MITSUBISHI ELECTRIC

PROGRAMMABLE CONTROLLERS
MELSEC iQ-F

Side A	JAPANESE
Side B	ENGLISH
Side C	CHINESE

MELSEC iQ-F FX5-232-BD

Hardware Manual

FX5

Manual Number	JY997D53901
Revision	C
Date	January 2015

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:
MODBUS® is a registered trademark of Schneider Electric SA.
The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company.

Effective January 2015
Specifications are subject to change without notice.
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Safety Precaution (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 FX5U User's Manual (Hardware)	JY997D55301	Explains FX5U CPU module specification details for I/O, wiring, installation, and maintenance.
MELSEC iQ-F FX5 User's Manual (Serial Communication)	JY997D55901	Explains N:N network, MELSEC Communication protocol, inverter communication, and non-protocol communication.
MELSEC iQ-F FX5 User's Manual (MODBUS Communication)	JY997D56101	Explains the MODBUS serial communication network.

For wiring with communication equipment, system configuration, communication settings, and program examples, refer to the following manuals.
→ **MELSEC iQ-F FX5 User's Manual (Serial Communication)**
→ **MELSEC iQ-F FX5 User's Manual (MODBUS Communication)**

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

Applicable standards

FX5-232-BD comply with the EC Directive (EMC Directive). Further information can be found in the following manual.
→ **MELSEC iQ-F FX5U 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.

Note
• Manufactured by: Mitsubishi Electric Corporation
2-7-3 Marunouchi, Chiyoda-ku, Tokyo, 100-8310 Japan
• Manufactured at: Mitsubishi Electric Corporation Himeji Works
840 Chiyoda-machi, Himeji, Hyogo, 670-8677 Japan
• Authorized Representative in the European Community:
Mitsubishi Electric Europe B.V.
Gothaer Str. 8, 40880 Ratingen, Germany

1. Outline

FX5-232-BD is an expansion board equipped with a 9-pin D-Sub for RS-232C communication. The FX5-232-BD exchanges data with RS-232C devices.
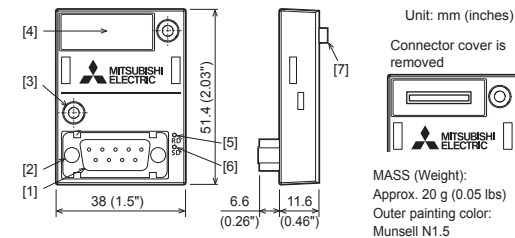
1.1 Incorporated Items

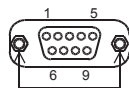| Product	FX5-232-BD communication board
Included items	M3×8 tapping screws for installation: 2 pcs. Hardware Manual (This manual)

1.2 Communication Function

MELSOFT connection, MELSEC Communication protocol (3C/4C frames), Non-protocol communication, MODBUS RTU, Predefined protocol support

1.3 External Dimensions and Part Names

Unit: mm (inches)

Connector cover is removed

MASS (Weight):
Approx. 20 g (0.05 lbs)
Outer painting color:
Munsell N1.5

51.4 (2.03")
38 (1.5")
6.6 (0.26")
11.6 (0.46")

[1] RS-232C connector (9-pin D-sub, male)
[2] Screws to fix a connector
[3] Mounting holes (2-φ3.2)
[4] Connector cover
[5] RD LED (green) Lighting while receiving data
[6] SD LED (green) Lighting while sending data
[7] CPU module connector

1.4 Pin Configuration

1 5
6 9
Screws to fix RS-232C connector #4-40UNC (inch screw thread)

Pin No.	Signal	Name
1	CD (DCD)	Receive carrier detection
2	RD (RXD)	Receive data
3	SD (TXD)	Send data
4	ER (DTR)	Send request
5	SG (GND)	Signal ground
6	DR (DSR)	Send enabled
7, 8, 9		Not used

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 MELSEC iQ-F FX5U User's Manual (Hardware).
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 cutting or wire debris does not enter the ventilation slits.
Failure to do so may cause fire, equipment failures or malfunctions.
• Connect the expansion board and expansion adapter securely to their designated connectors.
Loose connections may cause malfunctions.
• Make sure to affix the expansion board with tapping screws.
Tightening torque should follow the specifications in the manual.
If the screws are tightened outside of the specified torque range, poor connections may cause malfunctions.
• Work carefully when using a screwdriver such as installation of the product.
Failure to do so may cause damage to the product or accidents.

For the installation, refer to the following manual.
→ **MELSEC iQ-F FX5U User's Manual (Hardware)**

3. 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.

3.1 Applicable CPU module

Model name	Applicability
FX5U CPU module	Ver. 1.000 or later (from first production)

For details on the system configuration, refer to the following manuals.
→ **MELSEC iQ-F FX5 User's Manual (Serial Communication)**
→ **MELSEC iQ-F FX5 User's Manual (MODBUS Communication)**

3.2 General Specifications

The general specifications are equivalent to the CPU module. For general specifications, refer to the following manual.
However, since the product is not isolated between communication lines and the CPU module, please do not perform any dielectric withstand voltage tests or insulation resistance tests to this product.
→ **MELSEC iQ-F FX5U User's Manual (Hardware)**

3.3 Power Supply Specification

Item	Specification
Rated voltage[*1]	5 V DC
Current consumption[*1]	20 mA

*1 Power is supplied internally from the CPU module.

3.4 Performance specifications

Item	Specification
Transmission standard	Conforming to RS-232C
Maximum transmission distance	15 m (49' 2")
Connection method	9-pin D-sub, male
Insulation	Not insulated (Between communication line and CPU module)
Communication method[*1]	Half-duplex/Full-duplex
Baud rate[*1]	300/600/1200/2400/4800/9600/19200/38400 57600/115200 (bps)

*1 The communication method and baud rate vary depending on the types of the communication.

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
Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ 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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