



Programmable Controller MELSEC-F

Side A JAPANESE Side B ENGLISH

FX3U-4AD INSTALLATION MANUAL

Manual Number, Revision, Date table

This manual describes the part names, dimensions, mounting, and specifications of the product.

Effective October 2022 Specifications are subject to change without notice.

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Safety Precautions

This manual classifies the safety precautions into two categories: WARNING and CAUTION.

Warning and Caution icons with descriptions

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

Table with columns: Manual name, Manual No., Description

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

Certification of UL, cUL standards

The following product has UL and cUL certification. UL, cUL File Number: E95239 Models: MELSEC FX3U series manufactured from February 1st, 2006 FX3U-4AD

Compliance with EC directive (CE Marking)

This note does not guarantee that an entire mechanical module produced in accordance with the contents of this note will comply with the following standards.

Requirement for Compliance with EMC directive

The following products have shown compliance through direct testing (of the identified standards below) and design analysis (through the creation of a technical construction file) to the European Directive for Electromagnetic Compatibility (2014/30/EU) when used as directed by the appropriate documentation.

Attention This product is designed for use in industrial applications.

Type: Programmable Controller (Open Type Equipment) Models: MELSEC FX3U series manufactured from February 1st, 2006 FX3U-4AD

Table with columns: Standard, Remark

Caution for EC Directive

The FX3U-4AD has been found to be compliant to the European standards in the aforesaid manual and directive. However, for the very best performance from what are in fact delicate measuring and controlled output device Mitsubishi Electric would like to make the following points;

- Sensitive analog cable should not be laid in the same trunking or cable conduit as high voltage cabling. Where possible users should run analog cables separately.
• Good cable shielding should be used. Ground the shield of the twisted shielded cable at one point on the PLC side.
• When reading analog values, EMC accuracy can be improved out by averaging the readings. This can be achieved either through functions on the special function block for analog input or through a users program in the FX3U Series PLC main unit.

Note for compliance with EN61131-2:2007

- General note on the use of the power supply cable. The FX3U-4AD unit requires that the cable used for power supply is 30m or less.
• When an external power supply is used, attach a ferrite core to the power cable and make 2 turns around. (Ferrite core used in Mitsubishi Electric's test E04SR401938 manufactured by SEIWA ELECTRIC MFG. CO., LTD.)

Compliance with UKCA marking

The requirements for compliance with UKCA marking are the same as that with EC directive (CE marking).

1. Outline

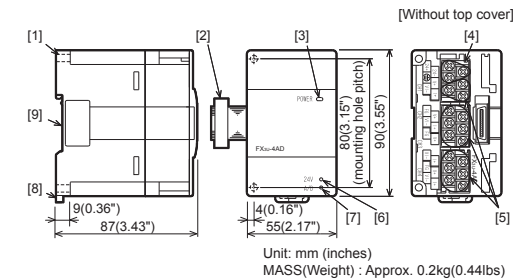
The FX3U-4AD special function block for analog input converts four analog input values (voltage, current) to digital values and transfers those digital values to the PLC main unit.

1.1 Incorporated Items

Table with columns: Product, Accessories

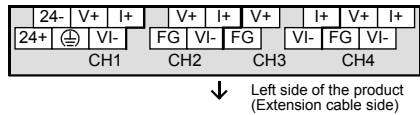
1.2 External Dimensions, Part Names, and Terminal Layout

1.2.1 External Dimensions and Part Names



- [1] Direct mounting hole: 2 holes of φ4.5 (0.18") (mounting screw: M4 screw)
[2] Extension cable
[3] POWER LED (green): Lit while 5V DC power is supplied from PLC.
[4] Terminal block for power supply (24V DC) (M3 terminal screw)
[5] Terminal block for analog input
[6] 24V LED (red): Lit while 24V DC power is supplied properly to terminals [24+] and [24-].
[7] A/D LED (red): Flashes (at high speed) during A/D conversion.
[8] DIN rail mounting hook
[9] DIN rail mounting groove (35 mm (1.38") wide)

1.2.2 Terminal Layout



2. Installation

INSTALLATION PRECAUTIONS



- 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 to high temperature, condensation, or rain and wind.
• Do not touch the conductive parts of the product directly. Doing so may cause device failures or malfunctions.
• Install the product securely using a DIN rail or mounting screws.
• Install the product on a flat surface.
• If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities.
• When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits of the PLC.
• Be sure to remove the dust proof sheet from the PLC's ventilation slits when installation work is completed.
• Failure to do so may cause fire, equipment failures or malfunctions.
• Connect extension cables securely to their designated connectors. Loose connections may cause malfunctions.

2.1 Arrangements

The product connects on the right side of an PLC main unit or extension units/blocks (including special function units/blocks). For connection to FX3GC/FX3UC Series PLC or FX2NC Series PLC extension block, FX2NC-CNV-IF or FX3UC-1PS-5V is required. For connection to FX5U/FX5UC PLC, FX5-CNV-BUS or FX5-CNV-BUSC is required. For further information of installation arrangements, refer to the following manual.

4.3 Power Supply Specifications

Table with columns: Item, Specification

4.4 Performance Specifications

Table with columns: Item, Description

2.2 Mounting

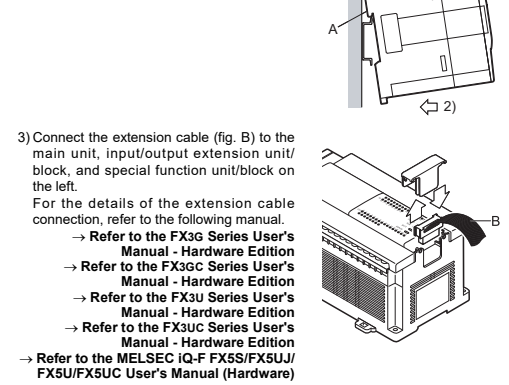
The product is mounted by the following method.

- Direct mounting
• DIN rail mounting

2.2.1 Direct Mounting

The product can be mounted with M4 screws by using the direct mounting holes. Refer to the External Dimensions (section 1.2) for the product's mounting hole pitch information. An interval space between each unit of 1 to 2 mm (0.04" to 0.08") is necessary.

2.2.2 DIN Rail Mounting The product can be mounted on a DIN rail (DIN46227, 35mm width). 1) Fit the upper edge of the DIN rail mounting groove (fig. A) onto the DIN rail. 2) Press the product against the DIN rail.



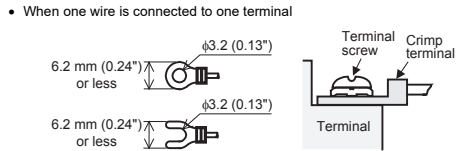
3. Wiring

Table with columns: WIRING PRECAUTIONS, WARNING

Table with columns: WIRING PRECAUTIONS, CAUTION

3.1 Applicable Cable and Terminal Tightening Torque

The size of the terminal screws is M3. The end disposal of the cable shows below. Tighten the terminal to a torque of 0.5 to 0.8N·m. Do not tighten terminal screws with a torque outside the above-mentioned range.

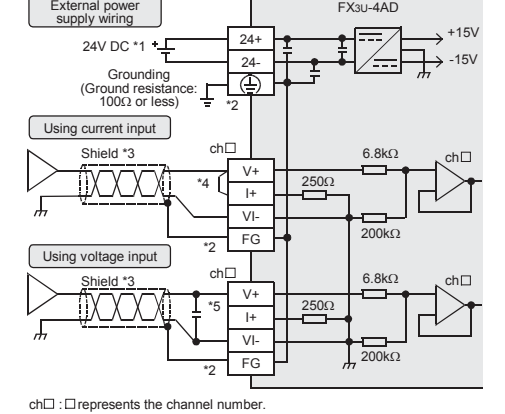


3.2 Power Supply Wiring

For the power supply wiring, refer to the following manual. -> Refer to the FX3S/FX3G/FX3GC/FX3U/FX3UC Series User's Manual - Analog Control Edition

3.3 Wiring of Analog Input

-> For the terminal layout, refer to Subsection 1.2.2



- *1 For FX3G/FX3U/FX5U PLC (AC power type), the 24V DC service power supply is also available.
*2 The [FG] terminal and the [] terminal are connected internally. There is no "FG" terminal for ch1. When using ch1, connect directly to the [] terminal.
*3 Use a 2-core twisted shield wire for analog input line, and separate it from other power lines or inductive lines.
*4 For the current input, short-circuit the [V+] terminal and the [I+] terminal.
*5 If there is voltage ripple in the input voltage or there is noise in the external wiring, connect a capacitor of approximately 0.1 to 0.47μF 25 V.

3.4 Grounding

- Grounding should be performed as stated below.
• The grounding resistance should be 100Ω or less.
• Independent grounding should be performed for best results. When independent grounding is not performed, perform "shared grounding" of the following figure.

4. 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 AND STORAGE 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 pallets. 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.

4.1 Applicable PLC

Table with columns: Model name, Applicability

The version number can be checked by monitoring D801 as the last three digits indicate it.

- *1 An FX2NC-CNV-IF or FX3UC-1PS-5V is necessary to connect the FX3U-4AD with the FX3G/FX3UC PLC.
*2 Up to 7 units can be connected to the FX3UC-32MT-LT(-2) PLC.
*3 An FX5-CNV-BUS or FX5-CNV-BUSC is necessary to connect the FX3U-4AD with the FX5U/FX5UC PLC.

4.2 General Specifications

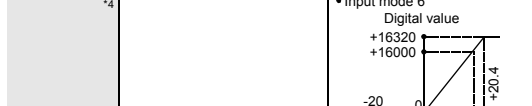
For the general specifications other than the following, refer to the manual of the PLC main unit. The items other than the following are equivalent to those of the PLC main unit.

Table with columns: Item, Specification

4.5 Input characteristics

Table with columns: Input mode, Input mode, Analog input range, Digital output range

The input characteristics in each input mode are as follows. For the details of the input characteristics, refer to the following manual. -> Refer to the FX3S/FX3G/FX3GC/FX3U/FX3UC Series User's Manual - Analog Control Edition



Total accuracy • ±0.3% (±60mV) for full scale of 20V (when ambient temperature is 25°C±5°C) and a current of -20 mA to +20 mA is input) Same when input is 4mA to 20mA

A/D conversion time 500μs x number of selected channels (If channels use the digital filter(s); 5ms x number of selected channels)

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.

Table with columns: WIRING PRECAUTIONS, WARNING

Table with columns: WIRING PRECAUTIONS, CAUTION

「电器电子产品有害物质限制使用标识要求」的表示方式

Note: This symbol mark is for China only.

含有有害6物质的名称, 含有量, 含有部品 本产品中所含有的有害6物质的名称, 含有量, 含有部品如下表所示。

产品中有有害物质的名称及含量

Table with columns: 部件名称, 有害物质 (铅, 汞, 镉, 六价铬, 多溴联苯, 多溴二苯醚)

本表格依据SJ/T 11364的规定编制。

○: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。 ×: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

基于中国标准法的参考规格: GB/T15969. 2

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