



Programmable Controller
MELSEC iQ-F

Side A JAPANESE
Side B ENGLISH

MELSEC iQ-F FX5-CCLIEF

Hardware Manual



| | |
|---------------|-------------|
| Manual Number | JY997D63901 |
| Revision | E |
| Date | April 2022 |

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 April 2022
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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 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 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 complies with the EC Directive (EMC Directive), UL standards (UL, cUL) and UKCA marking. 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

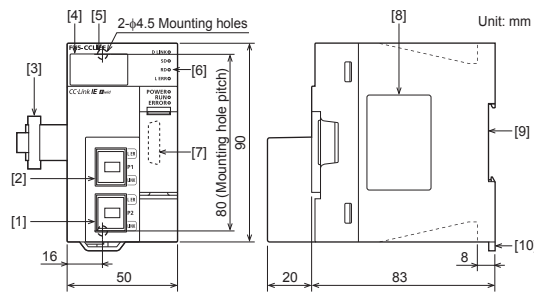
FX5-CCLIEF intelligent device station for CC-Link IE Field network (hereinafter referred to as FX5-CCLIEF) is an intelligent function module for connecting to a CC-Link IE Field network as an intelligent device station.

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 [Japanese /English] (This manual) |
| | Hardware manual [Chinese] |

1.2 External Dimensions, Part Names



Unit: mm
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 φ4.5 (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 |
| LINK | Green | On | Link-up |
| | | Off | Link-down |
| P2 L ER | Red | On | Error data are received |
| | | Off | Normal data are received |
| 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 FX5S/FX5UJ/FX5U/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) |

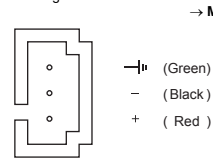
3.1.2 Cables to be used

Use Ethernet cable that meets the following standards.

| Ethernet cable | Type |
|----------------------|------------------------------------|
| Double shielded, STP | • IEEE802.3 (1000BASE-T) |
| Straight cable | • 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)

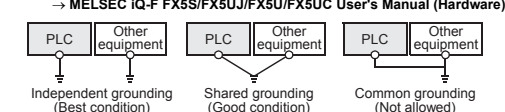


3.2 Grounding

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 FX5S/FX5UJ/FX5U/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

- 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.
 - 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.

DESIGN PRECAUTIONS ⚠ CAUTION

- Simultaneously turn on and off the power supplies of the CPU module and extension modules.

SECURITY PRECAUTIONS ⚠ WARNING

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from unreliable networks and devices via network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

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 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 |
|--------------------|-----------------------|
| FX5UJ CPU module | From first production |
| 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 FX5S/FX5UJ/FX5U/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 |
| | RWw | 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

- 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.