JY997D64401F Side B

MITSUBISHI ELECTRIC

Side A JAPANESE
Side B ENGLISH
Side C CHINESE

Programmable Controller
MELSEC iQ-F

# MELSEC iQ-F FX5-16ET/E□-H

# Hardware Manual

FX5

| | |
|---|---|
| Manual Number | JY997D64401 |
| Revision | F |
| Date | September 2025 |

This manual describes the part names, dimensions, and specifications of the product. Before use, read this manual and manuals of relevant products fully to acquire proficiency in handling and operating the product. Make sure to learn all the product information, safety information, and precautions.
And, store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.
Registration:
The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company.

Effective September 2025
Specifications are subject to change without notice.
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## Safety Precautions (Read these precautions before use.)

This manual classifies the safety precautions into two categories:

⚠WARNING and ⚠CAUTION.

| | |
|---|---|
| ⚠WARNING | Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury. |
| ⚠CAUTION | Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage. |

Depending on the circumstances, procedures indicated by ⚠CAUTION may also cause severe injury.
It is important to follow all precautions for personal safety.

## Associated Manuals

| Manual name | Manual No. | Description |
|---|---|---|
| MELSEC iQ-F FX5S/ FX5UJ/FX5U/FX5UC User's Manual (Hardware) | SH-082452ENG | Describes the details of hardware of the CPU module, including performance specifications, wiring, installation, and maintenance. |
| MELSEC iQ-F FX5 User's Manual (Application) | JY997D55401 | Describes the basic knowledge required for program design, functions of the CPU module, devices/labels, and parameters. |

**How to obtain manuals**
For the necessary product manuals or documents, consult with your local Mitsubishi Electric representative.

## Applicable standards

FX5-16ET/ES-H, FX5-16ET/ESS-H comply with the EU Directive (EMC Directive), UL standards (UL, cUL) and UKCA marking.
→ **MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)**
Regarding the standards that relate to the CPU module, please refer to either the product catalog or consult with your nearest Mitsubishi product provider.
**Attention**
This product is designed for use in industrial applications.

## 1. Outline

FX5-16ET/E□-H high-speed pulse input/output module (hereinafter called high-speed pulse input/output module) connects to the FX5 CPU module to expand the high-speed input/output function. High-speed input/output module can be used as general input/output.
For details including installation, wiring, and system configuration, refer to the following manuals.
→ **MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)**

### 1.1 Incorporated Items

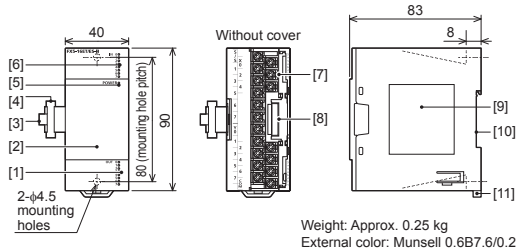
| Model | Included Items | |
|---|---|---|
| FX5-16ET/ES-H FX5-16ET/ESS-H | Product | 1 module |
| | Dust proof protection sheet | 1 sheet |
| | Hardware manual (This manual) | 1 manual |

### 1.2 Function

For function details, parameter settings, and program examples, refer to the following manual.
→ **MELSEC iQ-F FX5 User's Manual (Application)**

### 1.3 External Dimensions and Part Names

Unit: mm

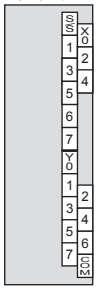



Weight: Approx. 0.25 kg
External color: Munsell 0.6B7.6/0.2

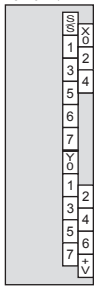
[1] Output display LED (green)
[2] Top cover
[3] Pullout tab
[4] Extension cable
[5] POWER LED (green)
[6] Input display LED (green)
[7] Terminal block (M3 screw)
[8] Extension connector
[9] Name plate
[10] DIN rail mounting groove (DIN rail: DIN46277, 35 mm wide)
[11] DIN rail mounting hooks

### 1.4 Terminal Layout

FX5-16ET/ES-H




FX5-16ET/ESS-H




## 2. Specifications

**STARTUP AND MAINTENANCE PRECAUTIONS** ⚠CAUTION

- Do not disassemble or modify the PLC.
  Doing so may cause fire, equipment failures, or malfunctions.
  For repair, contact your local Mitsubishi Electric representative.
- Do not drop the product or exert strong impact to it.
  Doing so may cause damage.

**DISPOSAL PRECAUTIONS** ⚠CAUTION

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.

**TRANSPORTATION PRECAUTIONS** ⚠CAUTION

- The product is a precision instrument. During transportation, avoid impacts larger than those specified in the general specifications by using dedicated packaging boxes and shock-absorbing palettes.
  Failure to do so may cause failures in the product.
  After transportation, verify operation of the product and check for damage of the mounting part, etc.

### 2.1 Applicable CPU module

| Model name | Applicability |
|---|---|
| FX5UJ CPU module | Ver. 1.030 or later |
| FX5U CPU module | Ver. 1.030 or later |
| FX5UC CPU module*1 | Ver. 1.030 or later |

*1 FX5-CNV-IFC or FX5-C1PS-5V is necessary to connect FX5-16ET/E□-H with the FX5UC CPU module.

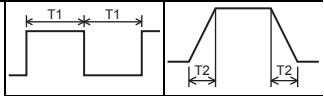
### 2.2 General Specifications

The general specifications are same with the CPU module specifications to be connected.
For general specifications, refer to the following manuals.
→ **MELSEC iQ-F FX5S/FX5UJ/FX5U/FX5UC User's Manual (Hardware)**

### 2.3 Power Supply Specification

| Item | Specification |
|---|---|
| Rated voltage | 5 V DC (internal power)<br>24 V DC (24 V DC service power supply or external power supply) |
| Current consumption | 100 mA/5 V DC<br>125 mA/24 V DC (The current of the input circuit is included.) |

### 2.4 Input Specification

| Item | | Specification | |
|---|---|---|---|
| No. of input points | | 8 points | |
| Connection type | | Terminal block (M3 screw) | |
| Input type | | Sink/source | |
| Input signal voltage | | 24 V DC +20%, -15% | |
| Input signal current | | 5.3 mA/24 V DC | |
| Input impedance | | 4.3 kΩ | |
| ON input sensitivity current | | 3.5 mA or more | |
| OFF input sensitivity current | | 1.5 mA or less | |
| Input response frequency | X□ to X□+5*1 | 200 kHz | |
| | X□+6, X□+7*1 | 10 kHz | |
| Pulse waveform | Waveform |  | |
| | | T1 (pulse width) | T2 (rise/fall time) |
| | X□ to X□+5*1 | 2.5 μs or more | 1.25 μs or less |
| | X□+6, X□+7*1 | 50 μs or more | 25 μs or less |



| Item | | Specification |
|---|---|---|
| Input response time (H/W filter delay) | X□ to X□+5*1 | ON: 2.5 μs or less<br>OFF: 2.5 μs or less |
| | X□+6, X□+7*1 | ON: 30 μs or less<br>OFF: 50 μs or less |
| Input response time (Digital filter setting value) | | None, 10 μs, 50 μs, 0.1 ms, 0.2 ms, 0.4 ms, 0.6 ms, 1 ms, 5 ms, 10 ms (initial values), 20 ms, 70 ms<br>When using this product in an environment with much noise, set the digital filter. |
| Input signal format | | No-voltage contact input<br>Sink: NPN open collector transistor<br>Source: PNP open collector transistor |
| Input circuit insulation | | Photo-coupler insulation |
| Indication of input operation | | LED is lit when input is on |

*1 □: Head input number of each high-speed pulse input/output module.

### 2.5 Output Specification

| Item | | Specification |
|---|---|---|
| No. of output points | | 8 points |
| Connection type | | Terminal block (M3 screw) |
| Output type | FX5-16ET/ES-H | Transistor/sink output |
| | FX5-16ET/ESS-H | Transistor/source output |
| Maximum frequency | | 200 kpps |
| External power supply | | 5 to 30 V DC |
| Max. load | | 1.6 A/8 points common |
| Open circuit leakage current | | 0.1 mA or less/30 V DC |
| Voltage drop when ON | Y□, Y□+1, Y□+4, Y□+5*1 | 1.0 V or less |
| | Y□+2, Y□+3, Y□+6, Y□+7*1 | 1.5 V or less |
| Response time | Y□, Y□+1, Y□+4, Y□+5*1 | 2.5 μs or less/10 mA or more (5 to 24 V DC) |
| | Y□+2, Y□+3, Y□+6, Y□+7*1 | 0.2 ms or less/200 mA or more (24 V DC) |
| Output circuit insulation | | Photo-coupler insulation |
| Indication of output operation | | LED is lit when output is on |

*1 □: Head output number of each high-speed pulse input/output module.

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

**Warranty**
Exclusion of loss in opportunity and secondary loss from warranty liability
Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:
(1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
(3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

**⚠ For safe use**

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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