

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

FX3U-USB-BD

USER'S MANUAL

| | |
|---------------|-------------|
| Manual Number | JY997D13501 |
| Revision | B |
| Date | June 2005 |

This manual describes the part names, dimensions, mounting, 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 The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company. Effective June 2005 Specifications are subject to change without notice. © 2005 Mitsubishi Electric Corporation

Safety Precaution (Read these precautions before use.)
 This manual classify 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 circumstances, procedures indicated by ⚠ **CAUTION** may also be linked to serious results. In any case, it is important to follow the directions for usage.

Associated Manuals

| Manual name | Manual No. | Description |
|--|-----------------------------------|---|
| FX3U Series User's Manual - Hardware Edition | JY997D16501 MODEL CODE: 09R516 | Explains FX3U Series PLC specification details for I/O, wiring, installation, and maintenance. |
| FX Series User's Manual - Data Communication Edition | JY997D16901 MODEL CODE: 09R715 | Explains N:N link, parallel link, computer link, no protocol communication by RS instructions/FX2N-232IF. |

Note: FX3UC Series PLC specification details for I/O, wiring, installation, and maintenance can only be found in the Japanese Manual.

How to obtain manuals
 For the necessary product manuals or documents, consult with the Mitsubishi Electric dealer from where you purchase your product.

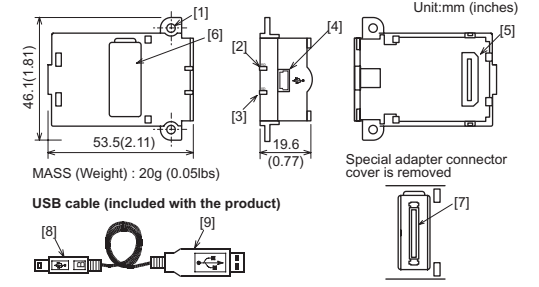
Applicable standard
 FX3U-USB-BD made in June, 2005 or later complies with EC directive (EMC Directive). Further information can be found in the following manual. However, FX3UC-32 MT-LT does not comply with EC directive (EMC Directive).
 → Refer to FX3U Series Hardware Manual (Manual No. JY997D18801)

1. Outline
 The FX3U-USB-BD board (hereinafter called USB-BD) is a function extension board for USB communication equipped with an USB port (MINI B plug, female). By connecting the USB-BD and a personal computer, program transfer to a PLC main unit and monitoring can be performed.

1.1 Incorporated Items
 Check if the following product and items are included in the package:

| Product | Quantity |
|---|----------|
| USB communication expansion board FX3U-USB-BD | 1 |
| M3 tapping screws | 2 |
| USB driver software (CD-ROM) | 1 |
| USB cable (3m (118.1")) | 1 |
| User's Manual (this manual) | 1 |

1.2 External Dimensions and Part Names



- [1] Mounting holes (2-φ3.2)
- [2] RD LED:Lighting while receiving data. (LED color: red)
- [3] SD LED:Lighting while sending data. (LED color: red)
- [4] USB Connector MINI B plug female
- [5] Main unit connector
- [6] Special adapter connector cover
- [7] Special adapter connector
- [8] USB Connector (To FX3U-USB-BD) MINI B plug male
- [9] USB Connector (To personal computer) A plug male

2. Installation

INSTALLATION PRECAUTIONS ⚠ **DANGER**

- Cut off all phases of the power source externally before starting the installation or wiring work, thus avoiding electric shock or damages to the product.

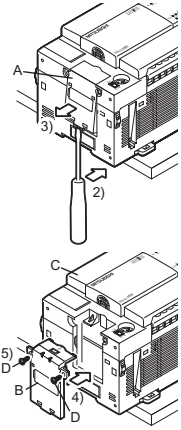
INSTALLATION PRECAUTIONS ⚠ **CAUTION**

- Use the product in the environment within the general specifications described in PLC main unit manual (Hardware Edition). Never use the product in areas with dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl₂, H₂S, NH₃, SO₂, or NO₂), flammable gas, vibrations or impacts, or expose it to high temperature, condensation, or wind and rain. If the product is used in such a place described above, electrical shock, fire, malfunction, damage, or deterioration may be caused.
- Use screwdrivers carefully when performing installation work, thus avoiding accident or product damage.
- When drilling screw holes or wiring, cutting chips or wire chips should not enter ventilation slits. Such an accident may cause fire, failure or malfunction.
- Do not touch the conductive parts of the product directly, thus avoiding failure or malfunction.
- Fix the expansion board securely to the specified connector. Incorrect connection may cause malfunction.

The following explains the installation method to FX3U/FX3UC Series PLC (FX3U Series PLC is used for the following example). For removing and installing details, refer to the PLC main unit manual. However, FX3UC Series PLC manual is only available in Japanese.
 → Refer to FX3U Series User's Manual - Hardware Edition

2.1 Installation Method

- Refer to the procedure 2) for configuring a new system.
 - Refer to the procedure 1) for adding product to an existing system.
- Power off the PLC. Disconnect all the cables connected to the PLC. Dismount the PLC from the DIN rail.
 - Using a flat blade screwdriver as shown in the right figure, lift the little dummy expansion board cover (right fig. A). Do not damage the circuit board or electronic parts.
 - Remove the dummy expansion board cover (right fig. A) in a parallel motion away from the main unit.
 - Make sure the expansion board (right fig. B) is in parallel with the main unit (right fig. C) and fix it to the expansion board connector.
 - Fix the expansion board (right fig. B) to the main unit using the M3 tapping screws of the provided (right fig. D). Tighten to a torque: 0.3 to 0.6 N·m



3. Specification

3.1 Applicable PLC

| Model name | Applicability |
|------------------|--|
| FX3U Series PLC | Ver.2.00 or later (from the first product) |
| FX3UC Series PLC | Ver.1.00 or later |

Only one function expansion board can be used for one main unit. Two or more FX3U-USB-BD cannot be used, or other expansion boards such as FX3U-422-BD or FX3U-485-BD cannot be installed/used together with FX3U-USB-BD. For details of the system configuration, refer to the following manual.
 → Refer to FX Series User's Manual - Data Communication Edition

3.2 General Specifications

General specifications are equivalent to the PLC main unit. For general specifications, refer to the following manual. However, please don't perform any dielectric withstand voltage test and insulation resistance test to this product.
 → Refer to FX3U Series User's Manual - Hardware Edition

3.3 Power Supply Specification

| Item | Specification |
|---------------------|--|
| Current consumption | 15mA / DC 5V (supplied by DC 5V power of main unit) 30mA / DC 5V (supplied by USB connector of personal computer) |

3.4 Communication Specifications

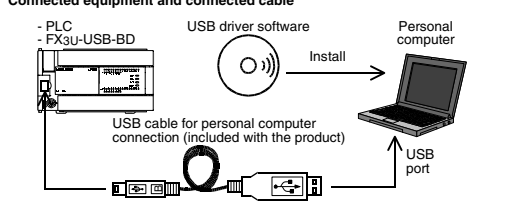
| Item | Specification |
|-------------------------------|---|
| Transmission standard | USB2.0 (For full speed) |
| Isolation | Photocoupler isolation (Between communication line and CPU) |
| Maximum transmission distance | 5m (196.9") at most (Included cable is 3m(118.1").) |
| Baud Rate | 9600/19200/38400/57600/115200 bps |
| Port | USB (MINI B plug female) |

3.5 System Requirements

| Item | Specification |
|-------------|---|
| OS | Microsoft® Windows®98, Windows®98SE Microsoft® Windows® Millennium Edition (Windows® Me) Microsoft® Windows®2000 Microsoft® Windows®XP |
| Software *1 | SW□D5C-GPPW-E (GX Developer), FX-PCS/WIN-E |

*1 GX Developer Ver. 8.23Z or later is applicable to the FX3U Series PLC. Its Ver. 8.13P or later is applicable to FX3UC Series PLC. For further details concerning alternative inapplicable programming tool setting, refer to the following manual.
 → Refer to FX3U Series User's Manual - Hardware Edition

4. System Configuration



For details of the programming communication, refer to the following manual.
 → Refer to FX Series User's Manual - Data Communication Edition

5. Connecting Procedure

- Power off the PLC.
- Connect the USB (MINI B plug male) connector of the USB cable to the FX3U-USB-BD.
- Connect the USB (A plug male) connector of the USB cable to the personal computer.
- Turn ON the power supply of the PLC.
- Turn ON the power supply of the personal computer.

6. Driver Installation

Procedure for installing the driver is explained below. Windows® XP installation follows.
 • Windows® 98, Windows® 98SE, Windows® Millennium Edition, and Windows® 2000, the installation method will vary. Installation of the driver is canceled during the following process, the installation is not carried out correctly. If the installation is canceled, uninstall the driver and install again. Please refer to Chapter 8 for instructions on uninstalling the driver. Please install the driver with the following procedure.
 1) When the USB cable is connected to the personal computer, the following screen is displayed. When the USB cable is connected to the personal computer, the following screen is displayed.



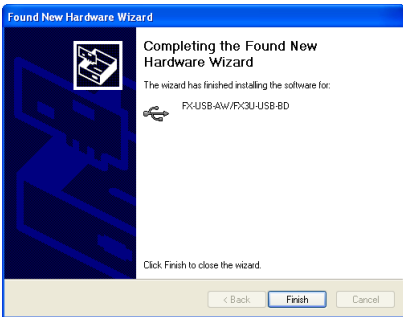
Insert the included CD-ROM into the personal computer's CD-ROM drive. Click [Next >]. The installation of the USB driver software will begin.
 - If using Windows® 98, Windows® 98SE, Windows® Millennium Edition, and Windows® 2000, A window to select the location of the installation files. Please select the CD-ROM drive.

2) The following screen is displayed. (Only in Windows® XP)



Click [Continue Anyway].

3) The following screen is displayed.



Click [Finish].

The installation of the USB driver software will finish.

- If Windows® 98, Windows® 98SE or Windows® Millennium Edition is used, installation of the USB Serial Port software begins, and ends automatically. The CD-ROM can be removed from the personal computer at this time.
- If using Windows® 2000 or Windows® XP, proceed to step 4).



4) The following screen is displayed.



Click [Next >].

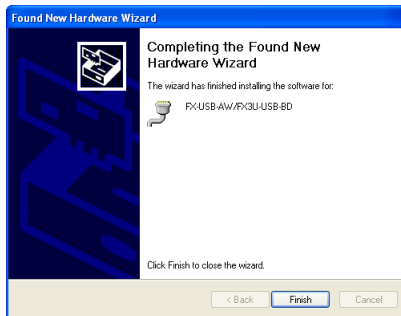
The installation of the USB Serial Port software will begin.

- If using Windows® 2000, a screen to select the location of the installation files is displayed. Please select the CD-ROM drive.

5) The screen of (2) is displayed. (Only in Windows® XP)

Click [Continue Anyway].

6) The following screen is displayed.



Click [Finish].

The installation of the USB Serial Port software will finish.

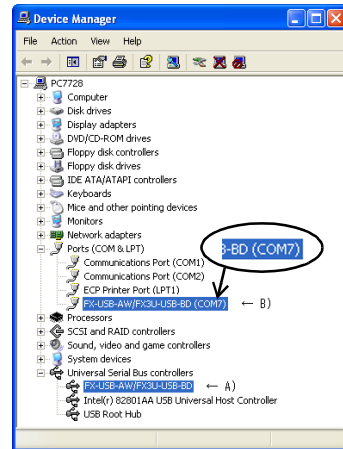
The CD-ROM (USB driver software) can be removed from the personal computer at this time.

7. Installation Confirmation of Driver

Procedure for confirming the installation of the driver is described below.

Windows® XP example follows.

- In Windows® XP, click [Start] → [Control Panel] → [System] → [Hardware] → [Device Manager (D)] and the window below will be displayed. Please confirm the COM number to which the driver is allocated (COM and LPT).
- If using Windows® 98, Windows® 98SE, Windows® Millennium Edition or Windows® 2000 A screen that is equivalent to the one below is displayed by clicking [My Computer] → [Control Panel] → [System] → [Device Manager] in the menu of the personal computer.



Check following:

- FX-USB-AW/FX3U-USB-BD is indicated at A).
- FX-USB-AW/FX3U-USB-BD (COM *) is indicated at B). * indicates the COM number used in FX3U-USB-BD.
- Install the driver again when ! is displayed.

Select the programming software COM number as the COM number currently assigned on the screen above.

Setting GX Developer:

Double-click [Online] → [Transfer setup] → [Serial] of personal computer side I/F. Select the same COM number as the COM number of the personal computer when the personal computer side I/F serial setting Dialog Box appears.

Click [OK] of [Connection Setup] screen to end.

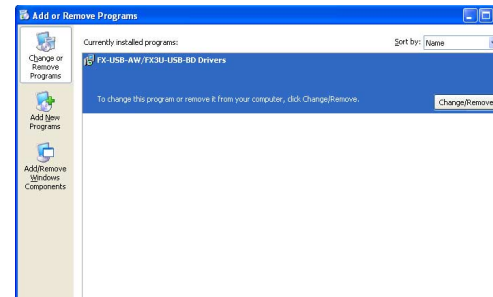


8. Method for Uninstalling Driver

The procedure for uninstalling the driver is explained below. A Windows XP example follows.

Please uninstall the driver by the procedure below.

- 1) Detach the USB cable from the personal computer. Click [Start] → [Control Panel] → [Add or Remove Programs] in the menu of the personal computer, the window below will be displayed.
 - In case of Windows Me of Windows 98 and Windows 98SE, Windows 2000 A screen that is equivalent to the one below is displayed by clicking [My Computer] → [Control Panel] → [Add/Remove Programs] in the menu of the personal computer.



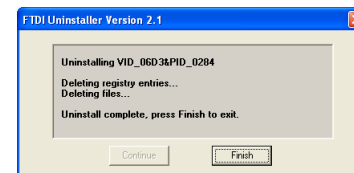
Click [Change/Remove].

2) The following screen is displayed.



Click [Continue].

3) The following screen is displayed.



Click [Finish].

9. Caution on use

STARTUP AND MAINTENANCE PRECAUTIONS **DANGER**

- Before a program or setting on-line or off-line change is performed, please read all relevant manuals and confirm safety aspects. Incorrect operation may damage the product or cause an accident.

STARTUP AND MAINTENANCE PRECAUTIONS **CAUTION**

- Do not disassemble or modify the unit. Doing so may cause failure, malfunction or fire. * For repair, contact your local Mitsubishi Electric distributor.
- Do not drop the product or do not exert strong impact, doing so may cause damage.

DISPOSAL PRECAUTIONS **CAUTION**

- Please contact a company certified in the disposal of electronic waste for environmentally safe recycling and disposal of the product.

TRANSPORT AND STORAGE PRECAUTIONS **CAUTION**

- During transportation avoid any impact as the product is a precision instrument. Check the operation of the product after transportation.

- Only one function extension board can be installed in the main unit; other function extension boards such as FX3U-422-BD or FX3U-485-BD cannot be installed nor used when the FX3U-USB-BD is installed.
- FX3U-USB-BD and a personal computer are connected and the PLC is turned on, and then an operations such as write, read, and monitor are tried for the first time using a programming tool, a communication error message may be displayed. In such a case, clear the message and try the operations again.
- If a communication error message is indicated while operating the programming tool (when executing 'Write to PLC', 'Read from PLC', or 'Monitor'), disconnect the USB cable once (from either the personal computer or the FX3U-USB-BD) and connect it again. Then clear the error message and choose Write, Read, or Monitor again.
- The programming tool may not be operated properly due to a contact failure at connectors or wire breakage. Make sure to save the program before transferring or changing it.

10. Troubleshooting

If communication cannot be established between the PLC and a personal computer using FX3U-USB-BD, confirm the following status by checking SD LED and RD LED in FX3U-USB-BD.

The status of SD LED and RD LED

| The status of SD LED and RD LED. | | Contents |
|----------------------------------|--------------|--|
| SD | Blinking | Communicating correctly |
| | Extinguished | <ul style="list-style-type: none"> • Confirm that the power is supplied to the personal computer. • Confirm the personal computer and the PLC are connected properly with the specified cable. • Confirm that the communication settings and connected PLC are correctly set in the software. Refer to the software manual. |
| RD | Blinking | Data receiving |
| | Extinguished | <ul style="list-style-type: none"> • Confirm that the power is supplied to PLC. • The PLC will not operate when a configuration that exceeds the DC 5V or DC 24V capacity is used. It will also be impossible to communicate normally. • Confirm that the specified cable is used to connect the personal computer and PLC. • Confirm that the communication settings and connected PLC are correctly set in the software. Refer to the software manual. |

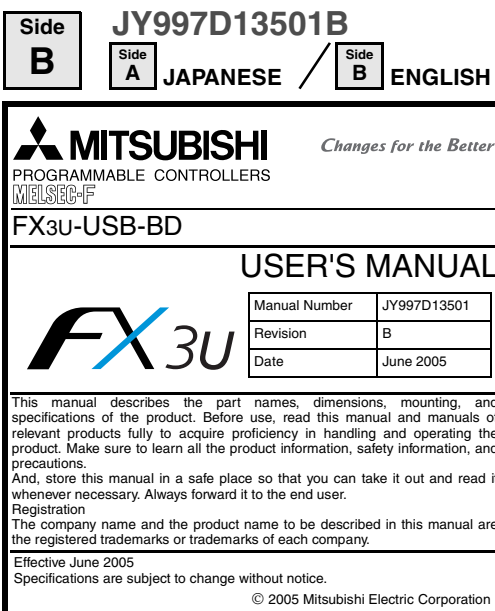
This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage 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.



1. Outline

The FX3U-USB-BD board (hereinafter called USB-BD) is a function extension board for USB communication equipped with a USB port (MINI B plug, female).

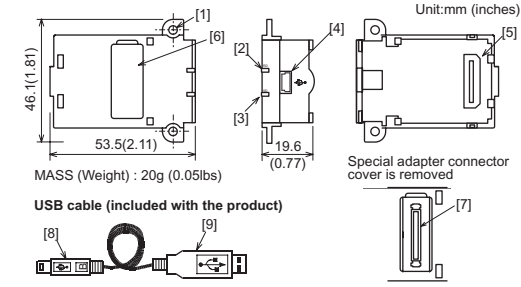
By connecting the USB-BD and a personal computer, program transfer to a PLC main unit and monitoring can be performed.

1.1 Incorporated Items

Check if the following product and items are included in the package:

Table with columns: Product, Included items, Quantity. Lists USB communication expansion board, M3 tapping screws, USB driver software (CD-ROM), USB cable, and User's Manual.

1.2 External Dimensions and Part Names



- Legend for part numbers: 1] Mounting holes, 2] RD LED, 3] SD LED, 4] USB Connector, 5] Main unit connector, 6] Special adapter connector cover, 7] Special adapter connector, 8] USB Connector (To FX3U-USB-BD), 9] USB Connector (To personal computer).

2. Installation

INSTALLATION PRECAUTIONS DANGER. Cut off all phases of the power source externally before starting the installation or wiring work, thus avoiding electric shock or damages to the product.

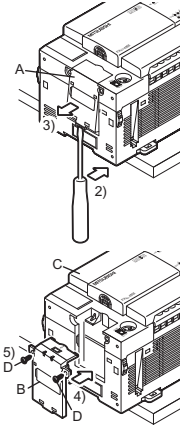
INSTALLATION PRECAUTIONS CAUTION. Use the product in the environment within the general specifications described in PLC main unit manual (Hardware Edition). Never use the product in areas with dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl2, H2S, NH3, SO2, or NO2), flammable gas, vibrations or impacts, or expose it to high temperature, condensation, or wind and rain.

The following explains the installation method to FX3U/FX3UC Series PLC (FX3U Series PLC is used for the following example). For removing and installing details, refer to the PLC main unit manual.

2.1 Installation Method

- Refer to the procedure 2) for configuring a new system.
- Refer to the procedure 1) for adding product to an existing system.

- Power off the PLC. Disconnect all the cables connected to the PLC. Dismount the PLC from the DIN rail.
- Using a flat blade screwdriver as shown in the right figure, lift the little dummy expansion board cover (right fig. A). Do not damage the circuit board or electronic parts.
- Remove the dummy expansion board cover (right fig. A) in a parallel motion away from the main unit.
- Make sure the expansion board (right fig. B) is in parallel with the main unit (right fig. C) and fix it to the expansion board connector.
- Fix the expansion board (right fig. B) to the main unit using the M3 tapping screws of the provided (right fig. D). Tighten to a torque: 0.3 to 0.6 N·m.



3. Specification

3.1 Applicable PLC

Table with columns: Model name, Applicability. Lists FX3U Series PLC and FX3UC Series PLC with their respective applicable versions.

Only one function expansion board can be used for one main unit. Two or more FX3U-USB-BD cannot be used, or other expansion boards such as FX3U-422-BD or FX3U-485-BD cannot be installed/used together with FX3U-USB-BD.

3.2 General Specifications

General specifications are equivalent to the PLC main unit. For general specifications, refer to the following manual. However, please don't perform any dielectric withstand voltage test and insulation resistance test to this product.

3.3 Power Supply Specification

Table with columns: Item, Specification. Lists current consumption (15mA/DC 5V and 30mA/DC 5V) and port type (USB MINI B plug female).

3.4 Communication Specifications

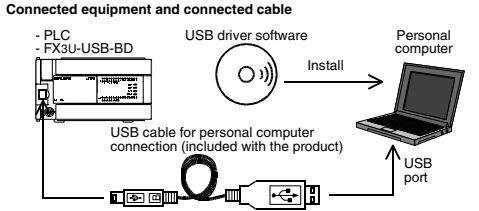
Table with columns: Item, Specification. Lists transmission standard (USB2.0), isolation (Photocoupler), maximum transmission distance (5m), baud rate (9600/19200/38400/57600/115200 bps), and port type (USB MINI B plug female).

3.5 System Requirements

Table with columns: Item, Specification. Lists OS requirements (Microsoft Windows 98/2000/XP) and software requirements (GX Developer).

*1 GX Developer Ver. 8.23Z or later is applicable to the FX3U Series PLC. Its Ver. 8.13P or later is applicable to FX3UC Series PLC. For further details concerning alternative inapplicable programming tool setting, refer to the following manual.

4. System Configuration



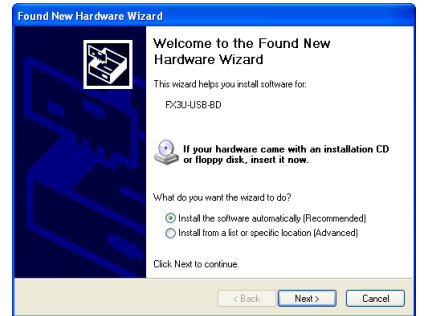
For details of the programming communication, refer to the following manual. → Refer to FX Series User's Manual - Data Communication Edition

5. Connecting Procedure

- Power off the PLC.
- Connect the USB (MINI B plug male) connector of the USB cable to the FX3U-USB-BD.
- Connect the USB (A plug male) connector of the USB cable to the personal computer.
- Turn ON the power supply of the PLC.
- Turn ON the power supply of the personal computer.

6. Driver Installation

Procedure for installing the driver is explained below. Windows® XP installation follows. Windows® 98, Windows® 98SE, Windows® Millennium Edition, and Windows® 2000, the installation method will vary. Installation of the driver is canceled during the following process, the installation is not carried out correctly.



Insert the included CD-ROM into the personal computer's CD-ROM drive. Click [Next >]. The installation of the USB driver software will begin.

Safety Precaution

This manual classify the safety precautions into two categories: DANGER and CAUTION.

Table defining DANGER (hazardous conditions, death or severe injury) and CAUTION (hazardous conditions, personal injury or physical damage).

Depending on circumstances, procedures indicated by CAUTION may also be linked to serious results. In any case, it is important to follow the directions for usage.

Associated Manuals

Table listing associated manuals: FX3U Series User's Manual (Hardware Edition) and FX Series User's Manual - Data Communication Edition, with their model codes and descriptions.

Note: FX3UC Series PLC specification details for I/O, wiring, installation, and maintenance can only be found in the Japanese Manual.

How to obtain manuals

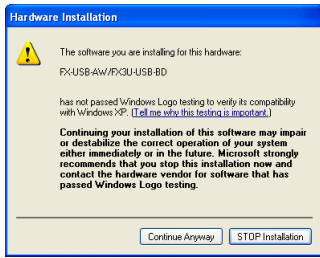
For the necessary product manuals or documents, consult with the Mitsubishi Electric dealer from where you purchase your product.

Applicable standard

FX3U-USB-BD made in June, 2005 or later complies with EC directive (EMC Directive). Further information can be found in the following manual. However, FX3UC-32 MT-LT does not comply with EC directive (EMC Directive).

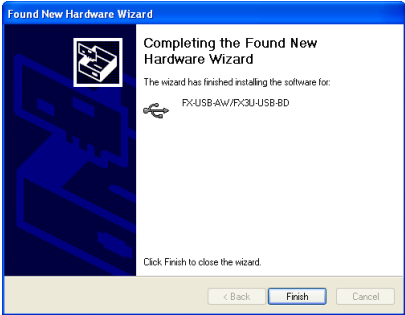
→ Refer to FX3U Series Hardware Manual (Manual No. JY997D18801)

2) The following screen is displayed. (Only in Windows® XP)



Click [Continue Anyway].

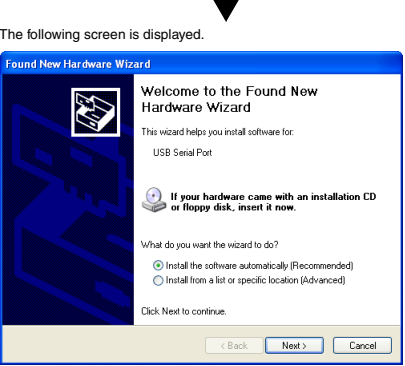
3) The following screen is displayed.



Click [Finish].

The installation of the USB driver software will finish. If Windows® 98, Windows® 98SE or Windows® Millennium Edition is used, installation of the USB Serial Port software begins, and ends automatically.

4) The following screen is displayed.



Click [Next >].

The installation of the USB Serial Port software will begin. If using Windows® 2000, a screen to select the location of the installation files is displayed.

5) The screen of 2) is displayed. (Only in Windows® XP)

Click [Continue Anyway].

6) The following screen is displayed.

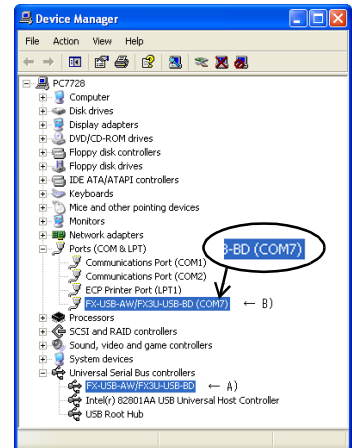


Click [Finish]. The installation of the USB Serial Port software will finish. The CD-ROM (USB driver software) can be removed from the personal computer at this time.

7. Installation Confirmation of Driver

Procedure for confirming the installation of the driver is described below. Windows® XP example follows.

- In Windows® XP click [Start] → [Control Panel] → [System] → [Hardware] → [Device Manager (D)] and the window below will be displayed. Please confirm the COM number to which the driver is allocated (COM and LPT).
- If using Windows® 98, Windows® 98SE, Windows® Millennium Edition or Windows® 2000 A screen that is equivalent to the one below is displayed by clicking [My Computer] → [Control Panel] → [System] → [Device Manager] in the menu of the personal computer.



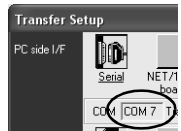
Check following:

- FX-USB-AW/FX3U-USB-BD is indicated at A).
- FX-USB-AW/FX3U-USB-BD (COM *) is indicated at B). * indicates the COM number used in FX3U-USB-BD.

Select the programming software COM number as the COM number currently assigned on the screen above.

Setting GX Developer:

Double-click [Online] → [Transfer setup] → [Serial] of personal computer side I/F. Select the same COM number as the COM number of the personal computer when the personal computer side I/F serial setting Dialog Box appears.

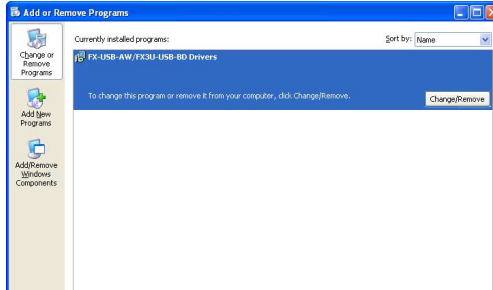


8. Method for Uninstalling Driver

The procedure for uninstalling the driver is explained below. A Windows XP example follows.

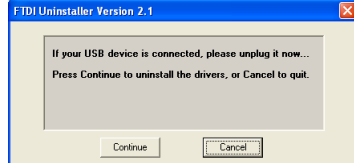
Please uninstall the driver by the procedure below.

- Detach the USB cable from the personal computer. Click [Start] → [Control Panel] → [Add or Remove Programs] in the menu of the personal computer, the window below will be displayed.
- In case of Windows Me of Windows 98 and Windows 98SE, Windows 2000 A screen that is equivalent to the one below is displayed by clicking [My Computer] → [Control Panel] → [Add/Remove Programs] in the menu of the personal computer.



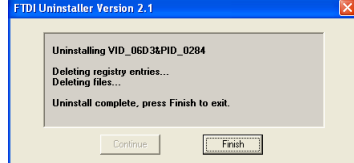
Click [Change/Remove].

2) The following screen is displayed.



Click [Continue].

3) The following screen is displayed.



Click [Finish].

9. Caution on use

Summary of safety warnings: DANGER (Before program change, read manuals), CAUTION (Do not disassemble, do not drop), CAUTION (Disposal: contact certified company), CAUTION (Transport and storage: avoid impact).

10. Troubleshooting

If communication cannot be established between the PLC and a personal computer using FX3U-USB-BD, confirm the following status by checking SD LED and RD LED in FX3U-USB-BD.

Table with columns: The status of SD LED and RD LED, Contents. Describes LED status for 'Communicating correctly', 'Data receiving', and 'Data sending'.

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