

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

**FX3U-232-BD**

**INSTALLATION MANUAL**

Manual Number	JY997D12901
Revision	E
Date	September 2010

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 September 2010. Specifications are subject to change without notice. © 2005 Mitsubishi Electric Corporation

**Safety Precaution** (Read these precautions before use.)

This manual classifies the safety precautions into two categories:

⚠ **DANGER** and ⚠ **CAUTION**.

<b>⚠ DANGER</b>	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
<b>⚠ CAUTION</b>	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
FX3U Series User's Manual - Hardware Edition	JY997D16501 MODEL CODE: 09R516	Explains the FX3U Series PLC specifications for I/O, wiring, installation, and maintenance.
FX3UC Series User's Manual - Hardware Edition	JY997D28701 MODEL CODE: 09R519	Explains the FX3UC Series PLC specifications for I/O, wiring, installation, and maintenance.
FX3G/FX3U/FX3UC Series User's 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-232IF.

This manual describes the specifications and installation details for the FX3U-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.

**Applicable standards**

FX3U-232-BD units made in June, 2005 or later comply with the EC Directive (EMC Directive). Further information can be found in the following manual. However, the FX3UC-32MT-LT does not comply with the EC Directive (EMC Directive).  
 → FX3U Series Hardware Manual (Manual No. JY997D18801)  
 → FX3UC-32MT-LT-2 Hardware Manual (Manual No. JY997D31601)

**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**

FX3U-232-BD is an expansion board equipped with a 9-pin D-Sub for RS-232C communication. The FX3U-232-BD exchanges data with RS-232C devices. For wiring, specifications, settings, and program examples, refer to the following manual.  
 → FX Series User's Manual - Data Communication Edition

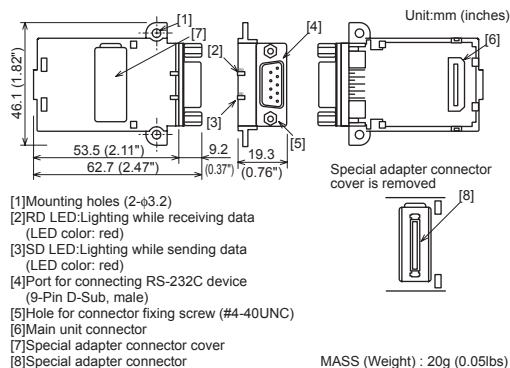
**1.1 Incorporated Items**

<b>Product</b>	RS-232C communication expansion board FX3U-232-BD
<b>Accessories</b>	M3 tapping screws for installation: 2 pcs. 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 FX3U-232-BD.
Remote maintenance	Program transfer or monitoring enabled via modem and phone line connected to port of the FX3U-232-BD.

**1.3 External Dimensions and Part Names**



The communication port of the FX3U-232-BD is a 9-Pin D-Sub male type. The table below shows the pin arrangement.

Pin No.	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 → FX3U-232-BD)
3	SD (TXD)	Send data input	Sends data (FX3U-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, Cl<sub>2</sub>, H<sub>2</sub>S, SO<sub>2</sub>, or NO<sub>2</sub>), flammable gas, vibration or impacts, or exposed 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.
- 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.

For the installation and removal, refer to the PLC main unit manual.  
 → FX3U Series User's Manual - Hardware Edition  
 → FX3UC Series User's Manual - Hardware Edition

**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
FX3U Series PLC	Ver.2.20 or later (from first production)
FX3UC-32MT-LT	Ver.1.00 or later (from first production)
FX3UC-32MT-LT-2	Ver.2.53 or later (from first production)

- The expansion board cannot be connected to FX3UC Series PLCs other than the FX3UC-32MT-LT(-2).
- Only one expansion board can be used per main unit. Additional expansion boards such as the FX3U-232-BD, FX3U-422-BD or FX3U-485-BD cannot be installed/used together with the FX3U-232-BD. For details on the system configuration, refer to the following manual.  
 → FX3U Series User's Manual - Hardware Edition  
 → FX3UC Series User's Manual - Hardware 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.  
 → FX3U Series User's Manual - Hardware Edition  
 → FX3UC Series User's Manual - Hardware Edition

**3.3 Power supply specifications**

5V DC, 20 mA is supplied from the internal power supply of the main unit.

**3.4 Communication specifications**

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

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.