

JAPANESE

ENGLISH





Programmable Controller MELSEC iO-F

# MELSEC IQ-E EX5-4AD-PT-ADP

# Hardware Manual



This manual describes the part names dimensions installation 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

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Effective October 2019

Specifications are subject to change without notice © 2016 MITSUBISHI ELECTRIC CORPORATION

#### Safety Precautions (Read these precautions before use.)

This manual classifies the safety precautions into two categories:

AWARNING and ACAUTION

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

Depending on the circumstances, procedures indicated by ACAUTION 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 FX5 User's Manual (Analog Control - CPU module built-in, Expansion adapter)	JY997D60501	Describes the analog function of the CPU module built-in and the analog adapter.
MELSEC iQ-F FX5UJ User's Manual (Hardware)	SH-082206ENG	Explains FX5UJ CPU module specification details for I/O, wiring, installation, and maintenance.
MELSEC iQ-F FX5U User's Manual (Hardware)	JY997D55301	Explains FX5U CPU module specification details for I/O, wiring, installation, and maintenance.
MELSEC iQ-F FX5UC User's Manual (Hardware)	JY997D61301	Explains FX5UC CPU module specification details for I/O, wiring, installation, and maintenance.

#### How to obtain manuals

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

#### Applicable standards

FX5-4AD-PT-ADP comply with the EC Directive (EMC Directive) and UL standards (III. cIII.) Further information can be found in the following manual

→ MELSEC iQ-F EX5UU User's Manual (Hardware) → MELSEC iO.E EX5U User's Manual (Hardware) MELSEC IQ F FX60 User's Manual (Hardware) Regarding the standards that relate to the CPU module, please refer to either the

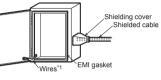
product catalog or consult with your nearest Mitsubishi product provider Attention This product is designed for use in industrial applications.

Caution for EC Directive

#### Installation in Enclosure

Programmable controllers are open-type devices that must be installed and used within conductive control cabinets. Please use the programmable controller while installed within a conductive shielded control cabinet. Installation within a control cabinet greatly affects the safety of the system and aids in shielding noise from the programmable controller Control cabinet

- The control cabinet must be conductive
- Ground the control cabinet with the thickest possible grounding cable
- To ensure that there is electric contact between the control cabinet and its door connect the cabinet and its doors with thick wires
- In order to suppress the leakage of radio waves, the control cabinet structure must have minimal openings. Also, wran the cable holes with a shielding cover or other shielding devices
- The gap between the control cabinet and its door must be as small as possible by attaching EMI gaskets between them.



- \*1 These wires are used to improve the conductivity between the door and control cabinet Cables
- Make sure to use shielded cables as cables nulled out of the control cabinet - Connect the shield such as shielded cables and shielding covers to the grounded
- control cabinet It is possible that the accuracy temporarily fluctuates within ±10 %.

#### 1 Outline

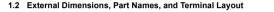
EX5-4AD-PT-ADP expansion adapter for resistance temperature detector temperature sensor input (hereinafter called PT-ADP) is an expansion adapter for connecting a resistance temperature detector (Pt100, Ni100 3-wire type) temperature sensor, and measuring 4 channels of temperature.

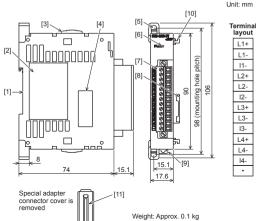
#### 1.1 Incorporated Items

Verify that the following product and items are included in the package:

EX5-4AD-PT-ADP resistance temperature detector temperature Product sensor input expansion adapter ardware manual [Japanese /English] (This manual)

Included Items Hardware manual [Chinese]





Outer painting color: Munsell 0.6B7.6/0.2

- [1] DIN rail mounting groove (DIN rail: DIN46277, 35 mm wide)
- [2] Name plate
- [3] Expansion adapter slide lock
- [4] Expansion adapter connector cover
- [5] Direct mounting hole: 2 holes of \$4.5 (mounting screw: M4 screw)
- [6] PWR LED (green)
- [7] Terminal block (European type terminal block)
- [8] Expansion adapter connector
- [9] DIN rail mounting hook
- [10] Expansion adapter fixing hook
- [11] Expansion adapter connector

#### 2. Installation

#### INSTALLATION PRECAUTIONS

- Make sure to cut off all phases of the power supply externally before attempting installation or wiring work
- Failure to do so may cause electric shock or damage to the product. Use the product within the generic environment specifications described in the
- User's Manual (Hardware) for the CPU module to be used. Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl<sub>2</sub>, H<sub>2</sub>S, SO<sub>2</sub> or NO<sub>2</sub>), flammable gas, vibration or impacts, or expose it to high temperature, condensation, or rain and wind. If the product is used in such conditions, electric shock, fire, malfunctions

### deterioration or damage may occur INSTALLATION

#### **CAUTION** PRECAUTIONS

- Do not touch the conductive parts of the product directly. Doing so may cause device failures or malfunctions.
- When drilling screw holes or wiring, make sure cutting or wire debris does not enter the ventilation slits.
- Failure to do so may cause fire, equipment failures or malfunctions
- Install the product on a flat surface
- If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities.
- Install the product securely using a DIN rail or mounting screws. Connect the expansion board and expansion adapter securely to their designated
- connectors Loose connections may cause malfunctions

For the installation, refer to the following manual.

- → MELSEC iQ-F FX5UJ User's Manual (Hardware)
- → MELSEC iQ-F FX5U User's Manual (Hardware) → MELSEC iQ-F FX5UC User's Manual (Hardware)

#### 3. Wiring

wires

### WIRING PRECAUTIONS **WARNING**

- Make sure to cut off all phases of the power supply externally before attempting installation or wiring work.
- Failure to do so may cause electric shock or damage to the product. Make sure to properly wire to the terminal block (European type) in
- accordance with the following precautions. Failure to do so may cause electric shock, equipment failures, a short-circuit.
- wire breakage malfunctions or damage to the product - The disposal size of the cable end should follow the dimensions described in the manual
- Tightening torque should follow the specifications in the manual - Twist the ends of stranded wires and make sure that there are no loose
  - Do not colder plate the electric wire ends
  - Do not connect more than the specified number of wires or electric wires of unenecified size
  - Affix the electric wires so that neither the terminal block nor the connected parts are directly stressed

#### WIRING PRECAUTIONS **ACAUTION**

- When drilling screw holes or wiring, make sure cutting or wire debris does not enter the ventilation slits.
- Failure to do so may cause fire, equipment failures or malfunctions. Make sure to observe the following precautions in order to prevent any
- damage to the machinery or accidents due to malfunction of the PLC caused by abnormal data written to the PLC due to the effects of noise:
- 1) Do not bundle the power line or analog input/output cable together with or lay them close to the main circuit, high-voltage line, load line or power line. As a guideline, lay the power line, control line and communication cables at least 100 mm away from the main circuit, high-voltage line, load line or nower line
- 2) Ground the shield of the analog input/output cable at one point on the signal receiving side.
- However, do not use common grounding with heavy electrical systems.

#### 3.1 Cable End Treatment And Tightening Torque

#### 3.1.1 European type terminal block

- 1) Wiring type Use the wire supplied together with Pt100/Ni100 or a shielded twisted wire when wiring the Pt100/Ni100 resistance temperature detector.
- Suitable wiring

No. of wire	Wire size		
per terminal	Single wire, Strand wire	Ferrules with insulating sleeve	
One wire	AWG22 to 20 (0.3 to 0.5 mm <sup>2</sup> )	AWG22 to 20 (0.3 to 0.5 mm <sup>2</sup> )	
Two wires	AWG22 (0.3 mm <sup>2</sup> )	-	

Strip the coating of strand wire and twist the cable core before connecting it,

When using a wire ferrule with an insulating sleeve, choose a wire with

proper cable sheath referring to the above outside dimensions, otherwise

2.6 mm

- Stick terminal with insulating sleeve

Insulation sleeve

Mode

AI 0.5-8 WH

Contact area

(Crimp area)

Caulking tool

CRIMPFOX 6

CRIMPFOX 6T-F

8 mm

14 mm

Tightening torque

Wire end treatment

<Reference>

the wire cannot be inserted easily

9 mm

Manufacturer

Phoenix Contact GmbH & Co. KG

Strand wire/single wire

Tighten the terminal screws with 0.20 Nom. Do not tighten the screws outside the specified torque. Failure to do so may cause equipment failures or malfunctions.

or strip the coating of single wire before connecting it.

For tightening the terminal, use a commercially available small screwdriver having a straight form that is not widened toward the end as shown right

#### Noto

If the diameter of screwdriver grip is too small, tightening torque may not be achieved. To achieve the appropriate tightening torque shown in the table above, use the following screwdriver or appropriate replacement (grip diameter: approximately 25 mm (0.98"))

0.4 mm

Manufacturer	Model names	
Phoenix Contact GmbH & Co. KG	SZS 0.4×2.5	

6) Terminal block fixed screw tightening torque

Tighten the screws within the range of 0.2 to 0.3 Nom. Do not tighten terminal screws exceeding with a torque outside the abovementioned range

# Failure to do so may cause equipment failures or malfunctions.

# 3.2 Wiring Of Resistance Temperature Detector

#### $\rightarrow$ For the terminal configuration. refer to Section 1.2 3.2.1 Example of resistance temperature detector wiring



ID-Grounding (Ground resistance: 100 Ω or less) □: □ represents the channel number.

3.2.2 Precautions on resistance temperature detector wiring

 Only 3 wire Pt100 and Ni100 resistance temperature detectors can be used. Senarate the cable of the resistance thermometer detector from other nower cables or areas easily affected by inductive noise (from commercial power,

### 3.3 Grounding

etc.)

Grounding should be performed as stated below.

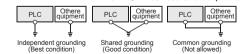
The grounding resistance should be 100 Ω or less.

 Independent arounding should be performed for best results. When independent grounding is not performed, perform "shared grounding" of

the following figure For the details, refer to the following manual.

MELSEC IO E EVELLI Llear's Manual (Hardware

-	→ MELSEC iQ-F FX5U	User's	Manual	(Hardware
_	MELSEC IO-E EX5UC	lleor'e	Manual	Hardward



The grounding wire size should be AWG 22 to 20 (0.3 to 0.5 mm<sup>2</sup>).

- The grounding point should be close to the PLC, and all grounding wire should
- be as short as possible.

#### 4. Specifications

\A/i+F

2.5 mm

straight tip

STARTUP AND MAINTENANCE PRECAUTIONS		
For repair, contact y	fire, equipment failures, or malfunctions. our local Mitsubishi Electric representative. Juct or exert strong impact to it.	
DISPOSAL PRECAUT		
Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.		
environmentally safe	e recycling and disposal of your device.	
environmentally safe	e recycling and disposal of your device.	
TRANSPORTATION PRECAUTIONS • The product is a pre- than those specified boxes and shock-ab Failure to do so may	CAUTION cision instrument. During transportation, avoid impacts larger in the general specifications by using dedicated packaging	
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FX5UJ CPU module	From first production	
FX5U CPU module	Ver. 1.040 or later	Number of occu
FX5UC CPU module	Ver. 1.040 or later	*1. Only 2 wire

#### 4.2 General Specifications

The items other than the following are equivalent to those of the CPU module. For general specifications, refer to the following manual.

→ MELSEC iQ-F FX5UJ User's Manual (Hardware) → MELSEC iQ-F FX5U User's Manual (Hardware)
→ MELSEC iQ-F FX5UC User's Manual (Hardware)

Item	Specification		
		Between all external terminals and ground	
Insulation resistance	10 $M\Omega$ or higher by 500 V DC insulation resistance tester	terminal of CPU module	

#### 4.3 Power Supply Specifications

is Tower Supply Opecifications		
Item	Specification	
Internal electric supply (A/D conversion circuit)	24 V DC 20 mA Internal electric supply is carried out from 24 V DC power supply of a CPU module.	
Internal electric supply (Interface)	5 V DC 10 mA Internal electric supply is carried out from 5 V DC power supply of a CPU module.	

4.4 Performance Specifications

	ltem		Specif	Specification	
	item		Centigrade (°C)	Fahrenheit (°F)	
Number of analog input points		4 points (4 channels)			
Usable resistance temperature detector*1		Pt100 (JIS C 1604-1997, JIS C 1604 2013) Ni100 (DIN 43760 1987)			
Tomporatur		Pt100	-200 to +850°C	-328 to +1562°F	
Temperature measuring range		Ni100	-60 to +250℃	-76 to +482°F	
			16-bit signed binary		
Digital outpu	ut value	Pt100	-2000 to +8500	-3280 to +15620	
		Ni100	-600 to +2500	-760 to +4820	
	Ambient temperature	Pt100	±0.8℃		
	25±5℃	Ni100	±0.4℃		
Accuracy	Ambient temperature	mbient temperature Pt100			
-20 to 55℃		Ni100	±1.2℃		
Resolution		-	0.1℃	0.1 to 0.2°F	
Conversion speed Isolation method		Approx. 85 ms/channel <sup>*2</sup>			
		Between input terminal and CPU module: Photocoupler Between input channels: Non-isolation			
Number of occupied I/O points		0 point (This number is not related to the maximum number of I/O points of the PLC.)			

1 Only 3-wire type resistance temperature detectors can be used.

\*2 For details of the conversion speed, refer to the following manual.

→ MELSEC iQ-F FX5 User's Manual (Analog Control - CPU module built-in, Expansion adapter)

> 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.

## MITSUBISHI ELECTRIC CORPORATION

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