

MITSUBISHI *Changes for the Better*
 PROGRAMMABLE CONTROLLERS
 MELSEC-F

FX3G-232-BD

INSTALLATION MANUAL

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|---------------|---------------|
| Manual Number | JY997D32001 |
| Revision | C |
| Date | November 2008 |

This manual describes the part names, dimensions, mounting, and specifications of the product. Before use, read this manual and the manuals of all relevant products fully to acquire proficiency in handling and operating the product. Make sure to learn all the product information, safety information, and precautions. Store this manual in a safe place so that it can be taken out and read whenever necessary. Always forward it to the end user. Registration: The company and product names described in this manual are registered trademarks or the trademarks of their respective companies. Effective November 2008. Specifications are subject to change without notice. © 2008 Mitsubishi Electric Corporation

Safety Precaution (Read these precautions before use.)

This manual classifies the safety precautions into two categories:

⚠DANGER and ⚠CAUTION.

| | |
|-----------------|---|
| ⚠DANGER | 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 medium or slight personal injury or physical 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 |
|---|-----------------------------------|--|
| FX3G Series User's Manual - Hardware Edition | JY997D31301 MODEL CODE: 09R521 | Explains the FX3G Series PLC specifications for I/O, wiring, installation, and maintenance. |
| FX3G/FX3U/FX3UC Series Programming Manual - Basic & Applied Instruction Edition | JY997D16601 MODEL CODE: 09R517 | Describes PLC programming for basic/applied instructions and devices. |
| FX Series User's Manual - Data Communication Edition | JY997D16901 MODEL CODE: 09R715 | Explains N:N network, Parallel Link, Computer Link, Non-Protocol communication by RS and RS2 instructions/FX2N-232F. |

This manual describes the specifications and installation details for the FX3G-232-BD. For wiring with communication equipment, system configuration, communication settings, and program examples, refer to the "FX Series User's Manual - Data Communication Edition".

How to obtain manuals

For product manuals or documents, consult with the Mitsubishi Electric dealer from who you purchased your product.

1. Outline

FX3G-232-BD is an expansion board equipped with a 9-pin D-Sub for RS-232C communication. The FX3G-232-BD exchanges data with RS-232C devices. For wiring, specifications, settings, and program examples, refer to the following manual.

→ Refer to the **FX Series User's Manual - Data Communication Edition**

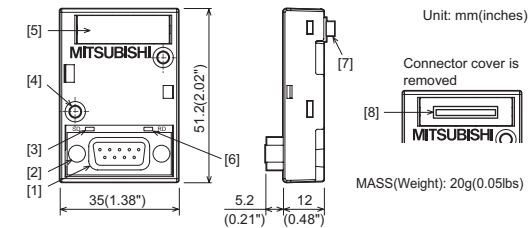
1.1 Incorporated Items

| | |
|-----------------------|---|
| Product | RS-232C communication expansion board FX3G-232-BD |
| Included items | M3×8 tapping screws for installation: 2 pcs. Side cover Installation Manual (This manual) |

1.2 Communication Function

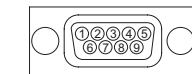
| Communication type | Function |
|----------------------------|---|
| Computer link | Data transfer between PLC and computer (specified as the master station) via dedicated protocol. |
| Non-protocol communication | Serial communication between PLC and RS-232C device via non-protocol. |
| Programming communication | Programming transfer or monitoring enabled via port of the FX3G-232-BD. |
| Remote maintenance | Program transfer or monitoring enabled via modem and phone line connected to port of the FX3G-232-BD. |

1.3 External Dimensions and Part Names



- [1]Port for connecting RS-232C device(9-Pin D-Sub, male)
- [2]Hole for connector fixing screw (#4-40UNC)
- [3]SD LED: Lighting while sending data
- [4]Mounting holes(2-φ3.2)
- [5]Connector cover
- [6]RD LED: Lighting while receiving data
- [7]Main unit connector
- [8]Memory cassette/Display module connector

The communication port of the FX3G-232-BD is a 9-Pin D-Sub male type. The table below shows the pin arrangement.



| PinNo. | Signal | Name | Function |
|--------|----------|---------------------------|--|
| 1 | CD | Receive carrier detection | Turns ON when carrier for data transfer is detected. |
| 2 | RD(RXD) | Receive data input | Receives data (RS-232C equipment → FX3G-232-BD) |
| 3 | SD(TXD) | Send data input | Sends data (FX3G-232-BD → RS-232C equipment) |
| 4 | ER(DTR) | Send request | Turns ON when RS-232C equipment becomes ready for data transfer. |
| 5 | SG(GND) | Signal ground | Signal ground |
| 6 | DR(DSR) | Send enabled | Turns ON when send request is given to RS-232C equipment |
| 7,8,9 | Not used | | |

2. Installation

INSTALLATION PRECAUTIONS ⚠DANGER

- 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.

INSTALLATION PRECAUTIONS ⚠CAUTION

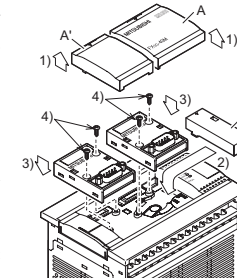
- Use the product within the generic environment specifications described in PLC main unit manual (Hardware Edition). Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl₂, H₂S, SO₂, or NO₂), flammable gas, vibration or impacts, or expose it high temperature, condensation, or rain and wind. If the product is used in such conditions, electric shock, fire, malfunctions, deterioration or damage may occur.
- Use screwdrivers carefully when performing installation work, thus avoiding accident or product damage.
- 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.
- Do not touch the conductive parts of the product directly. Doing so may cause device failures or malfunctions.
- Connect the expansion board securely to their designated connectors. Loose connections may cause malfunctions.

The following section describes the installation method to the FX3G Series PLC (FX3G-40M□). In this example, Turn off the power to the PLC before installation. For more details on installation and removal, refer to the PLC main unit manual.

→ Refer to the **FX3G Series User's Manual - Hardware Edition**

2.1 Installation Method

- Remove the top cover (A in the figure on the right) and/or top cover (S) (A' in the figure on the right). In a 14/24-point type main unit, only the top cover (A in the figure on the right) is provided.
- Attach the accessory side cover (B in the figure on the right). It is not necessary to attach the side cover (B in the figure on the right) when installing the FX3G-232-BD to only under the top cover (S) of a 40/60-point type main unit.
- Make sure the expansion board is in parallel with the main unit and attach it to the optional equipment connector.
- Fix the expansion board to the main unit using the provided M3 tapping screws. (2 places)
Tightening torque : 0.3 to 0.6 N·m



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 distributor.
- 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.

TRANSPORT AND STORAGE PRECAUTIONS ⚠CAUTION

- The product is a precision instrument. During transportation, avoid any impacts. Failure to do so may cause failures in the product. After transportation, verify the operations of the product.

3.1 Applicable PLC

| Model name | Applicability |
|-----------------|---|
| FX3G Series PLC | Ver.1.00 or later (from first production) |

The number of connectable expansion boards varies depending on the main unit as follows:
 FX3G-14M□, 24M□ Main units : 1 unit
 FX3G-40M□, 60M□ Main units : 2 units
 Never stack up two or more expansion boards.
 For details on the system configuration, refer to the following manual.
 → Refer to the **FX Series User's Manual - Data Communication Edition**

3.2 General Specifications

The general specifications are equivalent to the PLC main unit. For general specifications, refer to the following manuals. However, since the product is not isolated between communication lines and the CPU of main unit, please do not perform any dielectric withstand voltage tests or insulation resistance tests to this product.

→ Refer to the **FX3G Series User's Manual - Hardware Edition**

3.3 Communication specifications

| Item | Specification |
|--------------------------------------|--|
| Transmission standard | In conformance to RS-232C |
| Maximum transmission distance | 15m (49ft) maximum |
| Connection method | 9-pin D-Sub type (male) |
| Indication (LED) | RD, SD |
| Communication method | Full-duplex |
| Communication format | Non-Protocol Communication, Computer Link (dedicated protocol format 1 and 4), and Programming Communication |
| Baud rate | Non-Protocol Communication, Computer Link :300/600/1200/2400/4800/9600/19200/38400 bps Programming Communication :9600/19200/38400/57600/115200 bps |
| Insulation | Not insulated (Between communication line and CPU) |

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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.