



Programmable Controller
MELSEC iQ-F

MELSEC iQ-F FX5-CCLIEF

Hardware Manual



Manual Number	JY997D63901
Revision	B
Date	July 2017

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.

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Effective July 2017

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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 Manual

Manual name	Manual No.	Description
MELSEC iQ-F FX5 User's Manual (CC-Link IE)	JY997D64201	Describes the functions of the CC-Link IE Field network module.
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)	JY997D61401	Explains FX5UC CPU module specification details for I/O, wiring, installation, and maintenance.
MELSEC iQ-F FX5 Programming Manual (Instructions, Standard Functions/Function Blocks)	JY997D55801	Describes specifications of instructions and functions that can be used in programs.

How to obtain manuals

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

Applicable standards

FX5-CCLIEF comply with the EC Directive (EMC Directive) and UL standards (UL, cUL). Further information can be found in the following manual.

→ MELSEC iQ-F FX5 User's Manual (CC-Link IE)

Regarding the standards that relate to the CPU module, please refer to either the product catalog or consult with your local Mitsubishi Electric representative.

Attention

This product is designed for use in industrial applications.

1. Outline

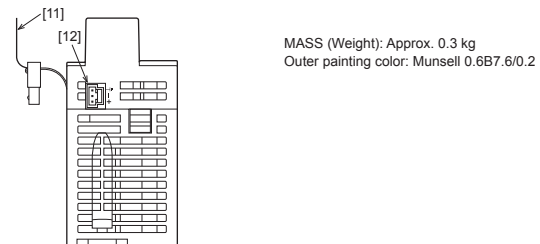
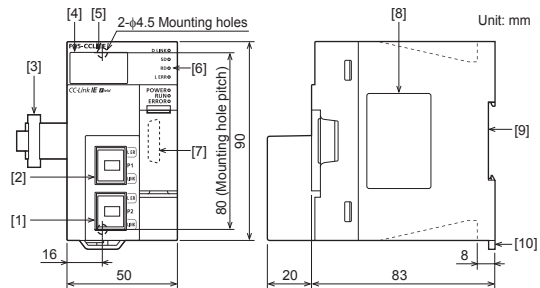
FX5-CCLIEF intelligent device station for CC-Link IE Field network (hereinafter referred to as FX5-CCLIEF) is an intelligent function module for connecting to a CC-Link IE Field network as an intelligent device station.

1.1 Incorporated Items

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

Product	FX5-CCLIEF intelligent device station for CC-Link IE Field network
Included Items	FX2NC-100MPCB power cable: (1 m, three wire) Dust proof protection sheet (1 sheet) Hardware manual (This manual)

1.2 External Dimensions, Part Names



MASS (Weight): Approx. 0.3 kg
Outer painting color: Munsell 0.6B7.6/0.2

- [1] Modular jack for P2 (RJ-45) (with cap)
- [2] Modular jack for P1 (RJ-45) (with cap)
- [3] Extension cable
- [4] Dot matrix LED
- [5] Direct mounting hole: 2 holes of $\phi 4.5$ (mounting screw: M4 screw)
- [6] Operation status display LEDs
- [7] Extension connector (for next module)
- [8] Name plate
- [9] DIN rail mounting groove (DIN rail: DIN 46277, 35 mm wide)
- [10] DIN rail mounting hook
- [11] Pullout tab
- [12] Power connector

1.3 Indications of LEDs

LED display	LED color	Status	Indication
D LINK ^{*1}	Green	On	Data link (cyclic transmission being performed)
		Flashing	Data link (cyclic transmission stopped)
		Off	Data link not performed (disconnection)
SD	Green	On	Data being sent
		Off	Data not being sent
RD	Green	On	Data being received
		Off	Data not being received
L ERR	Red	On	Error data are received
		Off	Normal data are received
POWER	Green	On	Power on
		Off	Power off
RUN	Green	On	Normal operation
		Off	Error
ERROR ^{*1}	Red	On	Minor error (Major error when the RUN LED turns off)
		Flashing	Moderate error (Major error when the RUN LED turns off)
		Off	Normal operation
P1 L ER	Red	On	Error data are received
		Off	Normal data are received
P1 LINK	Green	On	Link-up
		Off	Link-down
P2 L ER	Red	On	Error data are received
		Off	Normal data are received
P2 LINK	Green	On	Link-up
		Off	Link-down
Dot matrix LED	Orange	-	Displays the station number set in the module and the module communication test result.

*1 The LED is always off in offline mode.

2. Installation

INSTALLATION 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.
- 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, Cl₂, H₂S, SO₂ or NO₂), 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 PRECAUTIONS **CAUTION**

- 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 that cutting and wiring debris do not enter the ventilation slits of the PLC. Failure to do so may cause fire, equipment failures or malfunctions.
- The dust proof sheet should be affixed to the ventilation slits before installation and wiring work to block foreign objects such as cutting and wiring debris. However, when the installation work is completed, make sure to remove the sheet to provide adequate ventilation. 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 extension cables securely to their designated connectors. Loose connections may cause malfunctions.

For further information on mounting, refer to the following manual.

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

3. Wiring

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.

WIRING PRECAUTIONS **CAUTION**

- Securely connect the connector to the module. Poor contact may cause malfunction.
- 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:
 - Do not bundle the power line and communication cables 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 power line.

3.1 Connector to be used and cable

3.1.1 Pin configuration

The pin configuration of the RJ-45 connector is as follows:

Pin No.	Signal	Contents
1	TP0+	Data 0 send and receive (+ side)
2	TP0-	Data 0 send and receive (- side)
3	TP1+	Data 1 send and receive (+ side)
4	TP2+	Data 2 send and receive (+ side)
5	TP2-	Data 2 send and receive (- side)
6	TP1-	Data 1 send and receive (- side)
7	TP3+	Data 3 send and receive (+ side)
8	TP3-	Data 3 send and receive (- side)

3.1.2 Cables to be used

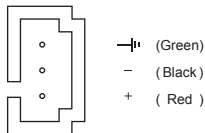
Use Ethernet cable that meets the following standards.

Ethernet cable	Type
Double shielded, STP Straight cable	<ul style="list-style-type: none"> IEEE802.3 (1000BASE-T) ANSI/TIA/EIA-568-B (Category 5e)

3.1.3 Power supply connector

For further information on the power supply wiring and power cable, refer to the following manual.

→ MELSEC IQ-F FX5 User's Manual (CC-Link IE)



3.2 Grounding

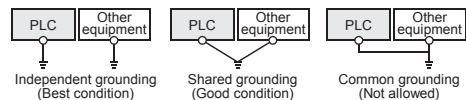
Ground the PLC as stated below.

- Perform class D grounding. (Grounding resistance: 100 Ω or less)
- Ground the PLC independently if possible.

If the PLC cannot be grounded independently, perform the "Shared grounding" shown below.

For details, refer to the following manual.

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



- Bring the grounding point close to the PLC as much as possible so that the ground cable can be shortened.

4. Specification

DESIGN PRECAUTIONS	WARNING
<ul style="list-style-type: none"> Make sure to set up the following safety circuits outside the PLC to ensure safe system operation even during external power supply problems or PLC failure. Otherwise, malfunctions may cause serious accidents. <ul style="list-style-type: none"> Most importantly, set up the following: an emergency stop circuit, a protection circuit, an interlock circuit for opposite movements (such as normal vs. reverse rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positioning limits). Note that when the CPU module detects an error, such as a watchdog timer error, during self-diagnosis, all outputs are turned off. Also, when an error that cannot be detected by the CPU module occurs in an input/output control block, output control may be disabled. External circuits and mechanisms should be designed to ensure safe machinery operation in such a case. For the operating status of each station after a communication failure, refer to manuals relevant to the network. Incorrect output or malfunction due to a communication failure may result in an accident. Construct an interlock circuit in the program so that the whole system always operates on the safe side before executing the control (for data change) of the PLC in operation. Read the manual thoroughly and ensure complete safety before executing other controls (for program change, parameter change, forcible output and operation status change) of the PLC in operation. Otherwise, the machine may be damaged and accidents may occur due to erroneous operations. Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure. If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail. Failure to do so may result in an accident due to an incorrect output or malfunction. To maintain the safety of the programmable controller system against unauthorized access from external devices via the network, take appropriate measures. To maintain the safety against unauthorized access via the Internet, take measures such as installing a firewall. 	

DESIGN PRECAUTIONS	CAUTION
<ul style="list-style-type: none"> Simultaneously turn on and off the power supplies of the CPU module and extension modules. 	

STARTUP AND MAINTENANCE PRECAUTIONS	CAUTION
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device. 	

TRANSPORTATION PRECAUTIONS	CAUTION
<ul style="list-style-type: none"> 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 pallets. 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. 	

4.1 Applicable CPU module

Model name	Applicability
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-CCLIEF to the FX5UC CPU module.

4.2 General Specifications

The items other than the following are equivalent to those of the CPU module.

For the general specification, refer to the following manual.

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

Items	Specifications	
Dielectric withstand voltage	500 V AC for 1 minute	Between all terminals and ground terminal
Insulation resistance	10 MΩ or higher by 500 V DC insulation resistance tester	

4.3 Power Supply Specifications

Items	Specifications	
External power supply	Power supply voltage	24 V DC +20%, -15%
	Allowable instantaneous power failure time	Operation continues when the instantaneous power failure is shorter than 1 ms.
	Current consumption	230 mA
Internal power supply	Power supply voltage	5 V DC
	Current consumption	10 mA

4.4 Performance Specifications

Items	Specifications	
Station type	Intelligent device station	
Station number	1 to 120 (sets by parameter or program)	
Communication speed	1 Gbps	
Network topology	Line topology, star topology (coexistence of line topology and star topology is also possible), and ring topology	
Maximum station-to-station distance	100 m (conforms to ANSI/TIA/EIA-568-B (Category 5e))	
Cascade connection	Max. 20 stages	
Communication method	Token passing	
Maximum number of link points*1	RX	384 points, 48 bytes
	RY	384 points, 48 bytes
	RWr	1024 points, 2048 bytes*2
	RWw	1024 points, 2048 bytes*2
Number of occupied I/O points	8 points	

*1 The maximum number of link points that a master station can assign to one FX5-CCLIEF unit.

*2 256 points (512 bytes) when the mode of the master station is online (High-Speed Mode).

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
<ul style="list-style-type: none"> 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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