MITSUBISHI ELECTRIC

PROGRAMMABLE CONTROLLERS
MELSEC-F

FX2N

FX2N-232-BD

USER'S GUIDE

JY992D63201G

This manual contains text, diagrams and explanations which will guide the reader in the correct installation, safe use and operation of the FX2N-232-BD (hereafter abbreviated to "232BD") and should be read and understood before attempting to install or use the unit. Further information can be found in the associated manuals mentioned below.
Specifications are subject to change without notice

Safety guidelines for the user and protection of the FX2N-232-BD.

This manual has been written to be used by trained and competent personnel. The definition of such a person or persons is as follows:

a) Any engineer using the product associated with this manual, should be of a competent nature, trained and qualified to the local and national standards. These engineers should be fully aware of all aspects of safety with regards to automated equipment.

b) Any commissioning or service engineer must be of a competent nature, trained and qualified to the local and national standards.

c) All operators of the completed equipment should be trained to use this product in a safe and coordinated manner in compliance to established safety practices.

Note: The term 'completed equipment' refers to a third party constructed device which contains or uses the product associated with this manual.

Notes on the Symbols Used in this Manual

At various times throughout this manual certain symbols will be used to highlight points of information which are intended to ensure the users personal safety and protect the integrity of equipment.

1) Indicates that the identified danger **WILL** cause physical and property damage.

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• Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.

• All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for the actual use of the product based on these illustrative examples.

• Please contact a Mitsubishi distributor for more information concerning applications in life critical situations or high reliability.

Associated Manuals

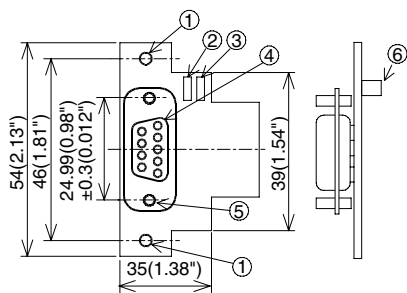|	Manual name	Manual No.	Description
★	FX Series User's Manual - Data Communication Edition	JY997D16901	Describes contents related to communication available in FX Series PLC such as wiring, communication setting and program examples. (Make sure to read this manual.)
★	FX2N Series Hardware Manual	JY992D66301	Describes contents related to hardware of FX2N Series PLC such as specifications, wiring and installation.
★	FX Programming Manual II	JY992D88101	Describes instructions in FX1S/FX1N/FX2N/FX2NC Series.

★ Indispensable manual

1. Outline of Product

The 232BD is an RS-232C communication board with a 9-Pin D-Sub. It is an insulated unit for signal exchange. Connected to the main unit of the FX2N Series PLC,
it enables serial data transfer between the PLC and equipment via an RS-232C port.

1.1 Communication Functions and Applicable PLC
(Available in indicated version or later)

Communication type	FX2N	Function
Computer link	V1.06	Data transfer via link protocol between PLC and computer (specified as the master station).

Communication type	FX2N	Function
No protocol communication	V1.06	Serial communication without protocol between PLC and equipment via RS-232C interface.
Optional programming port	First product	Optional port available for suitable programming tool when 232ADP is connected to PLC.
Remote maintenance	First product	Program transfer or monitoring enabled via modem and phone line connected to serial port of PLC.

1.2 Outside dimensions and name of each part

Unit: mm (inches)

① Mounting hole (2-φ3.5)

② RXD LED: Lit during receive.

③ TXD LED: Lit during send.

④ Connector for RS-232C equipment
The top face of this connector is higher than the top face of the PLC panel cover by approximately 7 mm (0.27").

⑤ Hole for connector fixing screw (#4-40UNC)
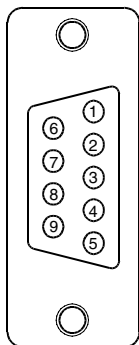
⑥ Connector for PLC

Accessories: Top cover for board   1
                    M3 screw to mount board   2
                    M3 screw to fix top cover   1

The communication connector of the 232BD is the D-sub, 9-pin socket type. The table below shows the pin arrangement.

Pin No.	Signal	Name	Function
1	CD	Receive carrier detection	Turns ON when carrier for data receive is detected.
2	RD(RXD)	Receive data input	Receive data (RS-232C equipment → 232BD)
3	SD(TXD)	Send data input	Send data (232BD → RS-232C equipment)
4	ER(DTR)	Send request	Turns ON when RS-232C equipment becomes ready for receive.
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		

1.3 System configuration

Only one function expansion board can be used for one main unit of FX2N.
FX2N-232-BD cannot be used by the plural. Other expansion boards cannot be used together with FX2N-232-BD. For the system configuration, refer to the FX Series User's Manual - Data Communication Edition offered separately.

2. Installation

Caution

- Use in the environments specified under the general specification in the manual.
  Do not use the product in environments with excessive or conductive dust, corrosive or flammable gas, oily smoke, moisture or rain, excessive heat, regular impact shocks or excessive vibration, as it may result in electrical shock, fire, malfunction, damage or deterioration on the product.

- Make sure to shut off the power outside the product before installing or wiring it.
  Otherwise, electric shock or serious damage to on the product may occur.

- Never drop wire chips or shavings into the vent slits when drilling screw holes or performing wiring, as they may cause fire, breakdown, or malfunction.
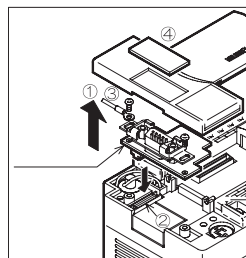
Securely install the 232BD to the designated port.
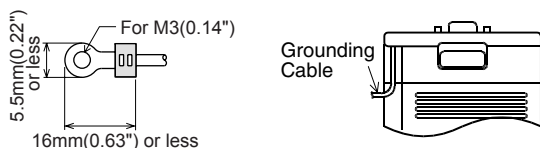Poor connection may cause malfunction.

2.1 Installation procedure

Turn OFF the power of the programmable controller, and mount the 232BD using the following procedure.

① Remove the panel cover from the top face of the main unit.

② Connect the 232BD to the board mounting connector provided on the main unit.

③ Fix the 232BD to the main unit using the M3 self-tapping screws provided, fitting the mounting bracket and the round crimp-style terminal with the ground cable as shown in the figure on the right.
Make sure that the crimp-style terminal is attached in the direction shown in the figure on the right, and that the ground cable extends from the unit shown in the figure below.
Tightening torque: 0.3 to 0.6 N•m

④ Cut out the hole provided on the left portion of the panel cover using a tool such as nippers and cutter so that the terminal block can be seen. The top face of this connector is higher than the top face of the panel cover of the programmable controller by approximately 7 mm (0.27").

3. Specifications

3.1 General specifications

The general specifications are equivalent to those of the PLC main unit. (Refer to the manual of the PLC main unit.)

3.2 Power supply specifications

5V DC, 20 mA is supplied as the power from the PLC.

3.3 Performance specifications

Item	Description
Transmission standard	In conformance to RS-232C
Maximum transmission distance	15 m (49ft) maximum
External equipment connection method	D-sub, 9-pin type (pin socket: manufactured by JST Mfg.) with JES-9P-2A3A (#4-40UNC, inch screw thread type)
Indication (LED)	RXD, TXD
Communication method	Full-duplex (When the version of PLC(FX2N) is Ver. 2.00 or later) / Half-duplex (When the version of PLC(FX2N) is earlier than Ver. 2.00)
Communication procedure	Non-procedure, dedicated protocol 1 procedure, dedicated protocol 4 procedure, protocol for programming tool
Baud rate	Following baud rate can be specified when using computer link or no protocol communication: 300/600/1200/2400/4800/9600/19200 bps
Insulation	Not insulated

4. CAUTION FOR USE

1) When programming tool is connected the 232BD, do not use any other communication format or parameters. If communication format or parameters is set, programming is not possible.

2) Only one programming tool (such as FX-10P, FX-20P, etc.) should be connected to either the programming port or the port provided on the 232BD. If a programming tool is connected to both connectors, the following may occur.

   a) The program inside the programmable controller may not be consistent with the program inside the programming tool. If the program is modified or the set value for the timer or the counter is modified, a part of the program may be damaged and the programmable controller may malfunction.

   b) When the sampling trace function of the programmable controller is used from both ports, the correct sampling trace result cannot be obtained.

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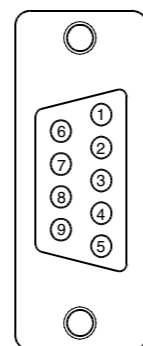### 1.2 Outside dimensions and name of each part

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M3 screw to mount board 2
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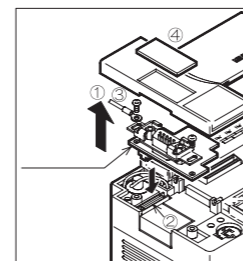
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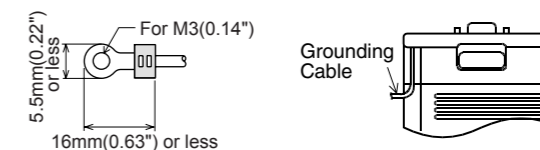Poor connection may cause malfunction.

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