GetAttr Request (When nothing can be acquired: LIST [0])
ObjStatus	○	—	Refer to 'Combinations of ObjStatus.'

Refer to the following:

 Page 54 Load port object

 Page 56 Location object

 Page 57 Internal buffer object

 Page 59 Carrier Objects

 Page 136 Substrate Objects

 Page 140 Substrate Location Objects

 Page 141 Batch Location Objects

 Page 103 Control Job Object

 Page 125 Process Job Objects

Combinations of ObjStatus

ObjAck	ErrorCode	ErrorText	Supplement
0: Execution completed	—	—	—

ObjAck	ErrorCode	ErrorText	Supplement
1: Error	3	Unknown object instance	The object instance is unknown.
	4	Unknown attribute name	The attribute name is unknown.
	6	Unknown object type	The object type is unknown.
	17	Command not valid for current state	The command is invalid for the current status.
	32770	Action failed due to errors	The action failed due to errors.



If an error with the same ErrorCode occurs multiple times, it is reported only once.

Example when errors (ErrorCode 3 and 4) occur

S14F1

1. L[5]

1. <OBJSPEC>

2. <OBJTYPE> "SubstLoc"

3. L[3]

1. <OBJID> "SubstLoc_1"

2. <OBJID> "SubstLoc_2"

3. <OBJID> "Carrier_01" ←Specification error: ObjID that does not exist in "SubstLoc"

4. L[0]

5. L[3]

1. <ATTRID> "DisableEvents"

2. <ATTRID> "SubstLocState"

3. <ATTRID> "Usage" ←Specification error: AttrID that does not exist in "SubstLoc"

S14F2

1. L[2]

1. L[2] ←L[2] instead of L[3] because a non-existent ObjID is discarded

1. L[2]

1. <OBJID> "SubstLoc_1"

2. L[2] ←L[2] instead of L[3] because a non-existent AttrID is discarded

1. L[2]

1. <ATTRID> "DisableEvents"

2. <ATTRDATA> false

2. L[2]

1. <ATTRID> "SubstLocState"

2. <ATTRDATA> 0

--- Non-existent AttrID "Usage" is discarded. ---

2. L[2]

1. <OBJID> "SubstLoc_2"

2. L[2] ←L[2] instead of L[3] because a non-existent AttrID is discarded

1. L[2]

1. <ATTRID> "DisableEvents"

2. <ATTRDATA> false

2. L[2]

1. <ATTRID> "SubstLocState"

2. <ATTRDATA> 0

--- Non-existent AttrID "Usage" is discarded. ---

--- Non-existent ObjID "Carrier_01" is discarded. ---

2. L[2]

1. <OBJACK> 1 (error)

2. L[2]

1. L[2]

1. <ERRCODE> 3 ←Error for a non-existent ObjID
 2. <ERRTEXT> "Unknown object instance"
2. L[2]
1. <ERRCODE> 4 ←Error for a non-existent AttrID
 2. <ERRTEXT> "Unknown attribute name"

S14F3: SetAttr Request

Message format

S14F3

1. L[4]

1. A[0..80] // OBJSPEC

2. A[1..80] // ObjType

3. L[0..1024] // ObjID list

1. A[1..80] // ObjID

⋮

4. L[0..256] // AttrSetting list

1. L[2]

1. A[1..80] // AttrID

2. any // AttrData

⋮



Transaction of S14F3 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters and attributes are determined.

Refer to 'Parameters' and 'Attribute setting' for this object service.

2. 'S14F4: SetAttr Data' is sent to the host.

3. When changing the attribute value of the target object, a control CPU is notified of the change.

- Substrate object: '10090-01003: SetAttr service (Substrate) notification'
- Substrate location object: '10090-01013: SetAttr service (SubstLoc) notification'
- Batch location object: '10090-01023: SetAttr service (BatchLoc) notification'
- Control job object: '10094-01003: SetAttr service (ControlJob) notification'

Other objects do not have attributes that can be changed by the host; therefore, the control CPU is not notified of anything.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
OBJSPEC	—	○	Can be omitted (zero length). Ignored even if provided.	None	—
ObjType	○	—	ObjType of the target object*1 <ul style="list-style-type: none"> • "Carrier" • "LoadPort" • "Location" • "InternalBuffer" • "Substrate" • "SubstLoc" • "BatchLoc" • "ControlJob" • "ProcessJob" For the target GEM300-related objects, refer to the following: Page 53 GEM300-Related Object List	Yes	6: Unknown (When omitted, 'S9F7: Illegal Data' is returned.)
ObjID list	—	○	Up to 1024 ObjIDs can be specified. When specifying '0', all objects of the target ObjType are targeted.	Yes	3: Unknown

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
AttrSetting list	○	—	An attribute of the target object. It can be changed when the access from host is the 'Read Write' attribute.	Yes	<ul style="list-style-type: none"> • 13: Omitted • 4: Attribute name unknown • 5: Read only • 7: Invalid value

*1 Note that characters are case-sensitive.

Attribute setting

(1) Load port object

There are no attributes that can be changed by the host.

For attribute formats of a load port object, refer to the following:

📖 Page 54 Load port object

(2) Location object

There are no attributes that can be changed by the host.

For attribute formats of a location object, refer to the following:

📖 Page 56 Location object

(3) Internal buffer object

There are no attributes that can be changed by the host.

For attribute formats of an internal buffer object, refer to the following:

📖 Page 57 Internal buffer object

(4) Carrier object

There are no attributes that can be changed by the host.

For attribute formats of a carrier object, refer to the following:

📖 Page 59 Carrier Objects

(5) Substrate object

For attribute formats of a substrate object, refer to the following:

📖 Page 136 Substrate Objects

- When the same attributes are provided, the value that appears earlier is overwritten by the value that appears later (last-win).

For LIST attributes, only applicable values are overwritten.

Ex.

- 1 If LIST [1] attributes are provided after LIST [3] attributes, the number of lists remains at 3 and only attribute values for LIST [1] are overwritten. (LIST [2] and [3] remain the same.)
- 2 If LIST [3] attributes are provided after LIST [1] attributes, the number of lists is changed to 3 and attribute values for LIST [1] to [3] are overwritten.

Attributes that can be changed by the host

Attribute name	Access from host	Error judgment condition and error code
LotID	Read Write	7: Other than ASCII*2
SubstType	Read Write	<ul style="list-style-type: none"> • 7: Out of applicable range for the data type • 9: Unknown (No applicable user definition)
SubstUsage	Read Write	<ul style="list-style-type: none"> • 7: Out of applicable range for the data type • 9: Unknown (No applicable user definition)

*2 Excluding the control characters.

(6) Substrate location object

For attribute formats of a substrate location object, refer to the following:

 Page 140 Substrate Location Objects

- When the same attributes are provided, the value that appears earlier is overwritten by the value that appears later (last-win).

For LIST attributes, only applicable values are overwritten.

Ex.

- ❶ If LIST [1] attributes are provided after LIST [3] attributes, the number of lists remains at 3 and only attribute values for LIST [1] are overwritten. (LIST [2] and [3] remain the same.)
- ❷ If LIST [3] attributes are provided after LIST [1] attributes, the number of lists is changed to 3 and attribute values for LIST [1] to [3] are overwritten.

Attribute that can be changed by the host

Attribute name	Access from host	Error judgment condition and error code
DisableEvents	Read Write	7: Out of applicable range

(7) Batch location object

For attribute formats of a batch location object, refer to the following:

 Page 141 Batch Location Objects

- When the same attributes are provided, the value that appears earlier is overwritten by the value that appears later (last-win).

For LIST attributes, only applicable values are overwritten.

Ex.

- ❶ If LIST [1] attributes are provided after LIST [3] attributes, the number of lists remains at 3 and only attribute values for LIST [1] are overwritten. (LIST [2] and [3] remain the same.)
- ❷ If LIST [3] attributes are provided after LIST [1] attributes, the number of lists is changed to 3 and attribute values for LIST [1] to [3] are overwritten.

Attribute that can be changed by the host

Attribute name	Access from host	Error judgment condition and error code
DisableEvents	Read Write	7: Out of applicable range

(8) Control job object

For attribute formats of a control job object, refer to the following:

 Page 103 Control Job Object

- When the same attributes are provided, the value that appears earlier is overwritten by the value that appears later (last-win).

For LIST attributes, only applicable values are overwritten.

Ex.

- If LIST [1] attributes are provided after LIST [3] attributes, the number of lists remains at 3 and only attribute values for LIST [1] are overwritten. (LIST [2] and [3] remain the same.)
- If LIST [3] attributes are provided after LIST [1] attributes, the number of lists is changed to 3 and attribute values for LIST [1] to [3] are overwritten.

Attributes that can be changed by the host

Attribute name	Access from host	State of which the attribute value cannot be changed	Error judgment condition and error code
ProcessingCtrlSpec	Read Write	<ul style="list-style-type: none"> 3 = EXECUTING 5 = COMPLETED 	Refer to the following:  Page 454 Control job object <ul style="list-style-type: none"> 17: State is 'EXECUTING' 17: State is 'COMPLETED'
CarrierInputSpec	Read Write	<ul style="list-style-type: none"> 3 = EXECUTING 5 = COMPLETED 	Refer to the following:  Page 454 Control job object <ul style="list-style-type: none"> 17: State is 'EXECUTING' 17: State is 'COMPLETED'
MtrlOutSpec	Read Write ^{*3}	5 = COMPLETED	Refer to the following:  Page 454 Control job object <ul style="list-style-type: none"> 14: Not support material redirection mode 14: Not support incomplete MtrlOutSpec 17: State is 'COMPLETED' 9: A value, which is other than the DestinationMap value left blank (L[0]) when creating a control job object, has been changed. (Including when values of unchanged SourceMap and DestinationMap are not provided) 9: Same combinations of CarrierID and SubstrateLocation (SlotID)^{*4} exist in DestinationMap. (Duplication) SECS/GEM communication software is not aware of whether 'material has arrived at a destination' and 'material is being transferred.'
MtrlOutbyStatus	Read Write	<ul style="list-style-type: none"> 3 = EXECUTING 5 = COMPLETED 	Refer to the following:  Page 454 Control job object <ul style="list-style-type: none"> 17: State is 'EXECUTING' 17: State is 'COMPLETED'
ProcessOrderMgmt	Read Write	<ul style="list-style-type: none"> 3 = EXECUTING 5 = COMPLETED 	Refer to the following:  Page 454 Control job object <ul style="list-style-type: none"> 17: State is 'EXECUTING' 17: State is 'COMPLETED'
PauseEvent	Read Write	<ul style="list-style-type: none"> 3 = EXECUTING 5 = COMPLETED 	Refer to the following:  Page 454 Control job object <ul style="list-style-type: none"> 17: State is 'EXECUTING' 17: State is 'COMPLETED'
DataCollectionPlan	Read Write	<ul style="list-style-type: none"> 3 = EXECUTING 5 = COMPLETED 	Refer to the following:  Page 454 Control job object <ul style="list-style-type: none"> 17: State is 'EXECUTING' 17: State is 'COMPLETED'

^{*3} Only blank DestinationMap can be changed.

^{*4} If omitted, it is assumed that all SlotIDs are specified in ascending order.

(9) Process job object

There are no attributes that can be changed by the host.

For attribute formats of a process job object, refer to the following:

 Page 125 Process Job Objects

Other error judgment

None

S14F4: SetAttr Data

Message format

S14F4

1. L[2]

1. L[0..1024] // ObjSetting list

1. L[2]

1. A[1..80] // ObjID

2. L[1..256] // AttrID list

1. L[2]

1. A[1..80] // AttrID

2. any // AttrData

⋮

⋮

⋮

2. L[2] // ObjStatus

1. U1[1] // OBJACK

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

⋮

Point

Transaction of S14F4 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

A

Processing during automatic response

'S14F4: SetAttr Data' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
ObjSetting	○	—	An attribute value as the result of 'SetAttr.' When ObjStatus indicates an error, a requested setting value may not be applied.
ObjStatus	○	—	Refer to 'Combinations of ObjStatus.'

Refer to the following:

 Page 54 Load port object

 Page 56 Location object

 Page 57 Internal buffer object

 Page 59 Carrier Objects

 Page 103 Control Job Object

 Page 125 Process Job Objects

 Page 136 Substrate Objects

 Page 140 Substrate Location Objects

 Page 141 Batch Location Objects

Combinations of ObjStatus

ObjAck	ErrorCode	ErrorText	Supplement
0: Execution completed	—	—	—
1: Error	3	Unknown object instance	The object instance is unknown.
	4	Unknown attribute name	The attribute name is unknown.
	5	Read-only attribute - access denied	The attribute is read-only, and access is denied.
	6	Unknown object type	The object type is unknown.
	7	Invalid attribute value	The attribute value is invalid.
	9	Verification error	Verification error
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
	17	Command not valid for current state	The command is invalid for the current status.
	32770	Action failed due to errors	The action failed due to errors.



If an error with the same ErrorCode occurs multiple times, it is reported only once.

Example when errors (ErrorCode 3, 4, and 5) occur

S14F3

1. L[4]

1. <OBJSPEC>

2. <OBJTYPE> "SubstLoc"

3. L[3]

1. <OBJID> "SubstLoc_1"

2. <OBJID> "SubstLoc_2"

3. <OBJID> "Carrier_01" ←Specification error: ObjID that does not exist in "SubstLoc"

4. L[3]

1. L[2]

1. <ATTRID> "DisableEvents"

2. <ATTRDATA> true

2. L[2]

1. <ATTRID> "SubstLocState" ←Specification error: Read Only attribute

2. <ATTRDATA> 1

3. L[2]

1. <ATTRID> "Usage" ←Specification error: AttrID that does not exist in "SubstLoc"

2. <ATTRDATA> "TEST"

S14F4

1. L[2]

1. L[3]

1. L[3]

1. <OBJID> "SubstLoc_1"

2. L[2] ←L[2] instead of L[3] because a non-existent AttrID is discarded

1. L[2]

1. <ATTRID> "DisableEvents"

2. <ATTRDATA> true

2. L[2]

1. <ATTRID> "SubstLocState" ←Read Only attribute

2. <ATTRDATA> 0 ←Current value because the change is unavailable

--- Non-existent AttrID "Usage" is discarded. ---

2. L[2]

1. <OBJID> "SubstLoc_2"

2. L[2] ←L[2] instead of L[3] because a non-existent AttrID is discarded

1. L[2]

1. <ATTRID> "DisableEvents"

2. <ATTRDATA> true

2. L[2]

1. <ATTRID> "SubstLocState" ←Read Only attribute

2. <ATTRDATA> 0 ←Current value because the change is unavailable

--- Non-existent AttrID "Usage" is discarded. ---

3. L[2]

1. <OBJID> "Carrier_01" ←OBJID that does not exist in "SubstLoc"

2. L[0] ←L[0] because "Carrier_01" is not found

2. L[2]

1. <OBJACK> 1 (error)

2. L[2]

1. L[2]

1. <ERRCODE> 3 ←Error for a non-existent ObjID

2. <ERRTEXT> "Unknown object Instance"

2. L[2]

1. <ERRCODE> 4 ←Error for a non-existent AttrID

2. <ERRTEXT> "Unknown attribute name"

3. L[2]

1. <ERRCODE> 5 ←Error for a Read Only attribute

2. <ERRTEXT> "Read-only attribute - access denied"

A

S14F5: GetType Request

Message format

S14F5

1. A[0..80] // OBJSPEC

Point

Transaction of S14F5 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameter' shown below.

2. 'S14F6: GetType Data' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
OBJSPEC	—	○	Can be omitted (zero length). Ignored even if provided.	None	—

Attribute setting

None

Other error judgment

None

S14F6: GetType Data

Message format

S14F6

1. L[2]

1. L[0..16] // ObjType list

1. A[1..80] // ObjType

:

2. L[2] // ObjStatus

1. U1[1] // ObjAck

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

:

Point

Transaction of S14F6 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

'S14F6: GetType Data' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
ObjType list	○	—	ObjTypes of objects owned by SECS/GEM communication software
ObjStatus	○	—	Refer to 'Combinations of ObjStatus.'

Combinations of ObjStatus

ObjAck	ErrorCode	ErrorText	Supplement
0: Execution completed	—	—	—
1: Error	17	Command not valid for current state	The command is invalid for the current status.
	32770	Action failed due to errors	The action failed due to errors.

Point

If an error with the same ErrorCode occurs multiple times, it is reported only once.

A

S14F7: GetAttrName Request

Message format

S14F7

1. L[2]

1. A[0..80] // OBJSPEC
2. L[0..16] // ObjType list
 1. A[1..80] // ObjType
- ⋮



Transaction of S14F7 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. 'S14F8: GetAttrName Data' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
OBJSPEC	—	○	Can be omitted (zero length). Ignored even if provided.	None	—
ObjType list	○	—	Can be omitted (zero list). If it is omitted, all ObjTypes are targeted.	Yes	6: Unknown (N/A)

Attribute setting

None

Other error judgment

None

S14F8: GetAttrName Data

Message format

S14F8

1. L[2]

1. L[0..16] // ObjType list

1. L[2]

1. A[1..80] // ObjType

2. L[0..256] // AttrName list

1. A[1..80] // AttrName

:

:

2. L[2] // ObjStatus

1. U1[1] // ObjAck

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

:



Transaction of S14F8 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model
User's Manual

Processing during automatic response

'S14F8: GetAttrName Data' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
AttrName list	○	—	AttrName for each target object
ObjStatus	○	—	Refer to 'Combinations of ObjStatus.'

Combinations of ObjStatus

ObjAck	ErrorCode	ErrorText	Supplement
0: Execution completed	—	—	—
1: Error	6	Unknown object type	The object type is unknown.
	17	Command not valid for current state	The command is invalid for the current status.
	32770	Action failed due to errors	The action failed due to errors.



If an error with the same ErrorCode occurs multiple times, it is reported only once.

A

Example when an error (ErrorCode 6) occurs

S14F7

1. L[2]
 1. <OBJSPEC>
2. L[3]
 1. <OBJTYPE> "SubstLoc"
 2. <OBJTYPE> "BatchLoc"
 3. <OBJTYPE> "Dummy" ←Specification error: "Dummy" is a non-existent ObjType.

S14F8

1. L[2]
 1. L[3]
 1. L[2]
 1. <OBJTYPE> "SubstLoc"
 2. L[5]
 1. <ATTRID> "ObjType"
 2. <ATTRID> "ObjID"
 3. <ATTRID> "SubstID"
 4. <ATTRID> "SubstLocState"
 5. <ATTRID> "DisableEvents"
 2. L[2]
 1. <OBJTYPE> "BatchLoc"
 2. L[5]
 1. <ATTRID> "ObjType"
 2. <ATTRID> "ObjID"
 3. <ATTRID> "BatchSubstIDMap"
 4. <ATTRID> "BatchLocState"
 5. <ATTRID> "DisableEvents"
 3. L[2]
 1. <OBJTYPE> "Dummy"
 2. L[0] ←L[0] because it is a non-existent ObjType
 2. L[2]
 1. <OBJACK> 1 (error)
 2. L[1]
 1. L[2]
 1. <ERRCODE> 6 ←Error for a non-existent ObjType
 2. <ERRTEXT> "Unknown object type"

S14F9 : Create Object Request

Message format

S14F9

1. L[3]
 1. A[0..80] // OBJSPEC
 2. A[1..80] // ObjType
 3. L[0..256] // AttrSetting list
 1. L[2]
 1. A[1..80] // AttrID
 2. any // AttrData
- ⋮



Transaction of S14F9 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:
 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

■Substrate object (register substrate)

Message format

S14F9

1. L[3]
 1. A[0..80] // OBJSPEC
 2. A[9] // ObjType "Substrate"
 3. L[1..256] // AttrSetting list
 1. L[2]
 1. A[1..80] // AttrID
 2. any // AttrData
- ⋮



Transaction of S14F9 can be user-defined to disable automatic responses and controlled via the ladder.
Automatic responses will be disabled not only for substrate objects but also for all objects of S14F9.
For details on the transaction definition, refer to the following:
 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

- 1.** Errors in parameters and attributes are determined.
Refer to 'Parameters' and 'Attribute setting' for this object service.
- 2.** When all of the following conditions are satisfied, a substrate object is created.
 - The maximum number of substrate objects that can be created has not been reached.
 - ObjType and ObjID are provided.
 - SubstLocID, or BatchLocID and SubstPosInBatch are provided.
(Refer to 'Other error judgment'.)
 - There is no error in parameters and attributes.
- 3.** 'S14F10: Create Object Acknowledge' is sent to the host.
- 4.** When a substrate object is created, '10090-01001: Create service (Register substrate service) notification' is sent to a control CPU.

A

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
OBJSPEC	○	—	Can be omitted (zero length). Ignored even if provided.	None	—
ObjType	○	—	"Substrate"* ¹	Yes	<ul style="list-style-type: none"> • 6: Unknown • 14: Not targeted for Create • 17: Creation limit exceeded (When omitted, 'S9F7: Illegal Data' is returned.)
AttrSetting list	—	○	An attribute of a substrate object	Yes	<ul style="list-style-type: none"> • 13: Omitted • 4: Attribute name unknown • Refer to 'Attribute setting.'

*¹ Note that characters are case-sensitive.

Attribute setting

For attribute formats of a substrate object, refer to the following:

 Page 136 Substrate Objects

- When the same attributes are provided, the value that appears earlier is overwritten by the value that appears later (last-win).

For LIST attributes, only applicable values are overwritten.

Ex.

❶ If LIST [1] attributes are provided after LIST [3] attributes, the number of lists remains at 3 and only attribute values for LIST [1] are overwritten. (LIST [2] and [3] remain the same.)

❷ If LIST [3] attributes are provided after LIST [1] attributes, the number of lists is changed to 3 and attribute values for LIST [1] to [3] are overwritten.

○: Applicable, —: Not applicable

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
ObjType	—	—	—	Not required. Ignored even if provided.	None	—	"Substrate"
ObjID	○	—	—	ObjID is treated as a parameter because it is required.	Yes	<ul style="list-style-type: none"> • 13: Omitted • 11: ID duplication • 12: Other than ASCII*¹ 	—
SubstState	—	○	—	—	Yes	7: Out of applicable range	0: AT SOURCE
SubstProcState	—	○	—	—	Yes	7: Out of applicable range	0: NEEDS PROCESSING
SubstLocID	—	—	○	Required when instantiating a substrate object on a substrate location.	Yes	<ul style="list-style-type: none"> • 7: Other than ASCII*¹ • Refer to 'Other error judgment.' 	(Null character)
SubstSource	—	○	—	—	Yes	7: Other than ASCII* ¹	(Null character)
SubstDestination	—	○	—	—	Yes	7: Other than ASCII* ¹	(Null character)

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
SubstHistory	—	○	—	TimeIn and TimeOut are ignored even if provided.	Yes	7: Non-ASCII* ¹ History ID	LIST [0]
BatchLocID	—	—	○	Required when instantiating a substrate object on a batch location.	Yes	• 7: Other than ASCII* ¹ • Refer to 'Other error judgment.'	(Null character)
SubstPosInBatch	—	—	○	Required when instantiating a substrate object on a batch location.	Yes	• 7: Other than ASCII* ¹ • Refer to 'Other error judgment.'	(Null character)
SubstIDStatus	—	—	—	—	Yes	7: Out of applicable range	0: NOT CONFIRMED
AcquiredID	—	—	—	—	Yes	7: Other than ASCII* ¹	(Null character)
LotID	—	○	—	—	Yes	7: Other than ASCII* ¹	(Null character)
MaterialStatus	—	○	—	—	None	—	0
SubstType	—	○	—	—	Yes	• 7: Out of applicable range for the data type • 9: Unknown (No applicable user definition)	0: WAFER
SubstUsage	—	○	—	—	Yes	• 7: Out of applicable range for the data type • 9: Unknown (No applicable user definition)	0: PRODUCT

*1 Excluding the control characters.

Other error judgment

Combinations of Conditional attributes: SubstLocID, BatchLocID, and SubstPosInBatch

○: Provided, —: Not provided

SubstLocID	BatchLocID	SubstPosInBatch	Judgment result	Error code
○	—	—	OK	—
○	○	○	NG	12
○	○	—	NG	12
○	—	○	NG	12
—	○	○	OK	—
—	○	—	OK	—
—	—	○	NG	13
—	—	—	NG	13

■Control job object

Message format

S14F9

1. L[3]
 1. A[0..80] // OBJSPEC
 2. A[10] // ObjType "ControlJob"
 3. L[1..256] // AttrSetting list
 1. L[2]
 1. A[1..80] // AttrID
 2. any // AttrData
- ⋮

Point

Transaction of S14F9 can be user-defined to disable automatic responses and controlled via the ladder. Automatic responses will be disabled not only for control job objects but also for all objects of S14F9. For details on the transaction definition, refer to the following:
 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

- 1.** Errors in parameters and attributes are determined.
Refer to 'Parameters' and 'Attribute setting' for this object service.
- 2.** When all of the following conditions are satisfied, a control job object is created.
 - The maximum number of control job objects that can be created has not been reached.
 - When using the control job queue management function, the maximum number of queues has not been reached.
 - ObjType and ObjID are provided.
 - There is no error in parameters and attributes.
- 3.** 'S14F10: Create Object Acknowledge' is sent to the host.
- 4.** When a control job object is created, '10094-01001: Create service (ControlJob) notification' is sent to a control CPU.
- 5.** When using the control job queue management function, the created control job object is added to the end of the queue.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
OBJSPEC	○	—	Can be omitted (zero length). Ignored even if provided.	None	—
ObjType	○	—	"ControlJob" (Case-sensitive)	Yes	<ul style="list-style-type: none"> • 6: Unknown • 14: Not targeted for Create • 17: Creation limit exceeded • 17: Control job queue limit exceeded^{*1} (When omitted, 'S9F7: Illegal Data' is returned.)
AttrSetting list	—	○	An attribute of a control job object	Yes	<ul style="list-style-type: none"> • 13: Omitted • 4: Attribute name unknown • Refer to 'Attribute setting.'

^{*1} When using the control job queue management function

Attribute setting

For attribute formats of a control job object, refer to the following:

☞ Page 103 Control Job Object

- When the same attributes are provided, the value that appears earlier is overwritten by the value that appears later (last-win).

For LIST attributes, only applicable values are overwritten.

Ex.

- If LIST [1] attributes are provided after LIST [3] attributes, the number of lists remains at 3 and only attribute values for LIST [1] are overwritten. (LIST [2] and [3] remain the same.)
- If LIST [3] attributes are provided after LIST [1] attributes, the number of lists is changed to 3 and attribute values for LIST [1] to [3] are overwritten.

○: Applicable, —: Not applicable

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
ObjType	—	—	—	Not required. Ignored even if provided.	None	—	"ControlJob"
ObjID	○	—	—	ObjID is treated as a parameter because it is required.	Yes	<ul style="list-style-type: none"> 13: Omitted 11: ID duplication 12: Other than ASCII*¹ 	—
ProcessingCtrlSpec	○* ²	—	—	—	Yes	<ul style="list-style-type: none"> 13: PRJobID omitted (zero length) 9: PRJobID duplication 9: RuleName duplication in the same ControlRule 9: MaterialStatus duplication in the same OutputRule Refer to 'ProcessingCtrlSpec verification' in 'Other error judgment.' (☞ ProcessingCtrlSpec verification) 	LIST [0]
CarrierInputSpec	○* ²	—	—	LIST [0] allowed	Yes	<ul style="list-style-type: none"> 7: Other than ASCII*¹ 9: CarrierID duplication Refer to 'CarrierInputSpec verification' in 'Other error judgment.' (☞ CarrierInputSpec verification) 	LIST [0]

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
MtrlOutSpec	○ ^{*2}	—	—	<ul style="list-style-type: none"> When not supporting the material redirection mode, only LIST [0] is allowed. When 'SubstrateLocation' (SlotID) of 'SourceMap' is omitted (LIST [0]), it is assumed that all SlotIDs are specified in ascending order. When 'SubstrateLocation' (SlotID) of 'DestinationMap' is omitted (LIST [0]), it is regarded as the same specification as 'SubstrateLocation' of 'SourceMap.' 	Yes	<ul style="list-style-type: none"> 13: CarrierID omitted (zero length) 7: SubstrateLocation (SlotID) is out of applicable range. 9: Same combinations of CarrierID and SubstrateLocation (SlotID)^{*3} exist in SourceMap. (Duplication)^{*4} 9: Same combinations of CarrierID and SubstrateLocation (SlotID)^{*5} exist in DestinationMap. (Duplication)^{*6} 9: Among process jobs specified in PRJobID of ProcessingCtrlSpec, CarrierID included in PRMtlNameList of a process job with PRMtlType = 13 (Carrier) does not exist in SourceMap. Refer to 'MtrlOutSpec verification,' 'SourceMap verification,' and 'DestinationMap verification' in 'Other error judgment.' ( MtrlOutSpec verification, SourceMap verification, DestinationMap verification) 	LIST [0]
MtrlOutbyStatus	—	○	—	When 'SubstrateLocation' (SlotID) of 'DestinationMap' is omitted (LIST [0]), it is assumed that all SlotIDs are specified in ascending order.	Yes (if provided)	<ul style="list-style-type: none"> 9: Unknown MaterialStatus (Not applicable to user-defined MaterialStatus) 13: CarrierID omitted (zero length) 7: SubstrateLocation (SlotID) is out of applicable range. 9: Same combinations of CarrierID and SubstrateLocation (SlotID)^{*3} exist in DestinationMap. (Duplication)^{*7} Refer to 'DestinationMap verification' in 'Other error judgment.' ( DestinationMap verification) 	LIST [0]
ProcessOrderMgmt	○ ^{*2}	—	—	—	Yes	7: Unknown (Not applicable to user-defined ProcessOrderMgmt)	0
StartMethod	○ ^{*2}	—	—	—	Yes	7: Out of applicable range	false = UserStart

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
PauseEvent	—	○	—	<ul style="list-style-type: none"> The enable/disable code (CEED) of CEID is ignored. The CEID data type follows the SECS item setting.*⁸ 	Yes (if provided)	<ul style="list-style-type: none"> 9: Unknown CEID (N/A) 9: CEID duplication 	LIST [0]
DataCollectionPlan	—	○	—	—	Yes	7: Other than ASCII* ¹	(Null character)
State	—	—	—	Not required. Ignored even if provided.	None	—	0 = QUEUED
CurrentPRJob	—	—	—	<ul style="list-style-type: none"> Not required. Ignored even if provided. This product creates data as LIST from PRJobID provided in ProcessingCtrlS pec. 	None	—	LIST [0]
PRJobStatusList	—	—	—	<ul style="list-style-type: none"> Not required. Ignored even if provided. This product creates data as LIST from PRJobID provided in ProcessingCtrlS pec. 	None	—	LIST [0]

*1 Excluding the control characters.

*2 Can be omitted in SECS/GEM communication software.

*3 If omitted, it is assumed that all SlotIDs are specified in ascending order.

*4 Refer to the duplication examples ❶ and ❷.

*5 If omitted, it is regarded as the same specification as 'SubstrateLocation' of 'SourceMap.'

*6 Refer to the duplication examples ❸ and ❹.

*7 Refer to the duplication examples ❺ and ❻.

*8 For details on SECS items, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

- Duplication examples

Item	Description
❶ Duplication in multiple SourceMap	<ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. L[2] (SourceMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierA" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. <SlotID> 2 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierB" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 2. <SlotID> 2 2. L[2] <ol style="list-style-type: none"> 1. L[2] (SourceMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierA" 2. L[1] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierC" 2. L[1] <ol style="list-style-type: none"> 1. <SlotID> 1
❷ Duplication in the same SourceMap	<ol style="list-style-type: none"> 1. L[1] <ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. L[2] (SourceMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierA" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierB" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 2. <SlotID> 2
❸ Duplication in multiple DestinationMap	<ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. L[2] (SourceMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierA" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 2. <SlotID> 2 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierC" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierC.Slot1 is duplicated. 2. <SlotID> 2 2. L[2] <ol style="list-style-type: none"> 1. L[2] (SourceMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierB" 2. L[1] <ol style="list-style-type: none"> 1. <SlotID> 1 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierC" 2. L[1] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierC.Slot1 is duplicated.
❹ Duplication in the same DestinationMap	<ol style="list-style-type: none"> 1. L[1] <ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. L[2] (SourceMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierA" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 2. <SlotID> 2 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierB" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierB.Slot1 is duplicated. 2. <SlotID> 1 ← CarrierB.Slot1 is duplicated.

Item	Description
5 Duplication in multiple DestinationMap	<ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. <MaterialStatus> 1 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierA" 2. L[1] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. L[2] <ol style="list-style-type: none"> 1. <MaterialStatus> 2 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierA" 2. L[1] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated.
6 Duplication in the same DestinationMap	<ol style="list-style-type: none"> 1. L[1] <ol style="list-style-type: none"> 1. L[2] <ol style="list-style-type: none"> 1. <MaterialStatus> 1 2. L[2] (DestinationMap) <ol style="list-style-type: none"> 1. <CarrierID> "CarrierA" 2. L[2] <ol style="list-style-type: none"> 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. <SlotID> 1 ← CarrierA.Slot1 is duplicated.

Other error judgment

• ProcessingCtrlSpec verification

Attribute data (parent)	Attribute data (child)	Error judgment presence	Error judgment condition and error code	Initial value
PRJobID	—	Yes	<ul style="list-style-type: none"> • 13: Omitted (zero length) • 7: Other than ASCII*¹ • 9: Unknown (N/A) • 9: PRJobID duplication 	(Null character)
ControlRule	RuleName	Yes	<ul style="list-style-type: none"> • S9F7: Other than ASCII*¹ • S9F7: Unknown (Not applicable to user-defined ControlRule) • 9: No specification for rules that require specification from the host • 9: RuleName duplication in the same ControlRule 	(Null character)
	RuleValue	Yes	<ul style="list-style-type: none"> • S9F7: Different from user-defined data type • 7: Other than ASCII*¹ when the data type is ASCII • 9: Out of user-defined applicable range 	0
OutputRule	MaterialStatus	Yes	<ul style="list-style-type: none"> • S9F7: Other than U1 • S9F7: Unknown (Not applicable to user-defined OutputRule) • 9: No specification for rules that require specification from the host • 9: MaterialStatus duplication in the same OutputRule 	0
	OutputRuleValue	Yes	<ul style="list-style-type: none"> • S9F7: Different from user-defined data type • 7: Other than ASCII*¹ when the data type is ASCII • 9: Out of user-defined applicable range 	0

*1 Excluding the control characters.



Create objects in the following order: 'Process job object' → 'Control job object.'

Create an instance of process job object of PRJobID specified in ProcessingCtrlSpec in advance.

• CarrierInputSpec verification

CarrierID	CarrierIDStatus of applicable carrier object	SlotMapStatus of applicable carrier object	Judgment result	Error code
No applicable instance exists.	—	—	NG	9
Applicable instance exists.	0 = ID NOT READ	Not concerned	OK	—
	1 = WAITING FOR HOST	Not concerned	OK	—
	2 = ID VERIFICATION OK	0 = SLOT MAP NOT READ	OK	—
		1 = WAITING FOR HOST	OK	—
		2 = SLOT MAP VERIFICATION OK	OK	—
		3 = SLOT MAP VERIFICATION FAILED	NG	9
	3 = ID VERIFICATION FAILED	Not concerned	NG	9



Create objects in the following order: 'Carrier object' → 'Process job object' → 'Control job object.'

Create an instance of carrier object of CarrierID specified in CarrierInputSpec in advance.

• MtrlOutSpec verification

No.	Item format	Supplement	Slot integrity mode		Material redirection mode			
					Not support incomplete MtrlOutSpec		Supports incomplete MtrlOutSpec	
			Judgment result	Error code	Judgment result	Error code	Judgment result	Error code
1	LIST [0]	• Blank list	OK	—	OK	—	OK	—
2	LIST [1..32] LIST [0] :	• Blank list	NG	S9F7	NG	S9F7	NG	S9F7
3	LIST [1..32] LIST [2] LIST [0] LIST [0] :	• Blank list SourceMap DestinationMap	OK	—	OK	—	OK	—
4	LIST [1..32] LIST [2] LIST [2] ASCII [1..80] LIST [1..25] U1 [1] : LIST [2] ASCII [1..80] LIST [1..25] U1 [1] : :	• Normal case SourceMap CarrierID SubstrateLocation SlotID : DestinationMap CarrierID SubstrateLocation SlotID : :	NG	14	OK	—	OK	—
5	LIST [1..32] LIST [2] LIST [2] ASCII [1..80] LIST [0] LIST [2] ASCII [1..80] LIST [0] :	• Normal case (SlotID omitted) SourceMap CarrierID SubstrateLocation ^{*2} DestinationMap CarrierID SubstrateLocation ^{*3}	NG	14	OK	—	OK	—
6	LIST [1..32] LIST [2] LIST [2] ASCII [1..80] LIST [1..25] U1 [1] : LIST [2] ASCII [1..80] LIST [0] :	• Normal case (SlotID omitted) SourceMap CarrierID SubstrateLocation SlotID : DestinationMap CarrierID SubstrateLocation ^{*3}	NG	14	OK	—	OK	—
7	LIST [1..32] LIST [2] LIST [2] ASCII [1..80] LIST [0] LIST [0] :	• Incomplete MtrlOutSpec SourceMap CarrierID SubstrateLocation ^{*2} DestinationMap	NG	14	NG ^{*1}	14 ^{*1}	OK	—
8	LIST [1..32] LIST [2] LIST [2] ASCII [1..80] LIST [1..25] U1 [1] : : LIST [0] :	Incomplete MtrlOutSpec SourceMap CarrierID SubstrateLocation SlotID : : DestinationMap	NG	14	NG ^{*1}	14 ^{*1}	OK	—

No.	Item format	Supplement	Slot integrity mode		Material redirection mode			
					Not support incomplete MtrlOutSpec		Supports incomplete MtrlOutSpec	
			Judgment result	Error code	Judgment result	Error code	Judgment result	Error code
9	LIST [1..32] LIST [2] LIST [2] ASCII [0] LIST [Not concerned] LIST [Not concerned] :	<ul style="list-style-type: none"> Insufficient parameter SourceMap <u>CarrierID</u> SubstrateLocation DestinationMap	NG	14	NG ^{*1}	13 ^{*1}	NG ^{*1}	13 ^{*1}
10	LIST [1..32] LIST [2] LIST [2] ASCII [1..80] LIST [Not concerned] LIST [2] ASCII [0] LIST [Not concerned] :	<ul style="list-style-type: none"> Insufficient parameter SourceMap CarrierID SubstrateLocation DestinationMap <u>CarrierID</u> SubstrateLocation	NG	14	NG ^{*1}	13 ^{*1}	NG ^{*1}	13 ^{*1}
11	LIST [1..32] LIST [2] LIST [0] LIST [2] ASCII [Not concerned] LIST [Not concerned] :	<ul style="list-style-type: none"> Insufficient parameter (asymmetric) <u>SourceMap</u> <u>DestinationMap</u> CarrierID SubstrateLocation	NG	14	NG ^{*1}	12 ^{*1}	NG ^{*1}	12 ^{*1}
12	LIST [1..32] LIST [2] LIST [2] ASCII [1..80] LIST [n] U1 [1] U1 [1] LIST [2] ASCII [1..80] LIST [m] U1 [1] :	<ul style="list-style-type: none"> Insufficient parameter (asymmetric) SourceMap CarrierID <u>SubstrateLocation</u> Example) 2 SlotID SlotID DestinationMap CarrierID <u>SubstrateLocation</u> Example) 1 SlotID	NG	14	NG ^{*1}	12 ^{*1}	NG ^{*1}	12 ^{*1}

*1 Supported only by SECS/GEM communication software with software version 1.43V or later.

*2 If omitted, it is assumed that all SlotIDs are specified in ascending order.

*3 If omitted, it is regarded as the same specification as 'SubstrateLocation' of 'SourceMap.'

• SourceMap verification

CarrierInputSpec specification	CarrierID specified in SourceMap	CarrierIDStatus of applicable carrier object	SlotMapStatus of applicable carrier object	SlotStatus of SlotMap of applicable carrier object	Judgment result	Error code
LIST [0] (No material)	Specified	—	—	—	NG	12

CarrierInputSpec specification	CarrierID specified in SourceMap	CarrierIDStatus of applicable carrier object	SlotMapStatus of applicable carrier object	SlotStatus of SlotMap of applicable carrier object	Judgment result	Error code
LIST [1..32]	Not exist in CarrierInputSpec.	—	—	—	NG	12
	Exists in CarrierInputSpec, however, there is no applicable instance.	—	—	—	NG	9
	Exists in CarrierInputSpec, and there is an applicable instance.	0 = ID NOT READ	Not concerned	Not concerned	OK	—
		1 = WAITING FOR HOST	Not concerned	Not concerned	OK	—
		2 = ID VERIFICATION OK	0 = SLOT MAP NOT READ	Not concerned	OK	—
			1 = WAITING FOR HOST	Not concerned	OK	—
			2 = SLOT MAP VERIFICATION OK	1 = EMPTY	NG	9
				2 = NOT EMPTY	OK	—
				Other than 1 and 2	NG	9
			3 = SLOT MAP VERIFICATION FAILED	Not concerned	NG	9
		3 = ID VERIFICATION FAILED	Not concerned	Not concerned	NG	9

Point

Create objects in the following order: 'Carrier object' → 'Process job object' → 'Control job object.'
Create an instance of carrier object of CarrierID specified in SourceMap in advance.

• DestinationMap verification

CarrierID specified in DestinationMap	CarrierIDStatus of applicable carrier object	SlotMapStatus of applicable carrier object	SlotStatus of SlotMap of applicable carrier object	Judgment result	Error code
No applicable instance exists.	—	—	—	NG	12
Applicable instance exists.	0 = ID NOT READ	Not concerned	Not concerned	OK	—
	1 = WAITING FOR HOST			OK	—
	2 = ID VERIFICATION OK			0 = SLOT MAP NOT READ	OK
		1 = WAITING FOR HOST		OK	—
		2 = SLOT MAP VERIFICATION OK		1 = EMPTY	OK
			2 = NOT EMPTY	NG	9
			Other than 1 and 2	NG	9
	3 = SLOT MAP VERIFICATION FAILED	Not concerned	NG	9	
	3 = ID VERIFICATION FAILED		Not concerned	NG	9

Point

Create objects in the following order: 'Carrier object' → 'Process job object' → 'Control job object.'
Create an instance of carrier object of CarrierID specified in DestinationMap in advance.

A

S14F10: Create Object Acknowledge

Message format

S14F10

1. L[3]

1. A[0..80] // OBJSPEC

2. L[0..256] // AttrSetting list

1. L[2]

1. A[1..80] // AttrID

2. any // AttrData

:

3. L[2] // ObjStatus

1. U1[1] // ObjAck

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

:



Transaction of S14F10 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

'S14F10: Create Object Acknowledge' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
OBJSPEC	○	—	ObjID of the Created object is returned. (If Create fails, it will be a zero-length item.)
AttrSetting list	—	○	All attributes of the Created object (If Create fails, it will be LIST [0].)
ObjStatus	○	—	Refer to 'Combinations of ObjStatus.'

Combinations of ObjStatus

ObjAck	ErrorCode	ErrorText	Supplement
0: Execution completed	—	—	—
1: Error	4	Unknown attribute name	The attribute name is unknown.
	6	Unknown object type	The object type is unknown.
	7	Invalid attribute value	The attribute value is invalid.
	9	Verification error	Verification error
	11	Object identifier in use	The object identifier is in use.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
	14	Unsupported option requested	The requested option is not supported.
	17	Command not valid for current state	The command is invalid for the current status.
	32770	Action failed due to errors	The action failed due to errors.



If an error with the same ErrorCode occurs multiple times, it is reported only once.

S14F11: Delete Object Request

Message format

S14F11

1. L[2]

1. A[0..80] // OBJSPEC

2. L[0..256] // AttrSetting list

1. L[2]

1. A[1..80] // AttrID

2. any // AttrData

⋮

Point

Transaction of S14F11 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model
User's Manual

Processing during automatic response

1. Errors in parameters and attributes are determined.

Refer to 'Parameters' and 'Attribute setting' for this carrier action.

2. An object that matches the provided ObjType and ObjID is deleted.

The format that can be provided is as follows:

Example) When ObjType is "Substrate" and ObjID is "SubstID_001"

- Format 1: ObjType and ObjID are provided in the AttrSetting list.

S14F11

1. L[2]

1. A[0] *Not specified

2. L[2]

1. L[2]

1. A[7] "ObjType"

2. A[9] "Substrate"

2. L,2

1. A[5] "ObjID"

2. A[11] "SubstID_001"

- Format 2: Only ObjID is provided in the AttrSetting list.

S14F11

1. L[2]

1. A[0] *Not specified

2. L[1]

1. L[2]

1. A[5] "ObjID"

2. A[11] "SubstID_001"

For format 2, ObjID must be unique in all ObjTypes to be Deleted.

Point

Only one object can be deleted per request.

When multiple ObjTypes and ObjIDs are provided, each one of them that appears first is targeted and those that appear later are ignored.

3. 'S14F12: Delete Object Acknowledge' is sent to the host.

4. When an object is deleted, the deletion notification is sent to a control CPU.

When a substrate object is deleted, '10090-01002: Delete service (Remove substrate service) notification' is sent to the

control CPU.

When a control job object is deleted, '10094-01002: Delete service (ControlJob) notification' is sent to a control CPU.

5. When a control job object is deleted, the deletion target object is removed from the queue if it exists.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
OBJSPEC	○	—	Can be omitted (zero length). Ignored even if provided.	None	—
AttrSetting list	—	○	Ignored if it is not ObjType or ObjID.	Yes	• 4: Attribute name unknown • Refer to 'Attribute setting.'

Attribute setting

○: Applicable, —: Not applicable

Attribute	Mandatory (Required)	Optional (Depending on equipment)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition	Initial value
ObjType	—	—	○	Can be omitted.	Yes	• 6: Unknown • 14: Not targeted for Delete	—
ObjID	○	—	—	—	Yes	• 13: Omitted • 14: Not targeted for Delete • 3: Unknown • 6: Multiple ObjIDs (ObjType cannot be identified.)	—

Other error judgment

None

S14F12: Delete Object Acknowledge

Message format

S14F12

1. L[2]

1. L[0..256] // AttrSetting list

1. L[2]

1. A[1..80] // AttrID

2. any // AttrData

:

2. L[2] // ObjStatus

1. U1[1] // ObjAck

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

:

Point

Transaction of S14F12 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model
User's Manual

Processing during automatic response

'S14F12: Delete Object Acknowledge' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
AttrSetting list	—	○	All attributes of the Deleted object (If Delete fails: LIST [0])
ObjStatus	○	—	Refer to 'Combinations of ObjStatus.'

Combinations of ObjStatus

ObjAck	ErrorCode	ErrorText	Supplement
0: Execution completed	—	—	—
1: Error	3	Unknown object instance	The object instance is unknown.
	4	Unknown attribute name	The attribute name is unknown.
	6	Unknown object type	The object type is unknown.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
	14	Unsupported option requested	The requested option is not supported.
	17	Command not valid for current state	The command is invalid for the current status.
	32770	Action failed due to errors	The action failed due to errors.

Point

If an error with the same ErrorCode occurs multiple times, it is reported only once.

Stream 16 Process Management

The following shows the details on the service messages.

S16F5: Process Job Command Request

Message format

S16F5

- 1. L[4]
 - 1. U(1,2,4)[0..1] // DATAID
 - 2. A[1..80] // PRJobID (ObjID)
 - 3. A[1..80] // PRCMDNAME
 - 4. L[0..n] // CmdParameter
 - 1. L[2]
 - 1. A[1..80] // CPNAME(Command Parameters Name)
 - 2. any // CPVAL(Command Parameters Value)
- :

Transaction of S16F5 must be user-defined and controlled via the ladder.



When defining the transaction of S16F5 using the mapping function, multiple process job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID	○	—	—
PRCmdName	○	—	—
CmdParameter	—	○	—

A

■S16F5: ABORT

Message format

S16F5

1. L[4]

1. U(1,2,4)[0..1] // DATAID
2. A[1..80] // PRJobID (ObjID)
3. A[5] // PRCMDNAME "ABORT"
4. L[0] // CmdParameter

Transaction of S16F5 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual



When defining the transaction of S16F5 using the mapping function, multiple process job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID	○	—	—
PRCmdName	○	—	"ABORT"
CmdParameter	—	○	—

■S16F5: STOP

Message format

S16F5

- 1. L[4]
 - 1. U(1,2,4)[0..1] // DATAID
 - 2. A[1..80] // PRJobID (ObjID)
 - 3. A[4] // PRCMDNAME "STOP"
 - 4. L[0] // CmdParameter

Transaction of S16F5 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

📖C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

**Point**

When defining the transaction of S16F5 using the mapping function, multiple process job commands can be configured within one transaction definition.
For details on the mapping function, refer to the following:
📖C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID	○	—	—
PRCmdName	○	—	"STOP"
CmdParameter	—	○	—

■S16F5: CANCEL

Message format

S16F5

1. L[4]

1. U(1,2,4)[0..1] // DATAID
2. A[1..80] // PRJobID (ObjID)
3. A[6] // PRCMDNAME "CANCEL"
4. L[0] // CmdParameter

Transaction of S16F5 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual



When defining the transaction of S16F5 using the mapping function, multiple process job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID	○	—	—
PRCmdName	○	—	"CANCEL"
CmdParameter	—	○	—

■S16F5: PAUSE

Message format

S16F5

1. L[4]

- 1. U(1,2,4)[0..1] // DATAID
- 2. A[1..80] // PRJobID (ObjID)
- 3. A[5] // PRCMDNAME "PAUSE"
- 4. L[0] // CmdParameter

Transaction of S16F5 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

📖C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual



When defining the transaction of S16F5 using the mapping function, multiple process job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

📖C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID	○	—	—
PRCmdName	○	—	"PAUSE"
CmdParameter	—	○	—

A

■S16F5: RESUME

Message format

S16F5

1. L[4]

1. U(1,2,4)[0..1] // DATAID
2. A[1..80] // PRJobID (ObjID)
3. A[6] // PRCMDNAME "RESUME"
4. L[0] // CmdParameter

Transaction of S16F5 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual



When defining the transaction of S16F5 using the mapping function, multiple process job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID	○	—	—
PRCmdName	○	—	"RESUME"
CmdParameter	—	○	—

■S16F5: START

Message format

S16F5

1. L[4]

- 1. U(1,2,4)[0..1] // DATAID
- 2. A[1..80] // PRJobID (ObjID)
- 3. A[5] // PRCMDNAME "START"
- 4. L[0] // CmdParameter

Transaction of S16F5 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

📖C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual



When defining the transaction of S16F5 using the mapping function, multiple process job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

📖C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID	○	—	—
PRCmdName	○	—	"START"
CmdParameter	—	○	—

A

S16F6: Process Job Command Acknowledge

Message format

S16F6

- 1. L[2]
 - 1. A[1..80] // PRJobID
 - 2. L[2] // PRStatus
 - 1. BOOL[1] // ACKA
 - 2. L[0..256] // Status
 - 1. L[2]
 - 1. U2[1] // ErrorCode
 - 2. A[1..120] // ErrorText
- :

Transaction of S16F6 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRStatus	○	—	—

S16F11: PRJobCreateEnh

Message format

S16F11

1. L[7]

1. U(1,2,4)[0..1] // DATAID *following the SECS item setting

2. A[1..80] // PRJobID

3. BIN[1] // MF (0,13,14)

--- MF = 0 (No material) -----

4. L[0] // PRMtlNameList

--- MF = 13 (Carrier) -----

4. L[0..32] // PRMtlNameList

1. L[2]

1. A[1..80] // CarrierID

2. L[(0,25)]

1. U1[1] // SLOTID

:

--- MF = 14 (Substrate) -----

4. L[0..1024] // PRMtlNameList

1. A[1..80] // MID (Substrate ID)

:

5. L[3]

1. U1[1] // PRRECIPEMETHOD

2. A[1..80] // RCPSPEC or PPID

3. L[0..512] // Recipe Parameters List

1. L[2]

1. A[1..256] // RCPPARNM (Recipe Parameters Name)

2. any // RCPPARVAL (Recipe Parameters Value)

:

6. BOOL[1] // PRProcessStart

7. L[0..512] // PauseEvents List

1. U(1,2,4)[1] // CEID *following the SECS item setting

:

A

Point

Transaction of S16F11 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. When all of the following conditions are satisfied, a process job object is created.

- The maximum number of process job objects that can be created has not been reached.
- PRJobID is provided.
- There is no error in parameters.

3. 'S16F12: PRJobCreateEnh Acknowledge' is sent to the host.

4. When a process job object is created, '10040-00901: PRJobCreateEnh service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PRJobID	○	—	—	Yes	<ul style="list-style-type: none"> • 11: ID duplication • 12: Other than ASCII*¹ • 15: Creation limit exceeded
PRMtlType	○	—	MF (Material format code) <ul style="list-style-type: none"> • 0: No material • 13: Carrier • 14: Substrate 	Yes	12: Inappropriate parameter setting
PRMtlNameList	○	—	—	Yes	■PRMtlType = 13 (Carrier): CarrierID: <ul style="list-style-type: none"> • 12: Other than ASCII*¹ • 12: Unknown (N/A) SlotID: <ul style="list-style-type: none"> • 12: Out of applicable range • 12: CarrierID and SlotID combination duplication*² ■PRMtlType = 14 (Substrate): SubstrateID: <ul style="list-style-type: none"> • 12: Other than ASCII*¹ • 12: ID duplication in list • 12: Unknown (N/A)
PRRecipe	○	—	—	Yes	PRRecipeMethod: <ul style="list-style-type: none"> • 12: Out of applicable range RecID: <ul style="list-style-type: none"> • 12: Other than ASCII*¹ RCPPARNM: <ul style="list-style-type: none"> • S9F7: Other than ASCII*¹ • S9F7: Unknown (Not applicable to user-defined RecipeVariable) • 13: No specification of recipe variables that require specification from the host • 12: RCPPARNM duplication RCPPARVAL: <ul style="list-style-type: none"> • S9F7: Different from user-defined data type • 12: Other than ASCII*¹ when the data type is ASCII • 12: Out of user-defined applicable range
PRProcessStart	○	—	—	Yes	12: Out of applicable range
PRPauseEvent	○	—	<ul style="list-style-type: none"> • The enable/disable code (CEED) of CEID is ignored. • The CEID data type follows the SECS item setting.*³ 	Yes	12: Unknown CEID (N/A)

*¹ Excluding the control characters.

*² Refer to the duplication examples ❶ and ❷.

*³ For details on SECS items, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

- Duplication examples

Item	Description
❶ Duplication in multiple lists	1. L[2] 1. L[2] 1. <CarrierID> "CarrierA" 2. L[2] 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. <SlotID> 2 2. L[2] 1. <CarrierID> "CarrierA" 2. L[1] 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. <SlotID> 3
❷ Duplication in the same list	1. L[1] 1. L[2] 1. <CarrierID> "CarrierA" 2. L[2] 1. <SlotID> 1 ← CarrierA.Slot1 is duplicated. 2. <SlotID> 1 ← CarrierA.Slot1 is duplicated.

Point

When PRMtlType is '13: Carrier,' create objects in the following order: 'Carrier object' → 'Process job object' → 'Control job object.'

When PRMtlType is '14: Substrate,' create objects in the following order: 'Substrate object' → 'Process job object' → 'Control job object.'

Create an instance of object of CarrierID or SubstrateID specified in PRMtlNameList in advance.

S16F12: PRJobCreateEnh Acknowledge

Message format

S16F12

1. L[2]

1. A[1..80] // PRJobID

2. L[2] // PRStatus

1. BOOL[1] // ACKA

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

:



Transaction of S16F12 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model
User's Manual

Processing during automatic response

1. 'S16F12: PRJobCreateEnh Acknowledge' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID	○	—	—
PRStatus	○	—	Refer to 'Combinations of PRStatus.'

Combinations of PRStatus

ACKA	ErrorCode	ErrorText	Remarks
true (other than '0')	—	—	—
false (0)	11	Object identifier in use	The object identifier is in use.
	12	Parameters improperly specified	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
	15	Busy (no queueing or queue full)	Busy (There is no queue* ¹ or queue* ¹ is full.)
	32770	Action failed due to errors	The action failed due to errors.

*1 Replace 'queue' with 'pool.'



If an error with the same ErrorCode occurs multiple times, it is reported only once.

S16F15: PRJobMultiCreate

Message format

S16F15

```
1. L[2]
  1. U(1,2,4)[0..1] // DATAID *following the SECS item setting
  2. L[1..160] // PRJobMultiSpec (list)
    1. L[6]
      1. A[1..80] // PRJobID
      2. BIN[1] // MF (0,13,14)
    --- MF = 0 (No material) -----
      3. L[0] // PRMtlNameList
    --- MF = 13 (Carrier) -----
      3. L[0..32] // PRMtlNameList
        1. L[2]
          1. A[1..80] // CarrierID
          2. L[(0,25)]
            1. U1[1] // SLOTID
            :
        --- MF = 14 (Substrate) -----
          3. L[0..1024] // PRMtlNameList
            1. A[1..80] // MID (Substrate ID)
            :
    -----
  4. L[3]
    1. U1[1] // PRRECIPEMETHOD
    2. A[1..80] // RCPSPEC or PPID
    3. L[0..512] // Recipe Parameters List
      1. L[2]
        1. A[1..256] // RCPPARNM (Recipe Parameters Name)
        2. any // RCPPARVAL (Recipe Parameters Value)
        :
    5. BOOL[1] // PRProcessStart
    6. L[0..512] // PauseEvents List
      1. U(1,2,4)[1] // CEID *following the SECS item setting
      :
  :
```

A



Transaction of S16F15 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:
 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameter' shown below.

2. When all of the following conditions are satisfied, a process job object is created.

- The maximum number of process job objects that can be created has not been reached.
- PRJobID is provided.
- There is no error in parameters.

3. 'S16F16: PRJobMultiCreate Acknowledge' is sent to the host.

4. When a process job object is created, '10040-00903: PRJobMultiCreate service notification' is sent to a control CPU.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PRJobMultiSpec (list)	○	—	List of the following structures Structure: <ul style="list-style-type: none"> • PRJobID • PRMtType • PRMtNameList • PRRecipe • PRProcessStart • PRPauseEvent 	Refer to the table below.	Refer to the table below.

• PRJobMultiSpec list

Name	Supplement	Error judgment presence	Error code and error judgment condition
PRJobID	—	Yes	<ul style="list-style-type: none"> • 11: ID duplication • 12: Other than ASCII*¹ • 15: Creation limit exceeded
PRMtType	MF (Material format code) <ul style="list-style-type: none"> • 0: No material • 13: Carrier • 14: Substrate 	Yes	12: Inappropriate parameter setting
PRMtNameList	—	Yes	<p>■PRMtType = 13 (Carrier):</p> <p>CarrierID:</p> <ul style="list-style-type: none"> • 12: Other than ASCII*¹ • 12: Unknown (N/A) <p>SlotID:</p> <ul style="list-style-type: none"> • 12: Out of applicable range • 12: CarrierID and SlotID combination duplication*² <p>■PRMtType = 14 (Substrate):</p> <p>SubstrateID:</p> <ul style="list-style-type: none"> • 12: Other than ASCII*¹ • 12: Unknown (N/A) • 12: ID duplication in list
PRRecipe	—	Yes	<p>PRRecipeMethod:</p> <ul style="list-style-type: none"> • 12: Out of applicable range <p>RecID:</p> <ul style="list-style-type: none"> • 12: Other than ASCII*¹ <p>RCPARM:</p> <ul style="list-style-type: none"> • S9F7: Other than ASCII*¹ • S9F7: Unknown (Not applicable to user-defined RecipeVariable) • 13: No specification of recipe variables that require specification from the host • 12: RCPARM duplication <p>RCPARVAL:</p> <ul style="list-style-type: none"> • S9F7: Different from user-defined data type • 12: Other than ASCII*¹ when the data type is ASCII • 12: Out of user-defined applicable range
PRProcessStart	—	Yes	12: Out of applicable range

Name	Supplement	Error judgment presence	Error code and error judgment condition
PRPauseEvent	<ul style="list-style-type: none"> The enable/disable code (CEED) of CEID is ignored. The CEID data type follows the SECS item setting.^{*3} 	Yes	12: Unknown CEID (N/A)

*1 Excluding the control characters.

*2 Refer to the duplication examples ❶ and ❷.

*3 For details on SECS items, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

• Duplication examples

Item	Description
❶ Duplication in multiple lists	<p>1. L[2]</p> <p>1. L[2]</p> <p>1. <CarrierID> "CarrierA"</p> <p>2. L[2]</p> <p>1. <SlotID> 1 ← CarrierA.Slot1 is duplicated.</p> <p>2. <SlotID> 2</p> <p>2. L[2]</p> <p>1. <CarrierID> "CarrierA"</p> <p>2. L[1]</p> <p>1. <SlotID> 1 ← CarrierA.Slot1 is duplicated.</p> <p>2. <SlotID> 3</p>
❷ Duplication in the same list	<p>1. L[1]</p> <p>1. L[2]</p> <p>1. <CarrierID> "CarrierA"</p> <p>2. L[2]</p> <p>1. <SlotID> 1 ← CarrierA.Slot1 is duplicated.</p> <p>2. <SlotID> 1 ← CarrierA.Slot1 is duplicated.</p>

Point

When PRMtlType is '13: Carrier,' create objects in the following order: 'Carrier object' → 'Process job object' → 'Control job object.'

When PRMtlType is '14: Substrate,' create objects in the following order: 'Substrate object' → 'Process job object' → 'Control job object.'

Create an instance of object of CarrierID or SubstrateID specified in PRMtlNameList in advance.

A

S16F16: PRJobMultiCreate Acknowledge

Message format

S16F16

1. L[2]

1. L[0..160]

1. A[1..80] // PRJobID

:

2. L[2] // PRStatus

1. BOOL[1] // ACKA

2. L[0..512] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

:

Point

Transaction of S16F16 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F16: PRJobMultiCreate Acknowledge' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobMultiSpec (list)	—	○	Not notified by this product.
PRJobID (list)	○	—	—
PRStatus	○	—	Refer to 'Combinations of PRStatus.'

Combinations of PRStatus

Point

- PRStatus is reported per PRJobID specified in S16F15, in the specified order.
- If an error with the same ErrorCode occurs multiple times in the same PRJobID, it is reported only once.
- ErrorText, including the information of PRJobID of a failed service and the order specified in S16F15, is reported.

ACKA	ErrorCode	ErrorText	Remarks
true (other than '0')	—	—	—
false (0)	11	Object identifier in use: PRJobID(n)	The object identifier is in use.
	12	Parameters improperly specified: PRJobID(n)	Parameters are not properly specified.
	13	Insufficient parameters specified: PRJobID(n)	Not all parameters that need to be specified are specified.
	15	Busy (no queueing or queue full): PRJobID(n)	Busy (There is no queue* ¹ or queue* ¹ is full.)
	32770	Action failed due to errors: PRJobID(n)	The action failed due to errors.

*1 Replace 'queue' with 'pool.'

Example when errors (ErrorCode 11 and 15) occur

S16F15

1. L[2]

1. <DATAID>

2. L[4]

1. L[6]

1. <PRJobID> "PRJob_001" ← Instance not created (no instance)

2. <MF> 0

3. L[0]

4. L[3]

1. <PRRECIPEMETHOD> 1

2. <PPID> "PPID_1"

3. L[0]

5. <PRProcessStart> true

6. L[0]

2. L[6]

1. <PRJobID> "PRJob_001" ← Specification error: Duplicated specification

2. <MF> 0

3. L[0]

4. L[3]

1. <PRRECIPEMETHOD> 1

2. <PPID> "PPID_1"

3. L[0]

5. <PRProcessStart> true

6. L[0]

3. L[6]

1. <PRJobID> "PRJob_160" ← Instance not created (no instance)

2. <MF> 0

3. L[0]

4. L[3]

1. <PRRECIPEMETHOD> 1

2. <PPID> "PPID_1"

3. L[0]

5. <PRProcessStart> true

6. L[0]

4. L[6]

1. <PRJobID> "PRJob_161" ← Job creation limit exceeded: 158 jobs (PRJob_002 to PRJob_159) created

2. <MF> 0

3. L[0]

4. L[3]

1. <PRRECIPEMETHOD> 1

2. <PPID> "PPID_1"

3. L[0]

5. <PRProcessStart> true

6. L[0]

A

S16F16

1. L[2]

1. L[2]

1. <PRJobID> "PRJob_001" ← Instance creation of PRJobID specified earlier succeeded

2. <PRJobID> "PRJob_160"

2. L[2]

1. <ACKA> 0

2. L[2]

1. L[2]

1. <ErrorCode> 11

2. <ErrorText> "Object identifier in use : PRJob_001 (2)" ← PRJobID specified later

2. L[2]

1. <ErrorCode> 15

2. <ErrorText> "Busy (no queueing or queue full) : PRJob_161 (4)"

S16F17: PRJobDequeue

Message format

S16F17

- 1. L[0..160]
- 1. A[1..80] // PRJOBID
- :



Transaction of S16F17 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:
 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

- 1.** Errors in parameters are determined.
Refer to 'Parameter' shown below.
- 2.** When all of the following conditions are satisfied, a process job object is deleted.
 - PRJobState of an applicable process job object is '0 = POOLED.'
 - There is no error in parameters.
- 3.** 'S16F18: PRJobDequeue Acknowledge' is sent to the host.
- 4.** When a process job object is deleted, '10040-00904: PRJobDequeue service notification' is sent to a control CPU.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PRJobIDList	○	—	When it is L[0], it is assumed that all process jobs are specified.	Yes	<ul style="list-style-type: none">• 3: Unknown (N/A)• 15: PRJobState is not 'POOLED'

A

S16F18: PRJobDequeue Acknowledge

Message format

S16F18

1. L[2]

1. L[0..160]

1. A[1..80] // PRJobID

⋮

2. L[2] // PRStatus

1. BOOL[1] // ACKA

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

⋮

Point

Transaction of S16F18 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F18: PRJobDequeue Acknowledge' is sent to the host.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobID (list)	○	—	—
PRStatus	○	—	Refer to 'Combinations of PRStatus.'

Combinations of PRStatus

Point

- PRStatus is reported per PRJobID specified in S16F17, in the specified order.
- ErrorText, including the information of PRJobID of a failed service and the order specified in S16F17, is reported.

ACKA	ErrorCode	ErrorText	Remarks
true (other than '0')	—	—	—
false (0)	3	Unknown object instance: PRJobID(n)	The object instance is unknown.
	15	Busy: PRJobID(n)	The process job is in use (not 'POOLED').
	32770	Action failed due to errors: PRJobID(n)	The action failed due to errors.

Example when errors (ErrorCode 3 and 15) occur

S16F17

1. L[5]

1. <PRJOBID> "PRJob_001" ← PROCESS COMPLETE

2. <PRJOBID> "PRJob_002" ← PROCESSING

3. <PRJOBID> "PRJob_003" ← POOLED

4. <PRJOBID> "PRJob_004" ← POOLED

5. <PRJOBID> "PRJob_005" ← Instance not created (no instance)

S16F18

1. L[2]

1. L[2]

1. <PRJOBID> "PRJob_003"

2. <PRJOBID> "PRJob_004"

2. L[2]

1. <ACKA> False

2. L[3]

1. L[2]

1. <ErrorCode> 15

2. <ErrorText> "Busy : PRJob_001 (1)"

2. L[2]

1. <ErrorCode> 15

2. <ErrorText> "Busy : PRJob_002 (2)"

3. L[2]

1. <ErrorCode> 3

2. <ErrorText> "Unknown object instance : PRJob_005 (5)"

S16F19: PRGetAllJobs

Message format

S16F19

Header only



Transaction of S16F19 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F20: PRGetAllJobs Send' is sent to the host.

Parameters

None

Attribute setting

None

Other error judgment

None

S16F20: PRGetAllJobs Send

Message format

S16F20

1. L[0..160] // ProcessJobs List

 1. L[2]

 1. A[1..80] // PRJobID

 2. U1[1] // PRSTATE (PRJobState)

 :

Point

Transaction of S16F20 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:
 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F20: PRGetAllJobs Send' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobList	○	—	—

S16F21: PRGetSpace

Message format

S16F21

Header only



Transaction of S16F21 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F22: PRGetSpace Send' is sent to the host.

Parameters

None

Attribute setting

None

Other error judgment

None

S16F22: PRGetSpace Send

Message format

S16F22

1. U2[1] // PRJobSpace

Point

Transaction of S16F22 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F22: PRGetSpace Send' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRJobSpace	○	—	—

S16F23: PRJobSetRecipeVariable

Message format

S16F23

1. L[2]

1. A[1..80] // PRJOBID

2. L[1..512] // Recipe Parameters List

1. L[2]

1. A[1..256] // RCPPARNM (Recipe Parameters Name)

2. any // RCPPARVAL (Recipe Parameters Value)

:

Point

Transaction of S16F23 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. When all of the following conditions are satisfied, the recipe variable setting of a process job object is changed.

- PRJobID is provided.
- PRJobState allows changes to recipe variables.
- There is no error in parameters.

3. 'S16F24: PRJobSetRecipeVariable Acknowledge' is sent to the host.

4. When the recipe variable setting is changed, '10040-00905 : PRJobSetRecipeVariable service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PRJobID	○	—	—	Yes	<ul style="list-style-type: none">• 12: Other than ASCII*¹• 3: Unknown• 17: PRJobState that does not allow changes to recipe variables.
RecVariableList* ²	○	—	—	Yes	<p>RCPPARNM:</p> <ul style="list-style-type: none">• S9F7: Other than ASCII*¹• S9F7: Unknown (Not applicable to user-defined RecipeVariable)• 12: RCPPARNM duplication• 28: Not specified when an instance of process job object is generated <p>RCPPARVAL:</p> <ul style="list-style-type: none">• S9F7: Different from user-defined data type• 12: Other than ASCII*¹ when the data type is ASCII• 12: Out of user-defined applicable range

*1 Excluding the control characters.

*2 When 'RCPPARNM' specified in this parameter is duplicated in the 'RecVariableList' attribute of a target process job object, 'RCPPARVAL' will be changed only for the first found.

S16F24: PRJobSetRecipeVariable Acknowledge

Message format

S16F24

1. L[2]

1. BOOL[1] // ACKA

2. L[0..512] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

⋮

Point

Transaction of S16F24 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F24: PRJobSetRecipeVariable Acknowledge' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRStatus	○	—	Refer to 'Combinations of PRStatus.'

Combinations of PRStatus

Point

- PRStatus is reported per RCPPARNM specified in S16F23, in the specified order.
- ErrorText, including the information of RCPPARNM of a failed service and the order specified in S16F23, is reported.

ACKA	ErrorCode	ErrorText	Remarks
true (other than '0')	—	—	—
false (0)	3	Unknown object instance	The object instance is unknown.
	12	Parameters improperly specified: RCPPARNM(n)	Parameters are not properly specified.
	13	Insufficient parameters specified	Not all parameters that need to be specified are specified.
	17	Command not valid for current state	The command is invalid for the current status.
	28	Cannot change selected recipe: RCPPARNM(n)	A selected recipe cannot be changed.
	32770	Action failed due to errors: RCPPARNM(n)	The action failed due to errors.

A

S16F25: PRJobSetStartMethod

Message format

S16F25

1. L[2]

1. L[1..160] // PRJobIDList

1. A[1..80] // PRJobID

⋮

2. BOOL[1] // PRProcessStart



Transaction of S16F25 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameters' shown below.

2. When all of the following conditions are satisfied, PRProcessStart of a process job object is changed.

- PRJobID is provided.
- The current PRProcessStart value is different from a specified PRProcessStart value.
- PRJobState is '0 = POOLED.'
- There is no error in parameters.

3. 'S16F26: PRJobSetStartMethod Acknowledge' is sent to the host.

4. When PRProcessStart is changed, '10040-00906: PRJobSetStartMethod service notification' is sent to a control CPU.

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PRJobIDList	○	—	The list cannot be left blank.	Yes	• S9F7: Omitted (zero length) • 3: Unknown • 17: PRJobState is not 'POOLED'*1
PRProcessStart	○	—	—	Yes	12: Out of applicable range

*1 Excluding process jobs for which PRProcessStart is already specified

S16F26: PRJobSetStartMethod Acknowledge

Message format

S16F26

1. L[2]

1. L[0..160] // PRJobIDList

1. A[1..80] // PRJobID

⋮

2. L[2]

1. BOOL[1] // ACKA

2. L[0..256] // Status

1. L[2]

1. U2[1] // ErrorCode

2. A[1..120] // ErrorText

⋮

Point

Transaction of S16F26 can be user-defined to disable automatic responses and controlled via the ladder. For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F26: PRJobSetStartMethod Acknowledge' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRStatus	○	—	Refer to 'Combinations of PRStatus.'

Combinations of PRStatus

Point

- PRStatus is reported per PRJobID specified in S16F25, in the specified order.
- ErrorText, including the information of PRJobID of a failed service and the order specified in S16F25, is reported.

ACKA	ErrorCode	ErrorText	Remarks
true (other than '0')	—	—	—
false (0)	3	Unknown object instance: PRJobID(n)	The object instance is unknown.
	12	Parameters improperly specified	Parameters are not properly specified.
	17	Command not valid for current state: PRJobID(n)	The command is invalid for the current status.
	32770	Action failed due to errors	The action failed due to errors.

Example when errors (ErrorCode 3 and 17) occur

S16F25

1. L[2]

1. L[5]

1. <PRJOBID> "PRJob_001" ← PRProcessStart = true, PRJobState = PROCESS COMPLETE

2. <PRJOBID> "PRJob_002" ← PRProcessStart = false, PRJobState = PROCESSING

3. <PRJOBID> "PRJob_003" ← PRProcessStart = true, PRJobState = POOLED

4. <PRJOBID> "PRJob_004" ← PRProcessStart = false, PRJobState = POOLED

5. <PRJOBID> "PRJob_005" ← Instance not created (no instance)
 2. <PRProcessStart> true
-

S16F26

1. L[2]
 1. L[3]
 1. <PRJOBID> "PRJob_001" ← Already PRProcessStart = true
 2. <PRJOBID> "PRJob_003" ← Already PRProcessStart = true
 3. <PRJOBID> "PRJob_004" ← PRProcessStart change succeeded
 2. L[2]
 1. <ACKA> False
 2. L[2]
 1. L[2]
 1. <ErrorCode> 17
 2. <ErrorText> "Command not valid for current state : PRJob_002 (2)"
 2. L[2]
 1. <ErrorCode> 3
 2. <ErrorText> "Unknown object instance : PRJob_005 (5)"

S16F27: Control Job Command Request

Message format

S16F27

1. L[3]

1. A[1..80] // CTLJOBID (ControlJobID)
2. U1[1] // CTLJOBCMD (ControlJob Command)
3. L[0 or 2]
 1. A[6] // CPNAME (Command Parameters Name) "Action"
 2. any // CPVAL (Command Parameters Value) 0 or 1

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

■S16F27: CJStart

Message format

S16F27

1. L[3]

1. A[1..80] // CTLJOBID (ControlJobID)
2. U1[1] // 1: CJStart
3. L[0]

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CtrlJobID	○	—	—
CtrlJobCmd	○	—	1: CJStart

A

■S16F27: CJPause

Message format

S16F27

1. L[3]

1. A[1..80] // CTLJOBID (ControlJobID)

2. U1[1] // 2: CJPause

3. L[0]

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CtrlJobID	○	—	—
CtrlJobCmd	○	—	2: CJPause

■S16F27: CJResume

Message format

S16F27

1. L[3]

1. A[1..80] // CTLJOBID (ControlJobID)

2. U1[1] // 3: CJResume

3. L[0]

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CtrlJobID	○	—	—
CtrlJobCmd	○	—	3: CJResume

■S16F27: CJCancel

Message format

S16F27

1. L[3]

1. A[1..80] // CTLJOBID (ControlJobID)

2. U1[1] // 4: CJCancel

3. L[2]

1. A[6] // CPNAME (Command Parameters Name) "Action"

2. U1[1] // CPVAL (Command Parameters Value) 0 or 1

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CtrlJobID	○	—	—
CtrlJobCmd	○	—	4: CJCancel
Action	○	—	0: SAVEJOBS, 1: REMOVEJOBS

■S16F27: CJDeselect

Message format

S16F27

1. L[3]

1. A[1..80] // CTLJOBID (ControlJobID)

2. U1[1] // 5: CJDeselect

3. L[0]

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CtrlJobID	○	—	—
CtrlJobCmd	○	—	5: CJDeselect

■S16F27: CJStop

Message format

S16F27

1. L[3]

1. A[1..80] // CTLJOBID (ControlJobID)

2. U1[1] // 6: CJStop

3. L[2]

1. A[6] // CPNAME (Command Parameters Name) "Action"

2. U[1] // CPVAL (Command Parameters Value) 0 or 1

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CtrlJobID	○	—	—
CtrlJobCmd	○	—	6: CJStop
Action	○	—	0: SAVEJOBS, 1: REMOVEJOBS

■S16F27: CJAabort

Message format

S16F27

1. L[3]
 1. A[1..80] // CTLJOBID (ControlJobID)
 2. U1[1] // 7: CJAabort
 3. L[2]
 1. A[6] // CPNAME (Command Parameters Name) "Action"
 2. U[1] // CPVAL (Command Parameters Value) 0 or 1

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

📖C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual



When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

📖C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CtrlJobID	○	—	—
CtrlJobCmd	○	—	7: CJAabort
Action	○	—	0: SAVEJOBS, 1: REMOVEJOBS



■S16F27: CJHOQ

Message format

S16F27

1. L[3]

1. A[1..80] // CTLJOBID (ControlJobID)

2. U1[1] // 8: CJHOQ

3. L[0]

Transaction of S16F27 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Point

When defining the transaction of S16F27 using the mapping function, multiple control job commands can be configured within one transaction definition.

For details on the mapping function, refer to the following:

📖 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameters

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
CtrlJobID	○	—	—
CtrlJobCmd	○	—	8: CJHOQ

S16F28: Control Job Command Acknowledge

Message format

S16F28

- 1. L[2] // Status
 - 1. BOOL[1] // ACKA
- 2. L[0 or 2] // ErrorInfo
 - 1. U2[1] // ErrorCode
 - 2. A[1..120] // ErrorText

Transaction of S16F28 must be user-defined and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
Status	○	—	—

S16F29: PRSetMtrlOrder

Message format

S16F29

1. U1[1] // PRMTRLORDER

Point

Transaction of S16F29 can be user-defined to disable automatic responses and controlled via the ladder.

For details on the transaction definition, refer to the following:

 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. Errors in parameters are determined.

Refer to 'Parameter' shown below.

2. If there is no error in parameters, the value of PJM variable 'PRMtrlOrder' is changed.

3. 'S16F30: PRSetMtrlOrder Acknowledge' is sent to the host.

4. When the PRMtrlOrder value is changed, '10040-00902 : PRSetMtrlOrder service notification' is sent to a control CPU.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement	Error judgment presence	Error code and error judgment condition
PRMtrlOrder	○	—	Valid values • 1 = ARRIVAL (Processing in the order of material arrival) • 2 = OPTIMIZE (Processing in the order that maximizes throughput) • 3 = LIST (Processing in the order of the list)	Yes	• ACKA = FALSE: GEM300 functions not activated and initialized • ACKA = FALSE: Other than valid values • ACKA = FALSE: Fixed value (cannot be changed)

Point

S16F30: There is no ErrorCode in the message format of PRSetMtrlOrder Acknowledge; therefore, an error code is not reported.

S16F30: PRSetMtrlOrder Acknowledge

Message format

S16F30

1. BOOL[1] // ACKA

Point

Transaction of S16F30 can be user-defined to disable automatic responses and controlled via the ladder.
For details on the transaction definition, refer to the following:
C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

Processing during automatic response

1. 'S16F30: PRSetMtrlOrder Acknowledge' is sent to the host.

Parameter

○: Applicable, —: Not applicable

Name	Mandatory (Required)	Conditional (Required under specific conditions)	Supplement
PRAck	○	—	—

Point

S16F30: There are no ErrorCode and ErrorText in the message format of PRSetMtrlOrder Acknowledge; therefore, only ACKA is reported.

Appendix 5 CMS Reports

This section shows the CMS report list.

RPTID	Report name	Used variable
300	CMS_CarrierIDStatusChange_1	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30047: CarrierIDStatus
301	CMS_CarrierIDStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30047: CarrierIDStatus
302	CMS_SlotMapStatusChange_1	<ul style="list-style-type: none"> • VID 30098: PortID (When the variable is enabled) • VID 30014: CarrierID • VID 30049: LocationID • VID 30013: CarrierAccessingStatus • VID 30123: SlotMapStatus
303	CMS_SlotMapStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID (When the variable is enabled) • VID 30014: CarrierID • VID 30049: LocationID • VID 30122: SlotMap (When the variable is enabled) • VID 30121: Reason • VID 30123: SlotMapStatus
304	CMS_SlotMapStatusChange_3	<ul style="list-style-type: none"> • VID 30098: PortID (When the variable is enabled) • VID 30014: CarrierID • VID 30049: LocationID • VID 30123: SlotMapStatus
305	CMS_CarrierAccessingStatusChange_1	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30013: CarrierAccessingStatus
306	CMS_CarrierAccessingStatusChange_2	VID 30014: CarrierID
310	CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
311	CMS_PortTransferStateChange_2	VID 30098: PortID
312	CMS_PortTransferStateChange_3	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30113: PortTransferState
313	CMS_LoadPortReservationStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30082: LoadPortReservationState • VID 30014: CarrierID
314	CMS_LoadPortReservationStateChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30082: LoadPortReservationState
315	CMS_PortAssociationStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30090: PortAssociationState
316	CMS_PortAssociationStateChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30090: PortAssociationState
317	CMS_BufferCapacityChanged	VID 30158: BufferPartitionInfo
318	CMS_Carrier_Open_Close_Clampe_Unclamepe	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30049: LocationID • VID 30098: PortID (When the variable is enabled)
319	CMS_CarrierLocationChange	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30049: LocationID • VID 30048: CarrierLocationMatrix
320	CMS_PortAccessModeChange	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30000: AccessMode

Appendix 6 CMS Events

This section shows the CMS event list.

'Carrier State Model' state transition events

CEID	Event name	Trigger	Linked report	Used variable
30000	NO STATE to ID NOT READ	Carrier State Model state transition No.(2)	RPTID 300: CMS_CarrierIDStatusChange_1	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30001	NO STATE to WAITING FOR HOST	Carrier State Model state transition No.(3)* ¹	RPTID 301: CMS_CarrierIDStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30002	NO STATE to ID VERIFICATION OK	Carrier State Model state transition No.(4)* ¹	RPTID 300: CMS_CarrierIDStatusChange_1	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30003	NO STATE to ID VERIFICATION FAIL	Carrier State Model state transition No.(5)* ¹	RPTID 300: CMS_CarrierIDStatusChange_1	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30004	ID NOT READ to ID VERIFICATION OK	Carrier State Model state transition No.(6)* ¹	RPTID 301: CMS_CarrierIDStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30005	ID NOT READ to WAITING FOR HOST	Carrier State Model state transition No.(7)* ¹	RPTID 301: CMS_CarrierIDStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30006	WAITING FOR HOST to ID VERIFICATION OK	Carrier State Model state transition No.(8)* ¹	RPTID 301: CMS_CarrierIDStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30007	WAITING FOR HOST to ID VERIFICATION FAIL	Carrier State Model state transition No.(9)* ¹	RPTID 301: CMS_CarrierIDStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30008	ID NOT READ to WAITING FOR HOST	Carrier State Model state transition No.(10)* ¹	RPTID 301: CMS_CarrierIDStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30009	ID NOT READ to ID VERIFICATION OK	Carrier State Model state transition No.(11)* ¹	RPTID 301: CMS_CarrierIDStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30047: CarrierIDStatus
30010	SLOT MAP NOT READ to SLOT MAP VERIFICATION OK	Carrier State Model state transition No.(13)* ¹	RPTID 302: CMS_SlotMapStatusChange_1	<ul style="list-style-type: none"> • VID 30098: PortID (When the variable is enabled) • VID 30014: CarrierID • VID 30049: LocationID • VID 30013: CarrierAccessingStatus • VID 30123: SlotMapStatus
30011	SLOT MAP NOT READ to WAITING FOR HOST	Carrier State Model state transition No.(14)* ¹	RPTID 303: CMS_SlotMapStatusChange_2	<ul style="list-style-type: none"> • VID 30098: PortID (When the variable is enabled) • VID 30014: CarrierID • VID 30049: LocationID • VID 30122: SlotMap (When the variable is enabled) • VID 30121: Reason • VID 30123: SlotMapStatus
30012	WAITING FOR HOST to SLOT MAP VERIFICATION OK	Carrier State Model state transition No.(15)* ¹	RPTID 304: CMS_SlotMapStatusChange_3	<ul style="list-style-type: none"> • VID 30098: PortID (When the variable is enabled) • VID 30014: CarrierID • VID 30049: LocationID • VID 30123: SlotMapStatus
30013	WAITING FOR HOST to SLOT MAP VERIFICATION FAIL	Carrier State Model state transition No.(16)* ¹	RPTID 302: CMS_SlotMapStatusChange_1	<ul style="list-style-type: none"> • VID 30098: PortID (When the variable is enabled) • VID 30014: CarrierID • VID 30049: LocationID • VID 30013: CarrierAccessingStatus • VID 30123: SlotMapStatus
30014	NOT ACCESSED to IN ACCESS	Carrier State Model state transition No.(18)* ¹	RPTID 305: CMS_CarrierAccessingStatusChange_1	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30013: CarrierAccessingStatus

A

CEID	Event name	Trigger	Linked report	Used variable
30015	IN ACCESS to CARRIER COMPLETE	Carrier State Model state transition No.(19)*1	RPTID 305: CMS_CarrierAccessingStatusChange_1	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30013: CarrierAccessingStatus
30016	IN ACCESS to CARRIER STOPPED	Carrier State Model state transition No.(20)*1	RPTID 305: CMS_CarrierAccessingStatusChange_1	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30013: CarrierAccessingStatus
30017	CARRIER to NO STATE	Carrier State Model state transition No.(21)	RPTID 306: CMS_CarrierAccessingStatusChange_2	VID 30014: CarrierID

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

'Load Port Transfer State Model' state transition events

CEID	Event name	Trigger	Linked report	Used variable
30025	NO STATE to OUT OF SERVICE	Load Port Transfer State Model state transition No.(1)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30026	NO STATE to IN SERVICE	Load Port Transfer State Model state transition No.(1)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30027	OUT OF SERVICE to IN SERVICE	Load Port Transfer State Model state transition No.(2)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30028	IN SERVICE to OUT OF SERVICE	Load Port Transfer State Model state transition No.(3)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30029	IN SERVICE to TRANSFER READY	Load Port Transfer State Model state transition No.(4)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30030	IN SERVICE to TRANSFER BLOCKED	Load Port Transfer State Model state transition No.(4)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30031	TRANSFER READY to READY TO LOAD	Load Port Transfer State Model state transition No.(5)	RPTID 311: CMS_PortTransferStateChange_2	VID 30098: PortID
30032	TRANSFER READY to READY TO UNLOAD	Load Port Transfer State Model state transition No.(5)	RPTID 312: CMS_PortTransferStateChange_3	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30113: PortTransferState
30033	READY TO LOAD to TRANSFER BLOCKED	Load Port Transfer State Model state transition No.(6)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30034	READY TO UNLOAD to TRANSFER BLOCKED	Load Port Transfer State Model state transition No.(7)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30035	TRANSFER BLOCKED to READY TO LOAD	Load Port Transfer State Model state transition No.(8)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState
30036	TRANSFER BLOCKED to READY TO UNLOAD	Load Port Transfer State Model state transition No.(9)	RPTID 312: CMS_PortTransferStateChange_3	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30113: PortTransferState
30037	TRANSFER BLOCKED to TRANSFER READY	Load Port Transfer State Model state transition No.(10)	RPTID 310: CMS_PortTransferStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30113: PortTransferState

'Load Port Reservation State Model (internal buffer equipment/ fixed buffer equipment)' state transition events

CEID	Event name	Trigger	Linked report	Used variable
30038	NOT RESERVED to RESERVED	Load Port Reservation State Model state transition No.(2) ❶ 'Bind (S3F17)' service message ❷ 00087-00413: Carrier move started to Load Port notification ❸ 00087-00415: UNLOAD completed and Carrier move started to Load Port notification	RPTID 313: CMS_LoadPortReservationStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30082: LoadPortReservationState • VID 30014: CarrierID
30039	RESERVED to NOT RESERVED	Load Port Reservation State Model state transition No.(3)	RPTID 314: CMS_LoadPortReservationStateChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30082: LoadPortReservationState
30091	NOT RESERVED to RESERVED	Load Port Reservation State Model state transition No.(2) ❶ 00087-00111: Load Port reservation request ❷ 'ReserveAtPort' (S3F25) service message	RPTID 314: CMS_LoadPortReservationStateChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30082: LoadPortReservationState

'Load Port/Carrier Association State Model' state transition events

CEID	Event name	Trigger	Linked report	Used variable
30040	NOT ASSOCIATED to ASSOCIATED	Load Port/Carrier Association State Model state transition No.(2)	RPTID 315: CMS_PortAssociationStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30090: PortAssociationState
30041	ASSOCIATED to NOT ASSOCIATED	Load Port/Carrier Association State Model state transition No.(3)	RPTID 316: CMS_PortAssociationStateChange_2	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30090: PortAssociationState
30042	ASSOCIATED to ASSOCIATED	Load Port/Carrier Association State Model state transition No.(4)*1	RPTID 315: CMS_PortAssociationStateChange_1	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30014: CarrierID • VID 30090: PortAssociationState

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

A

'Access Mode State Model' state transition events

CEID	Event name	Trigger	Linked report	Used variable
30043	NO STATE to MANUAL	Access Mode State Model state transition No.(1)* ¹	RPTID 320: CMS_PortAccessModeChange	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30000: AccessMode
30044	NO STATE to AUTO	Access Mode State Model state transition No.(1)	RPTID 320: CMS_PortAccessModeChange	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30000: AccessMode
30045	MANUAL to AUTO	Access Mode State Model state transition No.(2)* ¹	RPTID 320: CMS_PortAccessModeChange	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30000: AccessMode
30046	AUTO to MANUAL	Access Mode State Model state transition No.(3)* ¹	RPTID 320: CMS_PortAccessModeChange	<ul style="list-style-type: none"> • VID 30098: PortID • VID 30000: AccessMode

*1 Supported only by SECS/GEM communication software with software version 1.40S or later.

Additional events

CEID	Event name	Trigger	Linked report	Used variable	Description
30047	Buffer Capacity Changed Event	'00087-00404: Buffer Capacity changed notification' is received from a control CPU.	RPTID 317: CMS_BufferCapacityChanged	VID 30158: BufferPartitionInfo	An event in which equipment reports that 'the buffer capacity has changed'
30048	Carrier Approaching Complete Event	'00087-00312: Carrier approaching complete notification' is received from a control CPU.	RPTID 306: CMS_CarrierAccessingStatusChange_2	VID 30014: CarrierID	An event in which equipment reports that 'the completion of accessing a carrier is approaching'
30049	Carrier Clamped Event	'00087-00307: Carrier clamped notification' is received from a control CPU.	RPTID 318: CMS_Carrier_Open_Close_Clamp_Unclamp	<ul style="list-style-type: none"> • VID 30014: CarrierID (When the variable is enabled) • VID 30049: LocationID • VID 30098: PortID 	An event in which equipment reports that 'a carrier has been clamped'
30050	Carrier Closed Event	'00087-00310: Carrier closed notification' is received from a control CPU.	RPTID 318: CMS_Carrier_Open_Close_Clamp_Unclamp	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30049: LocationID • VID 30098: PortID (When the variable is enabled) 	An event in which equipment reports that 'the door of a carrier has been closed'
30051	Carrier Location Change Event	'00087-00403: Carrier Location change notification' is received from a control CPU.	RPTID 319: CMS_CarrierLocationChange	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30049: LocationID • VID 30048: CarrierLocation Matrix 	An event in which equipment reports that 'the location of a carrier has changed'
30052	Carrier Opened Event	'00087-00309: Carrier opened notification' is received from a control CPU.	RPTID 318: CMS_Carrier_Open_Close_Clamp_Unclamp	<ul style="list-style-type: none"> • VID 30014: CarrierID • VID 30049: LocationID • VID 30098: PortID (When the variable is enabled) 	An event in which equipment reports that 'the door of a carrier has been opened'

CEID	Event name	Trigger	Linked report	Used variable	Description
30053	Carrier Unclamped Event	'00087-00308: Carrier unclamped notification' is received from a control CPU.	RPTID 318: CMS_Carrier_Open_Close_Clamp_Unclamped	<ul style="list-style-type: none"> • VID 30014: CarrierID (When the variable is enabled) • VID 30049: LocationID • VID 30098: PortID 	An event in which equipment reports that 'a carrier has been unclamped'
30054	CarrierID Read FailEvent	'00087-00502: CarrierID read fail notification' is received from a control CPU.	RPTID 311: CMS_PortTransferStateChange_2	VID 30098: PortID	An event in which equipment reports that 'CarrierID reading has failed for a carrier in a load port in the NOT ASSOCIATED STATE'
30055	ID Reader Available Event	'00087-00203: ID READER available notification' is received from a control CPU.	RPTID 311: CMS_PortTransferStateChange_2	VID 30098: PortID	An event in which equipment reports that 'the preparation of a carrier ID reader has been completed'
30056	ID Reader Unavailable Event	'00087-00204: ID READER unavailable notification' is received from a control CPU.	RPTID 311: CMS_PortTransferStateChange_2	VID 30098: PortID	An event in which equipment reports that 'a carrier ID reader can no longer be used'
30057	UnknownCarrierID Event	'00087-00503: Unknown CarrierID notification' is received from a control CPU.	RPTID 311: CMS_PortTransferStateChange_2	VID 30098: PortID	An event in which equipment reports that 'a carrier has arrived at a load port in the NOT ASSOCIATED state for which a carrier ID reader is not available'
30058	Duplicate CarrierID In Process Event	'00087-00504: Duplicate CarrierID in process notification' is received from a control CPU.	RPTID 306: CMS_CarrierAccessingStatusChange_2	VID 30014: CarrierID	An event in which equipment reports that 'CarrierID of a received carrier is the same as CarrierID of another carrier for which processing has started'

Appendix 7 CJM Report

This section shows the CJM report list.

RPTID	Report name	Used variable
330	CJM_StateChange	VID 30401: CtrlJobID

Appendix 8 CJM Events

This section shows the CJM event list.

CEID	Event name	Trigger	Linked report	Used variable
30100	NO STATE to QUEUED	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30101	QUEUED to NO STATE	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30102	QUEUED to SELECTED	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30103	SELECTED to QUEUED	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30104	SELECTED to EXECUTING	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30105	SELECTED to WAITING FOR START	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30106	WAITING FOR START to EXECUTING	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30107	EXECUTING to PAUSED	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30108	PAUSED to EXECUTING	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30109	EXECUTING to COMPLETED	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30110	ACTIVE to COMPLETED	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID
30111	COMPLETED to NO STATE	Relay request	RPTID 330: CJM_StateChange	VID 30401: CtrlJobID



Appendix 9 PJM Reports

This section shows the PJM report list.

RPTID	Report name	Used variable
340	PJM_StateChange	<ul style="list-style-type: none">• VID 30500: PRJobID• VID 30508: PRJobState• VID 29: Clock (Timestamp)
341	PJM_WaitingForMaterial	<ul style="list-style-type: none">• VID 30500: PRJobID• VID 29: Clock (Timestamp)
342	PJM_Milestone	<ul style="list-style-type: none">• VID 29: Clock (Timestamp)• VID 30500: PRJobID• VID 30510: PRJobMilestone• VID 30511: PRAck

Appendix 10PJM Events

This section shows the PJM event list.

CEID	Event name	Trigger	Linked report	Used variable
30200	NO STATE to POOLED	Relay request	RPTID 340: PJM_StateChange	<ul style="list-style-type: none"> • VID 30500: PRJobID • VID 30508: PRJobState • VID 29: Clock (Timestamp)
30201	POOLED to SETTING UP	Relay request		
30202	SETTING UP to WAITING FOR START	Relay request		
30203	SETTING UP to PROCESSING	Relay request		
30204	WAITING FOR START to PROCESSING	Relay request		
30205	PROCESSING to PROCESS COMPLETE	Relay request		
30206	POST ACTIVE to NO STATE	Relay request		
30207	PROCESS COMPLETE to NO STATE	Relay request		
30208	ABORTED to NO STATE	Relay request		
30209	STOPPED to NO STATE	Relay request		
30210	EXECUTING to PAUSING	Relay request		
30211	SETTING UP to PAUSING	Relay request		
30212	WAITING FOR START to PAUSING	Relay request		
30213	PROCESSING to PAUSING	Relay request		
30214	PAUSING to PAUSED	Relay request		
30215	PAUSE to SETTING UP	Relay request		
30216	PAUSE to WAITING FOR START	Relay request		
30217	PAUSE to PROCESSING	Relay request		
30218	PAUSING to SETTING UP	Relay request		
30219	PAUSING to WAITING FOR START	Relay request		
30220	PAUSING to PROCESSING	Relay request		
30221	PAUSED to SETTING UP	Relay request		
30222	PAUSED to WAITING FOR START	Relay request		
30223	PAUSED to PROCESSING	Relay request		
30224	EXECUTING to STOPPING	Relay request		
30225	SETTING UP to STOPPING	Relay request		
30226	WAITING FOR START to STOPPING	Relay request		
30227	PROCESSING to STOPPING	Relay request		
30228	PAUSE to STOPPING	Relay request		
30229	PAUSING to STOPPING	Relay request		
30230	PAUSED to STOPPING	Relay request		
30231	EXECUTING to ABORTING	Relay request		
30232	SETTING UP to ABORTING	Relay request		
30233	WAITING FOR START to ABORTING	Relay request		
30234	PROCESSING to ABORTING	Relay request		
30235	STOPPING to ABORTING	Relay request		
30236	PAUSE to ABORTING	Relay request		
30237	PAUSING to ABORTING	Relay request		
30238	PAUSED to ABORTING	Relay request		
30239	ABORTING to ABORTED	Relay request		
30240	STOPPING to STOPPED	Relay request		
30241	POOLED to NO STATE	Relay request		

CEID	Event name	Trigger	Linked report	Used variable
30242	PR Job Waiting for Material	Relay request	RPTID 341: PJM_WaitingForMaterial	<ul style="list-style-type: none"> • VID 30500: PRJobID • VID 29: Clock (Timestamp)
30243	PR Job Setup	Relay request	RPTID 342: PJM_Milestone	<ul style="list-style-type: none"> • VID 29: Clock (Timestamp) • VID 30500: PRJobID • VID 30510: PRJobMilestone • VID 30511: PRAck
30244	PR Job Processing	Relay request		
30245	PR Job Processing Complete	Relay request		
30246	PR Job Complete	Relay request		
30247	PR Job Waiting for Start	Relay request		

Appendix 11 STS Reports

This section shows the STS report list.

RPTID	Report name	Used variable
321	STS_SubstrateStateChange	<ul style="list-style-type: none">• VID 31000: AcquiredID• VID 31001: SubstID• VID 31002: SubstIDStatus• VID 31003: SubstBatchLocID• VID 31004: SubstDestination• VID 31005: SubstHistory• VID 31006: SubstSubstLocID• VID 31007: SubstLotID• VID 31008: SubstMtrlStatus• VID 31009: SubstPosInBatch• VID 31010: SubstProcState• VID 31011: SubstSource• VID 31012: SubstState• VID 31013: SubstType• VID 31014: SubstUsage
322	STS_SubstrateLocationStateChange	<ul style="list-style-type: none">• VID 31031: SubstLocID• VID 31032: SubstLocState• VID 31033: SubstLocSubstID
323	STS_BatchLocationStateChange	<ul style="list-style-type: none">• VID 31034: BatchLocID• VID 31035: BatchLocState• VID 31036: BatchSubstIDMap



Appendix 12STS Events

This section shows the STS event list.

CEID	Event name	Trigger	Linked report	Used variable
30059	NO STATE to AT SOURCE	Relay request	RPTID 321: STS_SubstrateStateChange	<ul style="list-style-type: none"> • VID 31000: AcquiredID • VID 31001: SubstID • VID 31002: SubstIDStatus • VID 31003: SubstBatchLocID • VID 31004: SubstDestination • VID 31005: SubstHistory • VID 31006: SubstSubstLocID • VID 31007: SubstLotID • VID 31008: SubstMtrlStatus • VID 31009: SubstPosInBatch • VID 31010: SubstProcState • VID 31011: SubstSource • VID 31012: SubstState • VID 31013: SubstType • VID 31014: SubstUsage
30060	AT SOURCE to AT WORK			
30061	AT WORK to AT SOURCE			
30062	AT WORK to AT WORK			
30063	AT WORK to AT DESTINATION			
30064	AT DESTINATION to AT WORK			
30065	AT DESTINATION to NO STATE			
30066	AT DESTINATION to AT SOURCE			
30067	SUBSTRATE to NO STATE			
30068	NO STATE to NEEDS PROCESSING			
30069	NEEDS PROCESSING to IN PROCESS			
30070	IN PROCESS to PROCESSED			
30071	IN PROCESS to ABORTED			
30072	IN PROCESS to STOPPED			
30073	IN PROCESS to REJECTED			
30074	IN PROCESS to LOST			
30075	IN PROCESS to SKIPPED			
30076	IN PROCESS to NEEDS PROCESSING			
30077	NEEDS PROCESSING to LOST			
30078	NEEDS PROCESSING to SKIPPED			
30079	NO STATE to NOT CONFIRMED			
30080	NOT CONFIRMED to CONFIRMED			
30081	NOT CONFIRMED to WAITING FOR HOST			
30082	NOT CONFIRMED to WAITING FOR HOST			
30083	WAITING FOR HOST to CONFIRMED			
30084	WAITING FOR HOST to CONFIRMATION FAILED			
30085	UNOCCUPIED to OCCUPIED		RPTID 322: STS_SubstrateLocationStateChange	<ul style="list-style-type: none"> • VID 31031: SubstLocID • VID 31032: SubstLocState • VID 31033: SubstLocSubstID
30086	OCCUPIED to UNOCCUPIED		RPTID 323: STS_BatchLocationStateChange	<ul style="list-style-type: none"> • VID 31034: BatchLocID • VID 31035: BatchLocState • VID 31036: BatchSubstIDMap
30087	UNOCCUPIED to OCCUPIED			
30088	OCCUPIED to UNOCCUPIED		None	None
30089	SubstrateIDReaderAvailable			
30090	SubstrateIDReaderUnavailable			

Appendix 13 Sample Library

By using a structure label in the control CPU interface, data can be managed easily with a GEM300 standard support function. In this product, labels used for for GEM300 standard support functions are provided as a sample library.

The sample library is stored in the following folder of installation destination of this product.

- Storage folder: (SECS/GEM communication software installation folder)\SAMPLE\RD55UP12-V\LABEL\RD55UP12-V_GEM300.mslm

Sample library information

Item	Description
File name	RD55UP12-V_GEM300.mslm
Target module	RD55UP12-V-BZ15 (GEM300)
Target engineering tool	GX Works3
Type	Sample
Latest version	02A

Procedure to use the library

1. Register a library in GX Works3.
2. Utilize elements from a library to projects.

Registering user libraries in the library list

Register a library containing elements to be utilized in the list.

Operating procedure

■Registering a library to be referenced

1. Select [Project] ⇒ [Library Operation] ⇒ [Register to Library List] ⇒ [Library].
2. Select a file in the "Register Library to Library List" screen, then click the [Open] button.

■Deleting a library

1. Select the [Library] tab in the element selection window.
2. Select the library to be deleted, then select [Project] ⇒ [Library Operation] ⇒ [Delete from Library List].

Utilizing an element

Library elements registered in the element selection window can be utilized in other projects.

Operating procedure

1. Select an element (global label) in the [Library] tab in the element selection window.
 2. Drag and drop the selected element (global label) onto an element (global label) in the navigation window.
- An element can be dropped onto the place in which data of the same type as the element to be pasted can be created.

Updating library POU

Update the elements of a library imported to a project.

Operating procedure

1. Select a library or library POU to update in the [Library] tab in the element selection window.
2. Select [Project] ⇒ [Library Operation] ⇒ [Update Library POU]
Alternatively, right-click a library element, and select [Update Library POU] from the shortcut menu.
3. Select the checkboxes of "Global Label" and "Update with Elements in Callee" and click the [Update] button in the "Update Library POU" screen.

Point

After updating the library element version, all programs must be converted.

Labels

The following shows labels used in a sample library.

Global label list

The following table shows the global labels used in the control CPU interface.

Global label	Latest version
M+GEM300_BufferMemory	02A

■M+GEM300_BufferMemory

Point

The buffer memory of RD55UP12-V (the start I/O number is '000h') is assigned to each global label.

Label name	Data type	Class	Comment	Assignment (device/label)
G_bCIMREADY	Bit	VAR_GLOBAL	[CA-SECS status]-[CIM control READY]	U0\G16384.0
G_bCONNECT	Bit	VAR_GLOBAL	[CA-SECS status]-[HSMS line communication status]	U0\G16384.1
G_bCONNECT_RETRY	Bit	VAR_GLOBAL	[CA-SECS status]-[HSMS reconnection retry]	U0\G16384.2
G_bCommunication	Bit	VAR_GLOBAL	[CA-SECS status]-[GEM communication establishment status]	U0\G16384.3
G_bONLINE	Bit	VAR_GLOBAL	[CA-SECS status]-[GEM online status]	U0\G16384.4
G_bGEM300	Bit	VAR_GLOBAL	[CA-SECS status]-[GEM300 status]	U0\G16384.5
G_bQUEUE_FULL_1	Bit	VAR_GLOBAL	[CA-SECS status]-[Transaction queue full for PLC Transmission]	U0\G16384.6
G_bQUEUE_FULL_2	Bit	VAR_GLOBAL	[CA-SECS status]-[Queue full of control CPU interfaces for CPU to CITL]	U0\G16384.7
G_bQUEUE_FULL_3	Bit	VAR_GLOBAL	[CA-SECS status]-[Queue full of control CPU interfaces for CITL to CPU]	U0\G16384.8
G_bSDcard_ERROR	Bit	VAR_GLOBAL	[CA-SECS error-detected information]-[SD memory card file access error detection]	U0\G16385.1
G_bGEM300IF_W_ERRO R_1	Bit	VAR_GLOBAL	[CPU to CITL I/F error-detected information]-[Information type error detection]	U0\G20432.0
G_bGEM300IF_W_ERRO R_2	Bit	VAR_GLOBAL	[CPU to CITL I/F error-detected information]-[Detail type error detection]	U0\G20432.1
G_bGEM300IF_W_ERRO R_3	Bit	VAR_GLOBAL	[CPU to CITL I/F error-detected information]-[Data size error detection]	U0\G20432.2
G_wGEM300IF_W_ERRO R_INFO	Word [Signed]	VAR_GLOBAL	[CPU to CITL I/F error-detected information]-[Information type with error]	U0\G20433
G_wGEM300IF_W_ERRO R_DETAIL	Word [Signed]	VAR_GLOBAL	[CPU to CITL I/F error-detected information]-[Detail type with error]	U0\G20434

Label name	Data type	Class	Comment	Assignment (device/label)
G_udGEM300IF_W_ERR OR_SIZE	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	[CPU to CITL I/F error-detected information]-[Data size with error]	U0\G20435
G_bGEM300IF_R_HS_CITL_USE	Bit	VAR_GLOBAL	[CITL to CPU I/F: Write status flag]-[In-use flag]	U0\G20448.0
G_bGEM300IF_R_HS_CITL_WROTE	Bit	VAR_GLOBAL	[CITL to CPU I/F: Write status flag]-[Write completion flag]	U0\G20448.1
G_bGEM300IF_R_HS_CPU_USE	Bit	VAR_GLOBAL	[CITL to CPU I/F: Read status flag]-[In-use flag]	U0\G20449.0
G_bGEM300IF_R_HS_CPU_READ	Bit	VAR_GLOBAL	[CITL to CPU I/F: Read status flag]-[Read completion flag]	U0\G20449.1
G_wGEM300IF_R_INFO	Word [Signed]	VAR_GLOBAL	[CITL to CPU I/F: Information type]-[Information type]	U0\G20450
G_wGEM300IF_R_DETAIL	Word [Signed]	VAR_GLOBAL	[CITL to CPU I/F: Detail type]-[Detail type]	U0\G20451
G_udGEM300IF_R_DATA	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	[CITL to CPU I/F: Start address of data area]-[Start address]	U0\G20452
G_dGEM300IF_R_SIZE	Double Word [Unsigned]	VAR_GLOBAL	[CITL to CPU I/F: Data size of data area]-[Data size]	U0\G20454
G_bGEM300IF_W_HS_CPU_USE	Bit	VAR_GLOBAL	[CPU to CITL I/F: Write status flag]-[In-use flag]	U0\G20464.0
G_bGEM300IF_W_HS_CPU_WROTE	Bit	VAR_GLOBAL	[CPU to CITL I/F: Write status flag]-[Write completion flag]	U0\G20464.1
G_bGEM300IF_W_HS_CITL_USE	Bit	VAR_GLOBAL	[CPU to CITL I/F: Read status flag]-[In-use flag]	U0\G20465.0
G_bGEM300IF_W_HS_CITL_READ	Bit	VAR_GLOBAL	[CPU to CITL I/F: Read status flag]-[Read completion flag]	U0\G20465.1
G_wGEM300IF_W_INFO	Word [Signed]	VAR_GLOBAL	[CPU to CITL I/F: Information type]-[Information type]	U0\G20466
G_wGEM300IF_W_DETAIL	Word [Signed]	VAR_GLOBAL	[CPU to CITL I/F: Detail type]-[Detail type]	U0\G20467
G_udGEM300IF_W_DATA	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	[CPU to CITL I/F: Start address of data area]-[Start address]	U0\G20468
G_dGEM300IF_W_SIZE	Double Word [Unsigned]	VAR_GLOBAL	[CPU to CITL I/F: Data size of data area]-[Data size]	U0\G20470
G_bLP1_AMS	Bit	VAR_GLOBAL	[Load port status: Port access mode]-[AccessMode of PortID (PTN)1]	U0\G24576.0
G_bLP2_AMS	Bit	VAR_GLOBAL	[Load port status: Port access mode]-[AccessMode of PortID (PTN)2]	U0\G24576.1
G_bLP3_AMS	Bit	VAR_GLOBAL	[Load port status: Port access mode]-[AccessMode of PortID (PTN)3]	U0\G24576.2
G_bLP4_AMS	Bit	VAR_GLOBAL	[Load port status: Port access mode]-[AccessMode of PortID (PTN)4]	U0\G24576.3
G_bLP5_AMS	Bit	VAR_GLOBAL	[Load port status: Port access mode]-[AccessMode of PortID (PTN)5]	U0\G24576.4
G_bLP6_AMS	Bit	VAR_GLOBAL	[Load port status: Port access mode]-[AccessMode of PortID (PTN)6]	U0\G24576.5
G_wLP1_LTS	Word [Signed]	VAR_GLOBAL	[Load port status: Port transfer state]-[PortTransferState of PortID (PTN)1]	U0\G24577
G_wLP2_LTS	Word [Signed]	VAR_GLOBAL	[Load port status: Port transfer state]-[PortTransferState of PortID (PTN)2]	U0\G24578
G_wLP3_LTS	Word [Signed]	VAR_GLOBAL	[Load port status: Port transfer state]-[PortTransferState of PortID (PTN)3]	U0\G24579
G_wLP4_LTS	Word [Signed]	VAR_GLOBAL	[Load port status: Port transfer state]-[PortTransferState of PortID (PTN)4]	U0\G24580
G_wLP5_LTS	Word [Signed]	VAR_GLOBAL	[Load port status: Port transfer state]-[PortTransferState of PortID (PTN)5]	U0\G24581
G_wLP6_LTS	Word [Signed]	VAR_GLOBAL	[Load port status: Port transfer state]-[PortTransferState of PortID (PTN)6]	U0\G24582
G_bLP1_LTS_SS	Bit	VAR_GLOBAL	[Load port status: Service status]-[ServiceStatus of PortID (PTN)1]	U0\G24593.0
G_bLP2_LTS_SS	Bit	VAR_GLOBAL	[Load port status: Service status]-[ServiceStatus of PortID (PTN)2]	U0\G24593.1

Label name	Data type	Class	Comment	Assignment (device/label)
G_bLP3_LTS_SS	Bit	VAR_GLOBAL	[Load port status: Service status]-[ServiceStatus of PortID (PTN)3]	U0\G24593.2
G_bLP4_LTS_SS	Bit	VAR_GLOBAL	[Load port status: Service status]-[ServiceStatus of PortID (PTN)4]	U0\G24593.3
G_bLP5_LTS_SS	Bit	VAR_GLOBAL	[Load port status: Service status]-[ServiceStatus of PortID (PTN)5]	U0\G24593.4
G_bLP6_LTS_SS	Bit	VAR_GLOBAL	[Load port status: Service status]-[ServiceStatus of PortID (PTN)6]	U0\G24593.5
G_bLP1_LTS_ISS	Bit	VAR_GLOBAL	[Load port status: In service status]-[InServiceStatus of PortID (PTN)1]	U0\G24594.0
G_bLP2_LTS_ISS	Bit	VAR_GLOBAL	[Load port status: In service status]-[InServiceStatus of PortID (PTN)2]	U0\G24594.1
G_bLP3_LTS_ISS	Bit	VAR_GLOBAL	[Load port status: In service status]-[InServiceStatus of PortID (PTN)3]	U0\G24594.2
G_bLP4_LTS_ISS	Bit	VAR_GLOBAL	[Load port status: In service status]-[InServiceStatus of PortID (PTN)4]	U0\G24594.3
G_bLP5_LTS_ISS	Bit	VAR_GLOBAL	[Load port status: In service status]-[InServiceStatus of PortID (PTN)5]	U0\G24594.4
G_bLP6_LTS_ISS	Bit	VAR_GLOBAL	[Load port status: In service status]-[InServiceStatus of PortID (PTN)6]	U0\G24594.5
G_bLP1_LTS_TRS	Bit	VAR_GLOBAL	[Load port status: Transfer ready status]-[TransferReadyStatus of PortID (PTN)1]	U0\G24595.0
G_bLP2_LTS_TRS	Bit	VAR_GLOBAL	[Load port status: Transfer ready status]-[TransferReadyStatus of PortID (PTN)2]	U0\G24595.1
G_bLP3_LTS_TRS	Bit	VAR_GLOBAL	[Load port status: Transfer ready status]-[TransferReadyStatus of PortID (PTN)3]	U0\G24595.2
G_bLP4_LTS_TRS	Bit	VAR_GLOBAL	[Load port status: Transfer ready status]-[TransferReadyStatus of PortID (PTN)4]	U0\G24595.3
G_bLP5_LTS_TRS	Bit	VAR_GLOBAL	[Load port status: Transfer ready status]-[TransferReadyStatus of PortID (PTN)5]	U0\G24595.4
G_bLP6_LTS_TRS	Bit	VAR_GLOBAL	[Load port status: Transfer ready status]-[TransferReadyStatus of PortID (PTN)6]	U0\G24595.5
G_bLP1_LCAS	Bit	VAR_GLOBAL	[Load port status: Port association state]-[PortAssociationState of PortID (PTN)1]	U0\G24596.0
G_bLP2_LCAS	Bit	VAR_GLOBAL	[Load port status: Port association state]-[PortAssociationState of PortID (PTN)2]	U0\G24596.1
G_bLP3_LCAS	Bit	VAR_GLOBAL	[Load port status: Port association state]-[PortAssociationState of PortID (PTN)3]	U0\G24596.2
G_bLP4_LCAS	Bit	VAR_GLOBAL	[Load port status: Port association state]-[PortAssociationState of PortID (PTN)4]	U0\G24596.3
G_bLP5_LCAS	Bit	VAR_GLOBAL	[Load port status: Port association state]-[PortAssociationState of PortID (PTN)5]	U0\G24596.4
G_bLP6_LCAS	Bit	VAR_GLOBAL	[Load port status: Port association state]-[PortAssociationState of PortID (PTN)6]	U0\G24596.5
G_bLP1_LRS	Bit	VAR_GLOBAL	[Load port status: Port reservation state]-[LoadPortReservationState of PortID (PTN)1]	U0\G24597.0
G_bLP2_LRS	Bit	VAR_GLOBAL	[Load port status: Port reservation state]-[LoadPortReservationState of PortID (PTN)2]	U0\G24597.1
G_bLP3_LRS	Bit	VAR_GLOBAL	[Load port status: Port reservation state]-[LoadPortReservationState of PortID (PTN)3]	U0\G24597.2
G_bLP4_LRS	Bit	VAR_GLOBAL	[Load port status: Port reservation state]-[LoadPortReservationState of PortID (PTN)4]	U0\G24597.3
G_bLP5_LRS	Bit	VAR_GLOBAL	[Load port status: Port reservation state]-[LoadPortReservationState of PortID (PTN)5]	U0\G24597.4
G_bLP6_LRS	Bit	VAR_GLOBAL	[Load port status: Port reservation state]-[LoadPortReservationState of PortID (PTN)6]	U0\G24597.5
G_wNUM_CARRIER	Word [Signed]	VAR_GLOBAL	[Carrier: Carrier object count]-[Carrier object count]	U0\G24598
G_bLP1_IDRS	Bit	VAR_GLOBAL	[Carrier ID reader status]-[Carrier ID reader status of PortID (PTN)1]	U0\G24599.0

Label name	Data type	Class	Comment	Assignment (device/label)
G_bLP2_IDRS	Bit	VAR_GLOBAL	[Carrier ID reader status]-[Carrier ID reader status of PortID (PTN)2]	U0\G24599.1
G_bLP3_IDRS	Bit	VAR_GLOBAL	[Carrier ID reader status]-[Carrier ID reader status of PortID (PTN)3]	U0\G24599.2
G_bLP4_IDRS	Bit	VAR_GLOBAL	[Carrier ID reader status]-[Carrier ID reader status of PortID (PTN)4]	U0\G24599.3
G_bLP5_IDRS	Bit	VAR_GLOBAL	[Carrier ID reader status]-[Carrier ID reader status of PortID (PTN)5]	U0\G24599.4
G_bLP6_IDRS	Bit	VAR_GLOBAL	[Carrier ID reader status]-[Carrier ID reader status of PortID (PTN)6]	U0\G24599.5
G_wLP1_A_CARRIERID	Word [Signed] (0..39)	VAR_GLOBAL	[Load port/carrier association state]-[CarrierID associated with PortID (PTN)1]	U0\G24832
G_wLP2_A_CARRIERID	Word [Signed] (0..39)	VAR_GLOBAL	[Load port/carrier association state]-[CarrierID associated with PortID (PTN)2]	U0\G24872
G_wLP3_A_CARRIERID	Word [Signed] (0..39)	VAR_GLOBAL	[Load port/carrier association state]-[CarrierID associated with PortID (PTN)3]	U0\G24912
G_wLP4_A_CARRIERID	Word [Signed] (0..39)	VAR_GLOBAL	[Load port/carrier association state]-[CarrierID associated with PortID (PTN)4]	U0\G24952
G_wLP5_A_CARRIERID	Word [Signed] (0..39)	VAR_GLOBAL	[Load port/carrier association state]-[CarrierID associated with PortID (PTN)5]	U0\G24992
G_wLP6_A_CARRIERID	Word [Signed] (0..39)	VAR_GLOBAL	[Load port/carrier association state]-[CarrierID associated with PortID (PTN)6]	U0\G25032
G_wNUM_CONTROLJOB	Word [Signed]	VAR_GLOBAL	[Control job object]-[Control job object count]	U0\G28672
G_wQUEUE_AVAILABLE_SPACE	Word [Signed]	VAR_GLOBAL	[Control job queue]-[QueueAvailableSpace]	U0\G28673
G_stQUEUED_CJOBS	M+GEM300_ObjIDList(0..31)	VAR_GLOBAL	[Control job queue]-[QueuedCJobs]	U0\G28674
G_wNUM_QUEUED_CJOBS	Word [Signed]	VAR_GLOBAL	[Control job queue]-[QUEUED state control job count]	U0\G30722
G_wNUM_SELECTED_CJOBS	Word [Signed]	VAR_GLOBAL	[Control job queue]-[SELECTED state control job count]	U0\G30723
G_wNUM_EXECUTED_CJOBS	Word [Signed]	VAR_GLOBAL	[Control job queue]-[Processing state control job count]	U0\G30724
G_wNUM_PROCESSJOB	Word [Signed]	VAR_GLOBAL	[Process job object]-[Process job object count]	U0\G32768
G_wNUM_SUBST	Word [Signed]	VAR_GLOBAL	[Substrate object]-[Substrate object count]	U0\G36864
G_wNUM_SUBSTLOC	Word [Signed]	VAR_GLOBAL	[Substrate location object]-[Carrier substrate location count]	U0\G36865
G_wGEM300IF_R_AREA	Word [Signed] (0..262143)	VAR_GLOBAL	[CITL to CPU I/F: Data reading area]-[Data reading area]	U0\G1572864
G_wGEM300IF_W_AREA	Word [Signed] (0..262143)	VAR_GLOBAL	[CPU to CITL I/F: Data writing area]-[Data writing area]	U0\G1835008
G_st00000_00002	M+GEM300_00000-00002	VAR_GLOBAL	LoadPort initial request	U0\G1835008
G_st00039_00006	M+GEM300_00039-00006	VAR_GLOBAL	Get AttrName List request	U0\G1835008
G_st00039_00103	M+GEM300_00039-00103	VAR_GLOBAL	LoadPortObject SetAttr request	U0\G1835008
G_st00039_00104	M+GEM300_00039-00104	VAR_GLOBAL	LoadPortObject GetAttr request	U0\G1835008
G_st00039_00203	M+GEM300_00039-00203	VAR_GLOBAL	LocationObject SetAttr request	U0\G1835008
G_st00039_00204	M+GEM300_00039-00204	VAR_GLOBAL	LocationObject GetAttr request	U0\G1835008
G_st00039_00303	M+GEM300_00039-00303	VAR_GLOBAL	InternalBufferObject SetAttr request	U0\G1835008
G_st00039_00304	M+GEM300_00039-00304	VAR_GLOBAL	InternalBufferObject GetAttr request	U0\G1835008
G_st00040_00001	M+GEM300_00040-00001	VAR_GLOBAL	ProcessJobObject create request	U0\G1835008
G_st00040_00002	M+GEM300_00040-00002	VAR_GLOBAL	ProcessJobObject delete request	U0\G1835008
G_st00040_00003	M+GEM300_00040-00003	VAR_GLOBAL	ProcessJobObject SetAttr request	U0\G1835008
G_st00040_00004	M+GEM300_00040-00004	VAR_GLOBAL	ProcessJobObject GetAttr request	U0\G1835008
G_st00087_00001	M+GEM300_00087-00001	VAR_GLOBAL	CarrierObject create request	U0\G1835008
G_st00087_00002	M+GEM300_00087-00002	VAR_GLOBAL	CarrierObject delete request	U0\G1835008
G_st00087_00003	M+GEM300_00087-00003	VAR_GLOBAL	CarrierObject SetAttr request	U0\G1835008
G_st00087_00004	M+GEM300_00087-00004	VAR_GLOBAL	CarrierObject GetAttr request	U0\G1835008
G_st00087_00101	M+GEM300_00087-00101	VAR_GLOBAL	AccessMode AUTO request	U0\G1835008

Label name	Data type	Class	Comment	Assignment (device/label)
G_st00087_00102	M+GEM300_00087-00102	VAR_GLOBAL	AccessMode MANUAL request	U0\G1835008
G_st00087_00111	M+GEM300_00087-00111	VAR_GLOBAL	Load Port reservation request	U0\G1835008
G_st00087_00112	M+GEM300_00087-00112	VAR_GLOBAL	Load Port cancel reservation request	U0\G1835008
G_st00087_00201	M+GEM300_00087-00201	VAR_GLOBAL	IN SERVICE request	U0\G1835008
G_st00087_00202	M+GEM300_00087-00202	VAR_GLOBAL	OUT OF SERVICE request	U0\G1835008
G_st00087_00203	M+GEM300_00087-00203	VAR_GLOBAL	ID READER available notification	U0\G1835008
G_st00087_00204	M+GEM300_00087-00204	VAR_GLOBAL	ID READER unavailable notification	U0\G1835008
G_st00087_00301	M+GEM300_00087-00301	VAR_GLOBAL	LOAD started notification	U0\G1835008
G_st00087_00302	M+GEM300_00087-00302	VAR_GLOBAL	LOAD completed notification	U0\G1835008
G_st00087_00303	M+GEM300_00087-00303	VAR_GLOBAL	UNLOAD available notification	U0\G1835008
G_st00087_00304	M+GEM300_00087-00304	VAR_GLOBAL	UNLOAD started notification	U0\G1835008
G_st00087_00305	M+GEM300_00087-00305	VAR_GLOBAL	UNLOAD completed notification	U0\G1835008
G_st00087_00306	M+GEM300_00087-00306	VAR_GLOBAL	TRANSFER failed notification	U0\G1835008
G_st00087_00307	M+GEM300_00087-00307	VAR_GLOBAL	Carrier clamped notification	U0\G1835008
G_st00087_00308	M+GEM300_00087-00308	VAR_GLOBAL	Carrier unclamped notification	U0\G1835008
G_st00087_00309	M+GEM300_00087-00309	VAR_GLOBAL	Carrier opened notification	U0\G1835008
G_st00087_00310	M+GEM300_00087-00310	VAR_GLOBAL	Carrier closed notification	U0\G1835008
G_st00087_00311	M+GEM300_00087-00311	VAR_GLOBAL	Carrier accessing started notification	U0\G1835008
G_st00087_00312	M+GEM300_00087-00312	VAR_GLOBAL	Carrier approaching complete notification	U0\G1835008
G_st00087_00313	M+GEM300_00087-00313	VAR_GLOBAL	Carrier accessing normally finished notification	U0\G1835008
G_st00087_00314	M+GEM300_00087-00314	VAR_GLOBAL	Carrier accessing abnormally finished notification	U0\G1835008
G_st00087_00401	M+GEM300_00087-00401	VAR_GLOBAL	Load Port Carrier association request	U0\G1835008
G_st00087_00402	M+GEM300_00087-00402	VAR_GLOBAL	Load Port Carrier cancel association request	U0\G1835008
G_st00087_00403	M+GEM300_00087-00403	VAR_GLOBAL	Carrier Location change notification	U0\G1835008
G_st00087_00404	M+GEM300_00087-00404	VAR_GLOBAL	Buffer Capacity changed notification	U0\G1835008
G_st00087_00411	M+GEM300_00087-00411	VAR_GLOBAL	Carrier move started to Internal Buffer notification	U0\G1835008
G_st00087_00412	M+GEM300_00087-00412	VAR_GLOBAL	Carrier move completed to Internal Buffer notification	U0\G1835008
G_st00087_00413	M+GEM300_00087-00413	VAR_GLOBAL	Carrier move started to Load Port notification	U0\G1835008
G_st00087_00414	M+GEM300_00087-00414	VAR_GLOBAL	Carrier move completed to Load Port notification	U0\G1835008
G_st00087_00415	M+GEM300_00087-00415	VAR_GLOBAL	UNLOAD completed and Carrier move started to Load Port notification	U0\G1835008
G_st00087_00501	M+GEM300_00087-00501	VAR_GLOBAL	CarrierID read successful notification	U0\G1835008
G_st00087_00502	M+GEM300_00087-00502	VAR_GLOBAL	CarrierID read fail notification	U0\G1835008
G_st00087_00503	M+GEM300_00087-00503	VAR_GLOBAL	Unknown CarrierID notification	U0\G1835008
G_st00087_00504	M+GEM300_00087-00504	VAR_GLOBAL	Duplicate CarrierID in process notification	U0\G1835008
G_st00087_00601	M+GEM300_00087-00601	VAR_GLOBAL	SlotMap verification ok notification	U0\G1835008
G_st00087_00602	M+GEM300_00087-00602	VAR_GLOBAL	SlotMap waiting for host verification notification	U0\G1835008
G_st00087_00603	M+GEM300_00087-00603	VAR_GLOBAL	SlotMap verification fail notification	U0\G1835008
G_st00087_00604	M+GEM300_00087-00604	VAR_GLOBAL	SlotMap read fail notification	U0\G1835008
G_st00087_00605	M+GEM300_00087-00605	VAR_GLOBAL	SlotMap abnormal substrate position notification	U0\G1835008
G_st00090_00001	M+GEM300_00090-00001	VAR_GLOBAL	SubstrateObject create request	U0\G1835008
G_st00090_00002	M+GEM300_00090-00002	VAR_GLOBAL	SubstrateObject delete request	U0\G1835008
G_st00090_00003	M+GEM300_00090-00003	VAR_GLOBAL	SubstrateObject SetAttr request	U0\G1835008
G_st00090_00004	M+GEM300_00090-00004	VAR_GLOBAL	SubstrateObject GetAttr request	U0\G1835008
G_st00090_00011	M+GEM300_00090-00011	VAR_GLOBAL	CarrierSubstLocObject create request	U0\G1835008
G_st00090_00012	M+GEM300_00090-00012	VAR_GLOBAL	CarrierSubstLocObject delete request	U0\G1835008
G_st00090_00013	M+GEM300_00090-00013	VAR_GLOBAL	SubstLocObject SetAttr request	U0\G1835008
G_st00090_00014	M+GEM300_00090-00014	VAR_GLOBAL	SubstLocObject GetAttr request	U0\G1835008
G_st00090_00023	M+GEM300_00090-00023	VAR_GLOBAL	BatchLocObject SetAttr request	U0\G1835008
G_st00090_00024	M+GEM300_00090-00024	VAR_GLOBAL	BatchLocObject GetAttr request	U0\G1835008
G_st00094_00001	M+GEM300_00094-00001	VAR_GLOBAL	ControlJobObject create request	U0\G1835008
G_st00094_00002	M+GEM300_00094-00002	VAR_GLOBAL	ControlJobObject delete request	U0\G1835008

Label name	Data type	Class	Comment	Assignment (device/label)
G_st00094_00003	M+GEM300_00094-00003	VAR_GLOBAL	ControlJobObject SetAttr request	U0\G1835008
G_st00094_00004	M+GEM300_00094-00004	VAR_GLOBAL	ControlJobObject GetAttr request	U0\G1835008
G_st00094_00102	M+GEM300_00094-00102	VAR_GLOBAL	ControlJob Deselect request	U0\G1835008
G_st00094_00103	M+GEM300_00094-00103	VAR_GLOBAL	ControlJob HOQ request	U0\G1835008
G_st10000_00001	M+GEM300_10000-00001	VAR_GLOBAL	GEM300 Initial acknowledge	U0\G1572864
G_st10000_00002	M+GEM300_10000-00002	VAR_GLOBAL	LoadPort initial acknowledge	U0\G1572864
G_st10039_00006	M+GEM300_10039-00006	VAR_GLOBAL	Get AttrName List acknowledge	U0\G1572864
G_st10039_00103	M+GEM300_10039-00103	VAR_GLOBAL	LoadPortObject SetAttr acknowledge	U0\G1572864
G_st10039_00104	M+GEM300_10039-00104	VAR_GLOBAL	LoadPortObject GetAttr acknowledge	U0\G1572864
G_st10039_00203	M+GEM300_10039-00203	VAR_GLOBAL	LocationObject SetAttr acknowledge	U0\G1572864
G_st10039_00204	M+GEM300_10039-00204	VAR_GLOBAL	LocationObject GetAttr acknowledge	U0\G1572864
G_st10039_00303	M+GEM300_10039-00303	VAR_GLOBAL	InternalBufferObject SetAttr acknowledge	U0\G1572864
G_st10039_00304	M+GEM300_10039-00304	VAR_GLOBAL	InternalBufferObject GetAttr acknowledge	U0\G1572864
G_st10040_00001	M+GEM300_10040-00001	VAR_GLOBAL	ProcessJobObject create acknowledge	U0\G1572864
G_st10040_00002	M+GEM300_10040-00002	VAR_GLOBAL	ProcessJobObject delete acknowledge	U0\G1572864
G_st10040_00003	M+GEM300_10040-00003	VAR_GLOBAL	ProcessJobObject SetAttr acknowledge	U0\G1572864
G_st10040_00004	M+GEM300_10040-00004	VAR_GLOBAL	ProcessJobObject GetAttr acknowledge	U0\G1572864
G_st10040_00901	M+GEM300_10040-00901	VAR_GLOBAL	PRJobCreateEnh service notification	U0\G1572864
G_st10040_00902	M+GEM300_10040-00902	VAR_GLOBAL	PRSetMtrlOrder service notification	U0\G1572864
G_st10040_00903	M+GEM300_10040-00903	VAR_GLOBAL	PRJobMultiCreate service notification	U0\G1572864
G_st10040_00904	M+GEM300_10040-00904	VAR_GLOBAL	PRJobDequeue service notification	U0\G1572864
G_st10040_00905	M+GEM300_10040-00905	VAR_GLOBAL	PRJobSetRecipeVariable service notification	U0\G1572864
G_st10040_00906	M+GEM300_10040-00906	VAR_GLOBAL	PRJobSetStartMethod service notification	U0\G1572864
G_st10087_00001	M+GEM300_10087-00001	VAR_GLOBAL	CarrierObject create acknowledge	U0\G1572864
G_st10087_00002	M+GEM300_10087-00002	VAR_GLOBAL	CarrierObject delete acknowledge	U0\G1572864
G_st10087_00003	M+GEM300_10087-00003	VAR_GLOBAL	CarrierObject SetAttr acknowledge	U0\G1572864
G_st10087_00004	M+GEM300_10087-00004	VAR_GLOBAL	CarrierObject GetAttr acknowledge	U0\G1572864
G_st10087_00101	M+GEM300_10087-00101	VAR_GLOBAL	AccessMode AUTO acknowledge	U0\G1572864
G_st10087_00102	M+GEM300_10087-00102	VAR_GLOBAL	AccessMode MANUAL acknowledge	U0\G1572864
G_st10087_00111	M+GEM300_10087-00111	VAR_GLOBAL	Load Port reservation acknowledge	U0\G1572864
G_st10087_00112	M+GEM300_10087-00112	VAR_GLOBAL	Load Port cancel reservation acknowledge	U0\G1572864
G_st10087_00201	M+GEM300_10087-00201	VAR_GLOBAL	IN SERVICE acknowledge	U0\G1572864
G_st10087_00202	M+GEM300_10087-00202	VAR_GLOBAL	OUT OF SERVICE acknowledge	U0\G1572864
G_st10087_00203	M+GEM300_10087-00203	VAR_GLOBAL	ID READER available response	U0\G1572864
G_st10087_00204	M+GEM300_10087-00204	VAR_GLOBAL	ID READER unavailable response	U0\G1572864
G_st10087_00301	M+GEM300_10087-00301	VAR_GLOBAL	LOAD started response	U0\G1572864
G_st10087_00302	M+GEM300_10087-00302	VAR_GLOBAL	LOAD completed response	U0\G1572864
G_st10087_00303	M+GEM300_10087-00303	VAR_GLOBAL	UNLOAD available response	U0\G1572864
G_st10087_00304	M+GEM300_10087-00304	VAR_GLOBAL	UNLOAD started response	U0\G1572864
G_st10087_00305	M+GEM300_10087-00305	VAR_GLOBAL	UNLOAD completed response	U0\G1572864
G_st10087_00306	M+GEM300_10087-00306	VAR_GLOBAL	TRANSFER failed response	U0\G1572864
G_st10087_00307	M+GEM300_10087-00307	VAR_GLOBAL	Carrier clamped response	U0\G1572864
G_st10087_00308	M+GEM300_10087-00308	VAR_GLOBAL	Carrier unclamped response	U0\G1572864
G_st10087_00309	M+GEM300_10087-00309	VAR_GLOBAL	Carrier opened response	U0\G1572864
G_st10087_00310	M+GEM300_10087-00310	VAR_GLOBAL	Carrier closed response	U0\G1572864
G_st10087_00311	M+GEM300_10087-00311	VAR_GLOBAL	Carrier accessing started response	U0\G1572864
G_st10087_00312	M+GEM300_10087-00312	VAR_GLOBAL	Carrier approaching complete response	U0\G1572864
G_st10087_00313	M+GEM300_10087-00313	VAR_GLOBAL	Carrier accessing normally finished response	U0\G1572864
G_st10087_00314	M+GEM300_10087-00314	VAR_GLOBAL	Carrier accessing abnormally finished response	U0\G1572864
G_st10087_00401	M+GEM300_10087-00401	VAR_GLOBAL	Load Port Carrier association acknowledge	U0\G1572864
G_st10087_00402	M+GEM300_10087-00402	VAR_GLOBAL	Load Port Carrier cancel association acknowledge	U0\G1572864
G_st10087_00403	M+GEM300_10087-00403	VAR_GLOBAL	Carrier Location change response	U0\G1572864

Label name	Data type	Class	Comment	Assignment (device/label)
G_st10087_00404	M+GEM300_10087-00404	VAR_GLOBAL	Buffer Capacity changed response	U0\G1572864
G_st10087_00411	M+GEM300_10087-00411	VAR_GLOBAL	Carrier move started to Internal Buffer response	U0\G1572864
G_st10087_00412	M+GEM300_10087-00412	VAR_GLOBAL	Carrier move completed to Internal Buffer response	U0\G1572864
G_st10087_00413	M+GEM300_10087-00413	VAR_GLOBAL	Carrier move started to Load Port response	U0\G1572864
G_st10087_00414	M+GEM300_10087-00414	VAR_GLOBAL	Carrier move completed to Load Port response	U0\G1572864
G_st10087_00415	M+GEM300_10087-00415	VAR_GLOBAL	UNLOAD completed and Carrier move started to Load Port response	U0\G1572864
G_st10087_00501	M+GEM300_10087-00501	VAR_GLOBAL	CarrierID read successful response	U0\G1572864
G_st10087_00502	M+GEM300_10087-00502	VAR_GLOBAL	CarrierID read fail response	U0\G1572864
G_st10087_00503	M+GEM300_10087-00503	VAR_GLOBAL	Unknown CarrierID response	U0\G1572864
G_st10087_00504	M+GEM300_10087-00504	VAR_GLOBAL	Duplicate CarrierID in process response	U0\G1572864
G_st10087_00601	M+GEM300_10087-00601	VAR_GLOBAL	SlotMap verification ok response	U0\G1572864
G_st10087_00602	M+GEM300_10087-00602	VAR_GLOBAL	SlotMap waiting for host verification response	U0\G1572864
G_st10087_00603	M+GEM300_10087-00603	VAR_GLOBAL	SlotMap verification fail response	U0\G1572864
G_st10087_00604	M+GEM300_10087-00604	VAR_GLOBAL	SlotMap read fail response	U0\G1572864
G_st10087_00605	M+GEM300_10087-00605	VAR_GLOBAL	SlotMap abnormal substrate position response	U0\G1572864
G_st10087_00901	M+GEM300_10087-00901	VAR_GLOBAL	Bind service notification	U0\G1572864
G_st10087_00902	M+GEM300_10087-00902	VAR_GLOBAL	CancelAllCarrierOut service notification	U0\G1572864
G_st10087_00903	M+GEM300_10087-00903	VAR_GLOBAL	CancelBind service notification	U0\G1572864
G_st10087_00904	M+GEM300_10087-00904	VAR_GLOBAL	CancelCarrier service notification	U0\G1572864
G_st10087_00905	M+GEM300_10087-00905	VAR_GLOBAL	CancelCarrierAtPort service notification	U0\G1572864
G_st10087_00906	M+GEM300_10087-00906	VAR_GLOBAL	CancelCarrierNotification service notification	U0\G1572864
G_st10087_00907	M+GEM300_10087-00907	VAR_GLOBAL	CancelCarrierOut service notification	U0\G1572864
G_st10087_00908	M+GEM300_10087-00908	VAR_GLOBAL	CancelReservationAtPort service notification	U0\G1572864
G_st10087_00909	M+GEM300_10087-00909	VAR_GLOBAL	CarrierIn service notification	U0\G1572864
G_st10087_00910	M+GEM300_10087-00910	VAR_GLOBAL	CarrierNotification service notification	U0\G1572864
G_st10087_00911	M+GEM300_10087-00911	VAR_GLOBAL	CarrierOut service notification	U0\G1572864
G_st10087_00912	M+GEM300_10087-00912	VAR_GLOBAL	CarrierReCreate service notification	U0\G1572864
G_st10087_00913	M+GEM300_10087-00913	VAR_GLOBAL	CarrierRelease service notification	U0\G1572864
G_st10087_00916	M+GEM300_10087-00916	VAR_GLOBAL	ChangeAccess service notification	U0\G1572864
G_st10087_00917	M+GEM300_10087-00917	VAR_GLOBAL	ChangeServiceStatus service notification	U0\G1572864
G_st10087_00918	M+GEM300_10087-00918	VAR_GLOBAL	ProceedWithCarrier service notification	U0\G1572864
G_st10087_00919	M+GEM300_10087-00919	VAR_GLOBAL	ReserveAtPort service notification	U0\G1572864
G_st10087_01001	M+GEM300_10087-01001	VAR_GLOBAL	Create service (Carrier) notification	U0\G1572864
G_st10087_01002	M+GEM300_10087-01002	VAR_GLOBAL	Delete service (Carrier) notification	U0\G1572864
G_st10090_00001	M+GEM300_10090-00001	VAR_GLOBAL	SubstrateObject create acknowledge	U0\G1572864
G_st10090_00002	M+GEM300_10090-00002	VAR_GLOBAL	SubstrateObject delete acknowledge	U0\G1572864
G_st10090_00003	M+GEM300_10090-00003	VAR_GLOBAL	SubstrateObject SetAttr acknowledge	U0\G1572864
G_st10090_00004	M+GEM300_10090-00004	VAR_GLOBAL	SubstrateObject GetAttr acknowledge	U0\G1572864
G_st10090_00011	M+GEM300_10090-00011	VAR_GLOBAL	CarrierSubstLocObject create acknowledge	U0\G1572864
G_st10090_00012	M+GEM300_10090-00012	VAR_GLOBAL	CarrierSubstLocObject delete acknowledge	U0\G1572864
G_st10090_00013	M+GEM300_10090-00013	VAR_GLOBAL	SubstLocObject SetAttr acknowledge	U0\G1572864
G_st10090_00014	M+GEM300_10090-00014	VAR_GLOBAL	SubstLocObject GetAttr acknowledge	U0\G1572864
G_st10090_00023	M+GEM300_10090-00023	VAR_GLOBAL	BatchLocObject SetAttr acknowledge	U0\G1572864
G_st10090_00024	M+GEM300_10090-00024	VAR_GLOBAL	BatchLocObject GetAttr acknowledge	U0\G1572864
G_st10090_01001	M+GEM300_10090-01001	VAR_GLOBAL	Create service (Register substrate service) notification	U0\G1572864
G_st10090_01002	M+GEM300_10090-01002	VAR_GLOBAL	Delete service (Remove substrate service) notification	U0\G1572864
G_st10090_01003	M+GEM300_10090-01003	VAR_GLOBAL	SetAttr service (Substrate) notification	U0\G1572864
G_st10090_01011	M+GEM300_10090-01011	VAR_GLOBAL	Create service (SubstLoc) notification	U0\G1572864
G_st10090_01012	M+GEM300_10090-01012	VAR_GLOBAL	Delete service (SubstLoc) notification	U0\G1572864
G_st10090_01013	M+GEM300_10090-01013	VAR_GLOBAL	SetAttr service (SubstLoc) notification	U0\G1572864

Label name	Data type	Class	Comment	Assignment (device/label)
G_st10090_01021	M+GEM300_10090-01021	VAR_GLOBAL	Create service (BatchLoc) notification	U0\G1572864
G_st10090_01022	M+GEM300_10090-01022	VAR_GLOBAL	Delete service (BatchLoc) notification	U0\G1572864
G_st10090_01023	M+GEM300_10090-01023	VAR_GLOBAL	SetAttr service (BatchLoc) notification	U0\G1572864
G_st10094_00001	M+GEM300_10094-00001	VAR_GLOBAL	ControlJobObject create acknowledge	U0\G1572864
G_st10094_00002	M+GEM300_10094-00002	VAR_GLOBAL	ControlJobObject delete acknowledge	U0\G1572864
G_st10094_00003	M+GEM300_10094-00003	VAR_GLOBAL	ControlJobObject SetAttr acknowledge	U0\G1572864
G_st10094_00004	M+GEM300_10094-00004	VAR_GLOBAL	ControlJobObject GetAttr acknowledge	U0\G1572864
G_st10094_00101	M+GEM300_10094-00101	VAR_GLOBAL	ControlJob Selected acknowledge	U0\G1572864
G_st10094_00102	M+GEM300_10094-00102	VAR_GLOBAL	ControlJob Deselect acknowledge	U0\G1572864
G_st10094_00103	M+GEM300_10094-00103	VAR_GLOBAL	ControlJob HOQ acknowledge	U0\G1572864
G_st10094_01001	M+GEM300_10094-01001	VAR_GLOBAL	Create service (ControlJob) notification	U0\G1572864
G_st10094_01002	M+GEM300_10094-01002	VAR_GLOBAL	Delete service (ControlJob) notification	U0\G1572864
G_st10094_01003	M+GEM300_10094-01003	VAR_GLOBAL	SetAttr service (ControlJob) notification	U0\G1572864

Structure label list

The following table shows the structure labels used in the control CPU interfaces.

Precautions

When using a structure label, make sure to use it for a global label. Otherwise, the order of members is no longer as defined due to the memory allocation in a packing block; therefore, data exchange with SECS/GEM communication software may not be performed correctly.

Structure label data name	Data structure
M+GEM300_00000-00002	☞ Page 162 00002 : LoadPort initial request
M+GEM300_00039-00006	☞ Page 166 00006: Get AttrName List request
M+GEM300_00039-00103	☞ Page 167 00103: LoadPortObject SetAttr request
M+GEM300_00039-00104	☞ Page 169 00104: LoadPortObject GetAttr request
M+GEM300_00039-00203	☞ Page 170 00203: LocationObject SetAttr request
M+GEM300_00039-00204	☞ Page 171 00204: LocationObject GetAttr request
M+GEM300_00039-00303	☞ Page 172 00303: InternalBufferObject SetAttr request
M+GEM300_00039-00304	☞ Page 174 00304: InternalBufferObject GetAttr request
M+GEM300_00040-00001	☞ Page 314 00001: ProcessJobObject create request
M+GEM300_00040-00002	☞ Page 316 00002: ProcessJobObject delete request
M+GEM300_00040-00003	☞ Page 317 00003: ProcessJobObject SetAttr request
M+GEM300_00040-00004	☞ Page 319 00004: ProcessJobObject GetAttr request
M+GEM300_00087-00001	☞ Page 183 00001: CarrierObject create request
M+GEM300_00087-00002	☞ Page 185 00002: CarrierObject delete request
M+GEM300_00087-00003	☞ Page 186 00003: CarrierObject SetAttr request
M+GEM300_00087-00004	☞ Page 188 00004: CarrierObject GetAttr request
M+GEM300_00087-00101	☞ Page 189 00101: AccessMode AUTO request
M+GEM300_00087-00102	☞ Page 190 00102: AccessMode MANUAL request
M+GEM300_00087-00111	☞ Page 191 00111: Load Port reservation request
M+GEM300_00087-00112	☞ Page 192 00112: Load Port cancel reservation request
M+GEM300_00087-00201	☞ Page 193 00201: IN SERVICE request
M+GEM300_00087-00202	☞ Page 194 00202: OUT OF SERVICE request
M+GEM300_00087-00203	☞ Page 195 00203: ID READER available notification
M+GEM300_00087-00204	☞ Page 196 00204: ID READER unavailable notification
M+GEM300_00087-00301	☞ Page 197 00301: LOAD started notification
M+GEM300_00087-00302	☞ Page 198 00302: LOAD completed notification
M+GEM300_00087-00303	☞ Page 199 00303: UNLOAD available notification
M+GEM300_00087-00304	☞ Page 200 00304: UNLOAD started notification
M+GEM300_00087-00305	☞ Page 201 00305: UNLOAD completed notification
M+GEM300_00087-00306	☞ Page 202 00306: TRANSFER failed notification
M+GEM300_00087-00307	☞ Page 203 00307: Carrier clamped notification
M+GEM300_00087-00308	☞ Page 204 00308: Carrier unclamped notification
M+GEM300_00087-00309	☞ Page 205 00309: Carrier opened notification
M+GEM300_00087-00310	☞ Page 206 00310: Carrier closed notification
M+GEM300_00087-00311	☞ Page 207 00311: Carrier accessing started notification
M+GEM300_00087-00312	☞ Page 208 00312: Carrier approaching complete notification
M+GEM300_00087-00313	☞ Page 209 00313: Carrier accessing normally finished notification
M+GEM300_00087-00314	☞ Page 210 00314: Carrier accessing abnormally finished notification
M+GEM300_00087-00401	☞ Page 211 00401: Load Port Carrier association request
M+GEM300_00087-00402	☞ Page 212 00402: Load Port Carrier cancel association request
M+GEM300_00087-00403	☞ Page 213 00403: Carrier Location change notification
M+GEM300_00087-00404	☞ Page 214 00404: Buffer Capacity changed notification
M+GEM300_00087-00411	☞ Page 215 00411: Carrier move started to Internal Buffer notification
M+GEM300_00087-00412	☞ Page 216 00412: Carrier move completed to Internal Buffer notification

Structure label data name	Data structure
M+GEM300_00087-00413	☞ Page 217 00413: Carrier move started to Load Port notification
M+GEM300_00087-00414	☞ Page 218 00414: Carrier move completed to Load Port notification
M+GEM300_00087-00415	☞ Page 219 00415: UNLOAD completed and Carrier move started to Load Port notification
M+GEM300_00087-00501	☞ Page 220 00501: CarrierID read successful notification
M+GEM300_00087-00502	☞ Page 221 00502: CarrierID read fail notification
M+GEM300_00087-00503	☞ Page 222 00503: Unknown CarrierID notification
M+GEM300_00087-00504	☞ Page 223 00504: Duplicate CarrierID in process notification
M+GEM300_00087-00601	☞ Page 224 00601: SlotMap verification ok notification
M+GEM300_00087-00602	☞ Page 225 00602: SlotMap waiting for host verification notification
M+GEM300_00087-00603	☞ Page 226 00603: SlotMap verification fail notification
M+GEM300_00087-00604	☞ Page 227 00604: SlotMap read fail notification
M+GEM300_00087-00605	☞ Page 228 00605: SlotMap abnormal substrate position notification
M+GEM300_00090-00001	☞ Page 330 00001: SubstrateObject create request
M+GEM300_00090-00002	☞ Page 333 00002: SubstrateObject delete request
M+GEM300_00090-00003	☞ Page 334 00003: SubstrateObject SetAttr request
M+GEM300_00090-00004	☞ Page 336 00004: SubstrateObject GetAttr request
M+GEM300_00090-00011	☞ Page 337 00011: CarrierSubstLocObject create request
M+GEM300_00090-00012	☞ Page 338 00012: CarrierSubstLocObject delete request
M+GEM300_00090-00013	☞ Page 339 00013: SubstLocObject SetAttr request
M+GEM300_00090-00014	☞ Page 341 00014: SubstLocObject GetAttr request
M+GEM300_00090-00023	☞ Page 342 00023: BatchLocObject SetAttr request
M+GEM300_00090-00024	☞ Page 343 00024: BatchLocObject GetAttr request
M+GEM300_00094-00001	☞ Page 294 00001: ControlJobObject create request
M+GEM300_00094-00002	☞ Page 297 00002: ControlJobObject delete request
M+GEM300_00094-00003	☞ Page 298 00003: ControlJobObject SetAttr request
M+GEM300_00094-00004	☞ Page 300 00004: ControlJobObject GetAttr request
M+GEM300_00094-00102	☞ Page 302 00102: ControlJob Deselect request
M+GEM300_00094-00103	☞ Page 303 00103: ControlJob HOQ request
M+GEM300_10000-00001	☞ Page 163 00001: GEM300 Initial acknowledge
M+GEM300_10000-00002	☞ Page 164 00002 : LoadPort initial acknowledge
M+GEM300_10039-00006	☞ Page 175 00006: Get AttrName List acknowledge
M+GEM300_10039-00103	☞ Page 177 00103: LoadPortObject SetAttr acknowledge
M+GEM300_10039-00104	☞ Page 178 00104: LoadPortObject GetAttr acknowledge
M+GEM300_10039-00203	☞ Page 179 00203: LocationObject SetAttr acknowledge
M+GEM300_10039-00204	☞ Page 180 00204: LocationObject GetAttr acknowledge
M+GEM300_10039-00303	☞ Page 181 00303: InternalBufferObject SetAttr acknowledge
M+GEM300_10039-00304	☞ Page 182 00304: InternalBufferObject GetAttr acknowledge
M+GEM300_10040-00001	☞ Page 320 00001: ProcessJobObject create acknowledge
M+GEM300_10040-00002	☞ Page 321 00002: ProcessJobObject delete acknowledge
M+GEM300_10040-00003	☞ Page 322 00003: ProcessJobObject SetAttr acknowledge
M+GEM300_10040-00004	☞ Page 323 00004: ProcessJobObject GetAttr acknowledge
M+GEM300_10040-00901	☞ Page 324 00901: PRJobCreateEnh service notification
M+GEM300_10040-00902	☞ Page 325 00902: PRSetMtrlOrder service notification
M+GEM300_10040-00903	☞ Page 326 00903: PRJobMultiCreate service notification
M+GEM300_10040-00904	☞ Page 327 00904: PRJobDequeue service notification
M+GEM300_10040-00905	☞ Page 328 00905: PRJobSetRecipeVariable service notification
M+GEM300_10040-00906	☞ Page 329 00906: PRJobSetStartMethod service notification
M+GEM300_10087-00001	☞ Page 229 00001: CarrierObject create acknowledge
M+GEM300_10087-00002	☞ Page 230 00002: CarrierObject delete acknowledge
M+GEM300_10087-00003	☞ Page 231 00003: CarrierObject SetAttr acknowledge
M+GEM300_10087-00004	☞ Page 232 00004: CarrierObject GetAttr acknowledge
M+GEM300_10087-00101	☞ Page 233 00101: AccessMode AUTO acknowledge
M+GEM300_10087-00102	☞ Page 234 00102: AccessMode MANUAL acknowledge

Structure label data name	Data structure
M+GEM300_10087-00111	☞ Page 235 00111: Load Port reservation acknowledge
M+GEM300_10087-00112	☞ Page 236 00112: Load Port cancel reservation acknowledge
M+GEM300_10087-00201	☞ Page 237 00201: IN SERVICE acknowledge
M+GEM300_10087-00202	☞ Page 238 00202: OUT OF SERVICE acknowledge
M+GEM300_10087-00203	☞ Page 239 00203: ID READER available response
M+GEM300_10087-00204	☞ Page 240 00204: ID READER unavailable response
M+GEM300_10087-00301	☞ Page 241 00301: LOAD started response
M+GEM300_10087-00302	☞ Page 242 00302: LOAD completed response
M+GEM300_10087-00303	☞ Page 243 00303: UNLOAD available response
M+GEM300_10087-00304	☞ Page 244 00304: UNLOAD started response
M+GEM300_10087-00305	☞ Page 245 00305: UNLOAD completed response
M+GEM300_10087-00306	☞ Page 246 00306: TRANSFER failed response
M+GEM300_10087-00307	☞ Page 247 00307: Carrier clamped response
M+GEM300_10087-00308	☞ Page 248 00308: Carrier unclamped response
M+GEM300_10087-00309	☞ Page 249 00309: Carrier opened response
M+GEM300_10087-00310	☞ Page 250 00310: Carrier closed response
M+GEM300_10087-00311	☞ Page 251 00311: Carrier accessing started response
M+GEM300_10087-00312	☞ Page 252 00312: Carrier approaching complete response
M+GEM300_10087-00313	☞ Page 253 00313: Carrier accessing normally finished response
M+GEM300_10087-00314	☞ Page 254 00314: Carrier accessing abnormally finished response
M+GEM300_10087-00401	☞ Page 255 00401: Load Port Carrier association acknowledge
M+GEM300_10087-00402	☞ Page 256 00402: Load Port Carrier cancel association acknowledge
M+GEM300_10087-00403	☞ Page 257 00403: Carrier Location change response
M+GEM300_10087-00404	☞ Page 258 00404: Buffer Capacity changed response
M+GEM300_10087-00411	☞ Page 259 00411: Carrier move started to Internal Buffer response
M+GEM300_10087-00412	☞ Page 260 00412: Carrier move completed to Internal Buffer response
M+GEM300_10087-00413	☞ Page 261 00413: Carrier move started to Load Port response
M+GEM300_10087-00414	☞ Page 262 00414: Carrier move completed to Load Port response
M+GEM300_10087-00415	☞ Page 263 00415: UNLOAD completed and Carrier move started to Load Port response
M+GEM300_10087-00501	☞ Page 265 00501: CarrierID read successful response
M+GEM300_10087-00502	☞ Page 267 00502: CarrierID read fail response
M+GEM300_10087-00503	☞ Page 268 00503: Unknown CarrierID response
M+GEM300_10087-00504	☞ Page 269 00504: Duplicate CarrierID in process response
M+GEM300_10087-00601	☞ Page 270 00601: SlotMap verification ok response
M+GEM300_10087-00602	☞ Page 271 00602: SlotMap waiting for host verification response
M+GEM300_10087-00603	☞ Page 272 00603: SlotMap verification fail response
M+GEM300_10087-00604	☞ Page 273 00604: SlotMap read fail response
M+GEM300_10087-00605	☞ Page 274 00605: SlotMap abnormal substrate position response
M+GEM300_10087-00901	☞ Page 275 00901: Bind service notification
M+GEM300_10087-00902	☞ Page 276 00902: CancelAllCarrierOut service notification
M+GEM300_10087-00903	☞ Page 277 00903: CancelBind service notification
M+GEM300_10087-00904	☞ Page 278 00904: CancelCarrier service notification
M+GEM300_10087-00905	☞ Page 279 00905: CancelCarrierAtPort service notification
M+GEM300_10087-00906	☞ Page 280 00906: CancelCarrierNotification service notification
M+GEM300_10087-00907	☞ Page 281 00907: CancelCarrierOut service notification
M+GEM300_10087-00908	☞ Page 282 00908: CancelReservationAtPort service notification
M+GEM300_10087-00909	☞ Page 283 00909: CarrierIn service notification
M+GEM300_10087-00910	☞ Page 284 00910: CarrierNotification service notification
M+GEM300_10087-00911	☞ Page 285 00911: CarrierOut service notification
M+GEM300_10087-00912	☞ Page 286 00912: CarrierReCreate service notification
M+GEM300_10087-00913	☞ Page 288 00913: CarrierRelease service notification
M+GEM300_10087-00916	☞ Page 289 00916 : ChangeAccess service notification
M+GEM300_10087-00917	☞ Page 291 00917: ChangeServiceStatus service notification

Structure label data name	Data structure
M+GEM300_10087-00918	Page 292 00918: ProceedWithCarrier service notification
M+GEM300_10087-00919	Page 293 00919: ReserveAtPort service notification
M+GEM300_10090-00001	Page 344 00001: SubstrateObject create acknowledge
M+GEM300_10090-00002	Page 345 00002: SubstrateObject delete acknowledge
M+GEM300_10090-00003	Page 346 00003: SubstrateObject SetAttr acknowledge
M+GEM300_10090-00004	Page 347 00004: SubstrateObject GetAttr acknowledge
M+GEM300_10090-00011	Page 348 00011 : CarrierSubstLocObject create acknowledge
M+GEM300_10090-00012	Page 349 00012: CarrierSubstLocObject delete acknowledge
M+GEM300_10090-00013	Page 350 00013: SubstLocObject SetAttr acknowledge
M+GEM300_10090-00014	Page 351 00014: SubstLocObject GetAttr acknowledge
M+GEM300_10090-00023	Page 352 00023: BatchLocObject SetAttr acknowledge
M+GEM300_10090-00024	Page 353 00024: BatchLocObject GetAttr acknowledge
M+GEM300_10090-01001	Page 354 01001: Create service (Register substrate service) notification
M+GEM300_10090-01002	Page 355 01002: Delete service (Remove substrate service) notification
M+GEM300_10090-01003	Page 356 01003: SetAttr service (Substrate) notification
M+GEM300_10090-01013	Page 358 01013: SetAttr service (SubstLoc) notification
M+GEM300_10090-01023	Page 360 01023: SetAttr service (BatchLoc) notification
M+GEM300_10094-00001	Page 304 00001: ControlJobObject create acknowledge
M+GEM300_10094-00002	Page 305 00002: ControlJobObject delete acknowledge
M+GEM300_10094-00003	Page 306 00003: ControlJobObject SetAttr acknowledge
M+GEM300_10094-00004	Page 307 00004: ControlJobObject GetAttr acknowledge
M+GEM300_10094-00101	Page 308 00101: ControlJob Selected acknowledge
M+GEM300_10094-00102	Page 309 00102: ControlJob Deselect acknowledge
M+GEM300_10094-00103	Page 310 00103: ControlJob HOQ acknowledge
M+GEM300_10094-01001	Page 311 01001: Create service (ControlJob) notification
M+GEM300_10094-01002	Page 312 01002: Delete service (ControlJob) notification
M+GEM300_10094-01003	Page 313 01003: SetAttr service (ControlJob) notification
M+GEM300_AttrIDList	Page 166 00006: Get AttrName List request
M+GEM300_BatchLocObject	Page 141 M+GEM300_BatchLocObject
M+GEM300_BatchSubstIDMap	Page 141 M+GEM300_BatchSubstIDMap
M+GEM300_CarrierInputSpec	Page 106 M+GEM300_CarrierInputSpec
M+GEM300_CarrierLocation	Page 56 M+GEM300_CarrierLocation
M+GEM300_CarrierObject	Page 61 M+GEM300_CarrierObject
M+GEM300_ContentMap	Page 61 M+GEM300_ContentMap
M+GEM300_ControlJobObject	Page 105 M+GEM300_ControlJobObject
M+GEM300_ControlRule	Page 105 M+GEM300_ControlRule
M+GEM300_CurrentPRJob	Page 107 M+GEM300_CurrentPRJob
M+GEM300_DestinationMap	Page 106 M+GEM300_DestinationMap
M+GEM300_InternalBufferObject	Page 57 M+GEM300_InternalBufferObject
M+GEM300_LoadPortObject	Page 55 M+GEM300_LoadPortObject
M+GEM300_LocationObject	Page 56 M+GEM300_LocationObject
M+GEM300_MtrlOutbyStatus	Page 106 M+GEM300_MtrlOutbyStatus
M+GEM300_MtrlOutSpec	Page 106 M+GEM300_MtrlOutSpec
M+GEM300_ObjIDList	Page 356 01003: SetAttr service (Substrate) notification Page 358 01013: SetAttr service (SubstLoc) notification Page 360 01023: SetAttr service (BatchLoc) notification
M+GEM300_OutputRule	Page 106 M+GEM300_OutputRule
M+GEM300_PauseEvent	Page 107 M+GEM300_PauseEvent
M+GEM300_PortIDList	Page 289 00916 : ChangeAccess service notification
M+GEM300_PRJobStatusList	Page 107 M+GEM300_PRJobStatusList
M+GEM300_PRMTNameList_MF13	Page 127 M+GEM300_PRMTNameList_MF13
M+GEM300_PRMTNameList_MF14	Page 127 M+GEM300_PRMTNameList_MF14
M+GEM300_ProcessingCtrlSpec	Page 105 M+GEM300_ProcessingCtrlSpec

Structure label data name	Data structure
M+GEM300_ProcessJobObject	 Page 126 M+GEM300_ProcessJobObject
M+GEM300_RecVariableList	 Page 127 M+GEM300_RecVariableList
M+GEM300_SlotIDList	 Page 106 M+GEM300_SlotIDList
M+GEM300_SlotMap	 Page 61 M+GEM300_SlotMap
M+GEM300_SourceMap	 Page 106 M+GEM300_SourceMap
M+GEM300_SubstHistory	 Page 139 M+GEM300_SubstHistory
M+GEM300_SubstLocObject	 Page 140 M+GEM300_SubstLocObject
M+GEM300_SubstrateObject	 Page 138 M+GEM300_SubstrateObject

Appendix 14 Use Cases

This section shows usage examples (state transition) when creating a user program that is compliant with GEM300 standards.

Guide for referencing use cases

The following shows the guide for referencing use cases.

Precautions

- CEID of the event report (S6F11) varies depending on user settings. In this use case, the default CEID is described.
- The description of Event Report Acknowledge (S6F12) is omitted.
- This use case varies depending on equipment and specifications. The actual processing and processing order need to be adjusted according to the environment.

State notation

The following table shows the notation for state models and states.

State model name	State name
LTS: Load Port Transfer State Model ( Page 69 Load Port Transfer State Model)	OS: OUT OF SERVICE IS: IN SERVICE RTL: READY TO LOAD RTU: READY TO UNLOAD TB: TRANSFER BLOCKED
LRS: Load Port Reservation State Model ( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	NR: NOT RESERVED R: RESERVED
LCAS: Load Port/Carrier Association State Model ( Page 77 Load Port/Carrier Association State Model)	NA: NOT ASSOCIATED A: ASSOCIATED
CIDS: Carrier ID Status ( Page 63 Carrier State Model)	INR: ID NOT READ IVF: ID VERIFICATION FAILED IVO: ID VERIFICATION OK WFH: WAITING FOR HOST
CSMS: Carrier Slot Map Status ( Page 63 Carrier State Model)	SNR: SLOT MAP NOT READ SVF: SLOT MAP VERIFICATION FAILED SVO: SLOT MAP VERIFICATION OK WFH: WAITING FOR HOST
CAS: Carrier Accessing Status ( Page 63 Carrier State Model)	NA: NOT ACCESSED IA: IN ACCESS CC: CARRIER COMPLETE CS: CARRIER STOPPED
AMS: Access Mode State Model ( Page 80 Access Mode State Model)	M: MANUAL A: AUTO
CJS: Control Job State ( Page 109 Control Job State Model Management)	Q: QUEUED S: SELECTED WFS: WAITING FOR START E: EXECUTING P: PAUSED C: COMPLETED
PJS: Process Job State ( Page 129 Process Job State Model Management)	PLD: POOLED SU: SETTING UPW FS: WAITING FOR START P: PROCESSING PC: PROCESS COMPLETE PAS: PAUSING PASD: PAUSED STP: STOPPING STPD: STOPPED ABT: ABORTING ABTD: ABORTED
STL: Substrate Location Status	UOC: UNOCCUPIED OC: OCCUPIED

A

State model name	State name
STT: Substrate Transport Status	AS: AT SOURCE AW: AT WORK AD: AT DESTINATION
STP: Substrate Processing Status	NP: NEEDS PROCESSING IP: IN PROCESS PC: PROCESSED

E87-CMS compliance

The following table shows the E87-CMS compliant use cases.

These use cases refer to the use cases described in "R1-2 Scenarios" of SEMI E87-0619.

Titles of references (E87-0619) to which each use case refers are as follows:

Title	Corresponding SEMI standard	Reference
Load Port Initialization	—	☞ Page 539 Load port initialization
Load Port Reservation from Equipment	—	☞ Page 541 Load port reservation from equipment
Normal Roundtrip 1	Table R1-2	☞ Page 542 Normal roundtrip 1
Normal Roundtrip 2	Table R1-3	☞ Page 546 Normal roundtrip 2
Normal Roundtrip 3	Table R1-4	☞ Page 550 Normal roundtrip 3
Normal Roundtrip 4	Table R1-5	☞ Page 556 Normal roundtrip 4
Normal Roundtrip 5	Table R1-6	☞ Page 562 Normal roundtrip 5
Normal Roundtrip 6	Table R1-7	☞ Page 566 Normal roundtrip 6
Normal Roundtrip 7 ^{*1}	Table R1-8	☞ Page 572 Normal roundtrip 7
Normal Roundtrip 8 ^{*1}	Table R1-9	☞ Page 576 Normal roundtrip 8
Abnormal CarrierID Verification 1	Table R1-10	☞ Page 582 Abnormal CarrierID verification 1
Abnormal CarrierID Verification 2	Table R1-11	☞ Page 585 Abnormal CarrierID verification 2
Abnormal CarrierID Verification 3	Table R1-12	☞ Page 588 Abnormal CarrierID verification 3
Abnormal Slot Map Verification 1	Table R1-13	☞ Page 591 Abnormal slot map verification 1
Abnormal Slot Map Verification 2	Table R1-14	☞ Page 594 Abnormal slot map verification 2
Carrier-Out Queuing	Table R1-15	☞ Page 598 Carrier-out queuing
Carrier-Out Dequeuing (Cancellation)	Table R1-16	☞ Page 602 Carrier-out dequeuing (cancellation)
Carrier Association Cancellation	Table R1-17	☞ Page 605 Carrier association cancellation
Access Mode Change (MANUAL to AUTO) 1 ^{*1}	—	☞ Page 607 Access mode change (MANUAL to AUTO) 1
Access Mode Change (MANUAL to AUTO) 2	—	☞ Page 608 Access mode change (MANUAL to AUTO) 2
Access Mode Change (AUTO to MANUAL) 1 ^{*1}	Table R1-18	☞ Page 609 Access mode change (AUTO to MANUAL) 1
Access Mode Change (AUTO to MANUAL) 2	—	☞ Page 610 Access mode change (AUTO to MANUAL) 2
Load Port Service Status Change	Table R1-19	☞ Page 611 Load port service status change
Correct Carrier Delivery to Wrong Port Scenario 1	Table R1-20	☞ Page 612 Correct carrier delivery to wrong port scenario 1
Correct Carrier Delivery to Wrong Port Scenario 2	Table R1-21	☞ Page 615 Correct carrier delivery to wrong port scenario 2
CarrierID Read Fail Scenario 1	Table R1-22	☞ Page 619 CarrierID read fail scenario 1
CarrierID Read Fail Scenario 2	Table R1-23	☞ Page 622 CarrierID read fail scenario 2
CarrierID Read Fail Scenario 3	Table R1-24	☞ Page 625 CarrierID read fail scenario 3
CarrierID Read Fail Scenario 4	Table R1-25	☞ Page 628 CarrierID read fail scenario 4
CarrierID Read Fail Scenario 5	Table R1-26	☞ Page 631 CarrierID read fail scenario 5

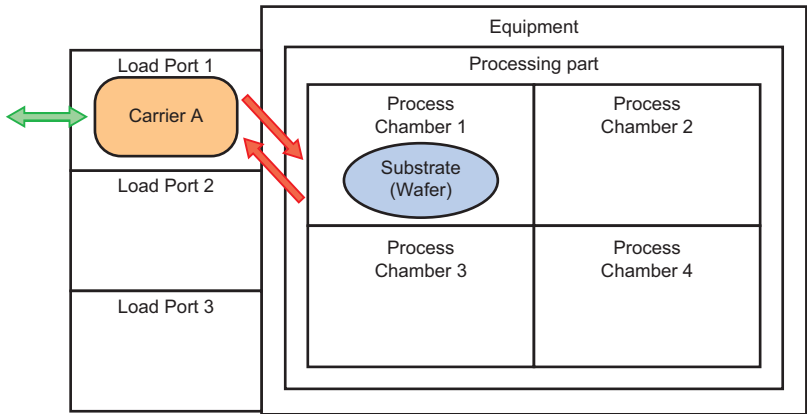
*1 Supported only by SECS/GEM communication software with software version 1.43V or later.

Configuration examples

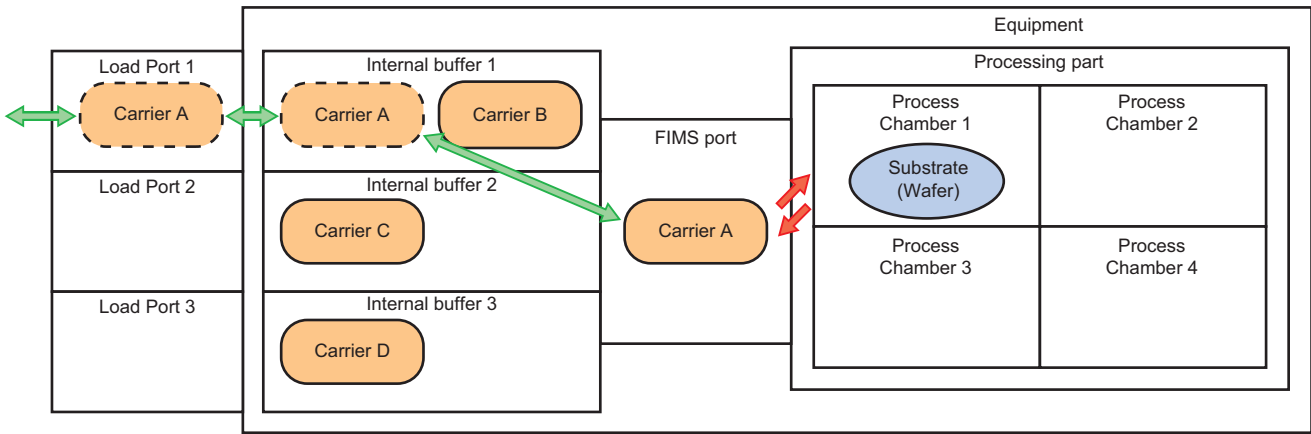
The following shows configuration examples of manufacturing equipment for the E87-CMS compliant use case. Each use case is explained with reference to the following configuration examples of semiconductor manufacturing equipment.

➡ : Carrier movement, ➡ : Wafer movement

- Fixed buffer manufacturing equipment



- Internal buffer manufacturing equipment



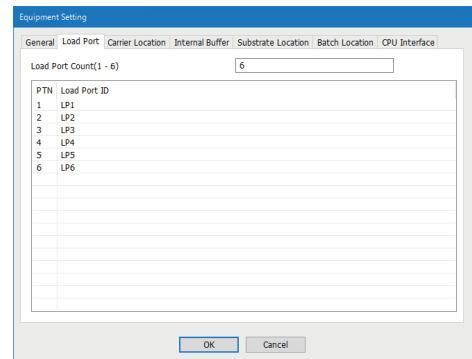
Load port initialization

The following shows the state transition satisfying the following conditions:

- Load port set (configured in a setting tool with the data transferred to a module)
- GEM300 standard support functions started and initialized ( Page 20 PROCEDURE BEFORE OPERATION)

■Equipment load port setting example

 Page 28 Load port



PTN	Load Port ID
1	LP1
2	LP2
3	LP3
4	LP4
5	LP5
6	LP6

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 540 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipme nt	Message	State model name			
					AMS 1 to 6	LTS 1 to 6	LRS 1 to 6	LCAS 1 to 6
0	—	Initial condition.	—	—	NoState	NoState	NoState	NoState
1	1 to 8	Load port status is initialized.	H←E	<div>• AMS 1 to 6: NO STATE to AUTO</div> <div>• LTS 1 to 6: NO STATE to IN SERVICE</div> <div>• LTS 1 to 6: IN SERVICE to TRANSFER READY</div> <div>• LTS 1 to 6: TRANSFER READY to READY TO LOAD</div>	A	RTL	NR	NA

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		—	←	Requests the initialization of all load ports. 00000-00002: LoadPort initial request(📖 Page 162 00002 : LoadPort initial request) • AccessModeHistory: 15(0Fh) • PortTransferHistory: [2, 2, 2, 2, 2, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
2	—*1	←	Reports the state transition load port 1. • S6F11: NO STATE to AUTO (CEID 30044) • S6F11: NO STATE to IN SERVICE (CEID 30026) • S6F11: IN SERVICE to TRANSFER READY (CEID 30029) • S6F11: TRANSFER READY to READY TO LOAD (CEID 30031)		—
3	—*1	←	Reports the state transition load port 2. • S6F11: NO STATE to AUTO (CEID 30044) • S6F11: NO STATE to IN SERVICE (CEID 30026) • S6F11: IN SERVICE to TRANSFER READY (CEID 30029) • S6F11: TRANSFER READY to READY TO LOAD (CEID 30031)		—
4	—*1	←	Reports the state transition load port 3. • S6F11: NO STATE to AUTO (CEID 30044) • S6F11: NO STATE to IN SERVICE (CEID 30026) • S6F11: IN SERVICE to TRANSFER READY (CEID 30029) • S6F11: TRANSFER READY to READY TO LOAD (CEID 30031)		—
5	—*1	←	Reports the state transition load port 4. • S6F11: NO STATE to AUTO (CEID 30044) • S6F11: NO STATE to IN SERVICE (CEID 30026) • S6F11: IN SERVICE to TRANSFER READY (CEID 30029) • S6F11: TRANSFER READY to READY TO LOAD (CEID 30031)		—
6	—*1	←	Reports the state transition load port 5. • S6F11: NO STATE to AUTO (CEID 30044) • S6F11: NO STATE to IN SERVICE (CEID 30026) • S6F11: IN SERVICE to TRANSFER READY (CEID 30029) • S6F11: TRANSFER READY to READY TO LOAD (CEID 30031)		—
7	—*1	←	Reports the state transition load port 6. • S6F11: NO STATE to AUTO (CEID 30044) • S6F11: NO STATE to IN SERVICE (CEID 30026) • S6F11: IN SERVICE to TRANSFER READY (CEID 30029) • S6F11: TRANSFER READY to READY TO LOAD (CEID 30031)		—
8	—		10000-00002: LoadPort initial acknowledge(📖 Page 164 00002 : LoadPort initial acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Load port reservation from equipment

The following shows the state transition satisfying the following conditions:

- Load port initialized ( Page 539 Load port initialization)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 541 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipme nt	Message	State model name
					LRS 1 to 6
0	—	Initial condition.	—	—	NR
1	1 to 3	Load port is reserved.	H←E	NotReserved to Reserved	R

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Reservation State Model state transition No.(2) ( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Requests the reservation of a load port. 00087-00111: Load Port reservation request ( Page 191 00111: Load Port reservation request)
2	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30091)		—
3	—		10087-00111: Load Port reservation acknowledge ( Page 235 00111: Load Port reservation acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Normal roundtrip 1

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted
- Load port reserved from equipment ( Page 541 Load port reservation from equipment)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 543 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corres pondi ng No. *1	Comment	Communi cation direction H: HOST E: Equipme nt	Message	State model name							
					LTS	LRS	LCA S	CIDS	CSM S	CAS		
0	—	Initial condition.	—	—	RTL	R	NA	No State	No State	No State		
1	1 to 3	Loading transfer starts.	H←E	TransferBlocked	TB	NR						
2	4 to 6	Loading transfer completes.	—	—			A	WFH	SNR	NA		
3	7 to 16	CarrierID is read.	H←E	WaitingForHost								
4	—	CarrierID is verified by host, and result is OK.	—	—								
5	17 to 20	Host commands to proceed.	H→E	ProceedWithCarrier							IVO	
6	21 to 22	Carrier is docked.	—	—								
7	23 to 26	Slot map is read.	H←E	WaitingForHost								WFH
8	—	Slot map is verified by host, and result is OK.	—	—								
9	27 to 30	Host commands to proceed.	H→E	ProceedWithCarrier								
10	31 to 36	Process starts.	—	—							IA	
11	37 to 39	Process completes.	—	—								CC
12	40 to 45	Carrier is undocked.	H←E	ReadyToUnload	RTU	TB					NA	
13	46 to 48	Unloading transfer starts.	H←E	TransferBlocked								
14	49 to 56	Unloading transfer completes.	H←E	ReadyToLoad	RTL							

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (☞ Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (☞ Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (☞ Page 241 00301: LOAD started response)	→	—
4	—		Load Port Reservation State Model state transition No.(3) (☞ Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (☞ Page 198 00302: LOAD completed notification)
5	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
6	—		10087-00302: LOAD completed response (☞ Page 242 00302: LOAD completed response)	→	—
7	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (☞ Page 203 00307: Carrier clamped notification)
8	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
9	—		10087-00307: Carrier clamped response (☞ Page 247 00307: Carrier clamped response)	→	—
10	—		Generates an instance of carrier object of the read carrier ID. • Load Port/Carrier Association State Model state transition No.(2) (☞ Page 77 Load Port/Carrier Association State Model) • Carrier State Model state transition No.(3) (☞ Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (☞ Page 220 00501: CarrierID read successful notification)
11	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
12	—*1	←	S6F11: NO STATE to WAITING FOR HOST (CEID 30001)		—
13	—		10087-00501: CarrierID read successful response (☞ Page 265 00501: CarrierID read successful response)	→	—
14	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)
15	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
16	—		10087-00403: Carrier Location change response (☞ Page 257 00403: Carrier Location change response)	→	—
17	Determines the continuation of processing. S3F17: ProceedWithCarrier (☞ Page 411 S3F17: ProceedWithCarrier)	→	Carrier ID host verification has succeeded. Carrier State Model state transition No.(8) (☞ Page 63 Carrier State Model)		—
18	—	←	S3F18: Carrier Action Acknowledge (☞ Page 418 S3F18: Carrier Action Acknowledge)		—
19	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION OK (CEID 30006)		—
20	—		10087-00918: ProceedWithCarrier service notification (☞ Page 292 00918: ProceedWithCarrier service notification)	→	—
21	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification (☞ Page 205 00309: Carrier opened notification)
22	—*1	←	S6F11: Carrier Opened (CEID 30052)		—

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No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
23	—		10087-00309: Carrier opened response (📄 Page 249 00309: Carrier opened response)	→	—
24	—		Passes the read information to HOST, and requests the verification. Carrier State Model state transition No.(14) (📄 Page 63 Carrier State Model)	←	Reading of a slot map has succeeded. 00087-00602: SlotMap waiting for host verification notification (📄 Page 225 00602: SlotMap waiting for host verification notification)
25	—*1	←	S6F11: SLOT MAP NOT READ to WAITING FOR HOST (CEID 30011)		—
26	—		10087-00602: SlotMap waiting for host verification response (📄 Page 271 00602: SlotMap waiting for host verification response)	→	—
27	Succeeds in the slot map verification. S3F17: ProceedWithCarrier (📄 Page 411 S3F17: ProceedWithCarrier)	→	Slot map host verification has succeeded. Carrier State Model state transition No.(15) (📄 Page 63 Carrier State Model)		—
28	—	←	S3F18: Carrier Action Acknowledge (📄 Page 418 S3F18: Carrier Action Acknowledge)		—
29	—*1	←	S6F11: WAITING FOR HOST to SLOT MAP VERIFICATION OK (CEID 30012)		—
30	—		10087-00918: ProceedWithCarrier service notification (📄 Page 292 00918: ProceedWithCarrier service notification)	→	—
31	—		Carrier State Model state transition No.(18) (📄 Page 63 Carrier State Model)	←	Access to a carrier has started. 00087-00311: Carrier accessing started notification (📄 Page 207 00311: Carrier accessing started notification)
32	—*1	←	S6F11: NOT ACCESSED to IN ACCESS (CEID 30014)		—
33	—		10087-00311: Carrier accessing started response (📄 Page 251 00311: Carrier accessing started response)	→	—
34	—		—	←	The completion of accessing a carrier has approached. 00087-00312: Carrier approaching complete notification (📄 Page 208 00312: Carrier approaching complete notification)
35	—*1	←	S6F11: Carrier Approaching Complete (CEID 30048)		—
36	—		10087-00312: Carrier approaching complete response (📄 Page 252 00312: Carrier approaching complete response)	→	—
37	—		Carrier State Model state transition No.(19) (📄 Page 63 Carrier State Model)	←	Access to a carrier has completed. (Carrier Complete) 00087-00313: Carrier accessing normally finished notification (📄 Page 209 00313: Carrier accessing normally finished notification)
38	—*1	←	S6F11: IN ACCESS to CARRIER COMPLETE (CEID 30015)		—
39	—		10087-00313: Carrier accessing normally finished response (📄 Page 253 00313: Carrier accessing normally finished response)	→	—
40	—		—	←	Closes the door. 00087-00310: Carrier closed notification (📄 Page 206 00310: Carrier closed notification)
41	—*1	←	S6F11: Carrier Closed (CEID 30050)		—
42	—		10087-00310: Carrier closed response (📄 Page 250 00310: Carrier closed response)	→	—
43	—		Load Port Transfer State Model state transition No.(9) (📄 Page 69 Load Port Transfer State Model)	←	Notifies that a carrier is undocked and it can be unloaded. 00087-00303: UNLOAD available notification (📄 Page 199 00303: UNLOAD available notification)
44	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
45	—		10087-00303: UNLOAD available response ( Page 243 00303: UNLOAD available response)	→	—
46	—		Load Port Transfer State Model state transition No.(7) ( Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification ( Page 200 00304: UNLOAD started notification)
47	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
48	—		10087-00304: UNLOAD started response ( Page 244 00304: UNLOAD started response)	→	—
49	—		Deletes an instance of carrier object of the unloaded carrier. • Carrier State Model state transition No.(21) ( Page 63 Carrier State Model) • Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model)	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification ( Page 201 00305: UNLOAD completed notification)
50	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
51	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
52	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
53	—		10087-00305: UNLOAD completed response ( Page 245 00305: UNLOAD completed response)	→	—
54	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
55	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
56	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Normal roundtrip 2

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- 'Bind' service accepted
- No load ports reserved

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 547 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State
1	1 to 6	Load port is associated with specified CarrierID, and reserved for loading.	H→E	Bind	TB	R	A	INR	SNR	NA
2	7 to 9	Loading transfer starts.	H←E	TransferBlocked		NR		IVO	SVO	IA
3	10 to 12	Loading transfer completes.	—	—						
4	13 to 21	CarrierID is read.	—	—						
5		CarrierID is verified by production equipment, and result is OK.	H←E	IDVerificationOK						
6	22 to 27	Carrier is docked.	—	—						
7		Slot map is read.	—	—						
8		Slot map is verified by production equipment, and result is OK.	H←E	SlotMapVerificationOK						
9	28 to 30	Process starts.	—	—						
10	31 to 36	Process completes.	—	—						
11	37 to 42	Carrier is undocked.	H←E	ReadyToUnload	RTU					
12	43 to 45	Unloading transfer starts.	H←E	TransferBlocked	TB					
13	46 to 53	Unloading transfer completes.	H←E	ReadyToLoad	RTL		NA	No State	No State	No State

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object, reserves a load port, and associates the load port with the carrier ID. • Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)	—	—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)	—	—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)	—	—
4	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)	—	—
5	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)	—	—
6	—	→	10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	→	—
7	—	←	Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
8	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)	—	—
9	—	→	10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
10	—	←	Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
11	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)	—	—
12	—	→	10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
13	—	←	—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
14	—*1	←	S6F11: Carrier Clamped (CEID 30049)	—	—
15	—	→	10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
16	—	←	Carrier ID equipment verification has succeeded. Carrier State Model state transition No.(6) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
17	—*1	←	S6F11: ID NOT READ to ID VERIFICATION OK (CEID 30004)	—	—
18	—	→	10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	—
19	—	←	—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
20	—*1	←	S6F11: Carrier Location Change (CEID 30051)	—	—
21	—	→	10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—

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No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
22	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification (📄 Page 205 00309: Carrier opened notification)
23	—*1	←	S6F11: Carrier Opened (CEID 30052)		—
24	—		10087-00309: Carrier opened response (📄 Page 249 00309: Carrier opened response)	→	—
25	—		Carrier State Model state transition No.(13) (📄 Page 63 Carrier State Model)	←	Slot map reading and equipment verification have succeeded. 00087-00601: SlotMap verification ok notification (📄 Page 224 00601: SlotMap verification ok notification)
26	—*1	←	S6F11: SLOT MAP NOT READ to SLOT MAP VERIFICATION OK (CEID 30010)		—
27	—		10087-00601: SlotMap verification ok response (📄 Page 270 00601: SlotMap verification ok response)	→	—
28	—		Carrier State Model state transition No.(18) (📄 Page 63 Carrier State Model)	←	Access to a carrier has started. 00087-00311: Carrier accessing started notification (📄 Page 207 00311: Carrier accessing started notification)
29	—*1	←	S6F11: NOT ACCESSED to IN ACCESS (CEID 30014)		—
30	—		10087-00311: Carrier accessing started response (📄 Page 251 00311: Carrier accessing started response)	→	—
31	—		—	←	The completion of accessing a carrier has approached. 00087-00312: Carrier approaching complete notification (📄 Page 208 00312: Carrier approaching complete notification)
32	—*1	←	S6F11: Carrier Approaching Complete (CEID 30048)		—
33	—		10087-00312: Carrier approaching complete response (📄 Page 252 00312: Carrier approaching complete response)	→	—
34	—		Carrier State Model state transition No.(19) (📄 Page 63 Carrier State Model)	←	Access to a carrier has completed. (Carrier Complete) 00087-00313: Carrier accessing normally finished notification (📄 Page 209 00313: Carrier accessing normally finished notification)
35	—*1	←	S6F11: IN ACCESS to CARRIER COMPLETE (CEID 30015)		—
36	—		10087-00313: Carrier accessing normally finished response (📄 Page 253 00313: Carrier accessing normally finished response)	→	—
37	—		—	←	Closes the door. 00087-00310: Carrier closed notification (📄 Page 206 00310: Carrier closed notification)
38	—*1	←	S6F11: Carrier Closed (CEID 30050)		—
39	—		10087-00310: Carrier closed response (📄 Page 250 00310: Carrier closed response)	→	—
40	—		Load Port Transfer State Model state transition No.(9) (📄 Page 69 Load Port Transfer State Model)	←	Notifies that a carrier is undocked and it can be unloaded. 00087-00303: UNLOAD available notification (📄 Page 199 00303: UNLOAD available notification)
41	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
42	—		10087-00303: UNLOAD available response (📄 Page 243 00303: UNLOAD available response)	→	—
43	—		Load Port Transfer State Model state transition No.(7) (📄 Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification (📄 Page 200 00304: UNLOAD started notification)

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
44	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
45	—		10087-00304: UNLOAD started response (📄 Page 244 00304: UNLOAD started response)	→	—
46	—		Deletes an instance of carrier object of the unloaded carrier. <ul style="list-style-type: none"> Carrier State Model state transition No.(21) (📄 Page 63 Carrier State Model) Load Port Transfer State Model state transition No.(8) (📄 Page 69 Load Port Transfer State Model) Load Port/Carrier Association State Model state transition No.(3) (📄 Page 77 Load Port/Carrier Association State Model) 	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification (📄 Page 201 00305: UNLOAD completed notification)
47	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
48	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
49	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
50	—		10087-00305: UNLOAD completed response (📄 Page 245 00305: UNLOAD completed response)	→	—
51	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (📄 Page 213 00403: Carrier Location change notification)
52	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
53	—		10087-00403: Carrier Location change response (📄 Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Normal roundtrip 3

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- FOUP used
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted
- Load port reserved from equipment ( Page 541 Load port reservation from equipment)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 551 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	R	NA	No State	No State	No State
1	1 to 3	Loading transfer starts.	H←E	TransferBlocked	TB	NR	A	WFH	SNR	NA
2	4 to 6	Loading transfer completes.	—	—						
3	7 to 16	CarrierID is read.	H←E	WaitingForHost						
4	—	CarrierID is verified by host, and result is OK.	—	—						
5	17 to 20	Host commands to proceed.	H→E	ProceedWithCarrier						
6	21 to 28	Carrier-in starts.	H←E	BufferCapacityChange	RTL	NA	NA	IVO	WFH	SVO
7	29 to 35	Carrier-in completes.	—	—						
8	—	Process starts.	—	—						
9	36 to 41	Slot map is read at FIMS port.	H←E	WaitingForHost						
10	—	Slot map is verified by host, and result is OK.	—	—						
11	42 to 48	Host commands to proceed.	H→E	ProceedWithCarrier	TB	R	A	IVO	SVO	IA
12	49 to 51	Process completes.	—	—						
13	52 to 57	Carrier completes.	H←E	CarrierComplete						
14	58 to 60	Host commands to carrier-out.	H→E	CarrierOut						
15	61 to 68	Carrier-out starts.	H←E	TransferBlocked						
16	69 to 77	Carrier-out completes.	H←E	ReadyToUnload	RTU	NR	A	IVO	SVO	IA
			H←E	BufferCapacityChange						
17	78 to 80	Unloading transfer starts.	H←E	TransferBlocked	TB	NR	A	IVO	SVO	IA
18	81 to 88	Unloading transfer completes.	H←E	ReadyToLoad	RTL					
							NA	No State	No State	No State

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
4	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
5	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
6	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
7	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
8	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
9	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
10	—		Generates an instance of carrier object of the read carrier ID. • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model) • Carrier State Model state transition No.(3) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
11	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
12	—*1	←	S6F11: NO STATE to WAITING FOR HOST (CEID 30001)		—
13	—		10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	—
14	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
15	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
16	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
17	Determines the continuation of processing. S3F17: ProceedWithCarrier (📖 Page 411 S3F17: ProceedWithCarrier)	→	Carrier ID host verification has succeeded. Carrier State Model state transition No.(8) (📖 Page 63 Carrier State Model)		—
18	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
19	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION OK (CEID 30006)		—
20	—		10087-00918: ProceedWithCarrier service notification (📖 Page 292 00918: ProceedWithCarrier service notification)	→	—
21	—		—	←	A carrier has been unclamped. 00087-00308: Carrier unclamped notification (📖 Page 204 00308: Carrier unclamped notification)

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No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
22	—*1	←	S6F11: Carrier Unclamped (CEID 30053)		—
23	—		10087-00308: Carrier unclamped response ( Page 248 00308: Carrier unclamped response)	→	—
24	—		—	←	Moving of a carrier to an FIMS port has started. 00087-00411: Carrier move started to Internal Buffer notification ( Page 215 00411: Carrier move started to Internal Buffer notification)
25	—		10087-00411: Carrier move started to Internal Buffer response ( Page 259 00411: Carrier move started to Internal Buffer response)	→	—
26	—		—	←	Notifies that the remaining amount of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
27	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
28	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
29	—		<ul style="list-style-type: none"> Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to an FIMS port has completed. 00087-00412: Carrier move completed to Internal Buffer notification ( Page 216 00412: Carrier move completed to Internal Buffer notification)
30	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
31	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
32	—		10087-00412: Carrier move completed to Internal Buffer response ( Page 260 00412: Carrier move completed to Internal Buffer response)	→	—
33	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
34	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
35	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
36	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification ( Page 205 00309: Carrier opened notification)
37	—*1	←	S6F11: Carrier Opened (CEID 30052)		—
38	—		10087-00309: Carrier opened response ( Page 249 00309: Carrier opened response)	→	—
39	—		Carrier State Model state transition No.(14) ( Page 63 Carrier State Model)	←	Reading of a slot map in an FIMS port has succeeded. 00087-00602: SlotMap waiting for host verification notification ( Page 225 00602: SlotMap waiting for host verification notification)
40	—*1	←	S6F11: SLOT MAP NOT READ to WAITING FOR HOST (CEID 30011)		—
41	—		10087-00602: SlotMap waiting for host verification response ( Page 271 00602: SlotMap waiting for host verification response)	→	—
42	Succeeds in the slot map verification. S3F17: ProceedWithCarrier ( Page 411 S3F17: ProceedWithCarrier)	→	Carrier State Model state transition No.(15) ( Page 63 Carrier State Model)		—
43	—	←	S3F18: Carrier Action Acknowledge ( Page 418 S3F18: Carrier Action Acknowledge)		—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
44	—*1	←	S6F11: WAITING FOR HOST to SLOT MAP VERIFICATION OK (CEID 30012)		—
45	—		10087-00918: ProceedWithCarrier service notification (📄 Page 292 00918: ProceedWithCarrier service notification)	→	—
46	—		Carrier State Model state transition No.(18) (📄 Page 63 Carrier State Model)	←	Access to a carrier has started. 00087-00311: Carrier accessing started notification (📄 Page 207 00311: Carrier accessing started notification)
47	—*1	←	S6F11: NOT ACCESSED to IN ACCESS (CEID 30014)		—
48	—		10087-00311: Carrier accessing started response (📄 Page 251 00311: Carrier accessing started response)	→	—
49	—		—	←	The completion of accessing a carrier has approached. 00087-00312: Carrier approaching complete notification (📄 Page 208 00312: Carrier approaching complete notification)
50	—*1	←	S6F11: Carrier Approaching Complete (CEID 30048)		—
51	—		10087-00312: Carrier approaching complete response (📄 Page 252 00312: Carrier approaching complete response)	→	—
52	—		Carrier State Model state transition No.(19) (📄 Page 63 Carrier State Model)	←	Access to a carrier has completed. (Carrier Complete) 00087-00313: Carrier accessing normally finished notification (📄 Page 209 00313: Carrier accessing normally finished notification)
53	—*1	←	S6F11: IN ACCESS to CARRIER COMPLETE (CEID 30015)		—
54	—		10087-00313: Carrier accessing normally finished response (📄 Page 253 00313: Carrier accessing normally finished response)	→	—
55	—		—	←	The door is closed, and a carrier has been undocked. 00087-00310: Carrier closed notification (📄 Page 206 00310: Carrier closed notification)
56	—*1	←	S6F11: Carrier Closed (CEID 30050)		—
57	—		10087-00310: Carrier closed response (📄 Page 250 00310: Carrier closed response)	→	—
58	Instructs the carrier-out. S3F17: CarrierOut (📄 Page 403 S3F17: CarrierOut)	→	—		—
59	—	←	S3F18: Carrier Action Acknowledge (📄 Page 418 S3F18: Carrier Action Acknowledge)		—
60	—		10087-00911: CarrierOut service notification (📄 Page 285 00911: CarrierOut service notification)	→	—
61	—		<ul style="list-style-type: none"> • Load Port Transfer State Model state transition No.(6) (📄 Page 69 Load Port Transfer State Model) • Load Port Reservation State Model state transition No.(2) (📄 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • Load Port/Carrier Association State Model state transition No.(2) (📄 Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to a load port has started. 00087-00413: Carrier move started to Load Port notification (📄 Page 217 00413: Carrier move started to Load Port notification)
62	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
63	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
64	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
65	—		10087-00413: Carrier move started to Load Port response ( Page 261 00413: Carrier move started to Load Port response)	→	—
66	—		—	←	Notifies that the remaining amount of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
67	—	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
68	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
69	—		Load Port Reservation State Model state transition No.(3) ( Page 74 Load Port Reservation State Model (internal buffer equipment/fix buffer equipment))	←	Moving of a carrier to a load port has completed. 00087-00414: Carrier move completed to Load Port notification ( Page 218 00414: Carrier move completed to Load Port notification)
70	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
71	—		10087-00414: Carrier move completed to Load Port response ( Page 262 00414: Carrier move completed to Load Port response)	→	—
72	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
73	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
74	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
75	—		Load Port Transfer State Model state transition No.(9) ( Page 69 Load Port Transfer State Model)	←	Notifies that a carrier can be unloaded. 00087-00303: UNLOAD available notification ( Page 199 00303: UNLOAD available notification)
76	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
77	—		10087-00303: UNLOAD available response ( Page 243 00303: UNLOAD available response)	→	—
78	—		Load Port Transfer State Model state transition No.(7) ( Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification ( Page 200 00304: UNLOAD started notification)
79	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
80	—		10087-00304: UNLOAD started response ( Page 244 00304: UNLOAD started response)	→	—
81	—		Deletes an instance of carrier object of the unloaded carrier. • Carrier State Model state transition No.(21) ( Page 63 Carrier State Model) • Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model)	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification ( Page 201 00305: UNLOAD completed notification)
82	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
83	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
84	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
85	—		10087-00305: UNLOAD completed response ( Page 245 00305: UNLOAD completed response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
86	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
87	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
88	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Normal roundtrip 4

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- 'Bind' service accepted
- No load ports reserved

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 551 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State
1	1 to 9	Load port is associated with specified CarrierID, and reserved for loading.	H→E	Bind		R	A	INR	SNR	NA
2	10 to 12	Loading transfer starts.	H←E	TransferBlocked	TB					
3	13 to 15	Loading transfer completes.	—	—		NR				
4	16 to 24	CarrierID is read.	—	—						
5		CarrierID is verified by equipment, and result is OK.	H←E	IDVerificationOK				IVO		
6	25 to 32	Carrier-in starts.	H←E	BufferCapacityChange						
7	33 to 42	Carrier-in completes.	—	—	RTL		NA			
8	—	Process starts.	—	—						
9	43 to 48	Slot map is read at FIMS port.	—	—						
10		Slot map is verified by equipment, and result is OK.	H←E	SlotMapVerificationOK					SVO	
11	49 to 54	Process completes.	—	—						IA
12	55 to 60	Carrier completes.	H←E	CarrierComplete						CC
13	61 to 63	Host commands to carrier-out.	H→E	CarrierOut						
14	64 to 71	Carrier-out starts.	H←E	TransferBlocked	TB	R	A			
15	72 to 83	Carrier-out completes.	H←E	ReadyToUnload	RTU	NR				
			H←E	BufferCapacityChange						
16	84 to 86	Unloading transfer starts.	H←E	TransferBlocked	TB					
17	87 to 94	Unloading transfer completes.	H←E	ReadyToLoad	RTL		NA	No State	No State	No State

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object, reserves a load port, and associates the load port with the carrier ID. • Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)	—	—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)	—	—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)	—	—
4	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)	—	—
5	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)	—	—
6	—	→	10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	→	—
7	—	←	—	←	Notifies that the remaining amount (unassigned space) of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification (📖 Page 214 00404: Buffer Capacity changed notification)
8	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)	—	—
9	—	→	10087-00404: Buffer Capacity changed response (📖 Page 258 00404: Buffer Capacity changed response)	→	—
10	—	←	Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
11	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)	—	—
12	—	→	10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
13	—	←	Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
14	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)	—	—
15	—	→	10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
16	—	←	—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
17	—*1	←	S6F11: Carrier Clamped (CEID 30049)	—	—
18	—	→	10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
19	—	←	Carrier ID equipment verification has succeeded. Carrier State Model state transition No.(6) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
20	—*1	←	S6F11: ID NOT READ to ID VERIFICATION OK (CEID 30004)	—	—
21	—	→	10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
22	—		—	←	Notifies that the location of a carrier has changed. ^{*2} 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
23	— ^{*1}	←	S6F11: Carrier Location Change (CEID 30051)		—
24	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
25	—		—	←	A carrier has been unclamped. 00087-00308: Carrier unclamped notification ( Page 204 00308: Carrier unclamped notification)
26	— ^{*1}	←	S6F11: Carrier Unclamped (CEID 30053)		—
27	—		10087-00308: Carrier unclamped response ( Page 248 00308: Carrier unclamped response)	→	—
28	—		—	←	Moving of a carrier to an FIMS port has started. 00087-00411: Carrier move started to Internal Buffer notification ( Page 215 00411: Carrier move started to Internal Buffer notification)
29	—		10087-00411: Carrier move started to Internal Buffer response ( Page 259 00411: Carrier move started to Internal Buffer response)	→	—
30	—		—	←	Notifies that the remaining amount (free space) of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
31	— ^{*1}	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
32	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
33	—		<ul style="list-style-type: none"> Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to an FIMS port has completed. 00087-00412: Carrier move completed to Internal Buffer notification ( Page 216 00412: Carrier move completed to Internal Buffer notification)
34	— ^{*1}	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
35	— ^{*1}	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
36	—		10087-00412: Carrier move completed to Internal Buffer response ( Page 260 00412: Carrier move completed to Internal Buffer response)	→	—
37	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
38	— ^{*1}	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
39	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
40	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
41	— ^{*1}	←	S6F11: Carrier Location Change (CEID 30051)		—
42	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
43	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification ( Page 205 00309: Carrier opened notification)

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
44	—*1	←	S6F11: Carrier Opened (CEID 30052)	←	—
45	—		10087-00309: Carrier opened response (📄 Page 249 00309: Carrier opened response)	→	—
46	—		Carrier State Model state transition No.(13) (📄 Page 63 Carrier State Model)	←	The equipment verification has succeeded after reading of a slot map in an FIMS port. 00087-00601: SlotMap verification ok notification (📄 Page 224 00601: SlotMap verification ok notification)
47	—*1	←	S6F11: SLOT MAP NOT READ to SLOT MAP VERIFICATION OK (CEID 30010)	←	—
48	—		10087-00601: SlotMap verification ok response (📄 Page 270 00601: SlotMap verification ok response)	→	—
49	—		Carrier State Model state transition No.(18) (📄 Page 63 Carrier State Model)	←	Access to a carrier has started. 00087-00311: Carrier accessing started notification (📄 Page 207 00311: Carrier accessing started notification)
50	—*1	←	S6F11: NOT ACCESSED to IN ACCESS (CEID 30014)	←	—
51	—		10087-00311: Carrier accessing started response (📄 Page 251 00311: Carrier accessing started response)	→	—
52	—		—	←	The completion of accessing a carrier has approached. 00087-00312: Carrier approaching complete notification (📄 Page 208 00312: Carrier approaching complete notification)
53	—*1	←	S6F11: Carrier Approaching Complete (CEID 30048)	←	—
54	—		10087-00312: Carrier approaching complete response (📄 Page 252 00312: Carrier approaching complete response)	→	—
55	—		Carrier State Model state transition No.(19) (📄 Page 63 Carrier State Model)	←	Access to a carrier has completed. (Carrier Complete) 00087-00313: Carrier accessing normally finished notification (📄 Page 209 00313: Carrier accessing normally finished notification)
56	—*1	←	S6F11: IN ACCESS to CARRIER COMPLETE (CEID 30015)	←	—
57	—		10087-00313: Carrier accessing normally finished response (📄 Page 253 00313: Carrier accessing normally finished response)	→	—
58	—		—	←	The door is closed, and a carrier has been undocked. 00087-00310: Carrier closed notification (📄 Page 206 00310: Carrier closed notification)
59	—*1	←	S6F11: Carrier Closed (CEID 30050)	←	—
60	—		10087-00310: Carrier closed response (📄 Page 250 00310: Carrier closed response)	→	—
61	Instructs the carrier-out. S3F17: CarrierOut (📄 Page 403 S3F17: CarrierOut)	→	—	→	—
62	—	←	S3F18: Carrier Action Acknowledge (📄 Page 418 S3F18: Carrier Action Acknowledge)	←	—
63	—		10087-00911: CarrierOut service notification (📄 Page 285 00911: CarrierOut service notification)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
64	—		<ul style="list-style-type: none"> Load Port Transfer State Model state transition No.(6) (📄 Page 69 Load Port Transfer State Model) Load Port Reservation State Model state transition No.(2) (📄 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) Load Port/Carrier Association State Model state transition No.(2) (📄 Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to a load port has started. 00087-00413: Carrier move started to Load Port notification (📄 Page 217 00413: Carrier move started to Load Port notification)
65	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
66	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
67	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
68	—		10087-00413: Carrier move started to Load Port response (📄 Page 261 00413: Carrier move started to Load Port response)	→	—
69	—		—	←	Notifies that the remaining amount of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification (📄 Page 214 00404: Buffer Capacity changed notification)
70	—	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
71	—		10087-00404: Buffer Capacity changed response (📄 Page 258 00404: Buffer Capacity changed response)	→	—
72	—		Load Port Reservation State Model state transition No.(3) (📄 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Moving of a carrier to a load port has completed. 00087-00414: Carrier move completed to Load Port notification (📄 Page 218 00414: Carrier move completed to Load Port notification)
73	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
74	—		10087-00414: Carrier move completed to Load Port response (📄 Page 262 00414: Carrier move completed to Load Port response)	→	—
75	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification (📄 Page 214 00404: Buffer Capacity changed notification)
76	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
77	—		10087-00404: Buffer Capacity changed response (📄 Page 258 00404: Buffer Capacity changed response)	→	—
78	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (📄 Page 213 00403: Carrier Location change notification)
79	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
80	—		10087-00403: Carrier Location change response (📄 Page 257 00403: Carrier Location change response)	→	—
81	—		Load Port Transfer State Model state transition No.(9) (📄 Page 69 Load Port Transfer State Model)	←	Notifies that a carrier can be unloaded. 00087-00303: UNLOAD available notification (📄 Page 199 00303: UNLOAD available notification)
82	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
83	—		10087-00303: UNLOAD available response (📄 Page 243 00303: UNLOAD available response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
84	—		Load Port Transfer State Model state transition No.(7) (📄 Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification (📄 Page 200 00304: UNLOAD started notification)
85	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
86	—		10087-00304: UNLOAD started response (📄 Page 244 00304: UNLOAD started response)	→	—
87	—		Deletes an instance of carrier object of the unloaded carrier. • Carrier State Model state transition No.(21) (📄 Page 63 Carrier State Model) • Load Port Transfer State Model state transition No.(8) (📄 Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) (📄 Page 77 Load Port/Carrier Association State Model)	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification (📄 Page 201 00305: UNLOAD completed notification)
88	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
89	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
90	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
91	—		10087-00305: UNLOAD completed response (📄 Page 245 00305: UNLOAD completed response)	→	—
92	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (📄 Page 213 00403: Carrier Location change notification)
93	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
94	—		10087-00403: Carrier Location change response (📄 Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Normal roundtrip 5

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- 'CarrierNotification' service accepted
- Load port reserved from equipment ( Page 541 Load port reservation from equipment)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 563 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	R	NA	No State	No State	No State
1	1 to 4	Equipment is notified of future Carrier arrival.	H→E	CarrierNotification	TB	NR	A	INR	SNR	NA
2	5 to 7	Loading transfer starts.	H←E	TransferBlocked				IVO	SVO	IA
3	8 to 10	Loading transfer completes.	—	—						
4	11 to 20	CarrierID is read.	—	—						
5	20	CarrierID is verified by equipment, and result is OK.	H←E	IDVerificationOK						
6	21 to 23	Carrier is docked.	—	—						
7	24 to 26	Slot map is read.	—	—						
8	26	Slot map is verified by equipment, and result is OK.	H←E	SlotMapVerificationOK						
9	27 to 32	Process starts.	—	—						
10	33 to 35	Process completes.	—	—						
11	36 to 41	Carrier is undocked.	H←E	ReadyToUnload	RTU		NA	No State	No State	No State
12	42 to 44	Unloading transfer starts.	H←E	TransferBlocked	TB					
13	45 to 52	Unloading transfer completes.	H←E	ReadyToLoad	RTL					

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation S3F17: CarrierNotification (☞ Page 400 S3F17: CarrierNotification)	→	Generates an instance of carrier object. Carrier State Model state transition No.(2) (☞ Page 63 Carrier State Model)		—
2	—	←	S3F18: Carrier Action Acknowledge (☞ Page 418 S3F18: Carrier Action Acknowledge)		—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)		—
4	—		10087-00910: CarrierNotification service notification (☞ Page 284 00910: CarrierNotification service notification)	→	—
5	—		Load Port Transfer State Model state transition No.(6) (☞ Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (☞ Page 197 00301: LOAD started notification)
6	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
7	—		10087-00301: LOAD started response (☞ Page 241 00301: LOAD started response)	→	—
8	—		Load Port Reservation State Model state transition No.(3) (☞ Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (☞ Page 198 00302: LOAD completed notification)
9	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
10	—		10087-00302: LOAD completed response (☞ Page 242 00302: LOAD completed response)	→	—
11	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (☞ Page 203 00307: Carrier clamped notification)
12	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
13	—		10087-00307: Carrier clamped response (☞ Page 247 00307: Carrier clamped response)	→	—
14	—		Carrier ID equipment verification has succeeded. • Load Port/Carrier Association State Model state transition No.(2) (☞ Page 77 Load Port/Carrier Association State Model) • Carrier State Model state transition No.(6) (☞ Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (☞ Page 220 00501: CarrierID read successful notification)
15	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
16	—*1	←	S6F11: ID NOT READ to ID VERIFICATION OK (CEID 30004)		—
17	—		10087-00501: CarrierID read successful response (☞ Page 265 00501: CarrierID read successful response)	→	—
18	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)
19	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
20	—		10087-00403: Carrier Location change response (☞ Page 257 00403: Carrier Location change response)	→	—
21	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification (☞ Page 205 00309: Carrier opened notification)
22	—*1	←	S6F11: Carrier Opened (CEID 30052)		—
23	—		10087-00309: Carrier opened response (☞ Page 249 00309: Carrier opened response)	→	—

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No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
24	—		Carrier State Model state transition No.(13) ( Page 63 Carrier State Model)	←	Slot map reading and equipment verification have succeeded. 00087-00601: SlotMap verification ok notification ( Page 224 00601: SlotMap verification ok notification)
25	—*1	←	S6F11: SLOT MAP NOT READ to SLOT MAP VERIFICATION OK (CEID 30010)		—
26	—		10087-00601: SlotMap verification ok response ( Page 270 00601: SlotMap verification ok response)	→	—
27	—		Carrier State Model state transition No.(18) ( Page 63 Carrier State Model)	←	Access to a carrier has started. 00087-00311: Carrier accessing started notification ( Page 207 00311: Carrier accessing started notification)
28	—*1	←	S6F11: NOT ACCESSED to IN ACCESS (CEID 30014)		—
29	—		10087-00311: Carrier accessing started response ( Page 251 00311: Carrier accessing started response)	→	—
30	—		—	←	The completion of accessing a carrier has approached. 00087-00312: Carrier approaching complete notification ( Page 208 00312: Carrier approaching complete notification)
31	—*1	←	S6F11: Carrier Approaching Complete (CEID 30048)		—
32	—		10087-00312: Carrier approaching complete response ( Page 252 00312: Carrier approaching complete response)	→	—
33	—		Carrier State Model state transition No.(19) ( Page 63 Carrier State Model)	←	Access to a carrier has completed. (Carrier Complete) 00087-00313: Carrier accessing normally finished notification ( Page 209 00313: Carrier accessing normally finished notification)
34	—*1	←	S6F11: IN ACCESS to CARRIER COMPLETE (CEID 30015)		—
35	—		10087-00313: Carrier accessing normally finished response ( Page 253 00313: Carrier accessing normally finished response)	→	—
36	—		—	←	The door is closed, and a carrier has been undocked. 00087-00310: Carrier closed notification ( Page 206 00310: Carrier closed notification)
37	—*1	←	S6F11: Carrier Closed (CEID 30050)		—
38	—		10087-00310: Carrier closed response ( Page 250 00310: Carrier closed response)	→	—
39	—		Load Port Transfer State Model state transition No.(9) ( Page 69 Load Port Transfer State Model)	←	Notifies that a carrier can be unloaded. 00087-00303: UNLOAD available notification ( Page 199 00303: UNLOAD available notification)
40	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
41	—		10087-00303: UNLOAD available response ( Page 243 00303: UNLOAD available response)	→	—
42	—		Load Port Transfer State Model state transition No.(7) ( Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification ( Page 200 00304: UNLOAD started notification)
43	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
44	—		10087-00304: UNLOAD started response ( Page 244 00304: UNLOAD started response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
45	—		Deletes an instance of carrier object of the unloaded carrier. • Carrier State Model state transition No.(21) ( Page 63 Carrier State Model) • Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model)	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification ( Page 201 00305: UNLOAD completed notification)
46	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
47	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
48	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
49	—		10087-00305: UNLOAD completed response ( Page 245 00305: UNLOAD completed response)	→	—
50	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
51	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
52	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Normal roundtrip 6

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- 'CarrierNotification' service accepted
- Load port reserved from equipment ( Page 541 Load port reservation from equipment)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 567 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corr espo ndin g No.*1	Comment	Communi cation direction H: HOST E: Equipme nt	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	R	NA	No State	No State	No State
1	1 to 7	Equipment is notified of future Carrier arrival.	H→E	CarrierNotification				INR	SNR	NA
2	8 to 10	Loading transfer starts.	H←E	TransferBlocked	TB	NR	A			
3	11 to 13	Loading transfer completes.	—	—				RTL	NA	
4	14 to 23	CarrierID is read.	—	—	TB	R	A			No State
5		CarrierID is verified by equipment, and result is OK.	H←E	IDVerificationOK				NR	NA	
6	24 to 31	Carrier-in starts.	H←E	BufferCapacityChange	TB	R	A			No State
7	32 to 41	Carrier-in completes.	—	—				RTU	NR	
8	—	Process starts.	—	—	TB	R	A			No State
9	42 to 47	Slot map is read at FIMS port.	—	—				TB	R	
10		Slot map is verified by equipment, and result is OK.	H←E	SlotMapVerificationOK	TB	R	A			No State
11	48 to 53	Process completes.	—	—				TB	R	
12	54 to 59	Carrier completes.	H←E	CarrierComplete	TB	R	A			No State
13	60 to 62	Host commands to carrier-out.	H→E	CarrierOut				TB	R	
14	63 to 70	Carrier-out starts.	H←E	TransferBlocked	TB	R	A			No State
15	71 to 82	Carrier-out completes.	H←E	ReadyToUnload				TB	R	
			H←E	BufferCapacityChange	TB	R	A			No State
16	83 to 85	Unloading transfer starts.	H←E	TransferBlocked				TB	R	
17	86 to 93	Unloading transfer completes.	H←E	ReadyToLoad	TB	R	A			No State

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation S3F17: CarrierNotification (📖 Page 400 S3F17: CarrierNotification)	→	Generates an instance of carrier object. Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model)		—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)		—
4	—		10087-00910: CarrierNotification service notification (📖 Page 284 00910: CarrierNotification service notification)	→	—
5	—		—	←	Notifies that the remaining amount (unassigned space) of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification (📖 Page 214 00404: Buffer Capacity changed notification)
6	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
7	—		10087-00404: Buffer Capacity changed response (📖 Page 258 00404: Buffer Capacity changed response)	→	—
8	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
9	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
10	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
11	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
12	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
13	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
14	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
15	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
16	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
17	—		Carrier ID equipment verification has succeeded. • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model) • Carrier State Model state transition No.(6) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
18	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
19	—*1	←	S6F11: ID NOT READ to ID VERIFICATION OK (CEID 30004)		—
20	—		10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	—
21	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
22	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—

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No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
23	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
24	—		—	←	A carrier has been unclamped. 00087-00308: Carrier unclamped notification ( Page 204 00308: Carrier unclamped notification)
25	—*1	←	S6F11: Carrier Unclamped (CEID 30053)		—
26	—		10087-00308: Carrier unclamped response ( Page 248 00308: Carrier unclamped response)	→	—
27	—		—	←	Moving of a carrier to an FIMS port has started. 00087-00411: Carrier move started to Internal Buffer notification ( Page 215 00411: Carrier move started to Internal Buffer notification)
28	—		10087-00411: Carrier move started to Internal Buffer response ( Page 259 00411: Carrier move started to Internal Buffer response)	→	—
29	—		—	←	Notifies that the remaining amount (free space) of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
30	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
31	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
32	—		<ul style="list-style-type: none"> • Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to an FIMS port has completed. 00087-00412: Carrier move completed to Internal Buffer notification ( Page 216 00412: Carrier move completed to Internal Buffer notification)
33	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
34	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
35	—		10087-00412: Carrier move completed to Internal Buffer response ( Page 260 00412: Carrier move completed to Internal Buffer response)	→	—
36	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
37	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
38	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
39	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
40	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
41	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
42	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification ( Page 205 00309: Carrier opened notification)
43	—*1	←	S6F11: Carrier Opened (CEID 30052)		—
44	—		10087-00309: Carrier opened response ( Page 249 00309: Carrier opened response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
45	—		Carrier State Model state transition No.(13) ( Page 63 Carrier State Model)	←	Slot map reading and equipment verification have succeeded. 00087-00601: SlotMap verification ok notification ( Page 224 00601: SlotMap verification ok notification)
46	—*1	←	S6F11: SLOT MAP NOT READ to SLOT MAP VERIFICATION OK (CEID 30010)		—
47	—		10087-00601: SlotMap verification ok response ( Page 270 00601: SlotMap verification ok response)	→	—
48	—		Carrier State Model state transition No.(18) ( Page 63 Carrier State Model)	←	Access to a carrier has started. 00087-00311: Carrier accessing started notification ( Page 207 00311: Carrier accessing started notification)
49	—*1	←	S6F11: NOT ACCESSED to IN ACCESS (CEID 30014)		—
50	—		10087-00311: Carrier accessing started response ( Page 251 00311: Carrier accessing started response)	→	—
51	—		—	←	The completion of accessing a carrier has approached. 00087-00312: Carrier approaching complete notification ( Page 208 00312: Carrier approaching complete notification)
52	—*1	←	S6F11: Carrier Approaching Complete (CEID 30048)		—
53	—		10087-00312: Carrier approaching complete response ( Page 252 00312: Carrier approaching complete response)	→	—
54	—		Carrier State Model state transition No.(19) ( Page 63 Carrier State Model)	←	Access to a carrier has completed. (Carrier Complete) 00087-00313: Carrier accessing normally finished notification ( Page 209 00313: Carrier accessing normally finished notification)
55	—*1	←	S6F11: IN ACCESS to CARRIER COMPLETE (CEID 30015)		—
56	—		10087-00313: Carrier accessing normally finished response ( Page 253 00313: Carrier accessing normally finished response)	→	—
57	—		—	←	The door is closed, and a carrier has been undocked. 00087-00310: Carrier closed notification ( Page 206 00310: Carrier closed notification)
58	—*1	←	S6F11: Carrier Closed (CEID 30050)		—
59	—		10087-00310: Carrier closed response ( Page 250 00310: Carrier closed response)	→	—
60	Instructs the carrier-out. S3F17: CarrierOut ( Page 403 S3F17: CarrierOut)	→	—		—
61	—	←	S3F18: Carrier Action Acknowledge ( Page 418 S3F18: Carrier Action Acknowledge)		—
62	—		10087-00911: CarrierOut service notification ( Page 285 00911: CarrierOut service notification)	→	—
63	—		<ul style="list-style-type: none"> Load Port Transfer State Model state transition No.(6) ( Page 69 Load Port Transfer State Model) Load Port Reservation State Model state transition No.(2) ( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) Load Port/Carrier Association State Model state transition No.(2) ( Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to a load port has started. 00087-00413: Carrier move started to Load Port notification ( Page 217 00413: Carrier move started to Load Port notification)

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
64	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
65	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
66	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
67	—		10087-00413: Carrier move started to Load Port response (☞ Page 261 00413: Carrier move started to Load Port response)	→	—
68	—		—	←	Notifies that the remaining amount of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification (☞ Page 214 00404: Buffer Capacity changed notification)
69	—	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
70	—		10087-00404: Buffer Capacity changed response (☞ Page 258 00404: Buffer Capacity changed response)	→	—
71	—		Load Port Reservation State Model state transition No.(3) (☞ Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Moving of a carrier to a load port has completed. 00087-00414: Carrier move completed to Load Port notification (☞ Page 218 00414: Carrier move completed to Load Port notification)
72	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
73	—		10087-00414: Carrier move completed to Load Port response (☞ Page 262 00414: Carrier move completed to Load Port response)	→	—
74	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification (☞ Page 214 00404: Buffer Capacity changed notification)
75	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
76	—		10087-00404: Buffer Capacity changed response (☞ Page 258 00404: Buffer Capacity changed response)	→	—
77	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)
78	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
79	—		10087-00403: Carrier Location change response (☞ Page 257 00403: Carrier Location change response)	→	—
80	—		Load Port Transfer State Model state transition No.(9) (☞ Page 69 Load Port Transfer State Model)	←	Notifies that a carrier can be unloaded. 00087-00303: UNLOAD available notification (☞ Page 199 00303: UNLOAD available notification)
81	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
82	—		10087-00303: UNLOAD available response (☞ Page 243 00303: UNLOAD available response)	→	—
83	—		Load Port Transfer State Model state transition No.(7) (☞ Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification (☞ Page 200 00304: UNLOAD started notification)
84	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
85	—		10087-00304: UNLOAD started response (☞ Page 244 00304: UNLOAD started response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
86	—		Deletes an instance of carrier object of the unloaded carrier. • Carrier State Model state transition No.(21) ( Page 63 Carrier State Model) • Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model)	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification ( Page 201 00305: UNLOAD completed notification)
87	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
88	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
89	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
90	—		10087-00305: UNLOAD completed response ( Page 245 00305: UNLOAD completed response)	→	—
91	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
92	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
93	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Normal roundtrip 7

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted
- 'ReserveAtPort' service accepted

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 573 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.	Comment	Communication direction H=HOST E = Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State
1	1 to 4	Reserves a port for future activity.	H→E	ReserveAtPort		R				
2	5 to 7	Loading transfer starts.	H←E	TransferBlocked	TB	NR				
3	8 to 10	Loading transfer completes.	—	—						
4	11 to 20	CarrierID is read.	H←E	WaitingForHost			A	WFH	SNR	NA
5	—	CarrierID is verified by host, and result is OK.	—	—						
6	21 to 24	Host commands to proceed.	H→E	ProceedWithCarrier			IVO			
7	25 to 27	Carrier is docked.	—	—						
8	28 to 30	Slot map is read.	H←E	WaitingForHost			WFH			
9	—	Slot map is verified by host, and result is OK.	—	—						
10	31 to 34	Host commands to proceed.	H→E	ProceedWithCarrier			SVO			
11	35 to 40	Process starts.	—	—				IA		
12	41 to 43	Process completes.	—	—			CC			
13	44 to 49	Carrier is undocked.	H←E	ReadyToUnload				RTU		
14	50 to 52	Unloading transfer starts.	H←E	TransferBlocked			TB			
15	53 to 60	Unloading transfer completes.	H←E	ReadyToLoad			RTL		NA	No State

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Reserves a port for future activity. S3F25: ReserveAtPort (📖 Page 426 S3F25: ReserveAtPort)	→	Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))		—
2	—	←	S3F26: Port Action Acknowledge (📖 Page 428 S3F26: Port Action Acknowledge)		—
3	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30091)		—
4	—		10087-00919: ReserveAtPort service notification (📖 Page 293 00919: ReserveAtPort service notification)	→	—
5	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
6	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
7	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
8	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
9	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		
10	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
11	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
12	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
13	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
14	—		Generates an instance of carrier object of the read carrier ID. • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model) • Carrier State Model state transition No.(3) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
15	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
16	—*1	←	S6F11: NO STATE to WAITING FOR HOST (CEID 30001)		—
17	—		10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	
18	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
19	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
20	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
21	Determines the continuation of processing. S3F17: ProceedWithCarrier (📖 Page 411 S3F17: ProceedWithCarrier)	→	Carrier ID host verification has succeeded. Carrier State Model state transition No.(8) (📖 Page 63 Carrier State Model)		—

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No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
22	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
23	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION OK (CEID 30006)		—
24	—		10087-00918: ProceedWithCarrier service notification (📖 Page 292 00918: ProceedWithCarrier service notification)	→	—
25	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification (📖 Page 205 00309: Carrier opened notification)
26	—*1	←	S6F11: Carrier Opened (CEID 30052)		—
27	—		10087-00309: Carrier opened response (📖 Page 249 00309: Carrier opened response)	→	—
28	—		Passes the read information to HOST, and requests the verification. Carrier State Model state transition No.(14) (📖 Page 63 Carrier State Model)	←	Reading of a slot map has succeeded. 00087-00602: SlotMap waiting for host verification notification (📖 Page 225 00602: SlotMap waiting for host verification notification)
29	—*1	←	S6F11: SLOT MAP NOT READ to WAITING FOR HOST (CEID 30011)		—
30	—		10087-00602: SlotMap waiting for host verification response (📖 Page 271 00602: SlotMap waiting for host verification response)	→	—
31	Succeeds in the slot map verification. S3F17: ProceedWithCarrier (📖 Page 411 S3F17: ProceedWithCarrier)	→	Slot map host verification has succeeded. Carrier State Model state transition No.(15) (📖 Page 63 Carrier State Model)		—
32	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
33	—*1	←	S6F11: WAITING FOR HOST to SLOT MAP VERIFICATION OK (CEID 30012)		—
34	—		10087-00918: ProceedWithCarrier service notification (📖 Page 292 00918: ProceedWithCarrier service notification)	→	—
35	—		Carrier State Model state transition No.(18) (📖 Page 63 Carrier State Model)	←	Access to a carrier has started. 00087-00311: Carrier accessing started notification (📖 Page 207 00311: Carrier accessing started notification)
36	—*1	←	S6F11: NOT ACCESSED to IN ACCESS (CEID 30014)		—
37	—		10087-00311: Carrier accessing started response (📖 Page 251 00311: Carrier accessing started response)	→	—
38	—		—	←	The completion of accessing a carrier has approached. 00087-00312: Carrier approaching complete notification (📖 Page 208 00312: Carrier approaching complete notification)
39	—*1	←	S6F11: Carrier Approaching Complete (CEID 30048)		—
40	—		10087-00312: Carrier approaching complete response (📖 Page 252 00312: Carrier approaching complete response)	→	—
41	—		Carrier State Model state transition No.(19) (📖 Page 63 Carrier State Model)	←	Access to a carrier has completed. (Carrier Complete) 00087-00313: Carrier accessing normally finished notification (📖 Page 209 00313: Carrier accessing normally finished notification)
42	—*1	←	S6F11: IN ACCESS to CARRIER COMPLETE (CEID 30015)		—
43	—		10087-00313: Carrier accessing normally finished response (📖 Page 253 00313: Carrier accessing normally finished response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
44	—		—	←	Closes the door. 00087-00310: Carrier closed notification (📄 Page 206 00310: Carrier closed notification)
45	—*1	←	S6F11: Carrier Closed (CEID 30050)		—
46	—		10087-00310: Carrier closed response (📄 Page 250 00310: Carrier closed response)	→	—
47	—		Load Port Transfer State Model state transition No.(9) (📄 Page 69 Load Port Transfer State Model)	←	Notifies that a carrier is undocked and it can be unloaded. 00087-00303: UNLOAD available notification (📄 Page 199 00303: UNLOAD available notification)
48	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
49	—		10087-00303: UNLOAD available response (📄 Page 243 00303: UNLOAD available response)	→	—
50	—		Load Port Transfer State Model state transition No.(7) (📄 Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification (📄 Page 200 00304: UNLOAD started notification)
51	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
52	—		10087-00304: UNLOAD started response (📄 Page 244 00304: UNLOAD started response)	→	—
53	—		Deletes an instance of carrier object of the unloaded carrier. • Carrier State Model state transition No.(21) (📄 Page 63 Carrier State Model) • Load Port Transfer State Model state transition No.(8) (📄 Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) (📄 Page 77 Load Port/Carrier Association State Model)	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification (📄 Page 201 00305: UNLOAD completed notification)
54	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
55	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
56	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
57	—		10087-00305: UNLOAD completed response (📄 Page 245 00305: UNLOAD completed response)	→	—
58	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (📄 Page 213 00403: Carrier Location change notification)
59	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
60	—		10087-00403: Carrier Location change response (📄 Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Normal roundtrip 8

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- FOUP used
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted
- 'ReserveAtPort' service accepted

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 577 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.	Comment	Communication direction H=HOST E = Equipment	Message	State model name							
					LTS	LRS	LCA S	CIDS	CSM S	CAS		
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State		
1	1 to 4	Reserve Port for future activity.	H→E	ReserveAtPort		R						
2	5 to 7	Loading transfer starts.	H←E	TransferBlocked	TB	NR						
3	8 to 10	Loading transfer completes.	—	—								
4	11 to 20	CarrierID is read.	H←E	WaitingForHost	RTL		A	WFH	SNR	NA		
5	—	CarrierID is verified by host, and result is OK.	—	—								
6	21 to 24	Host commands to proceed.	H→E	ProceedWithCarrier			IVO					
7	25 to 32	Carrier-in starts.	H←E	BufferCapacityChange								
8	33 to 39	Carrier-in completes.	—	—			NA				WFH	
9		Process starts.	—	—								
10	40 to 45	Slot map is read at FIMS port.	H←E	WaitingForHost								
11		—	—	—								
12	46 to 52	Host commands to proceed.	H→E	ProceedWithCarrier	SVO	IA						
13	53 to 55	Process completes.	—	—								
14	56 to 61	Carrier completes.	H←E	CarrierComplete							CC	
15	62 to 64	Host commands to carrier-out.	H→E	CarrierOut								
16	65 to 72	Carrier-out starts.	H←E	TransferBlocked	TB	R	A					
17	73 to 81	Carrier-out completes.	H←E	ReadyToUnload	RTU	NR						
			H←E	BufferCapacityChange								
18	82 to 84	Unloading transfer starts.	H←E	TransferBlocked	TB		NA	No State	No State	No State		
19	85 to 92	Unloading transfer completes.	H←E	ReadyToLoad	RTL							

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Reserves a port for future activity. S3F25: ReserveAtPort (📖 Page 426 S3F25: ReserveAtPort)	→	Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	—	—
2	—	←	S3F26: Port Action Acknowledge (📖 Page 428 S3F26: Port Action Acknowledge)	—	—
3	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30091)	—	—
4	—	—	10087-00919: ReserveAtPort service notification (📖 Page 293 00919: ReserveAtPort service notification)	→	—
5	—	—	Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
6	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)	—	—
7	—	—	10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
8	—	—	Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
9	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)	—	—
10	—	—	10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
11	—	—	—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
12	—*1	←	S6F11: Carrier Clamped (CEID 30049)	—	—
13	—	—	10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
14	—	—	Generates an instance of carrier object of the read carrier ID. • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model) • Carrier State Model state transition No.(3) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
15	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)	—	—
16	—*1	←	S6F11: NO STATE to WAITING FOR HOST (CEID 30001)	—	—
17	—	—	10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	—
18	—	—	—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
19	—*1	←	S6F11: Carrier Location Change (CEID 30051)	—	—
20	—	—	10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
21	Determines the continuation of processing. S3F17: ProceedWithCarrier (📖 Page 411 S3F17: ProceedWithCarrier)	→	Carrier ID host verification has succeeded. Carrier State Model state transition No.(8) (📖 Page 63 Carrier State Model)	—	—

A

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
22	—	←	S3F18: Carrier Action Acknowledge (📄 Page 418 S3F18: Carrier Action Acknowledge)		—
23	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION OK(CEID 30006)		—
24	—		10087-00918: ProceedWithCarrier service notification (📄 Page 292 00918: ProceedWithCarrier service notification)	→	—
25	—		—	←	A carrier has been unclamped. 00087-00308: Carrier unclamped notification (📄 Page 204 00308: Carrier unclamped notification)
26	—*1	←	S6F11: Carrier Unclamped (CEID 30053)		—
27	—		10087-00308: Carrier unclamped response (📄 Page 248 00308: Carrier unclamped response)	→	—
28	—		—	←	Moving of a carrier to an FIMS port has started. 00087-00411: Carrier move started to Internal Buffer notification (📄 Page 215 00411: Carrier move started to Internal Buffer notification)
29	—		10087-00411: Carrier move started to Internal Buffer response (📄 Page 259 00411: Carrier move started to Internal Buffer response)	→	—
30	—		—	←	Notifies that the remaining amount of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification (📄 Page 214 00404: Buffer Capacity changed notification)
31	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
32	—		10087-00404: Buffer Capacity changed response (📄 Page 258 00404: Buffer Capacity changed response)	→	—
33	—		<ul style="list-style-type: none"> • Load Port Transfer State Model state transition No.(8) (📄 Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) (📄 Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to an FIMS port has completed. 00087-00412: Carrier move completed to Internal Buffer notification (📄 Page 216 00412: Carrier move completed to Internal Buffer notification)
34	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
35	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
36	—		10087-00412: Carrier move completed to Internal Buffer response (📄 Page 260 00412: Carrier move completed to Internal Buffer response)	→	—
37	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification (📄 Page 214 00404: Buffer Capacity changed notification)
38	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
39	—		10087-00404: Buffer Capacity changed response (📄 Page 258 00404: Buffer Capacity changed response)	→	—
40	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification (📄 Page 205 00309: Carrier opened notification)
41	—*1	←	S6F11: Carrier Opened (CEID 30052)		—
42	—		10087-00309: Carrier opened response (📄 Page 249 00309: Carrier opened response)	→	—
43	—		Carrier State Model state transition No.(14) (📄 Page 63 Carrier State Model)	←	Reading of a slot map in an FIMS port has succeeded. 00087-00602: SlotMap waiting for host verification notification (📄 Page 225 00602: SlotMap waiting for host verification notification)

No.	HOST	↔ SECS/GEM communication software ↔	Control CPU (controlled by user program)
44	—*1	← S6F11: SLOT MAP NOT READ to WAITING FOR HOST (CEID 30011)	—
45	—	10087-00602: SlotMap waiting for host verification response (☞ Page 271 00602: SlotMap waiting for host verification response)	→ —
46	Succeeds in the slot map verification. S3F17: ProceedWithCarrier (☞ Page 411 S3F17: ProceedWithCarrier)	→ Carrier State Model state transition No.(15) (☞ Page 63 Carrier State Model)	—
47	—	← S3F18: Carrier Action Acknowledge (☞ Page 418 S3F18: Carrier Action Acknowledge)	—
48	—*1	← S6F11: WAITING FOR HOST to SLOT MAP VERIFICATION OK (CEID 30012)	—
49	—	10087-00918: ProceedWithCarrier service notification (☞ Page 292 00918: ProceedWithCarrier service notification)	→ —
50	—	Carrier State Model state transition No.(18) (☞ Page 63 Carrier State Model)	← Access to a carrier has started. 00087-00311: Carrier accessing started notification (☞ Page 207 00311: Carrier accessing started notification)
51	—*1	← S6F11: NOT ACCESSED to IN ACCESS (CEID 30014)	—
52	—	10087-00311: Carrier accessing started response (☞ Page 251 00311: Carrier accessing started response)	→ —
53	—	—	← The completion of accessing a carrier has approached. 00087-00312: Carrier approaching complete notification (☞ Page 208 00312: Carrier approaching complete notification)
54	—*1	← S6F11: Carrier Approaching Complete (CEID 30048)	—
55	—	10087-00312: Carrier approaching complete response (☞ Page 252 00312: Carrier approaching complete response)	→ —
56	—	Carrier State Model state transition No.(19) (☞ Page 63 Carrier State Model)	← Access to a carrier has completed. (Carrier Complete) 00087-00313: Carrier accessing normally finished notification (☞ Page 209 00313: Carrier accessing normally finished notification)
57	—*1	← S6F11: IN ACCESS to CARRIER COMPLETE (CEID 30015)	—
58	—	10087-00313: Carrier accessing normally finished response (☞ Page 253 00313: Carrier accessing normally finished response)	→ —
59	—	—	← The door is closed, and a carrier has been undocked. 00087-00310: Carrier closed notification (☞ Page 206 00310: Carrier closed notification)
60	—*1	← S6F11: Carrier Closed (CEID 30050)	—
61	—	10087-00310: Carrier closed response (☞ Page 250 00310: Carrier closed response)	→ —
62	Host commands to carrier-out. S3F17: CarrierOut (☞ Page 403 S3F17: CarrierOut)	→ —	—
63	—	← S3F18: Carrier Action Acknowledge (☞ Page 418 S3F18: Carrier Action Acknowledge)	—
64	—	10087-00911: CarrierOut service notification (☞ Page 285 00911: CarrierOut service notification)	→ —

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
65	—		<ul style="list-style-type: none"> Load Port Transfer State Model state transition No.(6) (📄 Page 69 Load Port Transfer State Model) Load Port Reservation State Model state transition No.(2) (📄 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) Load Port/Carrier Association State Model state transition No.(2) (📄 Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to a load port has started. 00087-00413: Carrier move started to Load Port notification (📄 Page 217 00413: Carrier move started to Load Port notification)
66	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
67	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
68	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
69	—		10087-00413: Carrier move started to Load Port response (📄 Page 261 00413: Carrier move started to Load Port response)	→	—
70	—		—	←	Notifies that the remaining amount of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification (📄 Page 214 00404: Buffer Capacity changed notification)
71	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
72	—		10087-00404: Buffer Capacity changed response (📄 Page 258 00404: Buffer Capacity changed response)	→	—
73	—		Load Port Reservation State Model state transition No.(3) (📄 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Moving of a carrier to a load port has completed. 00087-00414: Carrier move completed to Load Port notification (📄 Page 218 00414: Carrier move completed to Load Port notification)
74	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
75	—		10087-00414: Carrier move completed to Load Port response (📄 Page 262 00414: Carrier move completed to Load Port response)	→	—
76	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification (📄 Page 214 00404: Buffer Capacity changed notification)
77	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
78	—		10087-00404: Buffer Capacity changed response (📄 Page 258 00404: Buffer Capacity changed response)	→	—
79	—		Load Port Transfer State Model state transition No.(9) (📄 Page 69 Load Port Transfer State Model)	←	Notifies that a carrier can be unloaded. 00087-00303: UNLOAD available notification (📄 Page 199 00303: UNLOAD available notification)
80	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
81	—		10087-00303: UNLOAD available response (📄 Page 243 00303: UNLOAD available response)	→	—
82	—		Load Port Transfer State Model state transition No.(7) (📄 Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification (📄 Page 200 00304: UNLOAD started notification)
83	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
84	—		10087-00304: UNLOAD started response (📄 Page 244 00304: UNLOAD started response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
85	—		Deletes an instance of carrier object of the unloaded carrier. • Carrier State Model state transition No.(21) ( Page 63 Carrier State Model) • Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) • Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model)	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification ( Page 201 00305: UNLOAD completed notification)
86	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
87	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
88	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
89	—		10087-00305: UNLOAD completed response ( Page 245 00305: UNLOAD completed response)	→	—
90	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
91	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
92	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Abnormal CarrierID verification 1

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted
- Carrier returned by using the 'CancelCarrier' service
- Load port reserved from equipment ( Page 541 Load port reservation from equipment)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 583 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	R	NA	No State	No State	No State
1	1 to 3	Loading transfer starts.	H←E	TransferBlocked	TB	NR	A	WFH	SNR	NA
2	4 to 6	Loading transfer completes.	—	—						
3	7 to 16	CarrierID is read.	H←E	WaitingForHost						
4	—	CarrierID is verified by host, and result is Failed.	—	—						
5	17 to 20	Host commands to return.	H→E	CancelCarrier	RTU			IVF		
6	21 to 23	Carrier is made ready to unload.	H←E	ReadyToUnload						

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
4	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
5	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
6	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
7	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
8	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
9	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
10	—		Generates an instance of carrier object of the read carrier ID. • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model) • Carrier State Model state transition No.(3) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
11	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
12	—*1	←	S6F11: NO STATE to WAITING FOR HOST (CEID 30001)		—
13	—		10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	—
14	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
15	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
16	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
17	Determines the interruption of processing. S3F17: CancelCarrier (📖 Page 387 S3F17: CancelCarrier)	→	Carrier ID host verification has failed. Carrier State Model state transition No.(9) (📖 Page 63 Carrier State Model)		—
18	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
19	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION FAIL (CEID 30007)		—
20	—		10087-00904: CancelCarrier service notification (📖 Page 278 00904: CancelCarrier service notification)	→	—
21	—		Load Port Transfer State Model state transition No.(9) (📖 Page 69 Load Port Transfer State Model)	←	Notifies that a carrier is undocked and it can be unloaded. 00087-00303: UNLOAD available notification (📖 Page 199 00303: UNLOAD available notification)

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No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
22	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
23	—		10087-00303: UNLOAD available response ( Page 243 00303: UNLOAD available response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Abnormal CarrierID verification 2

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- 'Bind' service accepted
- Carrier returned by using the 'CancelCarrier' service
- No load ports reserved

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 586 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name						
					LTS	LR S	LCA S	CIDS (A) CSMS (A) CAS (A)	CID S (B)	CSM S (B)	CAS (B)
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State	No State
1	1 to 6	Load port is associated with specified CarrierID, and reserved for loading.	H→E	Bind		R	A	CIDA: INR CSMS: SNR CAS: NA			
2	7 to 9	Loading transfer starts.	H←E	TransferBlocked	TB	NR	A	CIDA: INR CSMS: SNR CAS: NA	No State	No State	No State
3	10 to 12	Loading transfer completes.	—	—							
4	13 to 23	CarrierID is read.	—	—							
5		CarrierID is verified by production equipment, and result is Failed. The carrier object created by the Bind service is destroyed. A carrier object with the id determined by read is created.	H←E	WaitingForHost							
6	24 to 27	Host commands to return.	H→E	CancelCarrier							
7	28 to 30	Carrier is made ready to unload.	H←E	ReadyToUnload	RTU						

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation (Carrier A, LoadPort1) S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object of carrier A, reserves the load port 1, and associates the load port 1 with carrier A. • Carrier A: Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • LoadPort1: Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • LoadPort1: Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)	—	—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)	—	—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)	—	—
4	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)	—	—
5	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)	—	—
6	—	→	10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	—	—
7	—	←	LoadPort1: Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	Carrier B has arrived at the load port 1, and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
8	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)	—	—
9	—	→	10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	—	—
10	—	←	LoadPort1: Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of carrier B has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
11	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)	—	—
12	—	→	10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	—	—
13	—	←	—	←	Carrier B has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
14	—*1	←	S6F11: Carrier Clamped (CEID 30049)	—	—
15	—	→	10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	—	—
16	—	←	Carrier ID equipment verification has failed. A carrier object (carrier A) associated with the load port 1 is deleted. In addition, a carrier object (carrier B) is created with the read carrier ID, and the carrier B is associated with the load port 1. • Carrier A: Carrier State Model state transition No.(21) (📖 Page 63 Carrier State Model) • Carrier B: Carrier State Model state transition No.(3) (📖 Page 63 Carrier State Model) • LoadPort1: Load Port/Carrier Association State Model state transition No.(4) (📖 Page 77 Load Port/Carrier Association State Model)	←	Reading of a carrier ID in the load port 1 has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
17	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)	—	—
18	—*1	←	S6F11: ASSOCIATED to ASSOCIATED (CEID 30042)	—	—
19	—*1	←	S6F11: NO STATE to WAITING FOR HOST (CEID 30001)	—	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
20	—		10087-00501: CarrierID read successful response ( Page 265 00501: CarrierID read successful response)	→	—
21	—*1		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
22	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
23	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
24	Determines the cancellation of processing. S3F17: CancelCarrier ( Page 387 S3F17: CancelCarrier)	→	Carrier B: Carrier State Model state transition No.(9) ( Page 63 Carrier State Model)		—
25	—	←	S3F18: Carrier Action Acknowledge ( Page 418 S3F18: Carrier Action Acknowledge)		—
26	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION FAIL (CEID 30007)		—
27	—		10087-00904: CancelCarrier service notification ( Page 278 00904: CancelCarrier service notification)	→	—
28	—		LoadPort1: Load Port Transfer State Model state transition No.(9) ( Page 69 Load Port Transfer State Model)	←	Notifies that a carrier can be unloaded. 00087-00303: UNLOAD available notification ( Page 199 00303: UNLOAD available notification)
29	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
30	—		10087-00303: UNLOAD available response ( Page 243 00303: UNLOAD available response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Abnormal CarrierID verification 3

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- 'Bind' service accepted
- Processing of a carrier continued by using the 'ProceedWithCarrier' service
- No load ports reserved

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 589 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name						
					LTS	LRS	LCA S	CIDS (A) CSMS (A) CAS (A)	CIDS (B)	CSMS (B)	CAS (B)
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State	No State
1	1 to 6	Load port is associated with specified CarrierID, and reserved for loading.	H→E	Bind		R	A	CIDS: INRCSMS: SNR CAS: NA			
2	7 to 9	Loading transfer starts.	H←E	TransferBlocked	TB	NR	No State		WFH	SNR	NA
3	10 to 12	Loading transfer completes.	—	—							
4	13 to 23	CarrierID is read.	—	—							
5		CarrierID is verified by production equipment, and result is Failed.	H←E	WaitingForHost							
6	24 to 27	Host commands to proceed.	H→E	ProceedWithCarrier						IVO	
7	—	Go to next step.	—	—							

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation (Carrier A, LoadPort1) S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object of carrier A, reserves the load port 1, and associates the load port 1 with carrier A. • Carrier A: Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • LoadPort1: Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • LoadPort1: Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)	—	—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)	—	—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)	—	—
4	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)	—	—
5	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)	—	—
6	—	→	10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	—	—
7	—	←	LoadPort1: Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	Carrier B has arrived at the load port 1, and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
8	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)	—	—
9	—	→	10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	—	—
10	—	←	LoadPort1: Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of carrier B has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
11	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)	—	—
12	—	→	10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	—	—
13	—	←	—	←	Carrier B has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
14	—*1	←	S6F11: Carrier Clamped (CEID 30049)	—	—
15	—	→	10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	—	—
16	—	←	Carrier ID equipment verification has failed. A carrier object (carrier A) associated with the load port 1 is deleted. In addition, a carrier object (carrier B) is created with the read carrier ID, and the carrier B is associated with the load port 1. • Carrier A: Carrier State Model state transition No.(21) (📖 Page 63 Carrier State Model) • Carrier B: Carrier State Model state transition No.(3) (📖 Page 63 Carrier State Model) • LoadPort1: Load Port/Carrier Association State Model state transition No.(4) (📖 Page 77 Load Port/Carrier Association State Model)	←	Reading of a carrier ID in the load port 1 has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
17	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)	—	—
18	—*1	←	S6F11: ASSOCIATED to ASSOCIATED (CEID 30042)	—	—
19	—*1	←	S6F11: NO STATE to WAITING FOR HOST (CEID 30001)	—	—

A

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
20	—		10087-00501: CarrierID read successful response ( Page 265 00501: CarrierID read successful response)	→	—
21	—		—	←	Notifies that the location of a carrier has changed.* ² 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
22	—* ¹	←	S6F11: Carrier Location Change (CEID 30051)		—
23	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
24	Determines the continuation of processing. S3F17: ProceedWithCarrier ( Page 411 S3F17: ProceedWithCarrier)	→	The continuation of processing of a carrier has been instructed by HOST. Carrier B: Carrier State Model state transition No.(8) ( Page 63 Carrier State Model)		—
25	—	←	S3F18: Carrier Action Acknowledge ( Page 418 S3F18: Carrier Action Acknowledge)		—
26	—* ¹	←	S6F11: WAITING FOR HOST to ID VERIFICATION OK (CEID 30006)		—
27	—		10087-00918: ProceedWithCarrier service notification ( Page 292 00918: ProceedWithCarrier service notification)	→	—
—	—		(Proceeding to slot map verification)		(Proceeding to slot map verification)

*¹ The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*² Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Abnormal slot map verification 1

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted
- Carrier returned by using the 'CancelCarrier' service
- Load port reserved from equipment ( Page 541 Load port reservation from equipment)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 592 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	R	NA	No State	No State	No State
1	1 to 3	Loading transfer starts.	H←E	TransferBlocked	TB	NR	A	WFH IVO	SNR	NA
2	4 to 6	Loading transfer completes.	—	—						
3	7 to 16	CarrierID is read.	H←E	WaitingForHost						
4	—	CarrierID is verified by host, and result is OK.	—	—						
5	17 to 20	Host commands to proceed.	H→E	ProceedWithCarrier						
6	21 to 26	Carrier is docked.	—	—						
7	—	Slot map is read.	H←E	WaitingForHost						
8	—	Slot map is verified by host, and result is Failed.	—	—						
9	27 to 30	Host commands to return.	H→E	CancelCarrier						
10	31 to 36	Carrier is made ready to unload.	H←E	ReadyToUnload	RTU					

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
4	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
5	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
6	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
7	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
8	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
9	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
10	—		Generates an instance of carrier object of the read carrier ID, and associates it with a load port. • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model) • Carrier State Model state transition No.(3) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
11	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
12	—*1	←	S6F11: NO STATE to WAITING FOR HOST (CEID 30001)		—
13	—		10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	—
14	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
15	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
16	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
17	Determines the continuation of processing. S3F17: ProceedWithCarrier (📖 Page 411 S3F17: ProceedWithCarrier)	→	Carrier ID host verification has succeeded. Carrier State Model state transition No.(8) (📖 Page 63 Carrier State Model)		—
18	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
19	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION OK (CEID 30006)		—
20	—		10087-00918: ProceedWithCarrier service notification (📖 Page 292 00918: ProceedWithCarrier service notification)	→	—
21	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification (📖 Page 205 00309: Carrier opened notification)
22	—*1	←	S6F11: Carrier Opened (CEID 30052)		—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
23	—		10087-00309: Carrier opened response (📄 Page 249 00309: Carrier opened response)	→	—
24	—		Carrier State Model state transition No.(14) (📄 Page 63 Carrier State Model)	←	Reading of a slot map has succeeded. 00087-00602: SlotMap waiting for host verification notification (📄 Page 225 00602: SlotMap waiting for host verification notification)
25	—*1	←	S6F11: SLOT MAP NOT READ to WAITING FOR HOST (CEID 30011)		—
26	—		10087-00602: SlotMap waiting for host verification response (📄 Page 271 00602: SlotMap waiting for host verification response)	→	—
27	Fails in the slot map verification, and determines the cancellation of processing. S3F17: CancelCarrier (📄 Page 387 S3F17: CancelCarrier)	→	Carrier State Model state transition No.(16) (📄 Page 63 Carrier State Model)		—
28	—	←	S3F18: Carrier Action Acknowledge (📄 Page 418 S3F18: Carrier Action Acknowledge)		—
29	—*1	←	S6F11: WAITING FOR HOST to SLOT MAP VERIFICATION FAIL (CEID 30013)		—
30	—		10087-00904: CancelCarrier service notification (📄 Page 278 00904: CancelCarrier service notification)	→	—
31	—		—	←	The door is closed, and a carrier has been undocked. 00087-00310: Carrier closed notification (📄 Page 206 00310: Carrier closed notification)
32	—*1	←	S6F11: Carrier Closed (CEID 30050)		—
33	—		10087-00310: Carrier closed response (📄 Page 250 00310: Carrier closed response)	→	—
34	—		Load Port Transfer State Model state transition No.(9) (📄 Page 69 Load Port Transfer State Model)	←	Notifies that a carrier can be unloaded. 00087-00303: UNLOAD available notification (📄 Page 199 00303: UNLOAD available notification)
35	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
36	—		10087-00303: UNLOAD available response (📄 Page 243 00303: UNLOAD available response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Abnormal slot map verification 2

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- 'Bind' service accepted
- Carrier returned by using the 'CancelCarrier' service
- No load ports reserved

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 595 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State
1	1 to 9	Load port is associated with specified CarrierID, and reserved for loading.	H→E	Bind		R	A	INR	SNR	NA
2	10 to 12	Loading transfer starts.	H←E	TransferBlocked	TB	NR		IVO		
3	13 to 15	Loading transfer completes.	—	—						
4	16 to 24	CarrierID is read.	—	—						
5		CarrierID is verified by equipment, and result is OK.	H←E	IDVerificationOK						
6	25 to 32	Carrier-in starts.	H←E	BufferCapacityChange						
7	33 to 42	Carrier-in completes.	—	—	RTL		NA			
8	—	Process starts.	—	—						
9	43 to 48	Slot map is read at FIMS port.	—	—						
10		Slot map is verified by production equipment, and result is Failed.	H←E	WaitingForHost						
11	49 to 52	Host commands to return.	H→E	CancelCarrier						
12	53 to 55	Carrier returns to internal buffer.	—	—						

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object, reserves a load port, and associates the load port with the carrier ID. • Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)		—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)		—
4	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
5	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
6	—		10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	→	—
7	—		—	←	Notifies that the remaining amount (unassigned space) of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification (📖 Page 214 00404: Buffer Capacity changed notification)
8	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
9	—		10087-00404: Buffer Capacity changed response (📖 Page 258 00404: Buffer Capacity changed response)	→	—
10	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
11	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
12	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
13	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
14	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
15	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
16	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
17	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
18	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
19	—		Carrier ID equipment verification has succeeded. Carrier State Model state transition No.(6) (📖 Page 63 Carrier State Model)	←	Reading of a carrier ID has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)
20	—*1	←	S6F11: ID NOT READ to ID VERIFICATION OK (CEID 30004)		—
21	—		10087-00501: CarrierID read successful response (📖 Page 265 00501: CarrierID read successful response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
22	—		—	←	Notifies that the location of a carrier has changed. ^{*2} 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
23	— ^{*1}	←	S6F11: Carrier Location Change (CEID 30051)		—
24	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
25	—		—	←	A carrier has been unclamped. 00087-00308: Carrier unclamped notification ( Page 204 00308: Carrier unclamped notification)
26	— ^{*1}	←	S6F11: Carrier Unclamped (CEID 30053)		—
27	—		10087-00308: Carrier unclamped response ( Page 248 00308: Carrier unclamped response)	→	—
28	—		—	←	Moving of a carrier to an FIMS port has started. 00087-00411: Carrier move started to Internal Buffer notification ( Page 215 00411: Carrier move started to Internal Buffer notification)
29	—		10087-00411: Carrier move started to Internal Buffer response ( Page 259 00411: Carrier move started to Internal Buffer response)	→	—
30	—		—	←	Notifies that the remaining amount (free space) of internal buffer capacity has decreased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
31	— ^{*1}	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
32	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
33	—		<ul style="list-style-type: none"> Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model) 	←	Moving of a carrier to an FIMS port has completed. 00087-00412: Carrier move completed to Internal Buffer notification ( Page 216 00412: Carrier move completed to Internal Buffer notification)
34	— ^{*1}	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
35	— ^{*1}	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
36	—		10087-00412: Carrier move completed to Internal Buffer response ( Page 260 00412: Carrier move completed to Internal Buffer response)	→	—
37	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
38	— ^{*1}	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
39	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
40	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
41	— ^{*1}	←	S6F11: Carrier Location Change (CEID 30051)		—
42	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
43	—		—	←	Docks a carrier and opens the door. 00087-00309: Carrier opened notification ( Page 205 00309: Carrier opened notification)

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
44	—*1	←	S6F11: Carrier Opened (CEID 30052)		—
45	—		10087-00309: Carrier opened response (Page 249 00309: Carrier opened response)	→	—
46	—		Carrier State Model state transition No.(14) (Page 63 Carrier State Model)	←	The equipment verification has failed after reading of a slot map in an FIMS port. 00087-00603: SlotMap verification fail notification (Page 226 00603: SlotMap verification fail notification)
47	—*1	←	S6F11: SLOT MAP NOT READ to WAITING FOR HOST (CEID 30011)		—
48	—		10087-00603: SlotMap verification fail response (Page 272 00603: SlotMap verification fail response)	→	—
49	Determines the cancellation of processing. S3F17: CancelCarrier (Page 387 S3F17: CancelCarrier)	→	Carrier State Model state transition No.(16) (Page 63 Carrier State Model)		—
50	—	←	S3F18: Carrier Action Acknowledge (Page 418 S3F18: Carrier Action Acknowledge)		—
51	—*1	←	S6F11: WAITING FOR HOST to SLOT MAP VERIFICATION FAIL (CEID 30013)		—
52	—		10087-00904: CancelCarrier service notification (Page 278 00904: CancelCarrier service notification)	→	—
53	—		—	←	The door is closed, and a carrier has been undocked. 00087-00310: Carrier closed notification (Page 206 00310: Carrier closed notification)
54	—*1	←	S6F11: Carrier Closed (CEID 30050)		—
55	—		10087-00310: Carrier closed response (Page 250 00310: Carrier closed response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Carrier-out queuing

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- One load port available
- Initial condition: Two or more carriers are in the manufacturing equipment.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 599 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name				
					LTS	LRS	LCAS	CIDS (1) CSMS (1) CAS (1)	CIDS (2) CSMS (2) CAS (2)
0	—	Initial condition.	—	—	RTL	NR	NA	CIDS: IVO CSMS: SVO CAS: CC	CIDS: IVO CSMS: SVO CAS: CC
1	1 to 3	Host commands to carrier-out.	H→E	CarrierOut	TB	R	A		
2	4 to 8	Carrier-out #1 starts.	H←E	TransferBlocked					
3	9 to 11	Host commands to carrier-out #2 (Queued).	H→E	CarrierOut					
4	12 to 23	Carrier-out #1 completes.	H←E	ReadyToUnload	RTU	NR			
			H←E	BufferCapacityChange					
5	24 to 26	Unloading transfer #1 starts.	H←E	TransferBlocked	TB				
6	27 to 34	Unloading transfer #1 completes.	—	—	TB	R		No State	
7		Carrier-out #2 starts.	—	—					
8	35 to 46	Carrier-out #2 completes.	H←E	ReadyToUnload	RTU	NR			
			H←E	BufferCapacityChange					
9	47 to 49	Unloading transfer #2 starts.	H←E	TransferBlocked	TB				
10	50 to 57	Unloading transfer #2 completes.	H←E	ReadyToLoad	RTL		NA		No State

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs the carrier-out 1. (Carrier 1) S3F17: CarrierOut (☞ Page 403 S3F17: CarrierOut)	→	—		—
2	—	←	S3F18: Carrier Action Acknowledge (☞ Page 418 S3F18: Carrier Action Acknowledge)		—
3	—		10087-00911: CarrierOut service notification (☞ Page 285 00911: CarrierOut service notification)	→	—
4	—		<ul style="list-style-type: none"> Load Port Transfer State Model state transition No.(6) (☞ Page 69 Load Port Transfer State Model) Load Port Reservation State Model state transition No.(2) (☞ Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) Load Port/Carrier Association State Model state transition No.(2) (☞ Page 77 Load Port/Carrier Association State Model) 	←	Moving of the carrier 1 to a load port has started. (Carrier-out 1 starts.) 00087-00413: Carrier move started to Load Port notification (☞ Page 217 00413: Carrier move started to Load Port notification)
5	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
6	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
7	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
8	—		10087-00413: Carrier move started to Load Port response (☞ Page 261 00413: Carrier move started to Load Port response)	→	—
9	Instructs the carrier-out 2. (Carrier 2) S3F17: CarrierOut (☞ Page 403 S3F17: CarrierOut)	→	—		—
10	—	←	S3F18: Carrier Action Acknowledge (☞ Page 418 S3F18: Carrier Action Acknowledge)		—
11	—		10087-00911: CarrierOut service notification (☞ Page 285 00911: CarrierOut service notification)	→	Carrier-out 2 is queued. (Carrier 2)
12	—		Load Port Reservation State Model state transition No.(3) (☞ Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Moving of the carrier 1 to a load port has completed. (Carrier-out 1 completes.) 00087-00414: Carrier move completed to Load Port notification (☞ Page 218 00414: Carrier move completed to Load Port notification)
13	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
14	—		10087-00414: Carrier move completed to Load Port response (☞ Page 262 00414: Carrier move completed to Load Port response)	→	—
15	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. (Carrier-out 1) 00087-00404: Buffer Capacity changed notification (☞ Page 214 00404: Buffer Capacity changed notification)
16	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
17	—		10087-00404: Buffer Capacity changed response (☞ Page 258 00404: Buffer Capacity changed response)	→	—
18	—		—	←	Notifies that the location of the carrier 1 has changed. 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)

A

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
19	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
20	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
21	—		Load Port Transfer State Model state transition No.(9) ( Page 69 Load Port Transfer State Model)	←	Notifies that the carrier 1 can be unloaded. 00087-00303: UNLOAD available notification ( Page 199 00303: UNLOAD available notification)
22	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
23	—		10087-00303: UNLOAD available response ( Page 243 00303: UNLOAD available response)	→	—
24	—		Load Port Transfer State Model state transition No.(7) ( Page 69 Load Port Transfer State Model)	←	Unloading of the carrier 1 has started. 00087-00304: UNLOAD started notification ( Page 200 00304: UNLOAD started notification)
25	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
26	—		10087-00304: UNLOAD started response ( Page 244 00304: UNLOAD started response)	→	—
27	—		<ul style="list-style-type: none"> Carrier State Model state transition No.(21) ( Page 63 Carrier State Model) Load Port Reservation State Model state transition No.(2) ( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) Load Port/Carrier Association State Model state transition No.(4) ( Page 77 Load Port/Carrier Association State Model) 	←	Unloading of the carrier 1 has completed, and moving of the carrier 2 to a load port has started. (Carrier-out 2 starts.) 00087-00415: UNLOAD completed and Carrier move started to Load Port notification ( Page 219 00415: UNLOAD completed and Carrier move started to Load Port notification)
28	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
29	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
30	—*1	←	S6F11: ASSOCIATED to ASSOCIATED (CEID 30042)		—
31	—		10087-00415: UNLOAD completed and Carrier move started to Load Port response ( Page 263 00415: UNLOAD completed and Carrier move started to Load Port response)	→	—
32	—		—	←	Notifies that the location of the carrier 1 has changed. (Unloading completes.) 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
33	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
34	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
35	—		Load Port Reservation State Model state transition No.(3) ( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Moving of the carrier 2 to a load port has completed. (Carrier-out 2 completes.) 00087-00414: Carrier move completed to Load Port notification ( Page 218 00414: Carrier move completed to Load Port notification)
36	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
37	—		10087-00414: Carrier move completed to Load Port response ( Page 262 00414: Carrier move completed to Load Port response)	→	—
38	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. (Carrier-out 2) 00087-00404: Buffer Capacity changed notification ( Page 214 00404: Buffer Capacity changed notification)
39	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
40	—		10087-00404: Buffer Capacity changed response ( Page 258 00404: Buffer Capacity changed response)	→	—
41	—		—	←	Notifies that the location of the carrier 2 has changed. 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
42	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
43	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—
44	—		Load Port Transfer State Model state transition No.(9) ( Page 69 Load Port Transfer State Model)	←	Notifies that the carrier 2 can be unloaded. 00087-00303: UNLOAD available notification ( Page 199 00303: UNLOAD available notification)
45	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
46	—		10087-00303: UNLOAD available response ( Page 243 00303: UNLOAD available response)	→	—
47	—		Load Port Transfer State Model state transition No.(7) ( Page 69 Load Port Transfer State Model)	←	Unloading of the carrier 2 has started. 00087-00304: UNLOAD started notification ( Page 200 00304: UNLOAD started notification)
48	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
49	—		10087-00304: UNLOAD started response ( Page 244 00304: UNLOAD started response)	→	—
50	—		<ul style="list-style-type: none"> Carrier State Model state transition No.(21) ( Page 63 Carrier State Model) Load Port Transfer State Model state transition No.(8) ( Page 69 Load Port Transfer State Model) Load Port/Carrier Association State Model state transition No.(3) ( Page 77 Load Port/Carrier Association State Model) 	←	Unloading of the carrier 2 has completed. 00087-00305: UNLOAD completed notification ( Page 201 00305: UNLOAD completed notification)
51	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
52	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
53	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
54	—		10087-00305: UNLOAD completed response ( Page 245 00305: UNLOAD completed response)	→	—
55	—		—	←	Notifies that the location of the carrier 2 has changed. (Unloading completes.) 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
56	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
57	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Carrier-out dequeuing (cancellation)

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- Initial condition:
 - Two or more carriers are in the manufacturing equipment.
 - There is a carrier moving to a load from the inside of equipment. (Moving of a carrier has been notified by '00087-00413: Carrier move started to Load Port notification.' ( Page 217 00413: Carrier move started to Load Port notification))
 - One or more carrier-out services are being queued.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 603 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSMS	CAS
0	—	Initial condition.	—	—	TB	R	A	IVO	SVO	CC
1	1 to 2	Host commands to cancel all carrier-out services from queue.	H→E	CancelAllCarrierOut						
2	3	All carrier-out services are canceled from queue.	—	—						
3	4 to 15	Current carrier-out service completes.	H←E H←E	ReadyToUnload BufferCapacityChange	RTU	NR				
4	16 to 18	Unloading transfer starts.	H←E	TransferBlocked	TB					
5	19 to 26	Unloading transfer completes.	H←E	ReadyToLoad	RTL		NA	No State	No State	No State

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs the cancellation of all queued carrier-out services. S3F19: CancelAllCarrierOut (📖 Page 422 S3F19: CancelAllCarrierOut)	→	—		—
2	—	←	S3F20: Cancel All Carrier Out Acknowledge (📖 Page 423 S3F20: Cancel All Carrier Out Acknowledge)		—
3	—		10087-00902: CancelAllCarrierOut service notification (📖 Page 276 00902: CancelAllCarrierOut service notification)	→	Cancels all the queued carrier-out services.
4	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Moving of a carrier to a load port, which was being processed, has completed. 00087-00414: Carrier move completed to Load Port notification (📖 Page 218 00414: Carrier move completed to Load Port notification)
5	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
6	—		10087-00414: Carrier move completed to Load Port response (📖 Page 262 00414: Carrier move completed to Load Port response)	→	—
7	—		—	←	Notifies that the remaining amount of internal buffer capacity has increased. 00087-00404: Buffer Capacity changed notification (📖 Page 214 00404: Buffer Capacity changed notification)
8	—*1	←	S6F11: Buffer Capacity Changed (CEID 30047)		—
9	—		10087-00404: Buffer Capacity changed response (📖 Page 258 00404: Buffer Capacity changed response)	→	—
10	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
11	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
12	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
13	—		Load Port Transfer State Model state transition No.(9) (📖 Page 69 Load Port Transfer State Model)	←	Notifies that a carrier can be unloaded. 00087-00303: UNLOAD available notification (📖 Page 199 00303: UNLOAD available notification)
14	—*1	←	S6F11: TRANSFER BLOCKED to READY TO UNLOAD (CEID 30036)		—
15	—		10087-00303: UNLOAD available response (📖 Page 243 00303: UNLOAD available response)	→	—
16	—		Load Port Transfer State Model state transition No.(7) (📖 Page 69 Load Port Transfer State Model)	←	Unloading of a carrier has started. 00087-00304: UNLOAD started notification (📖 Page 200 00304: UNLOAD started notification)
17	—*1	←	S6F11: READY TO UNLOAD to TRANSFER BLOCKED (CEID 30034)		—
18	—		10087-00304: UNLOAD started response (📖 Page 244 00304: UNLOAD started response)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
19	—		<ul style="list-style-type: none"> Carrier State Model state transition No.(21) (☞ Page 63 Carrier State Model) Load Port Transfer State Model state transition No.(8) (☞ Page 69 Load Port Transfer State Model) Load Port/Carrier Association State Model state transition No.(3) (☞ Page 77 Load Port/Carrier Association State Model) 	←	Unloading of a carrier has completed. 00087-00305: UNLOAD completed notification (☞ Page 201 00305: UNLOAD completed notification)
20	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)		—
21	—*1	←	S6F11: TRANSFER BLOCKED to READY TO LOAD (CEID 30035)		—
22	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
23	—		10087-00305: UNLOAD completed response (☞ Page 245 00305: UNLOAD completed response)	→	—
24	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)
25	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
26	—		10087-00403: Carrier Location change response (☞ Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Carrier association cancellation

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- 'Bind' service accepted
- No load ports reserved

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 606 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCAS	CIDS	CSMS	CAS
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State
1	1 to 6	Load port is associated with specified CarrierID, and reserved for loading.	H→E	Bind		R	A	INR	SNR	NA
			H←E	Associated						
2	—	Host decides to cancel current carrier delivery.	—	—		NR	NA	No State	No State	No State
3	7 to 12	Host commands to cancel association.	H→E	CancelBind						
			H←E	NotAssociated						

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object, reserves a load port, and associates the load port with the carrier ID. • Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)	—	—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)	—	—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)	—	—
4	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)	—	—
5	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)	—	—
6	—	→	10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	—	—
7	Determines the cancellation of carrier delivery being processed, and instructs the cancellation of association. S3F17: CancelBind (📖 Page 384 S3F17: CancelBind)	→	Deletes an instance of carrier object, cancels the association of carrier ID and load port, and cancels the reservation of load port. • Carrier State Model state transition No.(21) (📖 Page 63 Carrier State Model) • Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • Load Port/Carrier Association State Model state transition No.(3) (📖 Page 77 Load Port/Carrier Association State Model)	—	—
8	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)	—	—
9	—*1	←	S6F11: CARRIER to NO STATE (CEID 30017)	—	—
10	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)	—	—
11	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)	—	—
12	—	→	10087-00903: CancelBind service notification (📖 Page 277 00903: CancelBind service notification)	—	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Access mode change (MANUAL to AUTO) 1

The following shows the state transition satisfying the following conditions:

- Load port initialized ( Page 539 Load port initialization)
- Access mode = MANUAL ( Page 609 Access mode change (AUTO to MANUAL) 1)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 607 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name	
					AMS	LRS
0	—	Initial condition.	—	—	M	NR
1	1	Host commands to change access mode to AUTO.	H→E	ChangeAccess	A	
2	2 to 4	Access mode is changed to AUTO.	H←E	AUTO		

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs to change the access mode to AUTO. S3F27: Change Access ( Page 430 S3F27: Change Access) ■Parameter examples • AccessMode: 1 • PortList/PortID (PTN): 1	→	Access Mode State Model state transition No.(2) ( Page 80 Access Mode State Model)		—
2		←	S3F28: Change Access Acknowledge ( Page 431 S3F28: Change Access Acknowledge)		
3	—*1	←	S6F11: MANUAL to AUTO (CEID 30045)		—
4	—		10087-00916: ChangeAccess service notification ( Page 289 00916 : ChangeAccess service notification)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Access mode change (MANUAL to AUTO) 2

The following shows the state transition satisfying the following conditions:

- Load port initialized ( Page 539 Load port initialization)
- Access mode = MANUAL ( Page 609 Access mode change (AUTO to MANUAL) 1)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 608 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name
					AMS
0	—	Initial condition.	—	—	M
1	1 to 3	Access mode is changed to AUTO.	H←E	Auto	A

^{*1} The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Access Mode State Model state transition No.(2) ( Page 80 Access Mode State Model)	←	Changes the access mode to 'AUTO.' 00087-00101: AccessMode AUTO request ( Page 189 00101: AccessMode AUTO request)
2	— ^{*1}	←	S6F11: MANUAL to AUTO (CEID 30045)		—
3	—		10087-00101: AccessMode AUTO acknowledge ( Page 233 00101: AccessMode AUTO acknowledge)	→	—

^{*1} The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Access mode change (AUTO to MANUAL) 1

The following shows the state transition satisfying the following conditions:

- Load port initialized ( Page 539 Load port initialization)
- Access mode = AUTO ( Page 607 Access mode change (MANUAL to AUTO) 1)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 609 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name	
					AMS	LRS
0	—	Initial condition.	—	—	A	NR
1	1	Host commands to change access mode to MANUAL.	H→E	ChangeAccess	M	
2	2 to 4	Access mode is changed to MANUAL.	H←E	Manual		

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs to change the access mode to MANUAL. S3F27: Change Access ( Page 430 S3F27: Change Access) ■Parameter examples • AccessMode: 0 • PortList/PortID (PTN): 1	→	Access Mode State Model state transition No.(3) ( Page 80 Access Mode State Model)		—
2	—	←	S3F28: Change Access Acknowledge ( Page 431 S3F28: Change Access Acknowledge)		—
3	—*1	←	S6F11: AUTO to MANUAL (CEID 30046)		—
4	—		10087-00916: ChangeAccess service notification ( Page 289 00916 : ChangeAccess service notification)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Access mode change (AUTO to MANUAL) 2

The following shows the state transition satisfying the following conditions:

- Load port initialized ( Page 539 Load port initialization)
- Access mode = AUTO ( Page 607 Access mode change (MANUAL to AUTO) 1)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 610 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name
					AMS
0	—	Initial condition.	—	—	A
1	1 to 3	Access mode is changed to MANUAL.	H←E	Manual	M

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Access Mode State Model state transition No.(3) ( Page 80 Access Mode State Model)	←	Changes the access mode to 'MANUAL.' 00087-00102: AccessMode MANUAL request ( Page 190 00102: AccessMode MANUAL request)
2	—*1	←	S6F11: AUTO to MANUAL (CEID 30046)		—
3	—		10087-00102: AccessMode MANUAL acknowledge ( Page 234 00102: AccessMode MANUAL acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Load port service status change

The following shows the state transition satisfying the following condition:

- Initial condition: Load port service status is IN SERVICE.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

☞ Page 611 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

☞ Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name
					LTS
0	—	Initial condition.	—	—	IS
1	1 to 4	Host commands to change service status to OUT OF SERVICE.	H→E	ChangeServiceStatus	OS
2	5 to 6	Service status is changed to OUT OF SERVICE.	H←E	OutofService	

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs to change the load port service status to 'OUT OF SERVICE.' S3F25: ChangeServiceStatus (☞ Page 425 S3F25: ChangeServiceStatus)	→	—		—
2	—	←	S3F26: Port Action Acknowledge (CAACK=4) (☞ Page 428 S3F26: Port Action Acknowledge)		—
3	—		10087-00917: ChangeServiceStatus service notification (☞ Page 291 00917: ChangeServiceStatus service notification)	→	—
4	—		Load Port Transfer State Model state transition No.(3) (☞ Page 69 Load Port Transfer State Model)	←	Changes the load port service status to 'OUT OF SERVICE.' 00087-00202: OUT OF SERVICE request (☞ Page 194 00202: OUT OF SERVICE request)
5	—*1	←	S6F11: IN SERVICE to OUT OF SERVICE (CEID 30028)		—
6	—		10087-00202: OUT OF SERVICE acknowledge (☞ Page 238 00202: OUT OF SERVICE acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

A

Correct carrier delivery to wrong port scenario 1

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Verification with equipment
- Case in which a carrier associated with the load port 1 for reservation by using the 'Bind' service has been loaded to the load port 3
- The load port 3 is not reserved, and not associated with any carriers.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 613 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name						
					LTS (LP1)	LRS (LP1) LCAS (LP1)	LTS (LP3)	LRS (LP3)	LCA S (LP3)	CID S	CSMS CAS
0	—	Initial condition.	—	—	RTL	LRS: NR LCAS: NA	RTL	NR	NA	No State	No State
1	1 to 6	Load port 1 is associated with specified CarrierID, and reserved for loading.	H→E H←E	Bind (LP1) LP1 Associated		LRS: R LCAS: A				INR	CSMS: SNRCAS: NA
2	7 to 9	Transfer starts at load port 3.	H←E	LP3 TRANSFER BLOCKED			TB				
3	10 to 11	Transfer Completes at load port 3.	H←E	Transfer Complete							
4	12 to 23	CarrierID read at load port 3. Equipment based verification indicates the carrier is at the correct equipment.	H←E H←E H←E	LP1 Not Associated LP3 Associated IVO		LRS: NR LCAS: NA			A	IVO	

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Advance carrier object reservation (Carrier A, LoadPort1) S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object of carrier A, reserves the load port 1, and associates the load port 1 with carrier A. • Carrier A: Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • LoadPort1: Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • LoadPort1: Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)	—	—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)	—	—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)	—	—
4	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)	—	—
5	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)	—	—
6	—	→	10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	—	—
7	—	←	LoadPort3: Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	Carrier A has arrived at the load port 3, and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
8	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)	—	—
9	—	→	10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	—	—
10	—	←	—	←	Loading of carrier A has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
11	—	→	10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	—	—
12	—	←	—	←	Carrier A has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
13	—*1	←	S6F11: Carrier Clamped (CEID 30049)	—	—
14	—	→	10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	—	—
15	—	←	Carrier ID equipment verification has succeeded; therefore, the following procedure is performed. ❶ Canceling the association for reservation of the load port 1 by using the 'Bind' service ❷ Associating ID of carrier A, which is successfully read, with the load port 3 ❸ Transitioning CIDS (CARRIER ID STATUS) of carrier A to 'ID VERIFICATION OK' • LoadPort1: Load Port Reservation State Model state transition No.(3) • LoadPort1: Load Port/Carrier Association State Model state transition No.(3) • LoadPort3: Load Port/Carrier Association State Model state transition No.(2) • Carrier A: Carrier State Model state transition No.(6) For details on this carrier ID equipment verification, refer to the following: 📖 Page 89 Case in which a carrier registered by using the 'Bind' service is delivered to an available load port	←	Reading of a carrier ID in the load port 3 has succeeded. 00087-00501: CarrierID read successful notification (📖 Page 220 00501: CarrierID read successful notification)

A

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
16	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
17	—*1	←	S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)		—
18	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
19	—*1	←	S6F11: ID NOT READ to ID VERIFICATION OK (CEID 30004)		—
20	—		10087-00501: CarrierID read successful response ( Page 265 00501: CarrierID read successful response)	→	—
21	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification ( Page 213 00403: Carrier Location change notification)
22	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
23	—		10087-00403: Carrier Location change response ( Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

Correct carrier delivery to wrong port scenario 2

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Verification with equipment
- ❶ The load port 1 is reserved, and the load port 1 and carrier A are associated by using the 'Bind' service.
- ❷ The load port 2 is reserved, and the load port 2 and carrier B are associated by using the 'Bind' service.
- The carrier A has been loaded to the load port 2 in the states of ❶ and ❷.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 616 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name							
					LTS (LP1)	LRS (LP1) LCAS (LP1)	LTS (LP2)	LRS (LP2)	LCA S (LP2)	CID S (A)	CSMS (A) CAS (A)	CIDS (B) CSMS (B) CAS (B)
0	—	Initial condition.	—	—	RTL	LRS: NR LCAS: NA	RTL	NR	NA	No State	No State	No State
1	1 to 6	Load port 1 is associated with specified CarrierID A, and reserved for loading.	H→E H←E	Bind (CarrierA, LP1) LP1 Associated		LRS: R LCAS: A				INR	CSMS: SNR CAS: NA	
2	7 to 12	Load port 2 is associated with specified CarrierID B, and reserved for loading.	H→E H←E	Bind (CarrierB, LP2) LP2 Associated				R	A			CIDS: INR CSMS: SNR CAS: NA
3	13 to 15	Carrier A Transfer starts at load port 2.	H←E	LP2 TRANSFER BLOCKED			TB					
4	16 to 18	Transfer Completes at load port2.	H←E	Transfer Complete				NR				
5	19 to 31	CarrierID read at load port 2, Equipment based verification indicates that a correct carrier was delivered to the wrong load port.	H←E H←E	LP1 Not Associated Carrier B object destroyed	RTL	LRS: NR LCAS: NA	TB	NR	A	WFH	CSMS: SNRCAS: NA	No State
6	32 to 35	Host oks processing.	H→E	ProceedWithCarrier						IVO		

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Carrier object reserved in advance by using the 'Bind' service (Carrier A, LoadPort1) S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object of carrier A, reserves the load port 1, and associates the load port 1 with carrier A. • Carrier A: Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • LoadPort1: Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • LoadPort1: Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)		—
2	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
3	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)		—
4	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
5	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
6	—		10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	→	—
7	Carrier object reserved in advance by using the 'Bind' service (Carrier B, LoadPort2) S3F17: Bind (📖 Page 380 S3F17: Bind)	→	Generates an instance of carrier object of carrier B, reserves the load port 2, and associates the load port 2 with carrier B. • Carrier B: Carrier State Model state transition No.(2) (📖 Page 63 Carrier State Model) • LoadPort2: Load Port Reservation State Model state transition No.(2) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment)) • LoadPort2: Load Port/Carrier Association State Model state transition No.(2) (📖 Page 77 Load Port/Carrier Association State Model)		—
8	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
9	—*1	←	S6F11: NO STATE to ID NOT READ (CEID 30000)		—
10	—*1	←	S6F11: NOT RESERVED to RESERVED (CEID 30038)		—
11	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
12	—		10087-00901: Bind service notification (📖 Page 275 00901: Bind service notification)	→	—
13	—		LoadPort2: Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	Carrier A has arrived at the load port 2, and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
14	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—

No.	HOST	↔ SECS/GEM communication software ↔	Control CPU (controlled by user program)
15	—	10087-00301: LOAD started response ( Page 241 00301: LOAD started response)	→ —
16	—	LoadPort2: Load Port Reservation State Model state transition No.(3) ( Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	← Loading of carrier A in the load port 2 has completed. 00087-00302: LOAD completed notification ( Page 198 00302: LOAD completed notification)
17	—*1	← S6F11: RESERVED to NOT RESERVED (CEID 30039)	—
18	—	10087-00302: LOAD completed response ( Page 242 00302: LOAD completed response)	→ —
19	—	—	← Carrier A has been clamped. 00087-00307: Carrier clamped notification ( Page 203 00307: Carrier clamped notification)
20	—*1	← S6F11: Carrier Clamped (CEID 30049)	—
21	—	10087-00307: Carrier clamped response ( Page 247 00307: Carrier clamped response)	→ —
22	—	Carrier ID equipment verification has succeeded; therefore, the following procedure is performed. ❶ Canceling the association for reservation of the load port 1 by using the 'Bind' service ❷ Deleting an instance of carrier B ❸ Associating an instance of carrier A with the load port 2 ❹ Transitioning CIDS (CARRIER ID STATUS) of carrier A from 'ID NOT READ' to 'WAITING FOR HOST' • LoadPort1: Load Port Reservation State Model state transition No.(3) • LoadPort1: Load Port/Carrier Association State Model state transition No.(3) • Carrier B: Carrier State Model state transition No.(21) • LoadPort2: Load Port/Carrier Association State Model state transition No.(4) • Carrier A: Carrier State Model state transition No.(7) For details on this carrier ID equipment verification, refer to the following:  Page 90 Case in which a carrier registered by using the 'Bind' service is delivered to another load port for which the 'Bind' service is used	← Reading of a carrier ID in the load port 2 has succeeded. 00087-00501: CarrierID read successful notification ( Page 220 00501: CarrierID read successful notification)
23	—*1	← S6F11: RESERVED to NOT RESERVED (CEID 30039)	—
24	—*1	← S6F11: ASSOCIATED to NOT ASSOCIATED (CEID 30041)	—
25	—*1	← S6F11: CARRIER to NO STATE (CEID 30017)	—
26	—*1	← S6F11: ASSOCIATED to ASSOCIATED (CEID 30042)	—
27	—*1	← S6F11: ID NOT READ to WAITING FOR HOST (CEID 30005)	—
28	—	10087-00501: CarrierID read successful response ( Page 265 00501: CarrierID read successful response)	→ —

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
29	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (Page 213 00403: Carrier Location change notification)
30	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
31	—		10087-00403: Carrier Location change response (Page 257 00403: Carrier Location change response)	→	—
32	Determines the continuation of processing. S3F17: ProceedWithCarrier (Page 411 S3F17: ProceedWithCarrier)	→	Carrier A: Carrier State Model state transition No.(8) (Page 63 Carrier State Model)		—
33	—	←	S3F18: Carrier Action Acknowledge (Page 418 S3F18: Carrier Action Acknowledge)		—
34	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION OK (CEID 30006)		—
35	—		10087-00918: ProceedWithCarrier service notification (Page 292 00918: ProceedWithCarrier service notification)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 Carrier ID is known at the timing of carrier ID reading; therefore, the carrier location is changed after the carrier ID reading in this case.

CarrierID read fail scenario 1

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Verification with equipment
- By using the 'Bind' service, a carrier object of carrier A is created, the load port 1 is reserved, and the carrier A and load port 1 are associated.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 620 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	R	A	INR	SNR	NA
1	1 to 6	Carrier Arrives.	H←E	Transfer Blocked	TB	NR				
2	7 to 15	ID read attempt fails.	H←E	State change to Waiting For Host				WFH		
3	—	Decision to continue is made.	—	—						
4	16 to 22	Host sends ProceedWithCarrier service.	H→E H←E	ProceedWithCarrier State change to ID Verification OK				IVO		

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
4	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
5	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
6	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
7	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
8	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
9	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
10	—		Carrier State Model state transition No.(7) (📖 Page 97 Case in which carrier ID reading fails for a carrier delivered to a load port reserved by using the 'Bind' service)	←	Carrier ID reading has failed. 00087-00502: CarrierID read fail notification (📖 Page 220 00501: CarrierID read successful notification)
11	—*1	←	S6F11: ID NOT READ to WAITING FOR HOST (CEID 30005)		—
12	—		10087-00502: CarrierID read fail response (📖 Page 267 00502: CarrierID read fail response)	→	—
13	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
14	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
15	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
16	Determines the continuation of processing. S3F17: ProceedWithCarrier (📖 Page 411 S3F17: ProceedWithCarrier)	→	Carrier State Model state transition No.(8) For details, refer to 'Example (1)' of 'State transition examples' in 'S3F17: ProceedWithCarrier.' (📖 Page 411 S3F17: ProceedWithCarrier)		—
17	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
18	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION OK (CEID 30006)		—
19	—		10087-00918: ProceedWithCarrier service notification (📖 Page 292 00918: ProceedWithCarrier service notification)	→	—
20	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
21	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
22	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this

manual.

*2 "UNKNOWN" is specified for the carrier ID value and the carrier location is changed due to the failure of carrier ID reading.

CarrierID read fail scenario 2

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Verification with equipment
- By using the 'Bind' service, a carrier object of carrier A is created, the load port 1 is reserved, and the carrier A and load port 1 are associated.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 623 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corr espo ndin g No. ^{*1}	Comment	Communi cation direction H: HOST E: Equipme nt	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	R	A	INR	SNR	NA
1	1 to 6	Carrier Arrives.	H←E	Transfer Blocked	TB	NR				
2	7 to 15	ID read attempt fails.	H←E	State change to Waiting For Host				WFH		
3	—	Decision to stop is made.	—	—						
4	16 to 22	Host sends CancelCarrier service.	H→E	CancelCarrier				IVF		
			H←E	State change to ID Verification Failed						

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
4	—		Load Port Reservation State Model state transition No.(3) (📖 Page 74 Load Port Reservation State Model (internal buffer equipment/fixed buffer equipment))	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
5	—*1	←	S6F11: RESERVED to NOT RESERVED (CEID 30039)		—
6	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
7	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
8	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
9	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
10	—		Carrier State Model state transition No.(7) (📖 Page 97 Case in which carrier ID reading fails for a carrier delivered to a load port reserved by using the 'Bind' service)	←	Carrier ID reading has failed. 00087-00502: CarrierID read fail notification (📖 Page 221 00502: CarrierID read fail notification)
11	—*1	←	S6F11: ID NOT READ to WAITING FOR HOST (CEID 30005)		—
12	—		10087-00502: CarrierID read fail response (📖 Page 267 00502: CarrierID read fail response)	→	—
13	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
14	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
15	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
16	Determines the interruption of processing. S3F17: CancelCarrier (📖 Page 387 S3F17: CancelCarrier)	→	Carrier State Model state transition No.(9) For details, refer to 'Example (1)' of 'State transition examples' in 'S3F17: CancelCarrier.' (📖 Page 387 S3F17: CancelCarrier)		—
17	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
18	—*1	←	S6F11: WAITING FOR HOST to ID VERIFICATION FAIL (CEID 30007)		—
19	—		10087-00904: CancelCarrier service notification (📖 Page 278 00904: CancelCarrier service notification)	→	—
20	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
21	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
22	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this

manual.

*2 "UNKNOWN" is specified for the carrier ID value and the carrier location is changed due to the failure of carrier ID reading.

CarrierID read fail scenario 3

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 626 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corr espo ndin g No.*1	Comment	Communi cation direction H: HOST E: Equipme nt	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State
1	1 to 5	Carrier Arrives.	H←E	Transfer Blocked	TB					
2	6 to 14	ID read attempt fails.	H←E	ID read fail event						
3	—	Decision to continue is made.	—	—						
4	15 to 22	Host sends ProceedWithCarrier service.	H→E	ProceedWithCarrier			A	IVO	SNR	NA
			H←E	State change to Id Verification OK						
			H←E	State change to Load Port Associated						

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (☞ Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (☞ Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (☞ Page 241 00301: LOAD started response)	→	—
4	—		—	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (☞ Page 198 00302: LOAD completed notification)
5	—		10087-00302: LOAD completed response (☞ Page 242 00302: LOAD completed response)	→	—
6	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (☞ Page 203 00307: Carrier clamped notification)
7	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
8	—		10087-00307: Carrier clamped response (☞ Page 247 00307: Carrier clamped response)	→	—
9	—		For details, refer to the following: ☞ Page 98 Case in which carrier ID reading fails for a carrier delivered to an available load port	←	Carrier ID reading has failed. 00087-00502: CarrierID read fail notification (☞ Page 221 00502: CarrierID read fail notification)
10	—*1	←	S6F11: CarrierID Read Fail (CEID 30054)		—
11	—		10087-00502: CarrierID read fail response (☞ Page 267 00502: CarrierID read fail response)	→	—
12	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)
13	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
14	—		10087-00403: Carrier Location change response (☞ Page 257 00403: Carrier Location change response)	→	—
15	Determines the continuation of processing. S3F17: ProceedWithCarrier (☞ Page 411 S3F17: ProceedWithCarrier)	→	Generates an instance of carrier object of the carrier ID specified by the 'ProceedWithCarrier' service, and associates it with a load port. • Carrier State Model state transition No.(4) • Load Port/Carrier Association State Model state transition No.(2) For details, refer to 'Example (1)' of 'State transition examples' in 'S3F17: ProceedWithCarrier.' (☞ Page 411 S3F17: ProceedWithCarrier)		—
16	—	←	S3F18: Carrier Action Acknowledge (☞ Page 418 S3F18: Carrier Action Acknowledge)		—
17	—*1	←	S6F11: NO STATE to ID VERIFICATION OK (CEID 30002)		—
18	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
19	—		10087-00918: ProceedWithCarrier service notification (☞ Page 292 00918: ProceedWithCarrier service notification)	→	—
20	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)
21	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
22	—		10087-00403: Carrier Location change response (☞ Page 257 00403: Carrier Location change response)	→	—

- *1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.
- *2 "UNKNOWN" is specified for the carrier ID value and the carrier location is changed due to the failure of carrier ID reading.

CarrierID read fail scenario 4

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 629 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCAS	CIDS	CSMS	CAS
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State
1	1 to 5	Carrier Arrives.	H←E	Transfer Blocked	TB					
2	6 to 14	ID read attempt fails.	H←E	ID read fail event						
3	—	Decision to stop is made.	—	—						
4	15 to 22	Host sends CancelCarrier.	H→E	CancelCarrier			A	IVF	SNR	NA
			H←E	State change to Id Verification Failed						
			H←E	State change to Load Port Associated						

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (📖 Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (📖 Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (📖 Page 241 00301: LOAD started response)	→	—
4	—		—	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (📖 Page 198 00302: LOAD completed notification)
5	—		10087-00302: LOAD completed response (📖 Page 242 00302: LOAD completed response)	→	—
6	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (📖 Page 203 00307: Carrier clamped notification)
7	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
8	—		10087-00307: Carrier clamped response (📖 Page 247 00307: Carrier clamped response)	→	—
9	—		For details, refer to the following: 📖 Page 98 Case in which carrier ID reading fails for a carrier delivered to an available load port	←	Carrier ID reading has failed. 00087-00502: CarrierID read fail notification (📖 Page 221 00502: CarrierID read fail notification)
10	—*1	←	S6F11: CarrierID Read Fail (CEID 30054)		—
11	—		10087-00502: CarrierID read fail response (📖 Page 267 00502: CarrierID read fail response)	→	—
12	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
13	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
14	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—
15	Determines the interruption of processing. S3F17: CancelCarrier (📖 Page 387 S3F17: CancelCarrier)	→	Generates an instance of carrier object of the carrier ID specified by the 'CancelCarrier' service, and associates it with a load port. • Carrier State Model state transition No.(5) • Load Port/Carrier Association State Model state transition No.(2) For details, refer to 'Example (2)' of 'State transition examples' in 'S3F17: CancelCarrier.' (📖 Page 387 S3F17: CancelCarrier)		—
16	—	←	S3F18: Carrier Action Acknowledge (📖 Page 418 S3F18: Carrier Action Acknowledge)		—
17	—*1	←	S6F11: NO STATE to ID VERIFICATION FAIL (CEID 30003)		—
18	—*1	←	S6F11: NOT ASSOCIATED to ASSOCIATED (CEID 30040)		—
19	—		10087-00904: CancelCarrier service notification (📖 Page 278 00904: CancelCarrier service notification)	→	—
20	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (📖 Page 213 00403: Carrier Location change notification)
21	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
22	—		10087-00403: Carrier Location change response (📖 Page 257 00403: Carrier Location change response)	→	—

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- *1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.
- *2 "UNKNOWN" is specified for the carrier ID value and the carrier location is changed due to the failure of carrier ID reading.

CarrierID read fail scenario 5

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Host verification
- 'Bind' and 'CarrierNotification' services not accepted

Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

Page 632 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					LTS	LRS	LCA S	CIDS	CSM S	CAS
0	—	Initial condition.	—	—	RTL	NR	NA	No State	No State	No State
1	1 to 5	Carrier Arrives.	H←E	Transfer Blocked	TB					
2	6 to 14	ID read attempt fails.	H←E	ID read fail event						
3	—	Decision to stop is made.	—	—						
4	15 to 20	Host sends CancelCarrierAtPort.	H→E	CancelCarrierAtPort						

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 508 CMS Reports, Page 509 CMS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Load Port Transfer State Model state transition No.(6) (☞ Page 69 Load Port Transfer State Model)	←	A carrier has arrived and the loading has started. 00087-00301: LOAD started notification (☞ Page 197 00301: LOAD started notification)
2	—*1	←	S6F11: READY TO LOAD to TRANSFER BLOCKED (CEID 30033)		—
3	—		10087-00301: LOAD started response (☞ Page 241 00301: LOAD started response)	→	—
4	—		—	←	Loading of a carrier has completed. 00087-00302: LOAD completed notification (☞ Page 198 00302: LOAD completed notification)
5	—		10087-00302: LOAD completed response (☞ Page 242 00302: LOAD completed response)	→	—
6	—		—	←	A carrier has been clamped. 00087-00307: Carrier clamped notification (☞ Page 203 00307: Carrier clamped notification)
7	—*1	←	S6F11: Carrier Clamped (CEID 30049)		—
8	—		10087-00307: Carrier clamped response (☞ Page 247 00307: Carrier clamped response)	→	—
9	—		For details, refer to the following: ☞ Page 98 Case in which carrier ID reading fails for a carrier delivered to an available load port	←	Carrier ID reading has failed. 00087-00502: CarrierID read fail notification (☞ Page 221 00502: CarrierID read fail notification)
10	—*1	←	S6F11: CarrierID Read Fail (CEID 30054)		—
11	—		10087-00502: CarrierID read fail response (☞ Page 267 00502: CarrierID read fail response)	→	—
12	—		—	←	Notifies that the location of a carrier has changed.*2 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)
13	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
14	—		10087-00403: Carrier Location change response (☞ Page 257 00403: Carrier Location change response)	→	—
15	Determines the interruption of processing. S3F17: CancelCarrierAtPort (☞ Page 393 S3F17: CancelCarrierAtPort)	→	—		—
16	—	←	S3F18: Carrier Action Acknowledge (☞ Page 418 S3F18: Carrier Action Acknowledge)		—
17	—		10087-00905: CancelCarrierAtPort service notification (☞ Page 279 00905: CancelCarrierAtPort service notification)	→	—
18	—		—	←	Notifies that the location of a carrier has changed. 00087-00403: Carrier Location change notification (☞ Page 213 00403: Carrier Location change notification)
19	—*1	←	S6F11: Carrier Location Change (CEID 30051)		—
20	—		10087-00403: Carrier Location change response (☞ Page 257 00403: Carrier Location change response)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 "UNKNOWN" is specified for the carrier ID value and the carrier location is changed due to the failure of carrier ID reading.

E94-CJM compliance

The following table shows the E94-CJM compliant use cases.
These use cases refer to the use cases described in "RELATED INFORMATION 1 APPLICATION NOTES" of SEMI E94-0713.

Titles of references (E94-0713) to which each use case refers are as follows:

Title	Corresponding SEMI standard	Reference
Normal Roundtrip 1 (Automatic Start)	Table R1-1	☞ Page 634 Normal roundtrip 1 (automatic start)
Normal Roundtrip 2 (User Start)	—	☞ Page 640 Normal roundtrip 2 (user start)
Carrier Swap During Processing	Table R1-2	☞ Page 647 Carrier swap during processing
Slot Map Change During Processing of Single Carrier	Table R1-3	☞ Page 656 Slot map change during processing of single carrier
Split During Processing With Late Announcement of Output FOUP	Table R1-4	☞ Page 662 Split during processing with late announcement of output FOUP

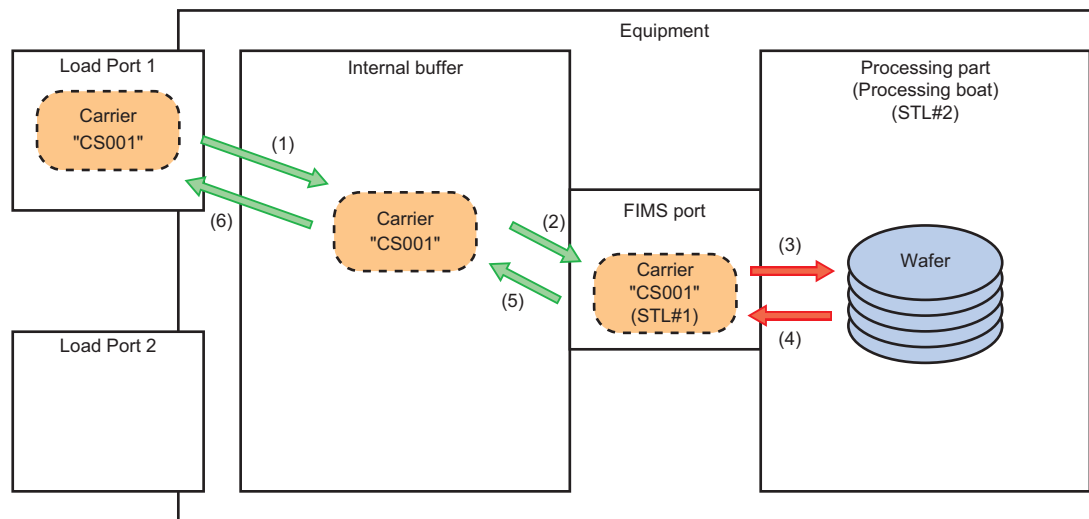
Normal roundtrip 1 (automatic start)

The following shows the state transition satisfying the following conditions:

- The batch processing tool processes the contents of a single carrier as a batch. (In this example, the usage example of a control job in a simple situation is shown.)
- The order of wafers is retained.
- Wafers return to the original carrier (source carrier). (Slot integrity mode)
- Internal buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- Load port initialized ( Page 539 Load port initialization)
- A carrier object of the carrier "CS001" is created, the load port 1 is reserved, and the carrier "CS001" is associated with the load port 1 by using the 'Bind' service. ( Page 556 Communication scenario with HOST) (#0 to 1)
- Control job queue management function = Enabled
- Number of concurrent control jobs = 1
- Maximum number of control job queues = 30
- Number of created process job objects = 0
- Number of created control job objects = 0
- Control job object attribute "StartMethod" is true (= auto).

The following configuration examples of semiconductor manufacturing equipment are referred to in this use case.

 : Carrier movement,  : Wafer movement



■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 636 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name				
					CJS	PJS	Queue Available Space	Queued CJobs[0..29]	
0	—	Initial condition.	—	—	No State	No State	30	[All null values]	
1	1	Create the process job.	H→E	PRJobCreateEnh (PRJobID=prj01_04, Mtrl=CS001, ReclID=ILD3)		POOLED			
2	2 to 3	—	H←E	PRJobCreateAck (PRJobID, PRJobStatus)					
3	4	Request a control job. Material out specification maintains wafer order from source carrier to destination carrier.	H→E	ControlJobCreate (CtrlJobID=cjf01_01, ProcessingCtrlSpec=(prj01_04, null, null), MtrlOutSpec= null, CarrierInputSpec=CS001, StartMethod=AUTO)	QUEUED		29	["cjf01_01", followed by null values]	
4	5 to 6	Request accepted.	H←E	ControlJobCreateAck (CtrlJobID=cjf01_01, JobStatus)					
5	7 to 11	No CJ in selected state so the newly created job immediately transitions.	H←E	Event (CJSELECTED, CtrlJobID=cjf01_01)					
6	12	A carrier for the selected control job arrives.	H←E	Event (CARRIERIDREAD, CID=CS001)	SELECTED		30	[All null values]	
7	13 to 17	The equipment recognizes it and starts execution of the ControlJob.	H←E	Event (ControlJobStart, cjf01_01)					
8	18 to 20	ControlJob starts the ProcessJob; begins loading wafers to the processing boat.	H←E	Event (PRJOBSETUP, prj01_01)	EXECUTING	SETTING UP			
9	21 to 22	Material processing starts after all material is in the processing boat.	H←E	Event (PRJOBPROCESSING, prj01_04)		PROCESSING			
10	23 to 24	Equipment begins to return material to the source carrier (= destination carrier).	H←E	Event (PROCESSINGCOMPLETE, PRJob=prj01_04)		PROCESS COMPLETE			
11	25	Carrier is filled with wafers.	H←E	Event (CarrierComplete=CS001)					
12	26	Host wants to get it.	H→E	Rcommand (CarrierOut=CS001)					
13	27	Equipment indicates carrier can now be picked up.	H←E	Event (ReadytoUnload, CarrierID=CS001, PortID)					
14	28	—	H←E	Event (PRJOBCOMPLETE, PRJob=prj01_01)					No State
15	29 to 35	Jobs may complete before the carrier is picked up.	H←E	Event (ControlJobCompleted=cjf01_01, status=OK)					COMPLETE

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 514 CJM Report, Page 515 CJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Creates a process job. S16F11: PRJobCreateEnh (📖 Page 477 S16F11: PRJobCreateEnh) ■Parameter examples • PRJOBID: "prj01_04" • MF: 13 • PRMtrlNameList: ("CS001", null) • PRRecipeMethod: 1 • RCPSPEC: "ILD3" • RecVariableList: null • PRProcessStart: True • PauseEvent: null	→	Creates a new process job object. ('DVVAL' is not updated.)		—
2	—	←	S16F12: PRJob CreateEnh Acknowledge (📖 Page 480 S16F12: PRJobCreateEnh Acknowledge)		—
3	—		10040-00901: PRJobCreateEnh service notification (📖 Page 324 00901: PRJobCreateEnh service notification) • A new process job object created	→	—
4	Requests a control job. S14F9: Create Object Request (📖 Page 451 S14F9: Create Object Request) ■Parameter examples • ObjType: "ControlJob" • ObjID: "cjf01_01" • ProcessingCtrlSpec: ("prj01_04", null, null) • CarrierInputSpec: "CS001" • MtrlOutSpec: null • ProcessOrderMgmt: 1 • StartMethod: true	→	Creates a new control job object. ('DVVAL' is not updated.)		—
5	—	←	S14F10: Create Object Acknowledge (📖 Page 464 S14F10: Create Object Acknowledge)		—
6	—		10094-01001: Create service (ControlJob) notification (📖 Page 311 01001: Create service (ControlJob) notification) • A new control job object created	→	—
7	—		Control Job State Model state transition No.(3) (📖 Page 112 When using the control job queue management function) ('DVVAL' is updated.)	←	The newly created control job state is transitioned to 'SELECTED' immediately. 00094-00101: ControlJob Selected request (📖 Page 301 00101: ControlJob Selected request)
8	—		10094-00101: ControlJob Selected acknowledge (📖 Page 308 00101: ControlJob Selected acknowledge) • CtrlJobID="cjf01_01"	→	—
9	—		—	←	CEID 30102 event report sending request relay: ON
10	—*1	←	S6F11: QUEUED to SELECTED (CEID 30102)		—
11	—		CEID 30102 event report sending request relay: OFF	→	—
12	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		A carrier arrives, and it is transferred to the internal buffer after the loading and the equipment verification of CarrierID. ■Parameter examples • CarrierID: "CS001" Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.10 to 27 in the following: 📖 Page 557 Usage examples of control CPU interfaces

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
13	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	Starts the control job execution. 00094-00003: ControlJobObject SetAttr request ( Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 3 = EXECUTING • Other attribute values are the same as those acquired in No.6.
14	—		10094-00003: ControlJobObject SetAttr acknowledge ( Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
15	—		—	←	CEID 30104 event report sending request relay: ON
16	—*1	←	S6F11: SELECTED to EXECUTING (CEID 30104)		—
17	—		CEID 30104 event report sending request relay: OFF	→	—
18	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Starts the process job. Descriptions of usage examples related to the process job are omitted in this table. For usage examples, refer to No.11 to 16 in the following:  Page 673 Usage examples of control CPU interfaces
19	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		A carrier is moved to an FIMS port, and the equipment verification of a slot map succeeds. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.28 to 51 in the following:  Page 557 Usage examples of control CPU interfaces
20	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Starts the loading of wafers to the processing boat. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.1 to 29 in the following:  Page 697 Usage examples of control CPU interfaces
21	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Loading of all wafers to the processing boat has completed. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.30 to 34 in the following:  Page 697 Usage examples of control CPU interfaces
22	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Processing (batch processing) has started. Descriptions of usage examples related to the process job and substrate tracking are omitted in this table. For usage examples, refer to No.17 to 21 in the following:  Page 673 Usage examples of control CPU interfaces For usage examples, refer to No.35 to 39 in the following:  Page 697 Usage examples of control CPU interfaces

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
23	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Processing (batch processing) has completed. Descriptions of usage examples related to the process job and substrate tracking are omitted in this table.</p> <p>For usage examples, refer to No.23 to 28 in the following:</p> <p>📖 Page 673 Usage examples of control CPU interfaces</p> <p>For usage examples, refer to No.40 to 44 in the following:</p> <p>📖 Page 697 Usage examples of control CPU interfaces</p>
24	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Wafers with the processing (batch processing) completed have been collected from the processing boat into a carrier.</p> <p>Descriptions of usage examples related to the substrate tracking are omitted in this table.</p> <p>For usage examples, refer to No.45 to 56 in the following:</p> <p>📖 Page 697 Usage examples of control CPU interfaces</p>
25	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Collection of all wafers has completed. Descriptions of usage examples related to the process job, substrate tracking, and carriers are omitted in this table.</p> <p>For usage examples, refer to No.52 to 60 in the following:</p> <p>📖 Page 557 Usage examples of control CPU interfaces</p> <p>For usage examples, refer to No.29 to 32 in the following:</p> <p>📖 Page 673 Usage examples of control CPU interfaces</p> <p>For usage examples, refer to No.57 to 61 in the following:</p> <p>📖 Page 697 Usage examples of control CPU interfaces</p>
26	<p>Host commands to carrier-out. Descriptions of usage examples related to carriers are omitted in this table.</p> <p>For usage examples, refer to No.61 to 63 in the following:</p> <p>📖 Page 557 Usage examples of control CPU interfaces</p>		Refer to descriptions for this No. in the 'HOST' column.		Refer to descriptions for this No. in the 'HOST' column.
27	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Carrier-out completes and the carrier is made ready to unload.</p> <p>Descriptions of usage examples related to carriers are omitted in this table.</p> <p>For usage examples, refer to No.64 to 83 in the following:</p> <p>📖 Page 557 Usage examples of control CPU interfaces</p>
28	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Deletes a process job.</p> <p>■Parameter example</p> <ul style="list-style-type: none"> ObjID: "prj01_01" <p>Descriptions of usage examples related to the process job are omitted in this table.</p> <p>For usage examples, refer to No.33 to 34 in the following:</p> <p>📖 Page 673 Usage examples of control CPU interfaces</p>

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
29	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	A control job has completed. 00094-00003: ControlJobObject SetAttr request ( Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 5 = COMPLETED • Other attribute values are the same as those acquired in No.6.
30	—		10094-00003: ControlJobObject SetAttr acknowledge ( Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
31	—		—	←	CEID 30109 event report sending request relay: ON
32	—*1	←	S6F11: EXECUTING to COMPLETED (CEID 30109)		—
33	—		CEID 30109 event report sending request relay: OFF	→	—
34	—		Deletes a control job, and updates 'DVVAL.'	←	Deletes a control job. 00094-00002: ControlJobObject Delete request ( Page 297 00002: ControlJobObject delete request) ■Parameter example • ObjID: "cjf01_01"
35	—		10094-00002: ControlJobObject Delete acknowledge ( Page 305 00002: ControlJobObject delete acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Normal roundtrip 2 (user start)

The following shows the state transition satisfying the following conditions:

- The batch processing tool processes the contents of a single carrier as a batch. (In this example, the usage example of a control job in a simple situation is shown.)
- The order of wafers is retained.
- Wafers return to the original carrier (source carrier). (Slot integrity mode)
- Internal buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- Load port initialized ( Page 539 Load port initialization)
- A carrier object of the carrier "CS001" is created, the load port 1 is reserved, and the carrier "CS001" is associated with the load port 1 by using the 'Bind' service. ( Page 556 Communication scenario with HOST) (#0 to 1)
- Control job queue management function = Enabled
- Number of concurrent control jobs = 1
- Maximum number of control job queues = 30
- Number of created process job objects = 0
- Number of created control job objects = 0
- Control job object attribute "StartMethod" is false (= UserStart).
- Transaction of 'S16F27: Control Job Command Request (CJStart)' is user-defined.
- Control job command (CJStart) accepted

For the configuration example, refer to the following:

 Page 634 Normal roundtrip 1 (automatic start)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 642 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name			
					CJS	PJS	Queue Available Space	Queued CJobs[0..29]
0	—	Initial condition.	—	—	No State	No State	30	[All null values]
1	1	Create the process job.	H→E	PRJobCreateEnh (PRJobID=prj01_04, Mtrl=CS001, RecID=ILD3)		POOLED		
2	2 to 3	—	H←E	PRJobCreateAck (PRJobID, PRJobStatus)				
3	4	Request a control job. Material out specification maintains wafer order from source carrier to destination carrier.	H→E	ControlJobCreate (CtrlJobID=cjf01_01, ProcessingCtrlSpec=(prj01_04, null, null), MtrlOutSpec= null, CarrierInputSpec=CS001, StartMethod=AUTO)				
4	5 to 6	Request accepted.	H←E	ControlJobCreateAck (CtrlJobID=cjf01_01, JobStatus)	QUEUED		29	["cjf01_01", followed by null values]
5	7 to 11	No CJ in selected state so the newly created job immediately transitions.	H←E	Event (CJSELECTED, CtrlJobID=cjf01_01)	SELECTED		30	[All null values]
6	12	A carrier for the selected control job arrives.	H←E	Event (CARRIERIDREAD, CID=CS001)				
7	13 to 17	The equipment recognizes it and waits for start instruction from the host.	H←E	Event (WAITING FOR START, cjf01_01)	WAITING FOR START			
8	18 to 29	Control job start instruction	H→E H←E	CJStart (cjf01_01) Event (ControlJobStart, cjf01_01)	EXECUTING			
9	30 to 32	ControlJob starts the ProcessJob; begins loading wafers to the processing boat.	H←E	Event (PRJOBSETUP, prj01_01)		SETTING UP		
10	33 to 34	Material processing starts after all material is in the processing boat.	H←E	Event (PRJOBPROCESSING, prj01_04)		PROCESSING		
11	35 to 36	Equipment begins to return material to the source carrier (= destination carrier).	H←E	Event (PROCESSINGCOMPLETE, PRJob=prj01_04)		PROCESS COMPLETE		
12	37	Carrier is filled with wafers.	H←E	Event (CarrierComplete=CS001)				
13	38	Host wants to get it.	H→E	Rcommand (CarrierOut=CS001)				
14	39	Equipment indicates carrier can now be picked up.	H←E	Event (ReadytoUnload, CarrierID=CS001, PortID)				
15	40	—	H←E	Event (PRJOBCOMPLETE, PRJob=prj01_01)		No State		
16	41 to 47	Jobs may complete before the carrier is picked up.	H←E	Event (ControlJobCompleted=cjf01_01, status=OK)	COMPLETE			

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 514 CJM Report, Page 515 CJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Creates a process job. S16F11: PRJobCreateEnh (📖 Page 477 S16F11: PRJobCreateEnh) ■Parameter examples • PRJOBID: "prj01_04" • MF: 13 • PRMtrlNameList: ("CS001", null) • PRRecipeMethod: 1 • RCPSPEC: "ILD3" • RecVariableList: null • PRProcessStart: True • PauseEvent: null	→	Creates a new process job object. ('DVVAL' is not updated.)		—
2	—	←	S16F12: PRJob CreateEnh Acknowledge (📖 Page 480 S16F12: PRJobCreateEnh Acknowledge)		—
3	—		10040-00901: PRJobCreateEnh service notification (📖 Page 324 00901: PRJobCreateEnh service notification) • A new process job object created	→	—
4	Requests a control job. S14F9: Create Object Request (📖 Page 451 S14F9: Create Object Request) ■Parameter examples • ObjType: "ControlJob" • ObjID: "cjf01_01" • ProcessingCtrlSpec: ("prj01_04", null, null) • CarrierInputSpec: "CS001" • MtrlOutSpec: null • ProcessOrderMgmt: 1 • StartMethod: false	→	Creates a new control job object. ('DVVAL' is not updated.)		—
5	—	←	S14F10: Create Object Acknowledge (📖 Page 464 S14F10: Create Object Acknowledge)		—
6	—		10094-01001: Create service (ControlJob) notification (📖 Page 311 01001: Create service (ControlJob) notification) • A new control job object created	→	—
7	—		Control Job State Model state transition No.(3) (📖 Page 112 When using the control job queue management function) ('DVVAL' is updated.)	←	The newly created control job state is transitioned to 'SELECTED' immediately. 00094-00101: ControlJob Selected request (📖 Page 301 00101: ControlJob Selected request)
8	—		10094-00101: ControlJob Selected acknowledge (📖 Page 308 00101: ControlJob Selected acknowledge) • CtrlJobID="cjf01_01"	→	—
9	—		—	←	CEID 30102 event report sending request relay: ON
10	—*1	←	S6F11: QUEUED to SELECTED (CEID 30102)		—
11	—		CEID 30102 event report sending request relay: OFF	→	—
12	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		A carrier arrives, and it is transferred to the internal buffer after the loading and the equipment verification of CarrierID. ■Parameter example • CarrierID: "CS001" Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.10 to 27 in the following: 📖 Page 557 Usage examples of control CPU interfaces

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
13	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	Waits for a control job start instruction from the host. 00094-00003: ControlJobObject SetAttr request ( Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 2 = WAITING FOR HOST • Other attribute values are the same as those acquired in No.6.
14	—		10094-00003: ControlJobObject SetAttr acknowledge ( Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
15	—		—	←	CEID 30105 event report sending request relay: ON
16	—*1	←	S6F11: SELECTED to WAITING FOR HOST (CEID 30105)		—
17	—		CEID 30105 event report sending request relay: OFF	→	—
18	Instructs to start the control job. S16F27: Control Job Command Request (CJStart) ( Page 499 S16F27: CJStart) ■Parameter examples • CtrlJobID: "cjf01_01" • CtrlJobCmd: 1	→	Stores the received item data in the item data storage device of S16F27 with transaction defined.		—
19	—		S16F27 reception notification relay: ON	→	Checks contents of Control Job Command Request (CJStart).
20	—		—	←	S16F27 reception notification relay: OFF
21	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	Starts the control job execution. 00094-00003: ControlJobObject SetAttr request ( Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 3 = EXECUTING • Other attribute values are the same as those acquired in No.6.
22	—		10094-00003: ControlJobObject SetAttr acknowledge ( Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
23	—		—		Stores the item data to be sent in the item data storage device of S16F28 with transaction defined.
24	—		—	←	S16F28 reception notification relay: ON
25	—	←	S16F28: Control Job Command Acknowledge ( Page 505 S16F28: Control Job Command Acknowledge)		—
26	—		S16F28 reception notification relay: OFF	→	—
27	—		—	←	CEID 30106 event report sending request relay: ON
28	—*1	←	S6F11: WAITING FOR START to EXECUTING (CEID 30106)		—
29	—		CEID 30106 event report sending request relay: OFF	→	—
30	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Starts the process job. Descriptions of usage examples related to the process job are omitted in this table. For usage examples, refer to No.11 to 16 in the following:  Page 673 Usage examples of control CPU interfaces

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
31	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		A carrier is moved to an FIMS port, and the equipment verification of a slot map succeeds. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.28 to 51 in the following: ☞ Page 557 Usage examples of control CPU interfaces
32	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Starts the loading of wafers to the processing boat. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.1 to 29 in the following: ☞ Page 697 Usage examples of control CPU interfaces
33	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Loading of all wafers to the processing boat has completed. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.30 to 34 in the following: ☞ Page 697 Usage examples of control CPU interfaces
34	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Processing (batch processing) has started. Descriptions of usage examples related to the process job and substrate tracking are omitted in this table. For usage examples, refer to No.17 to 22 in the following: ☞ Page 673 Usage examples of control CPU interfaces For usage examples, refer to No.35 to 39 in the following: ☞ Page 697 Usage examples of control CPU interfaces
35	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Processing (batch processing) has completed. Descriptions of usage examples related to the process job and substrate tracking are omitted in this table. For usage examples, refer to No.23 to 28 in the following: ☞ Page 673 Usage examples of control CPU interfaces For usage examples, refer to No.40 to 44 in the following: ☞ Page 697 Usage examples of control CPU interfaces
36	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Wafers with the processing (batch processing) completed have been collected from the processing boat into a carrier. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.45 to 56 in the following: ☞ Page 697 Usage examples of control CPU interfaces

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
37	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Collection of all wafers has completed. Descriptions of usage examples related to the process job, substrate tracking, and carriers are omitted in this table. For usage examples, refer to No.52 to 60 in the following: ☞ Page 557 Usage examples of control CPU interfaces For usage examples, refer to No.29 to 32 in the following: ☞ Page 673 Usage examples of control CPU interfaces For usage examples, refer to No.57 to 61 in the following: ☞ Page 697 Usage examples of control CPU interfaces
38	Host commands to carrier-out. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.61 to 63 in the following: ☞ Page 557 Usage examples of control CPU interfaces		Refer to descriptions for this No. in the 'HOST' column.		Refer to descriptions for this No. in the 'HOST' column.
39	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Carrier-out completes and the carrier is made ready to unload. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.64 to 83 in the following: ☞ Page 557 Usage examples of control CPU interfaces
40	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Deletes a process job. ■Parameter example • ObjID: "prj01_01" Descriptions of usage examples related to the process job are omitted in this table. For usage examples, refer to No.33 to 34 in the following: ☞ Page 673 Usage examples of control CPU interfaces
41	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	A control job has completed. 00094-00003: ControlJobObject SetAttr request (☞ Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 5 = COMPLETED • Other attribute values are the same as those acquired in No.6.
42	—		10094-00003: ControlJobObject SetAttr acknowledge (☞ Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
43	—		—	←	CEID 30109 event report sending request relay: ON
44	—*1	←	S6F11: EXECUTING to COMPLETED (CEID 30109)		—
45	—		CEID 30109 event report sending request relay: OFF	→	—
46	—		Deletes a control job, and updates 'DVVAL.'	←	Deletes a control job. 00094-00002: ControlJobObject Delete request (☞ Page 297 00002: ControlJobObject delete request) ■Parameter example • ObjID: "cjf01_01"
47	—		10094-00002: ControlJobObject Delete acknowledge (☞ Page 305 00002: ControlJobObject delete acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Carrier swap during processing

The following shows the state transition satisfying the following conditions:

- The batch processing tool processes the contents of four carriers ($100 = 4 \times 25$) as a batch.
- The order of wafers is retained.
- Wafers are collected by destination carriers ("CSB01" to "CSB04"), which are different from original carriers ("CSA01" to "CSA04").
- A source carrier is unloaded when emptied, and a destination carrier is loaded.
- Internal buffer manufacturing equipment
- FOUP used
- Verification with manufacturing equipment
- Load port reserved from equipment ( Page 541 Load port reservation from equipment)
- By using the 'CarrierNotification' service, carrier objects of carriers "CSA01," "CSA02," "CSA03," "CSA04," "CSB01," "CSB02," "CSB03," and "CSB04" have been created. ( Page 562 Communication scenario with HOST) (#0 to 1)
- Supports Material Redirection Mode = Yes
- Supports Incomplete MtrlOutSpec: No
- Control job queue management function = Enabled
- Number of concurrent control jobs = 1
- Maximum number of control job queues = 30
- Number of created process job objects = 0
- Number of created control job objects = 0

In addition, the substrate locations (STL) are as follows:

- #1: Carrier slot (carrier substrate location)^{*1}
- #2: Batch processing part (processing boat)

^{*1} Exists per slot in each carrier

The following configuration examples of semiconductor manufacturing equipment are referred to in this use case.

 Page 648 Communication scenario with HOST

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

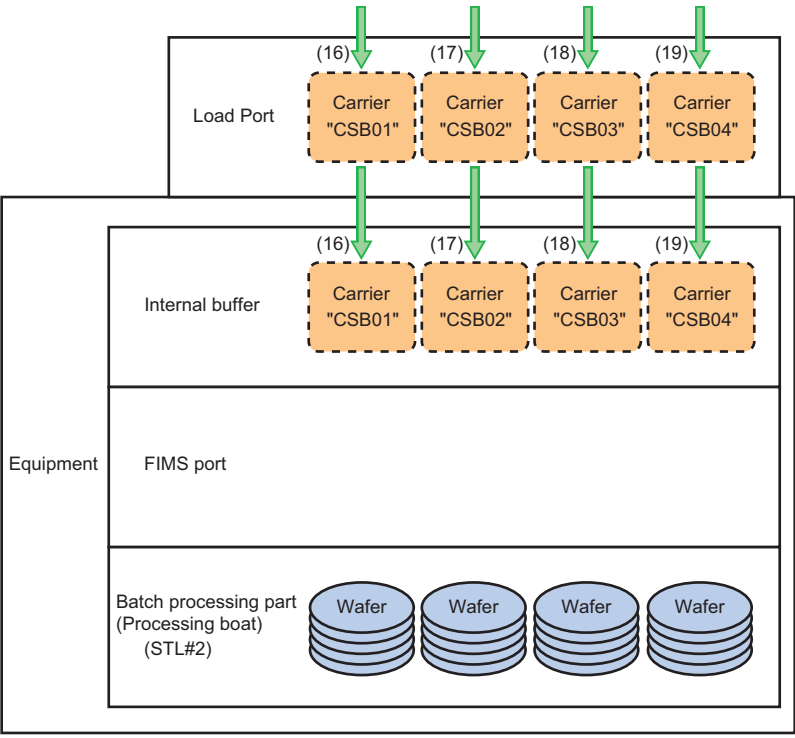
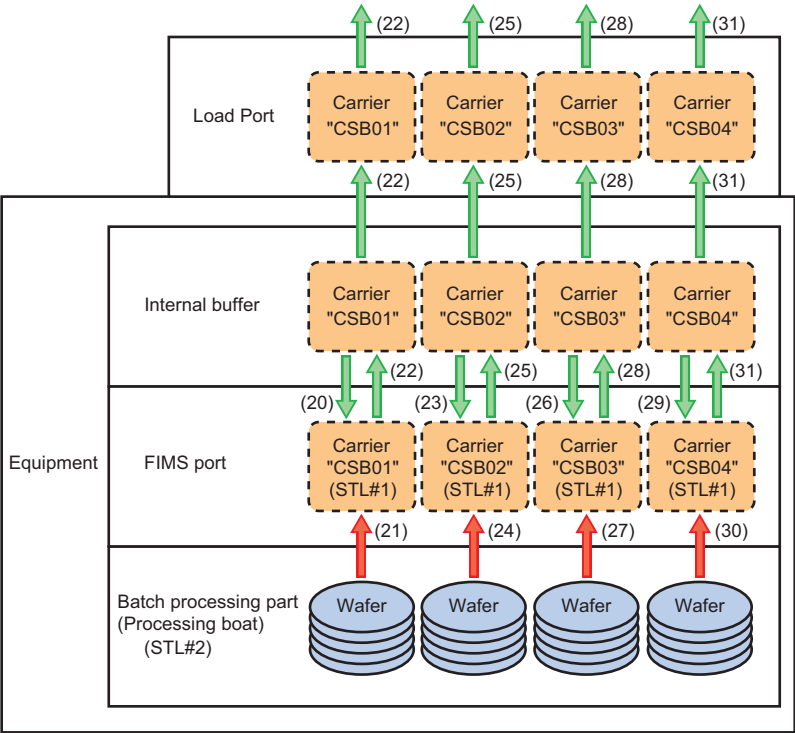
📖 Page 652 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

➡ : Carrier movement, ➡ : Wafer movement

No.	Carrier/wafer movement flow	Internal buffer manufacturing equipment
1	<p>Source carriers arrive sequentially, and import of wafers starts.</p> <p>(1) "CSA01" is loaded and moved to an FIMS port.</p> <p>(2) Loading of wafers from "CSA01" to the processing boat starts.</p> <p>(3) "CSA02" is loaded and transferred to the internal buffer.</p> <p>(4) "CSA03" is loaded and transferred to the internal buffer.</p> <p>(5) "CSA04" is loaded and transferred to the internal buffer.</p>	<p>The diagram illustrates the initial loading phase. At the top, the 'Load Port' contains four carriers: 'Carrier "CSA01"', 'Carrier "CSA02"', 'Carrier "CSA03"', and 'Carrier "CSA04"'. Green arrows (1) through (5) show these carriers moving sequentially into the 'Internal buffer' section. Below the internal buffer, the 'FIMS port' contains 'Carrier "CSA01" (STL#1)'. A green arrow (1) shows it moving from the internal buffer. A red arrow (2) shows a 'Wafer' being loaded from the FIMS port into the 'Batch processing part (Processing boat) (STL#2)', which is represented by a stack of wafers.</p>
2	<p>Wafers are imported and emptied source carriers are removed form equipment, sequentially.</p> <p>(6) Emptied "CSA01" is removed form equipment by using the 'CarrierOut' service.</p> <p>(7) "CSA02" is moved to an FIMS port.</p> <p>(8) Wafers are loaded from "CSA02" into the processing boat.</p> <p>(9) Emptied "CSA02" is removed form equipment by using the 'CarrierOut' service.</p> <p>(10) "CSA03" is moved to an FIMS port.</p> <p>(11) Wafers are loaded from "CSA03" into the processing boat.</p> <p>(12) Emptied "CSA03" is removed form equipment by using the 'CarrierOut' service.</p> <p>(13) "CSA04" is moved to an FIMS port.</p> <p>(14) Wafers are loaded from "CSA04" into the processing boat.</p> <p>(15) Emptied "CSA04" is removed form equipment by using the 'CarrierOut' service.</p>	<p>The diagram illustrates the sequential removal of carriers and loading of new wafers. In the 'Load Port', carriers 'CSA02', 'CSA03', and 'CSA04' move (green arrows 9, 12, 15) into the 'Internal buffer'. Simultaneously, 'Carrier "CSA01" (STL#1)' and 'Carrier "CSA02" (STL#1)' move (green arrows 6, 7) from the internal buffer to the 'FIMS port'. From the FIMS port, 'Carrier "CSA01" (STL#1)' is removed (green arrow 6), and 'Carrier "CSA02" (STL#1)' loads wafers (red arrow 8) into the 'Batch processing part'. This pattern repeats for 'CSA03' (green arrows 10, 11; red arrow 11) and 'CSA04' (green arrows 13, 14; red arrow 14). Finally, 'Carrier "CSA04" (STL#1)' is removed from the FIMS port (green arrow 15). The 'Batch processing part' now contains four stacks of wafers.</p>

No.	Carrier/wafer movement flow	Internal buffer manufacturing equipment
3	<p>Destination carriers arrive sequentially, and they are imported to equipment.</p> <p>(16) Empty "CSB01" is loaded and transferred to the internal buffer.</p> <p>(17) Empty "CSB02" is loaded and transferred to the internal buffer.</p> <p>(18) Empty "CSB03" is loaded and transferred to the internal buffer.</p> <p>(19) Empty "CSB04" is loaded and transferred to the internal buffer.</p>	
4	<p>Processed wafers are stored in destination carriers and removed from equipment, sequentially.</p> <p>(20) "CSB01" is moved to an FIMS port.</p> <p>(21) Wafers are loaded from the processing boat into "CSB01."</p> <p>(22) Emptied "CSB01" is removed form equipment by using the 'CarrierOut' service.</p> <p>(23) "CSB01" is moved to an FIMS port.</p> <p>(24) Wafers are loaded from the processing boat into "CSB01."</p> <p>(25) Emptied "CSB01" is removed form equipment by using the 'CarrierOut' service.</p> <p>(26) "CSB01" is moved to an FIMS port.</p> <p>(27) Wafers are loaded from the processing boat into "CSB01."</p> <p>(28) Emptied "CSB01" is removed form equipment by using the 'CarrierOut' service.</p> <p>(29) "CSB01" is moved to an FIMS port.</p> <p>(30) Wafers are loaded from the processing boat into "CSB01."</p> <p>(31) Emptied "CSB01" is removed form equipment by using the 'CarrierOut' service.</p>	

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipme nt	Message	State model name			
					CJS	PJS	CSA01 to CSA04 (CIDS, CSMS, CAS)	CSB01 to CSB04 (CIDS, CSMSCAS)
0	—	Initial condition.	—	—	No State	No State	CSA01 (INR, SNR, NA) CSA02 (INR, SNR, NA) CSA03 (INR, SNR, NA) CSA04 (INR, SNR, NA)	CSB01 (INR, SNR, NA) CSB02 (INR, SNR, NA) CSB03 (INR, SNR, NA) CSB04 (INR, SNR, NA)
1	1 to 3	Create the process job.	H→E	PRJobCreateEnh (PRJobID=prj01_01, Mtri=(CSA01, CSA02, CSA03, CSA04), ReclD=ILD1)	No State	POOLED (In POOL)	CSA01 (INR, SNR, NA) CSA02 (INR, SNR, NA) CSA03 (INR, SNR, NA) CSA04 (INR, SNR, NA)	CSB01 (INR, SNR, NA) CSB02 (INR, SNR, NA) CSB03 (INR, SNR, NA) CSB04 (INR, SNR, NA)
2	—	—	H←E	PRJobCreateAck (PRJobID, PRJobStatus)				
3	4 to 6	Request a control job. Material out specification maintains wafer order from source carrier to destination carrier.	H→E	ControlJobCreate (CtrlJobID=cjf01_01, ProcessingCtrlSpec=(prj01_01, null, null), ProcessOrderMgmt=ARRIVAL, MtrlOutSpec=((CSA01, null), (CSB01, null)), ((CSA02, null), (CSB02, null)), ((CSA03, null), (CSB03, null)), ((CSA04, null), (CSB04, null))), CarrierInputSpec=(CSA01, CSA02, CSA03, CSA04), StartMethod=AUTO)				
4	—	Request accepted.	H←E	ControlJobCreateAck (CtrlJobID=cjf01_01, JobStatus)	QUEUED	POOLED (In POOL)	CSA01 (INR, SNR, NA) CSA02 (INR, SNR, NA) CSA03 (INR, SNR, NA) CSA04 (INR, SNR, NA)	CSB01 (INR, SNR, NA) CSB02 (INR, SNR, NA) CSB03 (INR, SNR, NA) CSB04 (INR, SNR, NA)
5	7 to 11	No CJ in selected state so the newly created job immediately transitions.	H←E	Event (CJSELECTED, CtrlJobID=cjf01_01)	SELECTED			
6	12	A carrier for the selected control job arrives.	H←E	Event (CARRIERIDREAD, CID=CSA01)				

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipme nt	Message	State model name			
					CJS	PJS	CSA01 to CSA04 (CIDS, CSMS, CAS)	CSB01 to CSB04 (CIDS, CSMSCAS)
7	13 to 17	The equipment recognizes it and starts execution of the ControlJob.	H←E	Event (ControlJobStart, cjf01_01)	EXECUTING	POOLED (In POOL)	CSA01 (IVO, SVO, NA) CSA02 (INR, SNR, NA) CSA03 (INR, SNR, NA) CSA04 (INR, SNR, NA)	CSB01 (INR, SNR, NA) CSB02 (INR, SNR, NA) CSB03 (INR, SNR, NA) CSB04 (INR, SNR, NA)
8	18 to 20	ControlJob starts the ProcessJob; begins loading wafers to the processing boat.	H←E	Event (PRJOBSETUP, prj01_01)		SETTING UP (ACTIVE/ SETUP)	CSA01 (IVO, SVO, IA) CSA02 (INR, SNR, NA) CSA03 (INR, SNR, NA) CSA04 (INR, SNR, NA)	
9	—	—	H←E	Event (CarrierEmpty, CSA01)			CSA01 (IVO, SVO, CC) CSA02 (INR, SNR, NA) CSA03 (INR, SNR, NA) CSA04 (INR, SNR, NA)	
10	21	The next carrier arrives.	H←E	Event (CARRIERIDREAD, CSA02)			CSA01 (IVO, SVO, CC) CSA02 (IVO, SNR, NA) CSA03 (INR, SNR, NA) CSA04 (INR, SNR, NA)	
11	22 to 24	—	H→E	Rcommand (CarrierOut=CSA01)				
—	—	As carriers are emptied they are removed.	—	Steps 9-11 are repeated 3 more times			CSA01 (No State) CSA02 (IVO, SVO, CC) CSA03 (IVO, SVO, CC) CSA04 (IVO, SVO, CC)	
12	25	Material processing starts after all material is in the processing boat.	H←E	Event (PRJOBPROCESSING, prj01_01)		PROCES SING (ACTIVE/ PROCES SING)	CSA01 (No State) CSA02 (No State) CSA03 (No State) CSA04 (No State)	
13	26	Output carriers begin to arrive.	H←E	Event (CARRIERIDREAD, CID=CSB01)				CSB01 (IVO, SNR, NA) CSB02 (INR, SNR, NA) CSB03 (INR, SNR, NA) CSB04 (INR, SNR, NA)
—	—	Until all output carriers arrive.	—	Step 13 is repeated 3 more times				CSB01 (IVO, SNR, NA) CSB02 (IVO, SNR, NA) CSB03 (IVO, SNR, NA) CSB04 (IVO, SNR, NA)
14	26	Equipment begins to load output carriers.	H←E	Event (PROCESSINGCOMPLETE, PRJob=prj01_01)				CSB01 (IVO, SVO, IA) CSB02 (IVO, SNR, NA) CSB03 (IVO, SNR, NA) CSB04 (IVO, SNR, NA)
15	27 to 28	First output carrier is filled with wafers.	H←E	Event (CarrierComplete=CSB04)		PROCES S COMPLE TE (ACTIVE/ PROCES SING COMPLE TE)		CSB01 (IVO, SVO, CC) CSB02 (IVO, SNR, NA) CSB03 (IVO, SNR, NA) CSB04 (IVO, SNR, NA)
16	29 to 30	Host wants to get it.	H→E	Rcommand (CarrierOut=CSB04)				
17	—	Gets rest of carriers.	—	Steps 15 and 16 are repeated 3 more times				CSB01 (No State) CSB02 (IVO, SVO, CC) CSB03 (IVO, SVO, CC) CSB04 (IVO, SVO, CC)
18	31	—	H←E	Event (PRJOBCOMPLETE, PRJob=prj01_01)		No State		CSB01 (No State) CSB02 (No State) CSB03 (No State) CSB04 (No State)
19	32 to 38	—	H←E	Event (ControlJobCompleted=cjf01_01, status=OK)	COMPLETE D(COMPLET E)			

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 514 CJM Report, Page 515 CJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Creates a process job. S16F11: PRJobCreateEnh (☞ Page 477 S16F11: PRJobCreateEnh) ■Parameter examples • PRJOBID: "prj01_01" • MF: 13 • PRMtrlNameList: (("CSA01", null), ("CSA02", null), ("CSA03", null), ("CSA04", null)) • PRRecipeMethod: 1 • RCPSPec: "ILD1" • RecVariableList: null • PRProcessStart: True • PauseEvent: null	→	Creates a new process job object. ('DVVAL' is not updated.)		—
2	—	←	S16F12: PRJob CreateEnh Acknowledge (☞ Page 480 S16F12: PRJobCreateEnh Acknowledge)		—
3	—		10040-00901: PRJobCreateEnh service notification (☞ Page 324 00901: PRJobCreateEnh service notification) • A new process job object created	→	—
4	Requests a control job. S14F9: Create Object Request (☞ Page 451 S14F9: Create Object Request) ■Parameter examples • ObjType: "ControlJob" • ObjID: "cjf01_01" • ProcessingCtrlSpec: ("prj01_01", null, null) • CarrierInputSpec: ("CSA01", "CSA02", "CSA03", "CSA04") • MtrlOutSpec: (((("CSA01", null), ("CSB01", null)), ("CSA02", null), ("CSB02", null)), ("CSA03", null), ("CSB03", null)), ("CSA04", null), ("CSB04", null))) • ProcessOrderMgmt: 1 • StartMethod: true	→	Creates a new control job object. ('DVVAL' is not updated.)		—
5	—	←	S14F10: Create Object Acknowledge (☞ Page 464 S14F10: Create Object Acknowledge) • CtrlJobID="cjf01_01" • State=0		—
6	—		10094-01001: Create service (ControlJob) notification (☞ Page 311 01001: Create service (ControlJob) notification) • A new control job object created	→	—
7	—		Control Job State Model state transition No.(3) (☞ Page 112 When using the control job queue management function) ('DVVAL' is updated.)	←	The newly created control job state is transitioned to 'SELECTED' immediately. 00094-00101: ControlJob Selected request (☞ Page 301 00101: ControlJob Selected request)
8	—		10094-00101: ControlJob Selected acknowledge (☞ Page 308 00101: ControlJob Selected acknowledge) • CtrlJobID="cjf01_01"	→	—
9	—		—	←	CEID 30102 event report sending request relay: ON
10	—*1	←	S6F11: QUEUED to SELECTED (CEID 30102)		—

No.	HOST	↔ SECS/GEM communication software	↔ Control CPU (controlled by user program)
11	—	CEID 30102 event report sending request relay: OFF	→ —
12	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	A carrier arrives, and it is transferred to the internal buffer after the loading and the equipment verification of CarrierID. ■Parameter example • CarrierID: "CSA01" Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.10 to 27 in the following: ☞ Page 557 Usage examples of control CPU interfaces
13	—	Sets all attribute values of a control job object, and updates 'DVVAL.'	← Starts the control job execution. 00094-00003: ControlJobObject SetAttr request (☞ Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 3 = EXECUTING • Other attribute values are the same as those acquired in No.6.
14	—	10094-00003: ControlJobObject SetAttr acknowledge (☞ Page 306 00003: ControlJobObject SetAttr acknowledge)	→ —
15	—	—	← CEID 30104 event report sending request relay: ON
16	—*1	← S6F11: SELECTED to EXECUTING (CEID 30104)	—
17	—	CEID 30104 event report sending request relay: OFF	→ —
18	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Starts the process job. Descriptions of usage examples related to the process job are omitted in this table. For usage examples, refer to No.11 to 16 in the following: ☞ Page 673 Usage examples of control CPU interfaces
19	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	A carrier is moved to an FIMS port, and the equipment verification of a slot map succeeds. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.28 to 51 in the following: ☞ Page 557 Usage examples of control CPU interfaces
20	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Starts the loading of wafers to the processing boat. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.1 to 29 in the following: ☞ Page 697 Usage examples of control CPU interfaces
21	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	The next carrier arrives. For usage examples, refer to No.10 to 23 in the following: ☞ Page 557 Usage examples of control CPU interfaces
22	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Loading of all wafers to the processing boat has completed. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.30 to 34 in the following: ☞ Page 697 Usage examples of control CPU interfaces

No.	HOST	↔ SECS/GEM communication software	↔ Control CPU (controlled by user program)
23	Host commands to carrier-out. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.61 to 63 in the following: ☞ Page 557 Usage examples of control CPU interfaces	Refer to descriptions for this No. in the 'HOST' column.	Refer to descriptions for this No. in the 'HOST' column.
24	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Carrier-out completes and the carrier is made ready to unload. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.64 to 83 in the following: ☞ Page 557 Usage examples of control CPU interfaces
	Repeats 19 to 24 three times.		
25	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Processing (batch processing) has started. Descriptions of usage examples related to the process job and substrate tracking are omitted in this table. For usage examples, refer to No.17 to 22 in the following: ☞ Page 673 Usage examples of control CPU interfaces For usage examples, refer to No.35 to 39 in the following: ☞ Page 697 Usage examples of control CPU interfaces
26	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	A destination carrier has arrived. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.10 to 36 in the following: ☞ Page 557 Usage examples of control CPU interfaces
	Repeats 26 three times.		
27	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Processing (batch processing) has completed. Descriptions of usage examples related to the process job and substrate tracking are omitted in this table. For usage examples, refer to No.23 to 28 in the following: ☞ Page 673 Usage examples of control CPU interfaces For usage examples, refer to No.40 to 44 in the following: ☞ Page 697 Usage examples of control CPU interfaces
28	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Wafers with the processing (batch processing) completed have been collected from the processing boat into a carrier. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.45 to 56 in the following: ☞ Page 697 Usage examples of control CPU interfaces
29	Host commands to carrier-out. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.61 to 63 in the following: ☞ Page 557 Usage examples of control CPU interfaces	Refer to descriptions for this No. in the 'HOST' column.	Refer to descriptions for this No. in the 'HOST' column.

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
30	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Carrier-out completes and the carrier is made ready to unload. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.64 to 83 in the following: ☞ Page 557 Usage examples of control CPU interfaces
	Repeats 28 to 30 three times.				
31	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Collection of all wafers has completed. Descriptions of usage examples related to the process job, substrate tracking, and carriers are omitted in this table. For usage examples, refer to No.52 to 60 in the following: ☞ Page 557 Usage examples of control CPU interfaces For usage examples, refer to No.29 to 32 in the following: ☞ Page 673 Usage examples of control CPU interfaces For usage examples, refer to No.57 to 61 in the following: ☞ Page 697 Usage examples of control CPU interfaces
32	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	A control job has completed. 00094-00003: ControlJobObject SetAttr request (☞ Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 5 = COMPLETED • Other attribute values are the same as those acquired in No.6.
33	—		10094-00003: ControlJobObject SetAttr acknowledge (☞ Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
34	—		—	←	CEID 30109 event report sending request relay: ON
35	—*1	←	S6F11: EXECUTING to COMPLETED (CEID 30109)		—
36	—		CEID 30109 event report sending request relay: OFF	→	—
37	—		Deletes a control job, and updates 'DVVAL.'	←	Deletes a control job. 00094-00002: ControlJobObject Delete request (☞ Page 297 00002: ControlJobObject delete request) ■Parameter example • ObjID: "cjf01_01"
38	—		10094-00002: ControlJobObject Delete acknowledge (☞ Page 305 00002: ControlJobObject delete acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Slot map change during processing of single carrier

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Single-wafer processing equipment (that can handle multiple wafers being processed simultaneously)
- FOUP used
- Verification with manufacturing equipment
- Wafers are collected into a different slot in the source carrier.
- Load port initialized ( Page 539 Load port initialization)
- Carrier object of carrier "CS001" created by using the 'Bind' service ( Page 546 Communication scenario with HOST) (#0 to 1)
- Supports Material Redirection Mode = Yes
- Supports Incomplete MtrlOutSpec: No
- Control job queue management function = Enabled
- Number of concurrent control jobs = 1
- Maximum number of control job queues = 30
- Number of created process job objects = 0
- Number of created control job objects = 0

In addition, the substrate locations (STL) are as follows:

- #1: Carrier slot (carrier substrate location)^{*1}
- #2: Processing part (equipment substrate location)^{*2}

*1 Exists per slot in each carrier

*2 Can store 25 wafers.

For the configuration example, refer to the following:

 Page 688 Normal roundtrip 1 (single-wafer processing equipment)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 658 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name			
					CJS	PJS	STL#1	STL#2
0	—	Initial condition.	—	—	No State	No State	No State	1 to 25: UOC
1	1 to 3	Create the process job.	H→E	PRJobCreateEnh (PRJobID=prj01, Mtrl=CS001, RecID=ILD1)	No State	POOLED	No State	1 to 25: UOC
2	—	—	H←E	PRJobCreateAck (PRJobID, PRJobStatus)				
3	4 to 6	Request a control job. Material out specification inverts the wafer order.	H→E	ControlJobCreate (CtrlJobID=cj01, ProcessingCtrlSpec=(prj01, null, null), ProcessOrderMgmt=ARRIVAL, CarrierInputSpec=CS001, MtrlOutSpec=((((CS001, (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25)), (CS001, (25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1))))), StartMethod=AUTO)				
4	—	Request accepted.	H←E	ControlJobCreateAck (CtrlJobID=cj01, JobStatus)	QUEUED	POOLED	No State	1 to 25: UOC
5	7 to 11	No CJ in selected state so the newly created job immediately transitions.	H←E	Event (CJSELECTED, CtrlJobID=cj01)	SELECTED			
6	12	A carrier for the selected control job arrives.	H←E	Event (CARRIERIDREAD, CID=CS001)	SELECTED			
7	13 to 17	The equipment recognizes it and starts execution of the ControlJob.	H←E	Event (CJSTART, cj01)	EXECUTING	POOLED	No State	1 to 25: UOC
8	18 to 20	ControlJob starts the ProcessJob.	H←E	Event (PRJOBSETUP, prj01)	EXECUTING	SETTING UP	CS001.1 to 25: OC	
9	21	Material processing starts.	H←E	Event (PRJOBPROCESSING, prj01)		PROCESSING	CS001.1: UOC CS001.2 to 25: OC	1: OC 2 to 25: UOC
10	22	All wafers move into the equipment for processing.					CS001.1 to 25: UOC	1 to 25: OC
11	23	Wafer originating from slot 1 finishes processing and returns to slot 25 of its source carrier (as instructed by the MtrlOutSpec).			EXECUTING		CS001.1 to 24: UOC CS001.25: OC	1: UOC 2 to 25: OC
12	24	Wafer originating from slot 2 finishes processing and returns to slot 24 of its source carrier (as instructed by the MtrlOutSpec).					CS001.1 to 23: UOC CS001.24 to 25: OC	1 to 2: UOC 3 to 25: OC
13	23 to 24 repeated three times	Repeat steps above for other wafers.					CS001.1 to 25: OC	1 to 25: UOC
14	25	The ProcessJob completes.	H←E	Event (PRJOBCOMPLETE, PRJob=prj01)	COMPLETED	PROCESS COMPLETE	No State	1 to 25: UOC
15	26 to 30	The ControlJob completes.	H←E	Event (CONTROLJOBCOMPLETED=cj01, status=OK)				
16	31	The ProcessJob is deleted.	H←E	Event (PRJOBDELETED, PRJob=prj01)		No State		
17	32 to 33	The ControlJob is deleted.	H←E	Event (CONTROLJOBDELETED=cj01)	No State			

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 514 CJM Report, Page 515 CJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Creates a process job. S16F11: PRJobCreateEnh (☞ Page 477 S16F11: PRJobCreateEnh) ■Parameter examples • PRJOBID: "prj01" • MF: 13 • PRMtrlNameList: ("CS001", null) • PRRecipeMethod: 1 • RCPSPEC: "ILD1" • RecVariableList: null • PRProcessStart: True • PauseEvent: null	→	Creates a new process job object. ('DVVAL' is not updated.)		—
2	—	←	S16F12: PRJob CreateEnh Acknowledge (☞ Page 480 S16F12: PRJobCreateEnh Acknowledge)		—
3	—		10040-00901: PRJobCreateEnh service notification (☞ Page 324 00901: PRJobCreateEnh service notification) • A new process job object created	→	—
4	Requests a control job. Material out specification inverts the wafer order. S14F9: Create Object Request (☞ Page 451 S14F9: Create Object Request) ■Parameter examples • ObjType: "ControlJob" • ObjID: "cj01" • ProcessingCtrlSpec: ("prj01", null, null) • CarrierInputSpec: "CS001" • MtrlOutSpec: (("CS001", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25)), ("CS001", (25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1))) • ProcessOrderMgmt: 1 • StartMethod: true	→	Creates a new control job object. ('DVVAL' is not updated.)		—
5	—	←	S14F10: Create Object Acknowledge (☞ Page 464 S14F10: Create Object Acknowledge)		—
6	—		10094-01001: Create service (ControlJob) notification (☞ Page 311 01001: Create service (ControlJob) notification) • A new control job object created	→	—
7	—		Control Job State Model state transition No.(3) (☞ Page 112 When using the control job queue management function) ('DVVAL' is updated.)	←	The newly created control job state is transitioned to 'SELECTED' immediately. 00094-00101: ControlJob Selected request (☞ Page 301 00101: ControlJob Selected request)
8	—		10094-00101: ControlJob Selected acknowledge (☞ Page 308 00101: ControlJob Selected acknowledge) • CtrlJobID="cj01"	→	—
9	—		—	←	CEID 30102 event report sending request relay: ON
10	—*1	←	S6F11: QUEUED to SELECTED (CEID 30102)		—
11	—		CEID 30102 event report sending request relay: OFF	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
12	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		A carrier arrives and is loaded, and then the equipment verification of CarrierID succeeds. ■Parameter example • CarrierID: "CS001" Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.7 to 21 in the following: ☞ Page 547 Usage examples of control CPU interfaces
13	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	Starts the control job execution. 00094-00003: ControlJobObject SetAttr request (☞ Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 3 = EXECUTING • Other attribute values are the same as those acquired in No.6.
14	—		10094-00003: ControlJobObject SetAttr acknowledge (☞ Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
15	—		—	←	CEID 30104 event report sending request relay: ON
16	—*1	←	S6F11: SELECTED to EXECUTING (CEID 30104)		—
17	—		CEID 30104 event report sending request relay: OFF	→	—
18	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Starts the process job. Descriptions of usage examples related to the process job are omitted in this table. For usage examples, refer to No.11 to 16 in the following: ☞ Page 673 Usage examples of control CPU interfaces
19	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		The equipment verification of a slot map succeeds. Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.22 to 30 in the following: ☞ Page 547 Usage examples of control CPU interfaces
20	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Starts the loading of wafers to the processing part. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.1 to 32 in the following: ☞ Page 690 Usage examples of control CPU interfaces
21	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Processing has started. Descriptions of usage examples related to the process job and substrate tracking are omitted in this table. For usage examples, refer to No.17 to 22 in the following: ☞ Page 673 Usage examples of control CPU interfaces For usage examples, refer to No.33 to 37 in the following: ☞ Page 690 Usage examples of control CPU interfaces

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
22	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Loading of all wafers to the processing part has completed.</p> <p>Descriptions of usage examples related to the substrate tracking are omitted in this table.</p> <p>For usage examples, refer to No.1 to 37 in the following:</p> <p>☞ Page 690 Usage examples of control CPU interfaces</p>
23	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Processing of wafers originating from Slot 1 is finished and collected into Slot 25.</p> <p>Descriptions of usage examples related to the substrate tracking are omitted in this table.</p> <p>For usage examples, refer to No.38 to 59 in the following:</p> <p>☞ Page 690 Usage examples of control CPU interfaces</p>
24	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Processing of wafers originating from Slot 2 is finished and collected into Slot 24.</p> <p>Descriptions of usage examples related to the substrate tracking are omitted in this table.</p> <p>For usage examples, refer to No.38 to 59 in the following:</p> <p>☞ Page 690 Usage examples of control CPU interfaces</p>
					23 to 24 are repeated for other wafers.
25	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Processing has completed and a carrier has been unloaded.</p> <p>Descriptions of usage examples related to the process job, substrate tracking, and carriers are omitted in this table.</p> <p>For usage examples, refer to No.31 to 53 in the following:</p> <p>☞ Page 547 Usage examples of control CPU interfaces</p> <p>For usage examples, refer to No.23 to 32 in the following:</p> <p>☞ Page 673 Usage examples of control CPU interfaces</p> <p>For usage examples, refer to No.60 to 66 in the following:</p> <p>☞ Page 690 Usage examples of control CPU interfaces</p>
26	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	<p>A control job has completed.</p> <p>00094-00003: ControlJobObject SetAttr request (☞ Page 298 00003: ControlJobObject SetAttr request)</p> <p>■Parameter examples</p> <ul style="list-style-type: none"> • State: 5 = COMPLETED • Other attribute values are the same as those acquired in No.6.
27	—		10094-00003: ControlJobObject SetAttr acknowledge (☞ Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
28	—		—	←	CEID 30109 event report sending request relay: ON
29	—*1	←	S6F11: EXECUTING to COMPLETED (CEID 30109)		—
30	—		CEID 30109 event report sending request relay: OFF	→	—

No.	HOST	↔ SECS/GEM communication software ↔	Control CPU (controlled by user program)
31	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.	Deletes a process job. ■Parameter example • ObjID: "prj01" Descriptions of usage examples related to the process job are omitted in this table. For usage examples, refer to No.33 to 34 in the following: ☞ Page 673 Usage examples of control CPU interfaces
32	—	Deletes a control job, and updates 'DVVAL.'	← Deletes a control job. 00094-00002: ControlJobObject Delete request (☞ Page 297 00002: ControlJobObject delete request) ■Parameter example • ObjID: "cj01"
33	—	10094-00002: ControlJobObject Delete acknowledge (☞ Page 305 00002: ControlJobObject delete acknowledge)	→ —

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Split during processing with late announcement of output FOUP

The following shows the state transition satisfying the following conditions:

- Fixed buffer manufacturing equipment
- Single-wafer processing equipment (that can handle multiple wafers being processed simultaneously)
- FOUP used
- Verification with manufacturing equipment
- Wafers from slots 1 to 12 are collected into the original locations in the source carrier ("CS001").
- The collection destinations for wafers from slots 13 to 25 are not originally planned, however, they are updated by the host and the wafers are collected into slots 1 to 13 of the different carrier ("CS002").
- Load port initialized ( Page 539 Load port initialization)
- Carrier objects of carriers "CS001" and "CS002" created by using the 'Bind' service ( Page 546 Communication scenario with HOST) (#0 to 1)
- Supports Material Redirection Mode = Yes
- Supports Incomplete MtrlOutSpec: Yes
- Control job queue management function = Enabled
- Number of concurrent control jobs = 1
- Maximum number of control job queues = 30
- Number of created process job objects = 0
- Number of created control job objects = 0

In addition, the substrate locations (STL) are as follows:

- #1: Carrier slot (carrier substrate location)*¹
- #2: Processing part (equipment substrate location)*²

*1 Exists per slot in each carrier

*2 Can store 25 wafers.

For the configuration example, refer to the following:

 Page 688 Normal roundtrip 1 (single-wafer processing equipment)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 666 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					CJS	PJS	LTS	CAS	STL#1	STL#2
0	—	Initial condition.	—	—	No State	No State	LP1: RTL LP2: RTL	CS001: NA CS002: NA	No State	1 to 25: UOC
1	1 to 3	Create the process job.	H→E	PRJobCreateEnh (PRJobID=prj01, Mtrl=CS001, RecID=ILD1)		POOLED				
2	—	—	H←E	PRJobCreateAck (PRJobID, PRJobStatus)						
3	4 to 6	Request a control job. Material out specification defines two wafer groups. Wafers from slots 1 to 12 and wafers from slots 13 to 25. For the wafers from slots 1 to 12 it is defined that the destination location is equal to the source location. For wafers from slots 13 to 25, the destination location will be specified later.	H→E	ControlJobCreate (CtrlJobID=cj01, ProcessingCtrlSpec=(prj01, null, null), ProcessOrderMgmt=ARRIVAL, CarrierInputSpec=CS001, MtrlOutSpec=((CS001, (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)), (CS001, (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12))), ((CS001, (13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25)), null)), StartMethod=AUTO)						
4	—	Request accepted.	H←E	ControlJobCreateAck (CtrlJobID=cj01, JobStatus)						
5	7 to 11	No CJ in selected state so the newly created job immediately transitions.	H←E	Event (CJSELECTED, CtrlJobID=cj01)	SELECTED		LP1: TB LP2: RTL			
6	12	The source carrier for the selected control job arrives.	H←E	Event (CARRIERIDREAD, CID=CS001)						
7	13 to 17	The equipment recognizes it and starts execution of the ControlJob.	H←E	Event (ControlJobStart, cj01)	EXECUTING	SETTING UP				
8	18 to 19	ControlJob starts the ProcessJob.	H←E	Event (PRJOBSETUP, prj01)						
9	—	Material processing starts.	H←E	Event (PRJOBPROCESSING, prj01)						
10	20 to 22	Wafers move into the equipment starting with wafer in slot 1.						CS001: IA CS002: NA	CS001.1 to 25: OC	1 to 12: OC 13 to 25: UOC
11	23	Wafers originating from slots 1 to 12 in CS001 finish material processing and return to the source carrier, slots 1 to 12 (as instructed by the MtrlOutSpec), respectively.							CS001.1 to 25: OC	1 to 25: UOC

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipme nt	Message	State model name					
					CJS	PJS	LTS	CAS	STL#1	STL#2
12	24	After wafers from slots 1 to 12 have returned to carrier CS001 and wafers from slots 13 to 25 have left the carrier, accessing this carrier is complete, which means it can undock and get removed from the equipment.			EXECUTING	PROCESSING	LP1: RTU LP2: RTL	CS001: CC CS002: NA	CS001.1 to 12: OC CS001.13to 25: UOC	1 to 12: UOC 13 to 25: OC
13	25	Sometime before the wafer originating from slot13 finishes processing, an empty carrier arrives at the equipment. This step could also occur before step 12 is performed.	H←E	Event (CARRIERIDREAD, CID=CS002)			LP1: RTU LP2: TB		CS001.1 to 12: OC CS001.13to 25: UOC CS002.1 to 25: UOC	
14	26	Equipment and Host verify CarrierID and SlotMap of CS002. This step could also occur before step 12 is performed but has to follow step 13 of this sequence.								
15	27 to 29	Host specifies the destination location of the wafers originating from slot 13 to 25 in CS001 by an update of the MtrlOutSpec of cj01. Note that the Host must also include the original specification for slots 1 to 12 when updating MtrlOutSpec. This step could also occur before step 12 is performed but has to follow step 14 of this sequence.	H→E	SetAttr (ObjID=cj01, MtrlOutSpec=(((CS001, (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)), (CS001, (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)))), ((CS001, (13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25)), (CS002, (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13))))))						

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipme nt	Message	State model name					
					CJS	PJS	LTS	CAS	STL#1	STL#2
16	30	One after the other, wafers originating from slots 13 to 25 finish material processing and are moved to carrier CS002, slots 1 to 13 as instructed by the MtrlOutSpec, respectively.			EXECUT ING	PROCES SING	LP1: RTU LP2: TB	CS001: CC CS002: IA	CS001.1 to 12: OC CS001.13 to 25: UOC CS002.1 to 13: OC CS002.14 to 25: UOC	1 to 25: UOC
17	31	After wafers from slots 13 to 25 have returned to carrier CS002, accessing this carrier is completed, which means it can undock and get removed from the equipment.								
18	32	The ProcessJob completes.	H←E	Event (PRJOBCOMPLETE, PRJob=prj01)						
19	33 to 37	The ControlJob completes.	H←E	Event (CONTROLJOBCOM PLETED=cj01, status=OK)						
20	38	The ProcessJob is deleted.	H←E	Event (PRJOBDELETED, PRJob=prj01)						
21	39 to 40	The ControlJob is deleted.	H←E	Event (CONTROLJOBDELE TED=cj01, status=OK)	No State					

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 514 CJM Report, Page 515 CJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Creates a process job. S16F11: PRJobCreateEnh (📖 Page 477 S16F11: PRJobCreateEnh) ■Parameter examples • PRJOBID: "prj01" • MF: 13 • PRMtrlNameList: ("CS001", null) • PRRecipeMethod: 1 • RCPSPEC: "ILD1" • RecVariableList: null • PRProcessStart: True • PauseEvent: null	→	Creates a new process job object. ('DVVAL' is not updated.)		—
2	—	←	S16F12: PRJob CreateEnh Acknowledge (📖 Page 480 S16F12: PRJobCreateEnh Acknowledge)		—
3	—		10040-00901: PRJobCreateEnh service notification (📖 Page 324 00901: PRJobCreateEnh service notification) • A new process job object created	→	—
4	Requests a control job. Material out specification inverts the wafer order. S14F9: Create Object Request (📖 Page 451 S14F9 : Create Object Request) ■Parameter examples • ObjType: "ControlJob" • ObjID: "cj01" • ProcessingCtrlSpec: ("prj01", null, null) • CarrierInputSpec: "CS001" • MtrlOutSpec: (((("CS001", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)), ("CS001", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12))), ("CS001", (13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25)), null)) • ProcessOrderMgmt: 1 • StartMethod: true	→	Creates a new control job object. ('DVVAL' is not updated.)		—
5	—	←	S14F10: Create Object Acknowledge (📖 Page 464 S14F10: Create Object Acknowledge)		—
6	—		10094-01001: Create service (ControlJob) notification (📖 Page 311 01001: Create service (ControlJob) notification) • A new control job object created	→	—
7	—		Control Job State Model state transition No.(3) (📖 Page 112 When using the control job queue management function) ('DVVAL' is updated.)	←	The newly created control job state is transitioned to 'SELECTED' immediately. 00094-00101: ControlJob Selected request (📖 Page 301 00101: ControlJob Selected request)
8	—		10094-00101: ControlJob Selected acknowledge (📖 Page 308 00101: ControlJob Selected acknowledge) • CtrlJobID="cj01"	→	—
9	—		—	←	CEID 30102 event report sending request relay: ON
10	—*1	←	S6F11: QUEUED to SELECTED (CEID 30102)		—
11	—		CEID 30102 event report sending request relay: OFF	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
12	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		A carrier arrives at LP1 and is loaded, and then the equipment verification of CarrierID succeeds. ■Parameter example • CarrierID: "CS001" Descriptions of usage examples related to carriers are omitted in this table. For usage examples, refer to No.7 to 21 in the following: ☞ Page 547 Usage examples of control CPU interfaces
13	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	Starts the control job execution. 00094-00003: ControlJobObject SetAttr request (☞ Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 3 = EXECUTING • Other attribute values are the same as those acquired in No.6.
14	—		10094-00003: ControlJobObject SetAttr acknowledge (☞ Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
15	—		—	←	CEID 30104 event report sending request relay: ON
16	—*1	←	S6F11: SELECTED to EXECUTING (CEID 30104)		—
17	—		CEID 30104 event report sending request relay: OFF	→	—
18	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Starts the process job. Descriptions of usage examples related to the process job are omitted in this table. For usage examples, refer to No.11 to 16 in the following: ☞ Page 673 Usage examples of control CPU interfaces
19	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		The equipment verification of a slot map succeeds. Descriptions of usage examples related to carriers and the substrate tracking are omitted in this table. For usage examples, refer to No.22 to 30 in the following: ☞ Page 547 Usage examples of control CPU interfaces For usage examples, refer to No.1 to 15 in the following: ☞ Page 690 Usage examples of control CPU interfaces
20	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Starts the loading of wafers to the processing part. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.16 to 32 in the following: ☞ Page 690 Usage examples of control CPU interfaces

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
21	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Processing has started.</p> <p>Descriptions of usage examples related to the process job and substrate tracking are omitted in this table.</p> <p>For usage examples, refer to No.17 to 22 in the following:</p> <p>☞ Page 673 Usage examples of control CPU interfaces</p> <p>For usage examples, refer to No.33 to 37 in the following:</p> <p>☞ Page 690 Usage examples of control CPU interfaces</p>
22	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Loading of all wafers in slots 1 to 12 to the processing part has completed.</p> <p>Descriptions of usage examples related to the substrate tracking are omitted in this table.</p> <p>For usage examples, refer to No.16 to 32 in the following:</p> <p>☞ Page 690 Usage examples of control CPU interfaces</p>
23	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Processing of wafers originating from slots 1 to 12 is finished and collected into the original slots 1 to 12.</p> <p>Descriptions of usage examples related to the substrate tracking and carriers are omitted in this table.</p> <p>For usage examples, refer to No.33 to 59 in the following:</p> <p>☞ Page 690 Usage examples of control CPU interfaces</p>
24	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>Wafers in slots 13 to 25 are loaded into the processing part.</p> <p>When the loading of carriers completes, access to the carriers completes and they are ready to be unloaded.</p> <p>Descriptions of usage examples related to the substrate tracking and carriers are omitted in this table.</p> <p>For usage examples, refer to No.31 to 42 in the following:</p> <p>☞ Page 547 Usage examples of control CPU interfaces</p> <p>For usage examples, refer to No.16 to 32 in the following:</p> <p>☞ Page 690 Usage examples of control CPU interfaces</p>
25	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		<p>An empty carrier arrives at LP2 and is loaded, and then the equipment verification of CarrierID succeeds.</p> <p>■Parameter example</p> <ul style="list-style-type: none"> • CarrierID: "CS002" <p>Descriptions of usage examples related to carriers are omitted in this table.</p> <p>For usage examples, refer to No.7 to 21 in the following:</p> <p>☞ Page 547 Usage examples of control CPU interfaces</p>

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
26	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		The equipment verification of a slot map succeeds. Descriptions of usage examples related to the substrate tracking and carriers are omitted in this table. For usage examples, refer to No.22 to 30 in the following: ☞ Page 547 Usage examples of control CPU interfaces For usage examples, refer to No.1 to 2 in the following: ☞ Page 690 Usage examples of control CPU interfaces
27	Updates 'MtrlOutSpec' and specifies slots 1 to 13 in CS002 as the collection destination of wafers originating from slots 13 to 25 in CS001. S14F3: SetAttr Request (☞ Page 438 S14F3: SetAttr Request) ■Parameter examples • ObjType: "ControlJob" • ObjID: "cj01" • MtrlOutSpec: (((("CS001", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)), ("CS001", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12))), ("CS001", (13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25))), ("CS002", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13))))	→	Updates the 'MtrlOutSpec' attribute value of the control job object "cj01." ('DVVAL' is not updated.)		—
28	—	←	S14F4: SetAttr Data (☞ Page 443 S14F4: SetAttr Data)		—
29	—		10094-01003: SetAttr service (ControlJob) notification (☞ Page 313 01003: SetAttr service (ControlJob) notification) ObjIDList: cj01 AttrIDList: MtrlOutSpec ControlJobObject: Changed attribute value (((("CS001", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)), ("CS001", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12))), ("CS001", (13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25))), ("CS002", (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13))))	→	—
30	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Processing of wafers originating from slots 13 to 25 in CS001 is finished and collected into slots 1 to 13 in CS002. Descriptions of usage examples related to the substrate tracking and carriers are omitted in this table. For usage examples, refer to No.28 to 30 in the following: ☞ Page 547 Usage examples of control CPU interfaces For usage examples, refer to No.33 to 59 in the following: ☞ Page 690 Usage examples of control CPU interfaces
31	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		When the collection of wafers into CS002 completes, access to the carrier completes and it is ready to be unloaded. Descriptions of usage examples related to the substrate tracking and carriers are omitted in this table. For usage examples, refer to No.31 to 42 in the following: ☞ Page 547 Usage examples of control CPU interfaces

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
32	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Processing has completed. Descriptions of usage examples related to the process job and substrate tracking are omitted in this table. For usage examples, refer to No.23 to 32 in the following: ☞ Page 673 Usage examples of control CPU interfaces
33	—		Sets all attribute values of a control job object, and updates 'DVVAL.'	←	A control job has completed. 00094-00003: ControlJobObject SetAttr request (☞ Page 298 00003: ControlJobObject SetAttr request) ■Parameter examples • State: 5 = COMPLETED • Other attribute values are the same as those acquired in No.6.
34	—		10094-00003: ControlJobObject SetAttr acknowledge (☞ Page 306 00003: ControlJobObject SetAttr acknowledge)	→	—
35	—		—	←	CEID 30109 event report sending request relay: ON
36	— ^{*1}	←	S6F11: EXECUTING to COMPLETED (CEID 30109)		—
37	—		CEID 30109 event report sending request relay: OFF	→	—
38	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Deletes a process job. ■Parameter example • ObjID: "prj01" Descriptions of usage examples related to the process job are omitted in this table. For usage examples, refer to No.33 to 34 in the following: ☞ Page 673 Usage examples of control CPU interfaces
39	—		Deletes a control job, and updates 'DVVAL.'	←	Deletes a control job. 00094-00002: ControlJobObject Delete request (☞ Page 297 00002: ControlJobObject delete request) ■Parameter example • ObjID: "cj01"
40	—		10094-00002: ControlJobObject Delete request (☞ Page 305 00002: ControlJobObject delete acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

E40-PJM compliance

The following table shows the E40-PJM compliant use cases.
These use cases refer to the use cases described in "8.2Process Job Communications" of SEMI E40-0813.

Title	Reference
Normal Roundtrip 1 (Automatic Start Instruction)	☞ Page 672 Normal roundtrip 1 (automatic start instruction)
Normal Roundtrip 2 (Manual Start Specification)	☞ Page 676 Normal roundtrip 2 (manual start specification)
Exception Processing 1 (PAUSE)	☞ Page 680 Exception processing 1 (PAUSE)
Exception Processing 2 (STOP)	☞ Page 682 Exception processing 2 (STOP)
Exception Processing 3 (ABORT)	☞ Page 684 Exception processing 3 (ABORT)

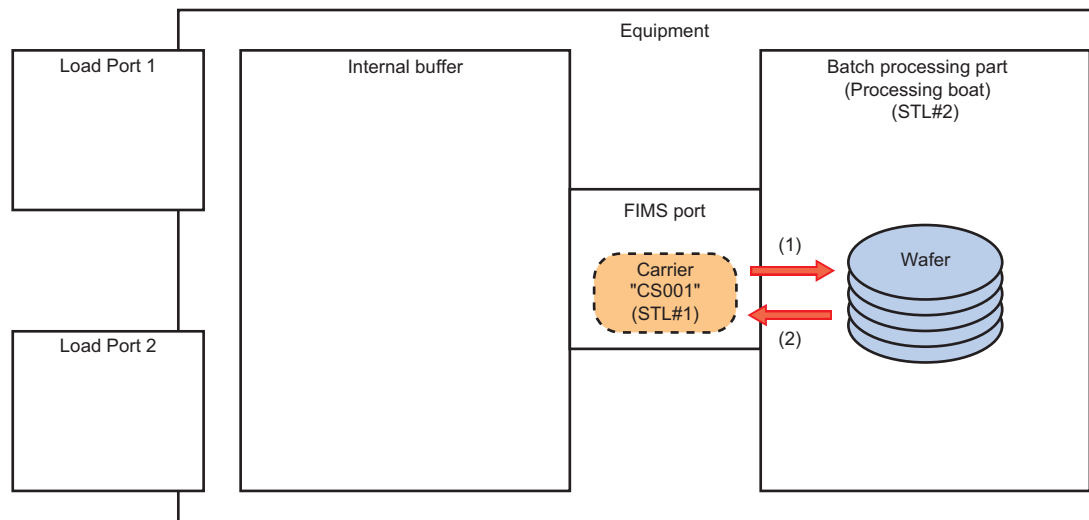
Normal roundtrip 1 (automatic start instruction)

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- Batch processing equipment
- Number of processing carriers: 1
- CarrierID/SlotMap verification: Host verification
- A carrier object of the carrier "CS001" has been created by any of the following:
 - S3F17: Bind ( Page 380 S3F17: Bind)
 - S3F17: CancelCarrierNotification ( Page 395 S3F17: CancelCarrierNotification)
 - 00087-00501: CarrierID read successful notification ( Page 220 00501: CarrierID read successful notification)
- Process object attribute "PRProcessStart" is true (= Automatic start).

The following configuration examples of semiconductor manufacturing equipment are referred to in this use case.

 : Carrier movement,  : Wafer movement



■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 673 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name PJS
0	—	Initial condition.	—	—	No State
1	1 to 2	Check the number of process jobs that can be created.	H→E	PRGetSpace	POOLED
2	3	Create the process job.	H→E	PRJob CreateEnh	
3	4 to 10	Process job creation completes.	H←E	POOLED	
4	11 to 16	Setting up the process job (Milestone)	H←E	PRJob SetUp	SETTING UP
5	17 to 22	Starting the process job (Milestone)	H←E	PRJob Processing	PROCESSING
6	23 to 28	Finishing the process job (Milestone)	H←E	PRJob Processing Complete	PROCESS COMPLETE
7	29 to 32	Completing the process job (Milestone)	H←E	PRJob Complete	
8	33 to 34	Delete the process job.	—	—	No State

*1 The corresponding number of usage examples of control CPU interfaces

■ Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 516 PJM Reports, Page 517 PJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Checks the number of process jobs that can be created. S16F21: PRGetSpace (📖 Page 492 S16F21: PRGetSpace)	→	—		—
2	—	←	S16F22: PRGetSpace Send (📖 Page 493 S16F22: PRGetSpace Send)		—
3	Creates a process job to be executed. S16F11: PRJobCreateEnh (📖 Page 477 S16F11: PRJobCreateEnh) ■Parameter examples • PRJOBID: "prj01" • MF: 13 • PRMtrlNameList: ("CS001", null) • PRRecipeMethod: 1 • RCPSPEC: "Recipe_1" • RecVariableList: null • PRProcessStart: True • PauseEvent: null	→	Creates a new process job object. ('DVVAL' is not updated.)		—
4	—	←	S16F12: PRJob CreateEnh Acknowledge (📖 Page 480 S16F12: PRJobCreateEnh Acknowledge)		—
5	—		10040-00901: PRJobCreateEnh service notification (📖 Page 324 00901: PRJobCreateEnh service notification) ■Parameter examples • ObjID: "prj01" • PRMtlType: 13 • PRMtrlNameList: ("CS001", null) • RecID: "Recipe_1" • PRRecipeMethod: 1 • RecVariableList: null • PRProcessStart: True • PauseEvent: null	→	—
6	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Changes the process job state to 'POOLED.' 00040-00003: ProcessJobObject SetAttr request (📖 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 0 = POOLED • Other attribute values are the same as shown in No.5.
7	—		10040-00003: ProcessJobObject SetAttr acknowledge (📖 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
8	—		—	←	CEID 30200 event report sending request relay: ON
9	—*1	←	S6F11: NO STATE to POOLED (CEID 30200)		—
10	—		CEID 30200 event report sending request relay: OFF	→	—
11	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Changes the process job state to 'SETTING UP.' 00040-00003: ProcessJobObject SetAttr request (📖 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 1 = SETTING UP • Other attribute values are the same as shown in No.5.
12	—		10040-00003: ProcessJobObject SetAttr acknowledge (📖 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
13	—		—	←	Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRAck (VID 30511) ■Parameter examples • PRJobMilestone: 1 = PRJob Setup • PRAck: true
14	—		—	←	Reports the milestone (PRJob Setup). CEID 30243 event report sending request relay: ON
15	—*1	←	S6F11: PRJob SetUp (CEID 30243)		—
16	—		CEID 30243 event report sending request relay: OFF	→	—
17	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Loading of all wafers to the processing boat has completed, and processing (batch processing) has started. Changes the process job state to 'PROCESSING.' 00040-00003: ProcessJobObject SetAttr request (🔗 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 3 = PROCESSING • Other attribute values are the same as shown in No.5.
18	—		10040-00003: ProcessJobObject SetAttr acknowledge (🔗 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
19	—		—	←	Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRAck (VID 30511) ■Parameter examples • PRJobMilestone: 2 = PRJob Processing • PRAck: true
20	—		—	←	Reports the milestone (PRJob Processing). CEID 30244 event report sending request relay: ON
21	—*1	←	S6F11: PRJob Processing (CEID 30244)		—
22	—		CEID 30244 event report sending request relay: OFF	→	—
23	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Processing (batch processing) has completed. Changes the process job state to 'PROCESS COMPLETE.' 00040-00003: ProcessJobObject SetAttr request (🔗 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 4 = PROCESS COMPLETE • Other attribute values are the same as shown in No.5.
24	—		10040-00003: ProcessJobObject SetAttr acknowledge (🔗 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
25	—		—	←	Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRAck (VID 30511) ■Parameter examples • PRJobMilestone: 3 = PRJob Processing complete • PRAck: true
26	—		—	←	Reports the milestone (PRJob Processing complete). CEID 30245 event report sending request relay: ON
27	—*1	←	S6F11: PRJob Processing complete (CEID 30245)		—
28	—		CEID 30245 event report sending request relay: OFF	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
29	—		—	←	Collection of all wafers has completed. Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRACK (VID 30511) ■Parameter examples • PRJobMilestone: 4 = PRJob Complete • PRACK: true
30	—		—	←	Reports the milestone (PRJob Complete). CEID 30246 event report sending request relay: ON
31	— ^{*1}	←	S6F11: PRJob Complete (CEID 30246)		—
32	—		CEID 30246 event report sending request relay: OFF	→	—
33	—		Deletes a process job object, and updates 'DVVAL.'	←	Deletes a process job object. 00040-00002: ProcessJobObject delete request ( Page 316 00002: ProcessJobObject delete request) ■Parameter example • ObjID: "prj01"
34	—		10040-00002: ProcessJobObject delete acknowledge ( Page 321 00002: ProcessJobObject delete acknowledge)	→	—

^{*1} The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Normal roundtrip 2 (manual start specification)

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- Batch processing equipment
- Number of processing carriers: 1
- CarrierID/SlotMap verification: Host verification
- Process object attribute "PRProcessStart" is false (= Manual start).
- Transaction of 'S16F5: Process Job Command (START)' is user-defined.
- A carrier object of the carrier "CS001" has been created by any of the following:
 - S3F17: Bind ( Page 380 S3F17: Bind)
 - S3F17: CancelCarrierNotification ( Page 395 S3F17: CancelCarrierNotification)
 - 00087-00501: CarrierID read successful notification ( Page 220 00501: CarrierID read successful notification)
- Process job command (START) accepted

For the configuration example, refer to the following:

 Page 672 Normal roundtrip 1 (automatic start instruction)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

 Page 677 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name
					PJS
0	—	Initial condition.	—	—	No State
1	1 to 2	Check the number of process jobs that can be created.	H→E	PRGetSpace	POOLED
2	3	Create the process job.	H→E	PRJob CreateEnh	
3	4 to 10	Process job creation completes.	H←E	POOLED	
4	11 to 16	Setting up the process job (Milestone)	H←E	PRJob SetUp	SETTING UP
5	17 to 22	Loading of all wafers to the processing boat has completed, and processing (batch processing) is ready. (Milestone)	H←E	PRJob Waiting For Start	WAITING FOR START
6	23 to 31	Process job start instruction	H→E	PRJob Start Process	PROCESSING
7	32 to 35	Starting the process job (Milestone)	H←E	PRJob Processing	
8	36 to 41	Finishing the process job (Milestone)	H←E	PRJob Processing Complete	
9	42 to 45	Completing the process job (Milestone)	H←E	PRJob Complete	PROCESS COMPLETE
10	46 to 47	Delete the process job.	—	—	No State

*1 The corresponding number of usage examples of control CPU interfaces

■ Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 516 PJM Reports, Page 517 PJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Checks the number of process jobs that can be created. S16F21: PRGetSpace (📖 Page 492 S16F21: PRGetSpace)	→	—		—
2	—	←	S16F22: PRGetSpace Send (📖 Page 493 S16F22: PRGetSpace Send)		—
3	Creates a process job to be executed. S16F11: PRJobCreateEnh (📖 Page 477 S16F11: PRJobCreateEnh) ■Parameter examples • PRJOBID: "prj01" • MF: 13 • PRMtrlNameList: ("CS001", null) • PRRecipeMethod: 1 • RCPSPEC: "Recipe_1" • RecVariableList: null • PRProcessStart: False • PauseEvent: null	→	Creates a new process job object. ('DVVAL' is not updated.)		—
4	—	←	S16F12: PRJob CreateEnh Acknowledge (📖 Page 480 S16F12: PRJobCreateEnh Acknowledge)		—
5	—		10040-00901: PRJobCreateEnh service notification (📖 Page 324 00901: PRJobCreateEnh service notification) ■Parameter examples • ObjID: "prj01" • PRMtlType: 13 • PRMtrlNameList: ("CS001", null) • RecID: "Recipe_1" • PRRecipeMethod: 1 • RecVariableList: null • PRProcessStart: False • PauseEvent: null	→	—
6	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Changes the process job state to 'POOLED.' 00040-00003: ProcessJobObject SetAttr request (📖 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 0 = POOLED • Other attribute values are the same as shown in No.5.
7	—		10040-00003: ProcessJobObject SetAttr acknowledge (📖 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
8	—		—	←	CEID 30200 event report sending request relay: ON
9	—*1	←	S6F11: NO STATE to POOLED (CEID 30200)		—
10	—		CEID 30200 event report sending request relay: OFF	→	—
11	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Changes the process job state to 'SETTING UP.' 00040-00003: ProcessJobObject SetAttr request (📖 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 1 = SETTING UP • Other attribute values are the same as shown in No.5.
12	—		10040-00003: ProcessJobObject SetAttr acknowledge (📖 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
13	—		—	←	Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRAck (VID 30511) ■Parameter examples • PRJobMilestone: 1 = PRJob Setup • PRAck: true
14	—		—	←	Reports the milestone (PRJob Setup). CEID 30243 event report sending request relay: ON
15	—*1	←	S6F11: PRJob SetUp (CEID 30243)		—
16	—		CEID 30243 event report sending request relay: OFF	→	—
17	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Loading of all wafers to the processing boat has completed, and processing (batch processing) is ready. Changes the process job state to 'WAITING FOR START.' 00040-00003: ProcessJobObject SetAttr request (🔗 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 2 = WAITING FOR START • Other attribute values are the same as shown in No.5.
18	—		10040-00003: ProcessJobObject SetAttr acknowledge (🔗 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
19	—		—	←	Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRAck (VID 30511) ■Parameter examples • PRJobMilestone: 5 = PRJob Waiting for Start • PRAck: true
20	—		—	←	Reports the milestone (PRJob Waiting for Start). CEID 30247 event report sending request relay: ON
21	—*1	←	S6F11: PRJob Waiting for Start (CEID 30247)		—
22	—		CEID 30247 event report sending request relay: OFF	→	—
23	Instructs to start the process job. S16F5: Process Job Command Request (🔗 Page 469 S16F5: Process Job Command Request) ■Parameter examples • PRJOBID: "prj01" • PRCMDNAME: "START"	→	Stores the received item data in the item data storage device of S16F5 with transaction defined.		—
24	—		S16F5 reception notification relay: ON	→	Checks contents of Process Job Command Request.
25	—		—	←	S16F5 reception notification relay: OFF
26	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Changes the process job state to 'PROCESSING.' 00040-00003: ProcessJobObject SetAttr request (🔗 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 3 = PROCESSING • Other attribute values are the same as shown in No.5.
27	—		10040-00003: ProcessJobObject SetAttr acknowledge (🔗 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
28	—		—		Stores the item data to be sent in the item data storage device of S16F6 with transaction defined.
29	—		—	←	S16F6 sending request relay: ON
30	—	←	S16F6: Process Job Command Acknowledge (🔗 Page 476 S16F6: Process Job Command Acknowledge)		—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
31	—		S16F6 sending request relay: OFF	→	—
32	—		—	←	Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRACK (VID 30511) ■Parameter examples • PRJobMilestone: 2 = PRJob Processing • PRACK: true
33	—		—	←	Reports the milestone (PRJob Processing). CEID 30244 event report sending request relay: ON
34	—*1	←	S6F11: PRJob Processing (CEID 30244)		—
35	—		CEID 30244 event report sending request relay: OFF	→	—
36	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Processing (batch processing) has completed. Changes the process job state to 'PROCESS COMPLETE.' 00040-00003: ProcessJobObject SetAttr request ( Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 4 = PROCESS COMPLETE • Other attribute values are the same as shown in No.5.
37	—		10040-00003: ProcessJobObject SetAttr acknowledge ( Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
38	—		—	←	Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRACK (VID 30511) ■Parameter examples • PRJobMilestone: 3 = PRJob Processing complete • PRACK: true
39	—		—	←	Reports the milestone (PRJob Processing complete). CEID 30245 event report sending request relay: ON
40	—*1	←	S6F11: PRJob Processing complete (CEID 30245)		—
41	—		CEID 30245 event report sending request relay: OFF	→	—
42	—		—	←	Collection of all wafers has completed. Changes the following values of DVVAL: PRJobMilestone (VID 30510) and PRACK (VID 30511) ■Parameter examples • PRJobMilestone: 4 = PRJob Complete • PRACK: true
43	—		—	←	Reports the milestone (PRJob Complete). CEID 30246 event report sending request relay: ON
44	—*1	←	S6F11: PRJob Complete (CEID 30246)		—
45	—		CEID 30246 event report sending request relay: OFF	→	—
46	—		Deletes a process job object, and updates 'DVVAL.'	←	Deletes a process job object. 00040-00002: ProcessJobObject delete request ( Page 316 00002: ProcessJobObject delete request) ■Parameter example • ObjID: "prj01"
47	—		10040-00002: ProcessJobObject delete acknowledge ( Page 321 00002: ProcessJobObject delete acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Exception processing 1 (PAUSE)

The following shows the state transition satisfying the following conditions:

- Process job being processed (PROCESSING) (🔗 Page 672 Normal roundtrip 1 (automatic start instruction))
- Transaction of 'S16F5: Process Job Command (PAUSE, RESUME)' is user-defined.
- Process job command (PAUSE) accepted, paused
- Process job command (RESUME) accepted, resumed

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

🔗 Page 680 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

🔗 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name PJS
0	—	Initial condition.	—	—	PROCESSING
1	1 to 12	Pausing a process job is instructed.	H→E	PRJob Pause	PAUSING
			H←E	PRJob State Change (PROCESSING to PAUSING)	
2	13 to 17	The process job has been stopped.	H←E	PRJob State Change (PAUSING to PAUSED)	PAUSED
3	18 to 29	Resuming a process job is instructed.	H→E	PRJob Resume	PROCESSING
			H←E	PRJob State Change (PAUSED to PROCESSING)	

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

🔗 Page 516 PJM Reports, Page 517 PJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs to pause a process job. S16F5: Process Job Command Request (PAUSE) (🔗 Page 473 S16F5: PAUSE)	→	Stores the received item data in the item data storage device of S16F5 with transaction defined.		—
2	—		S16F5 reception notification relay: ON	→	Checks contents of Process Job Command Request (PAUSE).
3	—		—	←	S16F5 reception notification relay: OFF
4	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Pausing of the process job has been started. 00040-00003: ProcessJobObject SetAttr request (🔗 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 6 = PAUSING • Other attribute values are not changed.
5	—		10040-00003: ProcessJobObject SetAttr acknowledge (🔗 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
6	—		—		Stores the item data to be sent in the item data storage device of S16F6 with transaction defined.
7	—		—	←	S16F6 sending request relay: ON
8	—	←	S16F6: Process Job Command Acknowledge (🔗 Page 476 S16F6: Process Job Command Acknowledge)		—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
9	—		S16F6 sending request relay: OFF	→	—
10	—		—	←	CEID 30213 event report sending request relay: ON
11	—*1	←	S6F11: PROCESSING to PAUSING (CEID 30213)		—
12	—		CEID 30213 event report sending request relay: OFF	→	—
13	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	The process job has been stopped. 00040-00003: ProcessJobObject SetAttr request (📄 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 7 = PAUSED • Other attribute values are not changed.
14	—		10040-00003: ProcessJobObject SetAttr acknowledge (📄 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
15	—		—	←	CEID 30214 event report sending request relay: ON
16	—*1	←	S6F11: PAUSING to PAUSED (CEID 30214)		—
17	—		CEID 30214 event report sending request relay: OFF	→	—
18	Instructs to resume a process job. S16F5: ProcessJob Command Request (RESUME) (📄 Page 474 S16F5: RESUME)	→	Stores the received item data in the item data storage device of S16F5 with transaction defined.		—
19	—		S16F5 reception notification relay: ON	→	Checks contents of ProcessJob Command Request (RESUME).
20	—		—	←	S16F5 reception notification relay: OFF
21	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	The process job has been resumed. 00040-00003: ProcessJobObject SetAttr request (📄 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 3 = PROCESSING • Other attribute values are not changed.
22	—		10040-00003: ProcessJobObject SetAttr acknowledge (📄 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
23	—		—		Stores the item data to be sent in the item data storage device of S16F6 with transaction defined.
24	—		—	←	S16F6 sending request relay: ON
25	—	←	S16F6: ProcessJob Command Acknowledge (📄 Page 476 S16F6: Process Job Command Acknowledge)		—
26	—		S16F6 sending request relay: OFF	→	—
27	—		—	←	CEID 30217 event report sending request relay: ON
28	—*1	←	S6F11: PAUSE to PROCESSING (CEID 30217)		—
29	—		CEID 30217 event report sending request relay: OFF	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Exception processing 2 (STOP)

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- Batch processing equipment
- Number of processing carriers: 1
- Process job being processed (PROCESSING) (Page 634 Normal roundtrip 1 (automatic start))
- Transaction of 'S16F5: Process Job Command (STOP)' is user-defined.
- Process job command (STOP) accepted
- Equipment stops the processing at an appropriate timing for safety, and collects all processing target wafers into destination carriers.

In addition, the substrate locations (STL) are as follows:

- #1: Carrier slot (carrier substrate location)*¹
- #2: Processing part (batch location)

*¹ Exists per slot in each carrier

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

Page 682 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

Page 535 State notation

#	Corresponding No. * ¹	Comment	Communication direction H: HOST E: Equipment	Message	State model name				
					PJS	STL# 1	STL# 2	STT	STP
0	—	Initial condition.	—	—	PROCESSING	UOC	OC	AW	IP
1	1 to 12	Stopping a process job is instructed.	H→E	PRJob Stop	STOPPING				
			H←E	PRJob State Change (EXECUTING to STOPPING)					
3	13	All processing target wafers have been collected into the collection destination.	H←E	PROCESSING COMPLETE		OC	UOC	AD	PC
			H←E	OCCUPIED (STL#1)					
			H←E	AT DESTINATION					
			H←E	UNOCCUPIED (STL#2)					
4	14 to 18	The process job has been stopped.	H←E	PRJob State Change (STOPPING to STOPPED)	STOPPED				

*¹ The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

Page 516 PJM Reports, Page 517 PJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs to stop a process job. S16F5: Process Job Command Request (STOP) (Page 471 S16F5: STOP)	→	Stores the received item data in the item data storage device of S16F5 with transaction defined.		—
2	—		S16F5 reception notification relay: ON	→	Checks contents of Process Job Command Request (STOP).
3	—		—	←	S16F5 reception notification relay: OFF

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
4	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Pausing of the process job has been started. 00040-00003: ProcessJobObject SetAttr request (Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 8 = STOPPING • Other attribute values are not changed.
5	—		10040-00003: ProcessJobObject SetAttr acknowledge (Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
6	—		—		Stores the item data to be sent in the item data storage device of S16F6 with transaction defined.
7	—		—	←	S16F6 sending request relay: ON
8	—	←	S16F6: Process Job Command Acknowledge (Page 476 S16F6: Process Job Command Acknowledge)		—
9	—		S16F6 sending request relay: OFF	→	—
10	—		—	←	CEID 30224 event report sending request relay: ON
11	—*1	←	S6F11: EXECUTING to STOPPING (CEID 30224)		—
12	—		CEID 30224 event report sending request relay: OFF	→	—
13	Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		Refer to descriptions for this No. in the 'Control CPU (controlled by user program)' column.		The processing is stopped at an appropriate timing for safety, and all processing target wafers are collected into destination carriers. Descriptions of usage examples related to the substrate tracking are omitted in this table. For usage examples, refer to No.45 to 61 in the following: Page 697 Usage examples of control CPU interfaces
14	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	The process job has been stopped. 00040-00003: ProcessJobObject SetAttr request (Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 10 = STOPPED • Other attribute values are not changed.
15	—		10040-00003: ProcessJobObject SetAttr acknowledge (Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
16	—		—	←	CEID 30240 event report sending request relay: ON
17	—*1	←	S6F11: STOPPING to STOPPED (CEID 30240)		—
18	—		CEID 30240 event report sending request relay: OFF	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Exception processing 3 (ABORT)

The following shows the state transition satisfying the following conditions:

- Internal buffer manufacturing equipment
- Batch processing equipment
- Number of processing carriers: 1
- Process job being processed (PROCESSING) (🔗 Page 634 Normal roundtrip 1 (automatic start))
- Transaction of 'S16F5: Process Job Command (ABORT)' is user-defined.
- Process job command (ABORT) accepted
- Equipment stops the processing unconditionally, and collection of wafers is not guaranteed.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

🔗 Page 684 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

🔗 Page 535 State notation

#	Corresponding No. *1	Comment	Communication direction H: HOST E: Equipment	Message	State model name
					PJS
0	—	Initial condition.	—	—	PROCESSING
1	1 to 12	Aborting a process job is instructed.	H→E	PRJob Abort	ABORTING
			H←E	PRJob State Change (EXECUTING to ABORTING)	
2	13 to 17	The process job has been aborted.	H←E	PRJob State Change (ABORTING to ABORTED)	ABORTED

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

🔗 Page 516 PJM Reports, Page 517 PJM Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs to abort a process job. S16F5: Process Job Command Request (ABORT) (🔗 Page 470 S16F5: ABORT)	→	Stores the received item data in the item data storage device of S16F5 with transaction defined.		—
2	—		S16F5 reception notification relay: ON	→	Checks contents of Process Job Command Request (ABORT).
3	—		—	←	S16F5 reception notification relay: OFF
4	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	Pausing of the process job has been started. 00040-00003: ProcessJobObject SetAttr request (🔗 Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 9 = ABORTING • Other attribute values are not changed.
5	—		10040-00003: ProcessJobObject SetAttr acknowledge (🔗 Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
6	—		—		Stores the item data to be sent in the item data storage device of S16F6 with transaction defined.
7	—		—	←	S16F6 sending request relay: ON
8	—	←	S16F6: Process Job Command Acknowledge (🔗 Page 476 S16F6: Process Job Command Acknowledge)		—
9	—		S16F6 sending request relay: OFF	→	—

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
10	—		—	←	CEID 30231 event report sending request relay: ON
11	—*1	←	S6F11: EXECUTING to ABORTING (CEID 30231)		—
12	—		CEID 30231 event report sending request relay: OFF	→	—
13	—		Sets all attribute values of a process job object, and updates 'DVVAL.'	←	The process job has been aborted. 00040-00003: ProcessJobObject SetAttr request ( Page 317 00003: ProcessJobObject SetAttr request) ■Parameter examples • PRJobState: 11 = ABORTED • Other attribute values are not changed.
14	—		10040-00003: ProcessJobObject SetAttr acknowledge ( Page 322 00003: ProcessJobObject SetAttr acknowledge)	→	—
15	—		—	←	CEID 30239 event report sending request relay: ON
16	—*1	←	S6F11: ABORTING to ABORTED (CEID 30239)		—
17	—		CEID 30239 event report sending request relay: OFF	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

E90-STS compliance

The following table shows the E90-STS compliant use cases.

These use cases refer to the use cases described in "R1-2 Example of Substrate Object State Model for Simple Equipment" of SEMI E90-0312.

Title	Reference
Equipment Substrate Location Object and Batch Location Object Creation	 Page 687 Equipment substrate location object and batch location object creation
Normal Roundtrip 1 (Single-Wafer Processing Equipment)	 Page 688 Normal roundtrip 1 (single-wafer processing equipment)
Normal Roundtrip 2 (Batch Processing Equipment)	 Page 695 Normal roundtrip 2 (batch processing equipment)
Host-Initiated Substrate Object Creation	 Page 703 Host-initiated substrate object creation
Host-Initiated Substrate Object Deletion	 Page 705 Host-initiated substrate object deletion
Disable Substrate Location State Transition Event Report by Host	 Page 707 Disable substrate location state transition event report by host

Equipment substrate location object and batch location object creation

The following shows the state transition satisfying the following conditions:

- Equipment substrate location setting: Set (Configure the setting in a setting tool, and transfer the data to a module.)
- Batch location setting: Set (Configure the setting in a setting tool, and transfer the data to a module.)

■Equipment substrate location setting example

☞ Page 31 Substrate location

■Batch location setting example

☞ Page 32 Batch location

In addition, the substrate locations (STL) are as follows:

- #1: Equipment substrate location (such as the location in which a transfer arm is installed)
- #2: Batch location (such as the processing part)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

☞ Page 687 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

☞ Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name	
					STL#1	STL#2
0	—	Initial condition.	—	—	No State	No State
1	1 to 2	Equipment substrate location object has been created.	—	—	UOC	UOC
		Batch location object has been created.	—	—		

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

☞ Page 519 STS Reports, Page 520 STS Events

No.	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Creates new instances of substrate location object specific to equipment and batch location object, and updates each 'DVVAL.'	←	Instructs the initialization of GEM300 standard support functions. 00000-00001: GEM300 Initial request (☞ Page 161 00001: GEM300 Initial request)
2	—		10000-00001: GEM300 Initial acknowledge (☞ Page 163 00001: GEM300 Initial acknowledge)	→	—

Normal roundtrip 1 (single-wafer processing equipment)

The following shows the state transition satisfying the following conditions:

- Carrier ID verification: completed
- Slot map reader: Available
- Slot map verification by equipment: Success
- Substrate object creation: Not completed (Creation is completed by equipment in this scenario.)
(Example) ObjID = "Subst_1" to "Subst_25" (SubstID specified by the host)
- Carrier substrate location object 'STL#1' creation: Not completed (Creation is completed by equipment in this scenario.)
(Example) ObjID = "CarrierA.01" to "CarrierA.25"
- Equipment substrate location object 'STL#2' creation: Completed (by equipment)
(Example) ObjID = "ProcessChamber"
- 'DisableEvents' of each substrate location: false (= notifying events)

In addition, the substrate locations (STL) are as follows:

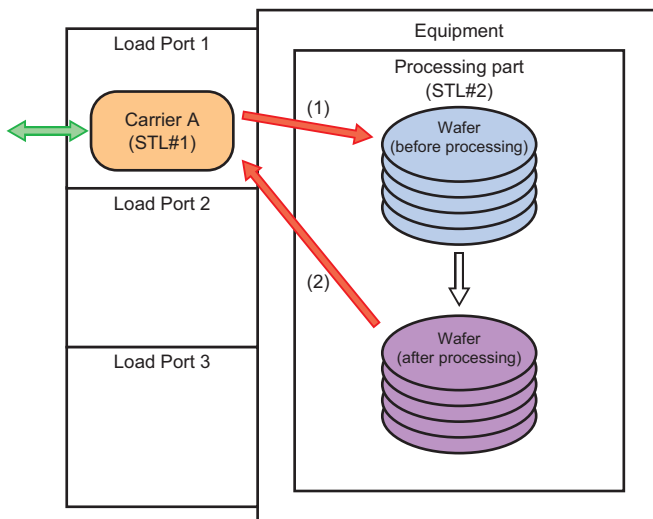
- #1: Carrier slot (carrier substrate location)^{*1}
- #2: Processing part (equipment substrate location)

^{*1} Exists per slot in each carrier

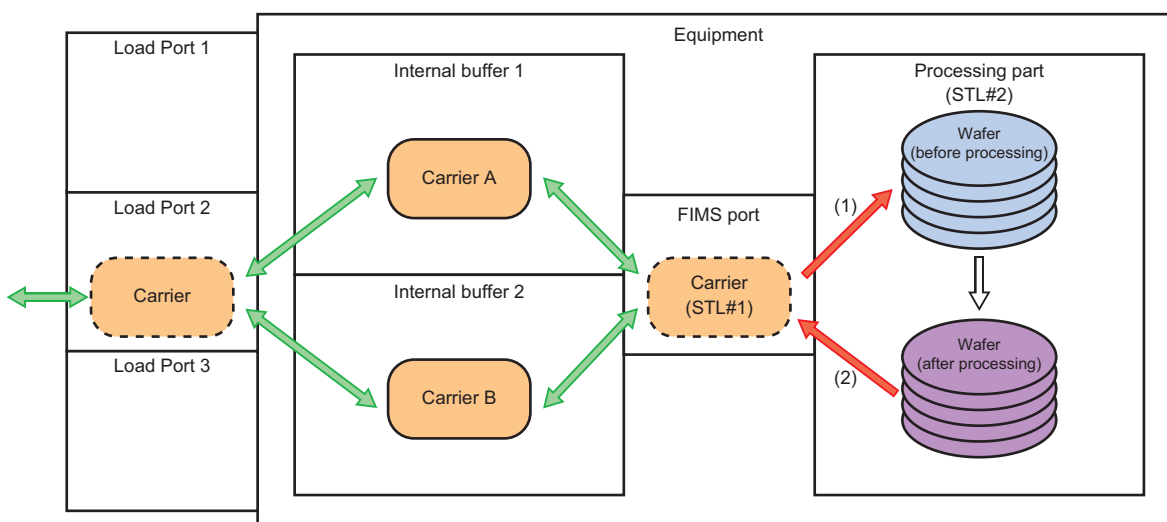
The following configuration examples of semiconductor manufacturing equipment are referred to in this use case.

→ : Carrier movement, → : Wafer movement

- Fixed buffer manufacturing equipment



- Internal buffer manufacturing equipment



■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 690 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name			
					STL#1	STL#2	STT	STP
0	—	Initial condition.	—	—	No State	UOC	No State	No State
1	1 to 2 repeated	Carrier substrate location object (STL#1) per carrier slot is created.	—	—	UOC		No State	No State
2	3 to 15 repeated	Substrate object is created for each wafer in carrier.	H←E	AT SOURCE	OC		AS	NP
			H←E	NEEDS PROCESSING				
			H←E	OCCUPIED				
3	16 to 32	Wafers to be processed have been collected from carrier slot (STL#1) into processing part (STL#2).	H←E	UNOCCUPIED (STL#1)	UOC	OC	AW	
			H←E	AT WORK				
			H←E	OCCUPIED (STL#2)				
4	33 to 37	Wafer processing has started.	H←E	IN PROCESS				IP
5	38 to 42	Wafer processing has completed.	H←E	PROCESSED				PC
6	43 to 59	Processed wafers have been collected from processing part (STL#2) into carrier slot (STL#1).	H←E	UNOCCUPIED (STL#2)	OC	UOC	AD	
			H←E	OCCUPIED (STL#1)				
			H←E	AT DESTINATION				
7	16 to 59 repeated	All wafer processing has completed.	—	—				
8	—	Carrier has been unloaded.	—	—				
9	60 to 64 repeated	Substrate object of each wafer in carrier is deleted.	H←E	NO STATE				
10	65 to 66 repeated	Carrier substrate location object (STL#1) per carrier slot is deleted.	—	—	No State		No State	No State

*1 The corresponding number of usage examples of control CPU interfaces

■ Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 519 STS Reports, Page 520 STS Events

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Creates a new instance of substrate location object in a carrier, and updates 'DVVAL.'	←	Specifies the initial state of carrier slot (substrate location object in a carrier) STL#1. 00090-00011: CarrierSubstLocObject create request (📖 Page 337 00011: CarrierSubstLocObject create request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "CarrierA.■" ² • SubstID: Blank • SubstLocState: 0 = UNOCCUPIED • DisableEvents: 0 = false
2	—		10090-00011: CarrierSubstLocObject create acknowledge (📖 Page 348 00011 : CarrierSubstLocObject create acknowledge)	→	—
3	—		Generates an instance of substrate object, and updates 'DVVAL.'	←	Specifies the initial state of a substrate object. 00090-00001: SubstrateObject create request (📖 Page 330 00001: SubstrateObject create request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 0 = AT SOURCE • SubstProcState: 0 = NEEDS PROCESSING • SubstLocID: "CarrierA.■" ² • SubstHistory: Arrival (existence confirmation) time at "CarrierA.■" ² added
4	—		10090-00001: SubstrateObject create acknowledge (📖 Page 344 00001: SubstrateObject create acknowledge)	→	—
5	—		—	←	CEID 30059 event report sending request relay: ON
6	— ^{*1}	←	S6F11: NO STATE to AT SOURCE (CEID 30059)		—
7	—		CEID 30059 event report sending request relay: OFF	→	—
8	—		—	←	CEID 30068 event report sending request relay: ON
9	— ^{*1}	←	S6F11: NO STATE to NEEDS PROCESSING (CEID 30068)		—
10	—		CEID 30068 event report sending request relay: OFF	→	—
11	—		Updates 'DVVAL.'	←	Registers 'SubstID' to the carrier slot (substrate location object in a carrier) STL#1, and changes 'SubstLocState' to 'OCCUPIED.' 00090-00013: SubstLocObject SetAttr request (📖 Page 339 00013: SubstLocObject SetAttr request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "CarrierA.■" ² • SubstID: "Subst_■" • SubstLocState: 1 = OCCUPIED • DisableEvents: 0 = false
12	—		10090-00013: SubstLocObject SetAttr acknowledge (📖 Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
13	—		—	←	CEID 30085 event report sending request relay: ON
14	— ^{*1}	←	S6F11: UNOCCUPIED to OCCUPIED (CEID 30085) (STL#1)		—
15	—		CEID 30085 event report sending request relay: OFF	→	—

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
16	—		Updates 'DVVAL.'	←	Empties 'SubstID' of the carrier slot (substrate location object in a carrier) STL#1, and changes 'SubstLocState' to 'UNOCCUPIED.' 00090-00013: SubstLocObject SetAttr request (🔗 Page 339 00013: SubstLocObject SetAttr request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "CarrierA.■"*2 • SubstID: Blank • SubstLocState: 0 = UNOCCUPIED • DisableEvents: 0 = false
17	—		10090-00013: SubstLocObject SetAttr acknowledge (🔗 Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
18	—		—	←	CEID 30086 event sending request relay: ON
19	—*1	←	S6F11: OCCUPIED to UNOCCUPIED (CEID 30086) (STL#1)		—
20	—		CEID 30086 event sending request relay: OFF	→	—
21	—		Updates 'DVVAL.'	←	Registers a history of the departure from STL#1 to 'SubstHistory' of a substrate object, and changes the substrate transport status (STT) to 'AT WORK.' 00090-00003: SubstrateObject SetAttr request (🔗 Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 0 = NEEDS PROCESSING • SubstLocID: "CarrierA.■"*2 • SubstHistory: Departure time from "CarrierA.■"*2 added
22	—		10090-00003: SubstrateObject SetAttr acknowledge (🔗 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
23	—		—	←	CEID 30060 event sending request relay: ON
24	—*1	←	S6F11: AT SOURCE to AT WORK (CEID 30060)		—
25	—		CEID 30060 event sending request relay: OFF	→	—
26	—		Updates 'DVVAL.'	←	Registers 'SubstID' to the processing part (equipment substrate location object) STL#2, and changes 'SubstLocState' to 'OCCUPIED.' 00090-00013: SubstLocObject SetAttr request (🔗 Page 339 00013: SubstLocObject SetAttr request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "ProcessChamber"*3 • SubstID: "Subst_■" • SubstLocState: 1 = OCCUPIED • DisableEvents: 0 = false
27	—		10090-00013: SubstLocObject SetAttr acknowledge (🔗 Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
28	—		—	←	CEID 30085 event report sending request relay: ON
29	—*1	←	S6F11: UNOCCUPIED to OCCUPIED (CEID 30085) (STL#2)		—
30	—		CEID 30085 event report sending request relay: OFF	→	—

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
31	—		Updates 'DVVAL.'	←	Changes 'SubstLocID' of a substrate object to 'STL#2,' and registers a history of the arrival at STL#2 to 'SubstHistory.' 00090-00003: SubstrateObject SetAttr request (🔗 Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 0 = NEEDS PROCESSING • SubstLocID: "ProcessChamber" ³ • SubstHistory: Arrival time at "ProcessChamber" ³ added
32	—		10090-00003: SubstrateObject SetAttr acknowledge (🔗 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
33	—		Updates 'DVVAL.'	←	Changes the substrate processing status (STP) of a substrate object to 'IN PROCESS.' 00090-00003: SubstrateObject SetAttr request (🔗 Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 1 = IN PROCESS • SubstLocID: "ProcessChamber" ³ • SubstHistory: No addition
34	—		10090-00003: SubstrateObject SetAttr acknowledge (🔗 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
35	—		—	←	CEID 30069 event sending request relay: ON
36	— ^{*1}	←	S6F11: NEEDS PROCESSING to IN PROCESS (CEID 30069)		—
37	—		CEID 30069 event sending request relay: OFF	→	—
38	—		Updates 'DVVAL.'	←	Changes the substrate processing status (STP) of a substrate object to 'PROCESSED.' 00090-00003: SubstrateObject SetAttr request (🔗 Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 2 = PROCESSED • SubstLocID: "ProcessChamber" ³ • SubstHistory: No addition
39	—		10090-00003: SubstrateObject SetAttr acknowledge (🔗 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
40	—		—	←	CEID 30070 event sending request relay: ON
41	— ^{*1}	←	S6F11: IN PROCESS to PROCESSED (CEID 30070)		—
42	—		CEID 30070 event sending request relay: OFF	→	—
43	—		Updates 'DVVAL.'	←	Empties 'SubstID' of the processing part (equipment substrate location object) STL#2, and changes 'SubstLocState' to 'UNOCCUPIED.' 00090-00013: SubstLocObject SetAttr request (🔗 Page 339 00013: SubstLocObject SetAttr request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "ProcessChamber" ³ • SubstID: Blank • SubstLocState: 0 = UNOCCUPIED • DisableEvents: 0 = false

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
44	—		10090-00013: SubstLocObject SetAttr acknowledge ( Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
45	—		—	←	CEID 30086 event sending request relay: ON
46	—*1	←	S6F11: OCCUPIED to UNOCCUPIED (CEID 30086) (STL#2)		—
47	—		CEID 30086 event sending request relay: OFF	→	—
48	—		Updates 'DVVAL.'	←	Registers a history of the departure from STL#2 to 'SubstHistory' of a substrate object. 00090-00003: SubstrateObject SetAttr request ( Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 2 = PROCESSED • SubstLocID: "ProcessChamber"*3 • SubstHistory: Departure time from "ProcessChamber"*3 added
49	—		10090-00003: SubstrateObject SetAttr acknowledge ( Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
50	—		Updates 'DVVAL.'	←	Registers 'SubstID' to the carrier slot (substrate location object in a carrier) STL#1, and changes 'SubstLocState' to 'OCCUPIED.' 00090-00013: SubstLocObject SetAttr request ( Page 339 00013: SubstLocObject SetAttr request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "CarrierA.■"*2 • SubstID: "Subst_■" • SubstLocState: 1 = OCCUPIED • DisableEvents: 0 = false
51	—		10090-00013: SubstLocObject SetAttr acknowledge ( Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
52	—		—	←	CEID 30085 event sending request relay: ON
53	—*1	←	S6F11: UNOCCUPIED to OCCUPIED (CEID 30085) (STL#1)		—
54	—		CEID 30085 event sending request relay: OFF	→	—
55	—		Updates 'DVVAL.'	←	Changes 'SubstLocID' of a substrate object to STL#1, registers a history of the arrival at STL#1 to 'SubstHistory,' and changes the substrate transport status (STT) to 'AT DESTINATION.' 00090-00003: SubstrateObject SetAttr request ( Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 2 = AT DESTINATION • SubstProcState: 2 = PROCESSED • SubstLocID: "CarrierA.■"*2 • SubstHistory: Arrival time at "CarrierA.■"*2 added
56	—		10090-00003: SubstrateObject SetAttr acknowledge ( Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
57	—		—	←	CEID 30063 event sending request relay: ON
58	—*1	←	S6F11: AT WORK to AT DESTINATION (CEID 30063)		—
59	—		CEID 30063 event sending request relay: OFF	→	—

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
60	—		Deletes an instance of substrate object, and updates 'DVVAL.'	←	Deletes a substrate object. 00090-00002: SubstrateObject delete request ( Page 333 00002: SubstrateObject delete request) ■Parameter example • ObjID: "Subst_■"
61	—		10090-00002: SubstrateObject delete acknowledge ( Page 345 00002: SubstrateObject delete acknowledge)	→	—
62	—		—	←	CEID 30065 event sending request relay: ON
63	— ^{*1}	←	S6F11: AT DESTINATION to NO STATE (CEID 30065)		—
64	—		CEID 30065 event sending request relay: OFF	→	—
65	—		Deletes an instance of substrate location object in a carrier, and updates 'DVVAL.'	←	Deletes a substrate location object in a carrier. 00090-00012: CarrierSubstLocObject delete request ( Page 338 00012: CarrierSubstLocObject delete request) ■Parameter example • ObjID: "CarrierA.■" ^{*2}
66	—		10090-00012: CarrierSubstLocObject delete acknowledge ( Page 349 00012: CarrierSubstLocObject delete acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

*2 STL#1

*3 STL#2

Normal roundtrip 2 (batch processing equipment)

The following shows the state transition satisfying the following conditions:

- Carrier ID verification: completed
- Slot map reader: Available
- Slot map verification by equipment: Success
- Substrate object creation: Not completed (Creation is completed by equipment in this scenario.)
(Example) ObjID = "Subst_1" to "Subst_50" (SubstID specified by the host)
- Carrier substrate location object 'STL#1' creation: Not completed (Creation is completed by equipment in this scenario.)
(Example) ObjID = "CarrierA.01" to "CarrierA.25," "CarrierB.01" to "CarrierB.25"
- Batch location object 'STL#2' creation: Completed (by equipment)
(Example) ObjID = "BatchC"
- 'DisableEvents' of each substrate location and batch location: false (= notifying events)

In addition, the substrate locations (STL) are as follows:

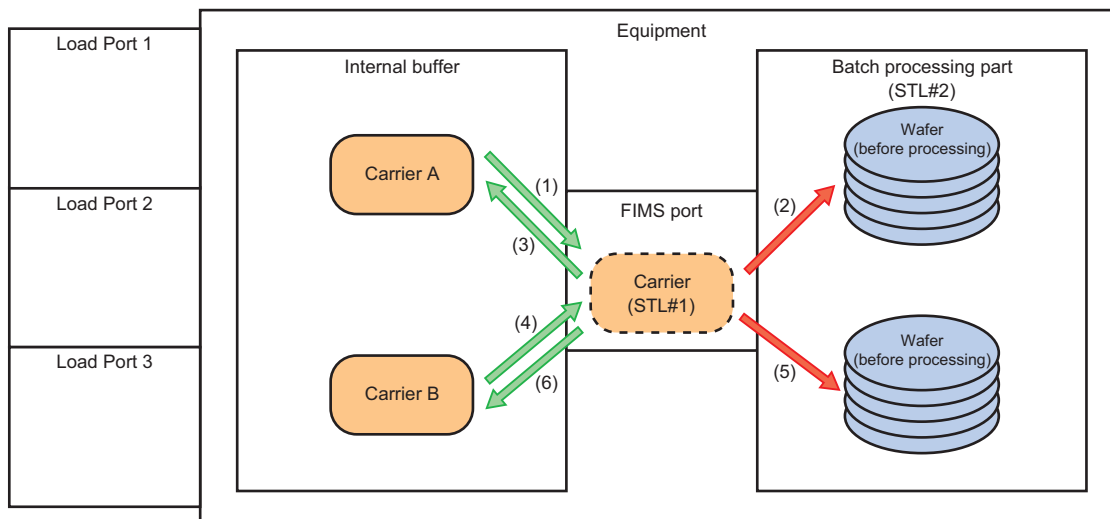
- #1: Carrier slot (carrier substrate location)*¹
- #2: Processing part (batch location)

*¹ Exists per slot in each carrier

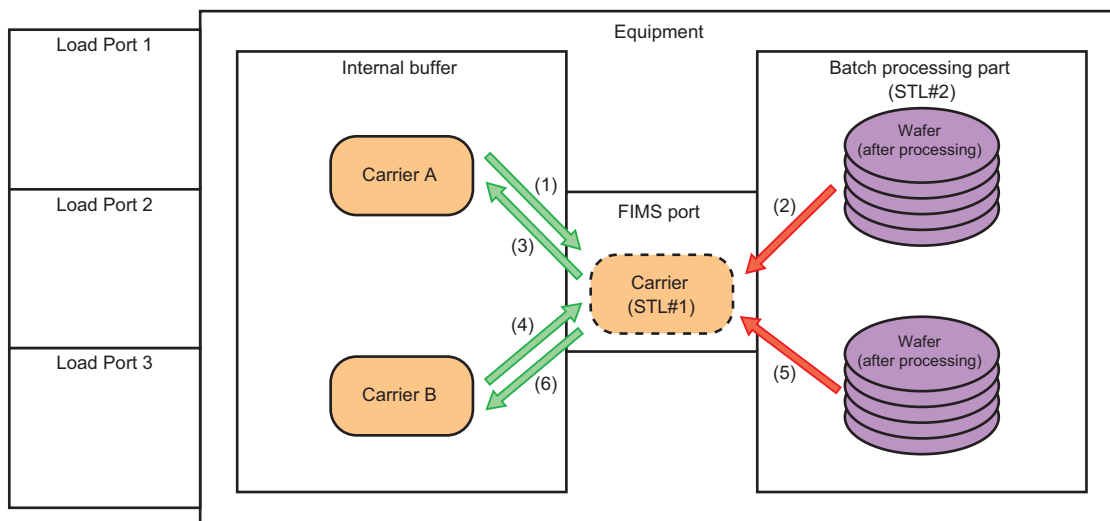
The following configuration examples of semiconductor manufacturing equipment are referred to in this use case.

➡ : Carrier movement, ➡ : Wafer movement

- Before batch processing (Import of wafers into the batch processing part)



- After batch processing (Collection of wafers into carriers)



■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

☞ Page 697 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

☞ Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name					
					STL#1	STL#2	STT	STP		
0	—	Initial condition.	—	—	No State	UOC	No State	No State		
1	1 to 2 repeated	Carrier substrate location object (STL#1) per carrier slot is created.	—	—	UOC					
2	3 to 15 repeated	Substrate object is created for each wafer in carrier.	H←E	AT SOURCE	OC		AS	NP		
			H←E	NEEDS PROCESSING						
			H←E	OCCPIED (STL#1)						
3	16 to 29 repeated	Wafers have been collected from carrier slot (STL#1) into batch processing part (STL#2).	H←E	UNOCCPIED (STL#1)	UOC		AW			
			H←E	AT WORK						
4	1 to 29 repeated	No.1 to 3 are repeated per carrier that comprises batch.	—	—						
5	30 to 34	Moving of all wafers that comprise batch has completed.	H←E	OCCUPIED (STL#2)		OC				
6	35 to 39 repeated	Batch processing has started.	H←E	OCCUPIED (STL#2)						IP
7	40 to 44 repeated	Batch processing has completed.	H←E	PROCESSED						PC
8	45 to 56 repeated	Processed wafers have been collected from batch processing part (STL#2) into carrier slot (STL#1).	H←E	OCCUPIED (STL#1)					OC	AD
			H←E	AT DESTINATION						
9	57 to 61	Collection of all wafers that comprise batch has completed.	H←E	UNOCCUPIED (STL#2)	UOC					
10	—	Carrier has been unloaded.	—	—						
11	62 to 66	Substrate object of each wafer in carrier is deleted.	H←E	NO STATE					No State	No State
12	67 to 68	Carrier substrate location object (STL#1) per carrier slot is deleted.	—	—				No State		
13	62 to 68 repeated	No.10 to 12 are repeated per carrier that comprises batch.	—	—						

*1 The corresponding number of usage examples of control CPU interfaces

■ Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 519 STS Reports, Page 520 STS Events

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	—		Creates a new instance of substrate location object in a carrier, and updates 'DVVAL.'	←	Specifies the initial state of carrier slot (substrate location object in a carrier) STL#1. 00090-00011: CarrierSubstLocObject create request (📖 Page 337 00011: CarrierSubstLocObject create request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "Carrier■.■" ² • SubstID: Blank • SubstLocState: 0 = UNOCCUPIED • DisableEvents: 0 = false
2	—		10090-00011: CarrierSubstLocObject create acknowledge (📖 Page 348 00011 : CarrierSubstLocObject create acknowledge)	→	—
3	—		Generates an instance of substrate object, and updates 'DVVAL.'	←	Specifies the initial state of a substrate object. 00090-00001: SubstrateObject create request (📖 Page 330 00001: SubstrateObject create request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 0 = AT SOURCE • SubstProcState: 0 = NEEDS PROCESSING • SubstLocID: "Carrier■.■" ² • BatchLocID: Blank ³ • SubstPosInBatch: Blank ³ • SubstHistory: Arrival (existence confirmation) time at "Carrier■.■" ² added
4	—		10090-00001: SubstrateObject create acknowledge (📖 Page 344 00001: SubstrateObject create acknowledge)	→	—
5	—		—	←	CEID 30059 event report sending request relay: ON
6	— ^{*1}	←	S6F11: NO STATE to AT SOURCE (CEID 30059)		—
7	—		CEID 30059 event report sending request relay: OFF	→	—
8	—		—	←	CEID 30068 event report sending request relay: ON
9	— ^{*1}	←	S6F11: NO STATE to NEEDS PROCESSING (CEID 30068)		—
10	—		CEID 30068 event report sending request relay: OFF	→	—
11	—		Updates 'DVVAL.'	←	Registers 'SubstID' to the carrier slot (substrate location object in a carrier) STL#1, and changes 'SubstLocState' to 'OCCUPIED.' 00090-00013: SubstLocObject SetAttr request (📖 Page 339 00013: SubstLocObject SetAttr request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "Carrier■.■" ² • SubstID: "Subst_■" • SubstLocState: 1 = OCCUPIED • DisableEvents: 0 = false
12	—		10090-00013: SubstLocObject SetAttr acknowledge (📖 Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
13	—		—	←	CEID 30085 event report sending request relay: ON
14	— ^{*1}	←	S6F11: UNOCCUPIED to OCCUPIED (CEID 30085) (STL#1)		—
15	—		CEID 30085 event report sending request relay: OFF	→	—

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No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
16	—		Updates 'DVVAL.'	←	Empties 'SubstID' of the carrier slot (substrate location object in a carrier) STL#1, and changes 'SubstLocState' to 'UNOCCUPIED.' 00090-00013: SubstLocObject SetAttr request (📄 Page 339 00013: SubstLocObject SetAttr request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "Carrier■.■" ² • SubstID: Blank • SubstLocState: 0 = UNOCCUPIED • DisableEvents: 0 = false
17	—		10090-00013: SubstLocObject SetAttr acknowledge (📄 Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
18	—		—	←	CEID 30086 event sending request relay: ON
19	— ^{*1}	←	S6F11: OCCUPIED to UNOCCUPIED (CEID 30086) (STL#1)		—
20	—		CEID 30086 event sending request relay: OFF	→	—
21	—		Updates 'DVVAL.'	←	Registers a history of the departure from STL#1 to 'SubstHistory' of a substrate object and changes the substrate transport status (STT) to 'AT WORK.' 00090-00003: SubstrateObject SetAttr request (📄 Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 0 = NEEDS PROCESSING • SubstLocID: "Carrier■.■" ² • BatchLocID: Blank ³ • SubstPosInBatch: Blank ³ • SubstHistory: Departure time from "Carrier■.■" ² added
22	—		10090-00003: SubstrateObject SetAttr acknowledge (📄 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
23	—		—	←	CEID 30060 event sending request relay: ON
24	— ^{*1}	←	S6F11: AT SOURCE to AT WORK (CEID 30060)		—
25	—		CEID 30060 event sending request relay: OFF	→	—
26	—		Updates 'DVVAL.'	←	Registers a wafer that has arrived at 'BatchSubstIDMap' of the batch processing part (batch location object) STL#2. 00090-00023: BatchLocObject SetAttr request (📄 Page 342 00023: BatchLocObject SetAttr request) ■Parameter examples • ObjType: "BatchLoc" • ObjID: "BatchC" ³ • BatchSubstIDMap[■].SubstID: "Subst_■" • BatchLocState: 0 = UNOCCUPIED • DisableEvents: 0 = false
27	—		10090-00023: BatchLocObject SetAttr acknowledge (📄 Page 352 00023: BatchLocObject SetAttr acknowledge)	→	—

No	HOST	↔ SECS/GEM communication software	↔ Control CPU (controlled by user program)
28	—	Updates 'DVVAL.'	← Changes 'SubstLocID' of a substrate object, and registers a history of the arrival at STL#2 to 'SubstHistory.' 00090-00003: SubstrateObject SetAttr request (Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 0 = NEEDS PROCESSING • SubstLocID: Blank ^{*2} • BatchLocID: "BatchC" ^{*3} • SubstPosInBatch: "■" ^{*3} • SubstHistory: Arrival time at "BatchC.■" ^{*3} added
29	—	10090-00003: SubstrateObject SetAttr acknowledge (Page 346 00003: SubstrateObject SetAttr acknowledge)	→ —
30	—	Updates 'DVVAL.'	← Changes 'BatchLocState' of the batch processing part (batch location object) STL#2 to 'OCCUPIED.' 00090-00023: BatchLocObject SetAttr request (Page 342 00023: BatchLocObject SetAttr request) ■Parameter examples • ObjType: "BatchLoc" • ObjID: "BatchC" ^{*3} • BatchSubstIDMap[■].SubstID: "Subst_■" • BatchLocState: 1 = OCCUPIED • DisableEvents: 0 = false
31	—	10090-00023: BatchLocObject SetAttr acknowledge (Page 352 00023: BatchLocObject SetAttr acknowledge)	→ —
32	—	—	← CEID 30085 event report sending request relay: ON
33	— ^{*1}	← S6F11: UNOCCUPIED to OCCUPIED (CEID 30085) (STL#2)	—
34	—	CEID 30085 event report sending request relay: OFF	→ —
35	—	Updates 'DVVAL.'	← Changes the substrate processing status (STP) of a substrate object to 'IN PROCESS.' 00090-00003: SubstrateObject SetAttr request (Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 1 = IN PROCESS • SubstLocID: Blank ^{*2} • BatchLocID: "BatchC" ^{*3} • SubstPosInBatch: "■" ^{*3} • SubstHistory: No addition
36	—	10090-00003: SubstrateObject SetAttr acknowledge (Page 346 00003: SubstrateObject SetAttr acknowledge)	→ —
37	—	—	← CEID 30069 event sending request relay: ON
38	— ^{*1}	← S6F11: NEEDS PROCESSING to IN PROCESS (CEID 30069)	—
39	—	CEID 30069 event sending request relay: OFF	→ —

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
40	—		Updates 'DVVAL.'	←	Changes the substrate processing status (STP) of a substrate object to 'PROCESSED.' 00090-00003: SubstrateObject SetAttr request ( Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 2 = PROCESSED • SubstLocID: Blank* ² • BatchLocID: "BatchC"* ³ • SubstPosInBatch: "■"* ³ • SubstHistory: No addition
41	—		10090-00003: SubstrateObject SetAttr acknowledge ( Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
42	—		—	←	CEID 30070 event sending request relay: ON
43	—* ¹	←	S6F11: IN PROCESS to PROCESSED (CEID 30070)		—
44	—		CEID 30070 event sending request relay: OFF	→	—
45	—		Updates 'DVVAL.'	←	Registers a history of the departure from STL#2 to 'SubstHistory' of a substrate object. 00090-00003: SubstrateObject SetAttr request ( Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 1 = AT WORK • SubstProcState: 2 = PROCESSED • SubstLocID: Blank* ² • BatchLocID: "BatchC"* ³ • SubstPosInBatch: "■"* ³ • SubstHistory: Departure time from "BatchC.■"* ³ added
46	—		10090-00003: SubstrateObject SetAttr acknowledge ( Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
47	—		Updates 'DVVAL.'	←	Registers 'SubstID' to the carrier slot (substrate location object in a carrier) STL#1, and changes 'SubstLocState' to 'OCCUPIED.' 00090-00013: SubstLocObject SetAttr request ( Page 339 00013: SubstLocObject SetAttr request) ■Parameter examples • ObjType: "SubstLoc" • ObjID: "Carrier■.■"* ² • SubstID: "Subst_■" • SubstLocState: 1 = OCCUPIED • DisableEvents: 0 = false
48	—		10090-00013: SubstLocObject SetAttr acknowledge ( Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
49	—		—	←	CEID 30085 event sending request relay: ON
50	—* ¹	←	S6F11: UNOCCUPIED to OCCUPIED (CEID 30085) (STL#1)		—
51	—		CEID 30085 event sending request relay: OFF	→	—

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
52	—		Updates 'DVVAL.'	←	Changes 'SubstLocID' of a substrate object, registers a history of the arrival at STL#1 to 'SubstHistory,' and changes the substrate transport status (STT) to 'AT DESTINATION.' 00090-00003: SubstrateObject SetAttr request (🔗 Page 334 00003: SubstrateObject SetAttr request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 2 = AT DESTINATION • SubstProcState: 2 = PROCESSED • SubstLocID: "Carrier■.■"*2 • BatchLocID: Blank*3 • SubstPosInBatch: Blank*3 • SubstHistory: Arrival time at "Carrier■.■"*2 added
53	—		10090-00003: SubstrateObject SetAttr acknowledge (🔗 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
54	—		—	←	CEID 30063 event sending request relay: ON
55	—*1	←	S6F11: AT WORK to AT DESTINATION (CEID 30063)		—
56	—		CEID 30063 event sending request relay: ON	→	—
57	—		Updates 'DVVAL.'	←	Empties 'BatchSubstIDMap' of the batch processing part (batch location object) STL#2, and changes 'BatchLocState' to 'UNOCCUPIED.' 00090-00023: BatchLocObject SetAttr request (🔗 Page 342 00023: BatchLocObject SetAttr request) ■Parameter examples • ObjType: "BatchLoc" • ObjID: "BatchC"*3 • BatchSubstIDMap: Blank • BatchLocState: 0 = UNOCCUPIED • DisableEvents: 0 = false
58	—		10090-00023: BatchLocObject SetAttr acknowledge (🔗 Page 352 00023: BatchLocObject SetAttr acknowledge)	→	—
59	—		—	←	CEID 30086 event sending request relay: ON
60	—*1	←	S6F11: OCCUPIED to UNOCCUPIED (CEID 30086) (STL#2)		—
61	—		CEID 30086 event sending request relay: OFF	→	—
62	—		Deletes an instance of substrate object, and updates 'DVVAL.'	←	Deletes a substrate object. 00090-00002: SubstrateObject delete request (🔗 Page 333 00002: SubstrateObject delete request) ■Parameter example • ObjID: "Subst_■"
63	—		10090-00002: SubstrateObject delete acknowledge (🔗 Page 345 00002: SubstrateObject delete acknowledge)	→	—
64	—		—	←	CEID 30065 event sending request relay: ON
65	—*1	←	S6F11: AT DESTINATION to NO STATE (CEID 30065)		—
66	—		CEID 30065 event sending request relay: OFF	→	—
67	—		Deletes an instance of substrate location object in a carrier, and updates 'DVVAL.'	←	Deletes a substrate location object in a carrier. 00090-00012: CarrierSubstLocObject delete request (🔗 Page 338 00012: CarrierSubstLocObject delete request) ■Parameter example • ObjID: "Carrier■.■"*2
68	—		10090-00012: CarrierSubstLocObject delete acknowledge (🔗 Page 349 00012: CarrierSubstLocObject delete acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this

manual.

*2 STL#1

*3 STL#2

Host-initiated substrate object creation

The following table shows the state transition.

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 697 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name	
					STT	STP
0	—	Initial condition.	—	—	No State	No State
1	1 to 11	Creating a substrate object is instructed.	H→E	register substrate	AS	NP
			H←E	AT SOURCE		
			H←E	NEEDS PROCESSING		

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 519 STS Reports, Page 520 STS Events

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Specifies the initial state of a substrate object. S14F9: Create Object Request (register substrate) (📖 Page 451 S14F9 : Create Object Request) ■Parameter examples • ObjType: "Substrate" • ObjID: "Subst_■" • SubstState: 0 = AT SOURCE • SubstProcState: 0 = NEEDS PROCESSING • SubstLocID: "ProcessChamber"*1 • SubstIDStatus: 0 = NOT CONFIRMED	→	Generates an instance of substrate object. ('DVVAL' is not updated.)	—	—
2	—	←	S14F10: Create Object Acknowledge (📖 Page 464 S14F10: Create Object Acknowledge)	—	—
3	—	—	10090-01001: Create service (Register substrate service) notification (📖 Page 354 01001: Create service (Register substrate service) notification) • A new substrate object created	→	—
4	—	—	Updates 'DVVAL.'	←	When sending the event report (S6F11), the attribute value of a substrate object is set to update 'DVVAL.' 00090-00003: SubstrateObject SetAttr request (📖 Page 334 00003: SubstrateObject SetAttr request) • A substrate object received by '10090-01001: Create service (Register substrate service) notification'
5	—	—	10090-00003: SubstrateObject SetAttr acknowledge (📖 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
6	—	—	—	←	CEID 30059 event report sending request relay: ON
7	—*2	←	S6F11: NO STATE to AT SOURCE (CEID 30059)	—	—

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No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
8	—		CEID 30059 event report sending request relay: OFF	→	—
9	—		—	←	CEID 30068 event report sending request relay: ON
10	—*2	←	S6F11: NO STATE to NEEDS PROCESSING (CEID 30068)		—
11	—		CEID 30068 event report sending request relay: OFF	→	—

*1 STL#2

*2 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Point

When a substrate object is created by the host (host-initiated), the event report (S6F11) is not sent by SECS/GEM communication software.

To send the event report (S6F11), the states No.4, No.6, and No.9 need to be controlled in the control CPU.

Host-initiated substrate object deletion

The following shows the state transition satisfying the following condition:

- Substrate object created (state not concerned)

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 705 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No.*1	Comment	Communication direction H: HOST E: Equipment	Message	State model name	
					STT	STP
0	—	Initial condition.	—	—	Not concerned	Not concerned
1	1 to 10	Deleting a substrate object is instructed.	H→E	remove substrate	No State	No State
			H←E	NO STATE		

*1 The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 519 STS Reports, Page 520 STS Events

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Instructs the deletion of a substrate object. S14F11: Delete Object Request (📖 Page 466 S14F11: Delete Object Request) • A target object to be deleted is specified in 'OBJSPEC' or 'AttrSetting.'	→	Deletes an instance of substrate object. ('DVVAL' is not updated.)		—
2	—	←	S14F12: Delete Object Acknowledge (📖 Page 468 S14F12: Delete Object Acknowledge)		—
3	—		10090-01002: Delete service (Remove substrate service) notification (📖 Page 355 01002: Delete service (Remove substrate service) notification)	→	—
4	—		Generates an instance of substrate object, and updates 'DVVAL.'	←	When sending the event report (S6F11), a substrate object is created to update 'DVVAL.' 00090-00001: SubstrateObject create request (📖 Page 330 00001: SubstrateObject create request) • A substrate object received by '10090-01002: Delete service (Remove substrate service) notification'
5	—		10090-00001: SubstrateObject create acknowledge (📖 Page 344 00001: SubstrateObject create acknowledge)	→	—
6	—		Deletes an instance of substrate object, and updates 'DVVAL.'	←	Deletes a substrate object. 00090-00002: SubstrateObject delete request (📖 Page 333 00002: SubstrateObject delete request) • ObjID of a substrate object received by '10090-01002: Delete service (Remove substrate service) notification'
7	—		10090-00002: SubstrateObject delete acknowledge (📖 Page 345 00002: SubstrateObject delete acknowledge)	→	—
8	—		—	←	CEID 30067 event report sending request relay: ON

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
9	—*1	←	S6F11: SUBSTRATE to NO STATE (CEID 30067)		—
10	—		CEID 30067 event report sending request relay: OFF	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

Point

When a substrate object is deleted by the host (host-initiated), the event report (S6F11) is not sent by SECS/GEM communication software.

To send the event report (S6F11), the states No.4, No.6, and No.8 need to be controlled in the control CPU.

Disable substrate location state transition event report by host

The following shows the state transition satisfying the following conditions:

- Substrate location objects (STL#1, #2) created
- Slot map verified
- Substrate object created
- DisableEvents of STL#1 and STL#2 are false (events enabled)

In addition, the substrate locations (STL) are as follows:

- #1: Carrier A slot (carrier substrate location)^{*1}
- #2: Processing part (equipment substrate location)

^{*1} Exists per slot in each carrier

■Communication scenario with HOST

For usage examples of control CPU interfaces to implement this scenario, refer to the following:

📖 Page 707 Usage examples of control CPU interfaces

For details on the state name, refer to the following:

📖 Page 535 State notation

#	Corresponding No. ^{*1}	Comment	Communication direction H: HOST E: Equipment	Message	State model name			
					STL#1	STL#2	STT	STP
0	—	Initial condition.	—	—	OC	UOC	AS	NP
1	1 to 3	Disables events of STL#1. (DisableEvents=true)	H→E	SetAttr				
2	4 to 17	Wafers to be processed have been collected from carrier slot (STL#1) into processing part (STL#2).	H←E	AT WORK	UOC	OC	AW	
			H←E	OCCPIED (STL#2)				

^{*1} The corresponding number of usage examples of control CPU interfaces

■Usage examples of control CPU interfaces

For details on the event report (S6F11), refer to the following:

📖 Page 519 STS Reports, Page 520 STS Events

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
1	Disables events of STL#1. (DisableEvents=true) S14F3: SetAttr Request (STL#1) (📖 Page 438 S14F3: SetAttr Request) • ObjType: SubstLoc • ObjID: STL#1 • ATTRID: DisableEvents • ATTRDATA: true (= 1 or more)	→	Changes the 'DisableEvents' attribute value of STL#1. ('DVVAL' is not updated.)		—
2	—	←	S14F4: SetAttr Data (📖 Page 443 S14F4: SetAttr Data)		—
3	—		10090-01013: SetAttr service (SubstLoc) notification (📖 Page 358 01013: SetAttr service (SubstLoc) notification) • ObjIDList: STL#1 • AttrIDList: DisableEvents • SubstLocObject: Changed attribute value (= 1)	→	—

No	HOST	↔	SECS/GEM communication software	↔	Control CPU (controlled by user program)
4	—		Updates 'DVVAL.'	←	Empties 'SubstID' of the carrier slot (substrate location object in a carrier) STL#1, and changes 'SubstLocState' to 'UNOCCUPIED.' 00090-00013: SubstLocObject SetAttr request (🔗 Page 339 00013: SubstLocObject SetAttr request) • ObjID: STL#1 • SubstID: Blank • SubstLocState: 0 = UNOCCUPIED
5	—		10090-00013: SubstLocObject SetAttr acknowledge (🔗 Page 350 00013: SubstLocObject SetAttr acknowledge)	→	'SubstLocState' of STL#1 is changed from 'OCCUPIED' to 'UNOCCUPIED,' however, 'DisableEvents' is 'true'; therefore, sending an event report is not requested.
6	—		Updates 'DVVAL.'	←	Registers a history of the departure from STL#1 to 'SubstHistory' of a substrate object and changes the substrate transport status (STT) to 'AT WORK.' 00090-00003: SubstrateObject SetAttr request (🔗 Page 334 00003: SubstrateObject SetAttr request) • SubstState: 1 = AT WORK • SubstHistory: History of the departure from STL#1
7	—		10090-00003: SubstrateObject SetAttr acknowledge (🔗 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—
8	—		—	←	CEID 30060 event sending request relay: ON
9	—*1	←	S6F11: AT SOURCE to AT WORK (CEID 30060)		—
10	—		CEID 30060 event sending request relay: OFF	→	—
11	—		Updates 'DVVAL.'	←	Registers 'SubstID' to the processing part (equipment substrate location object) STL#2, and changes 'SubstLocState' to 'OCCUPIED.' 00090-00013: SubstLocObject SetAttr request (🔗 Page 339 00013: SubstLocObject SetAttr request) • ObjID: STL#2 • SubstID: A wafer that has arrived • SubstLocState: 1 = OCCUPIED
12	—		10090-00013: SubstLocObject SetAttr acknowledge (🔗 Page 350 00013: SubstLocObject SetAttr acknowledge)	→	—
13	—		—	←	'SubstLocState' of STL#2 is changed from 'UNOCCUPIED' to 'OCCUPIED' and 'DisableEvents' is 'false'; therefore, sending an event report is requested. CEID 30085 event report sending request relay: ON
14	—*1	←	S6F11: UNOCCUPIED to OCCUPIED (CEID 30085) (STL#2)		—
15	—		CEID 30085 event report sending request relay: OFF	→	—
16	—		Updates 'DVVAL.'	←	Changes 'SubstLocID' of a substrate object to 'STL#2,' and registers a history of the arrival at STL#2 to 'SubstHistory.' 00090-00003: SubstrateObject SetAttr request (🔗 Page 334 00003: SubstrateObject SetAttr request) • SubstLocID: STL#2 • SubstHistory: History of the arrival at STL#2
17	—		10090-00003: SubstrateObject SetAttr acknowledge (🔗 Page 346 00003: SubstrateObject SetAttr acknowledge)	→	—

*1 The acknowledge operation of S6F12 varies depending on specifications of HOST; therefore, the description of S6F12 is omitted in this manual.

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REVISIONS

* The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
May 2023	SH(NA)-082616ENG-A	First edition
September 2024	SH(NA)-082616ENG-B	■Added or modified parts Section 2.1, Section 2.2, Section 2.3, Chapter3. Section 3.1, Chapter 4, Section 5.1, Section 5.2, Section 6.1, Section 6.3, Section 6.4, Section 6.5, Section 6.6, Section 7.1, Section 7.2, Section 7.4, Section 7.5, Section 7.6, Section 7.8, Chapter 8, Section 9.1, Section 9.2, Section 9.3, Appendix 1, Appendix 2, Appendix 3, Appendix 4, Appendix 5, Appendix 6, Appendix 7, Appendix 8, Appendix 9, Appendix 10
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[Gratis Warranty Term]

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[Gratis Warranty Range]

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 C Controller/C Intelligent Function Module SECS/GEM Communication Software Pre-installed Model User's Manual

TRANSLATION OF THE ORIGINAL INSTRUCTIONS

SH(NA)-082616ENG-C(2604)

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