



JY997D73301F

MELSEC iQ-F FX5-ASL-M

Hardware Manual



Manual Number	JY997D73301
Revision	F
Date	March 2021

This manual describes the part names, dimensions, installation, specifications of the product. Before use, read this manual and manuelevant products fully to acquire proficiency in handling and operatin product. Make sure to learn all the product information, safety information

product. Make sure to be the comparation of the 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.

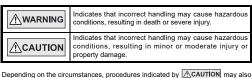
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Effective March 2021
Specifications are subject to change without notice.
© 2017 MITSUBISHI ELECTRIC CORPORATION This manual classifies the safety precautions into two categories:

MARNING and **MCAUTION**



cause severe injury. It is important to follow all precautions for personal safety

PRECAUTIONS REGARDING WARRANTY Note that there is precaution regarding warranty of this product

Item	FX5-ASL-M	Other programmable controller products (e.g. MELSEC iQ-F series)
Repair term after discontinuation of production	1 year	7 years

Associated Manual

Manual name	Manual No.	Description
MELSEC iQ-F FX5 User's Manual (AnyWireASLINK)	SH-081796ENG	Explains function of FX5-ASL-M.
MELSEC iQ-F FX5UJ User's Manual (Hardware)	SH-082206ENG	Explains FX5UJ CPU module specification details for I/O, wiring, installation, and maintenance.
MELSEC iQ-F FX5U User's Manual (Hardware)	JY997D55301	Explains FX5U CPU module specification details for I/O, wiring, installation, and maintenance.
MELSEC iQ-F FX5UC User's Manual (Hardware)	JY997D61401	Explains FX5UC CPU module specification details for I/O, wiring, installation, and maintenance.

For the necessary product manuals or documents, consult with your local Mitsubishi Electric representative.

Applicable standards

FX5-ASL-M complies with the EC Directive (EMC Directive) and UL standards (UL, cUL). Further information can be found in the following manual.

— MELSEC IQ-F FX5 User's Manual (AnyWireASLINK)
Regarding the standards that relate to the CPU module, please refer to either the

product catalog or consult with your local Mitsubishi Electric representative. Attention

This product is designed for use in industrial applications

1. Outline

The FX5-ASL-M type AnyWireASLINK system master module (hereinafter referred to as FX5-ASL-M) is an intelligent function module for building an AnyWireASLINK system with FX5 CPU module.

The FX5-ASL-M is jointly developed and manufactured by Mitsubishi Electric and

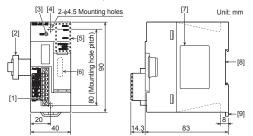
Anywire Corporation. The AnyWireASLINK system is a sensor network system.

1.1 Incorporated Items

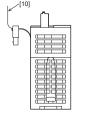
Check that the following product and items are included in the package:

Product	FX5-ASL-M type AnyWireASLINK system master module
	Dust proof protection sheet (1 sheet)
Included Items	Hardware manual [Japanese /English] (This manual)
	Hardware manual [Chinese]

1.2 External Dimensions, Part Names



MASS (Weight): Approx. 0.2 kg inting color: Munsell 0.6B7.6/0 2



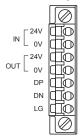
- [1] Transmission cable terminal block
- [2] Extension cable
- [4] Direct mounting hole: 2 holes of \$\phi4.5\$ (mounting screw: M4 screw)
- [5] Operation status display LEDs
- [6] Extension connector (for next module)
- [7] Name plate
- [8] DIN rail mounting groove (DIN rail: DIN 46277, 35 mm wide)
- [9] DIN rail mounting hook

For further information for wiring to the terminal block, refer to the following manual

LED display	LED color	Status	Indication
POWER	Green	On	Power on
FOWER	Green	Off	Power off or module failure
RUN	Green	On	Normal operation
KUN	Gleen	Off	Error
		On	Minor error or major error
ERROR	Red	Flashing	Moderate error or major error
		Off	Normal operation
LINK	Green	Flashing	Normal operation
LINK	Green	Off	5 V DC power off or module failure
		On	Automatic address detection in progress
SET	Green	Flashing	Writing in the EEPROM
		Off	Normal operation
		On	DP/DN disconnection, no response from the slave module
ALM	Red	Flashing (1-second intervals)	DP-DN short circuit, 24V-DP short circuit
		Flashing (0.2-second intervals)	A 24 V DC power supply is not being supplied or the voltage is low
		Off	Normal operation

1.4 Terminal Layout

1.3 Indications of LEDs



Termin	al name	Description
	24V	Power supply terminals for driving the transmission circuit of
IN	0V	the AnyWireASLINK system and for slave modules. Connect to a 24 V DC external power supply. The maximum passing current of [IN 24V] - [OUT 24V] and [IN 0V] - [OUT 0V] is 2 A.
	24V	Terminals for connecting insulation type (4-wire) slave
OUT	0V	Ifflouries. If the modules are connected to these terminals, supplying power for each module from the 24 V DC external power supply is not necessary. If OUT 24V and 0V are short-circuited, it may cause fusing of the built-in fuse.
)P	AnyWireASLINK transmission signal terminals DP: Transmission cable (+), DN: Transmission cable (-)
С	N	Connect to the DP and DN terminals on the slave module or terminating module.
L	.G	Connected to the neutral point of the noise filter inserted between the 24V and 0V terminals. Ground the LG terminal with the functional ground terminal (FG terminal) on the programmable controller at a single point.

MFI SEC iQ-E FX5 User's Manual (AnyWireASI INK)

2. Installation

INSTALLATION PRECAUTIONS	<u>^</u> \v	VARN	ING			
Make sure to cut attempting installation			power	supply	externally	bef
Failure to do so may	y cause electric	shock o	r dama	ge to the	e product.	
Use the product within the generic environment specifications described to the product within the generic environment specifications described to the product within the generic environment specifications described to the product within the generic environment specifications.		ibed				

the User's Manual (Hardware) for the CPU module to be used. 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 ra If the product is used in such conditions, electric shock, fire, malfunction

∴CAUTION

- Do not touch the conductive parts of the product directly Doing so may cause device failures or malfunctions.
- When drilling screw holes or wiring, make sure that cutting and wiring debr do not enter the ventilation slits of the PLC. Failure to do so may cause fire, equipment failures or malfunctions
- The dust proof sheet should be affixed to the ventilation slits befor installation and wiring work to block foreign objects such as cutting and wiring debris. However, when the installation work is completed, make sure tremove the sheet to provide adequate ventilation.

 Failure to do so may cause fire, equipment failures or malfunctions.
- Install the product on a flat surface.
- If the mounting surface is rough, undue force will be applied to the PC boar

- thereby causing nonconformities.

 Install the product securely using a DIN rail or mounting screws.
- Connect the extension cables securely to their designated connectors. Loose connections may cause malfunctions.

For further information on mounting, refer to the following manual.

→ MELSEC iQ-F FX5UJ User's Manual (Hardware)

→ MELSEC iQ-F FX5U User's Manual (Hardware)

→ MELSEC iQ-F FX5UC User's Manual (Hardware)

3. Wiring

<u>^</u>WARNING WIRING PRECAUTIONS

- Make sure to cut off all phases of the power attempting installation or wiring work. Failure to do so may cause electric shock or damage to the product.
- Make sure to properly wire to the terminal block (European type) accordance with the following precautions. Failure to do so may cause electric shock, equipment failures, a short-circu wire breakage, malfunctions, or damage to the product.
- The disposal size of the cable end should follow the dime
- Tightening torque should follow the specifications in the manual. Twist the ends of stranded wires and make sure that there are no loose
- Do not solder-plate the electric wire ends.
- Do not connect more than the specified number of wires or electric wires of unspecified size.
- Affix the electric wires so that neither the terminal block nor the connecte parts are directly stressed.
- If OUT 24V and 0V are short-circuited, it may cause fusing of the built-in fu

WIRING PRECAUTIONS **ACAUTION**

- Connect the power supply wiring to the dedicated terminals described in the manual.
 If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the PLC will burn out.
- Do not apply the 24 V DC power before wiring the entire AnyWireASLIN
- Make sure to observe the following precautions in order to prevent an damage to the machinery or accidents due to malfunction of the PLC cause by abnormal data written to the PLC due to the effects of noise: Do not bundle the power line and control line together with or lay them close to the main circuit, high-voltage line, load line or power line. As a guideline, lay the power line, control line and communication cables at least 100 mm away from the main circuit, high-voltage line, load line or
- power line Ground the shield of the shielded wire or shielded cable at one point or the PLC. However, do not use common grounding with heavy electrical
- e the cables in a duct or clamp them
- If not, dangling cable may swing or inadvertently be pulled, resulting damage to the module or cables or malfunction due to poor contact. When disconnecting the cable from the module, do not pull the cable by the
- writer usconnecting the dark cable part.

 For the cable connected to the terminal block, loosen the terminal screw.

 Pulling the cable connected to the module may result in malfunction damage to the module or cable.
- 3.1 Transmission Cable Terminal Block For details on the terminal block layout, refer to section 1.4

Model name	FMC 1,5/ 7-STF-3,81 (PHOENIX CONTACT GmbH & Co. KG)
Tightening torque	0.2 to 0.3 N•m (Connector fixing screw)
To tighten the	ne terminal block, a flathead screwdriver having a tip size of

- 0.4×2.5 mm is required.

 When the transmission cable terminal block is removed

 Before removing the transmission cable terminal block, check that the fixing screws on both sides are completely loosened (removed from the socket).

 Pulling with excessive force while the fixing screws of both ends are still tightened may damage the device.

 When the transmission cable terminal block is attached Before tightening, check that there are no short circuits due to disconnected or frayed wires. Then tighten the screws at both sides securely.

 (Tightening torque: 0.2 to 0.3 N=m)

Classification	Name	Diameter	Туре	Material	Temperatur e rating
Transmission	UL-listed general-purpose 2-wire cable (VCTF, VCT)	1.25 mm ² , 0.75 mm ²			70 °C
cable (DP, DN)	UL-listed general-purpose wire	1.25 mm ² , 0.75 mm ²	Strand wire		or more
	Dedicated flat cable	1.25 mm ² , 0.75 mm ²	Copper		90 °C
	UL-listed general-purpose 2-wire cable (VCTF, VCT)	0.75 to 2.0 mm ²	Strand wire	wire	70 °C
Power supply cable (24V, 0V)	UL-listed general-purpose wire	0.75 to 2.0 mm ²	Strand wire/ single wire		or more
	Dedicated flat cable	1.25 mm ² , 0.75 mm ²	Strand wire		90 °C

3.2 Cable Treatment

Recommended wire ferrules (PHOENIX CONTACT GmbH & Co. KG)

size	(PHOENIX CONTACT GmbH & Co. KG)
0.75 mm ²	AI 0,75-10 GY
1.25 mm ²	AI 1,5-10
3.3 Wiring	Procautions

Do not run multiple transmission cables (DP, DN) using a multicore cable.

- The voltage should not fall below the lower limit of the allowable voltage range due The voltage should not fail below the lower limits of the allocation voltage drop caused by the cable.

 If the voltage falls below the lower limit, malfunctions may occur.

 Do not connect soldered cables directly to the terminals. Doing so may loosen the
- screws, resulting in a poor contact.
- It is recommended to use a 1.25 mm² lead wire for the main line because the power supply is superimposed on the signal wire in the AnyWireASLINK system.
 General-purpose wire, cabtyre cable and flat cable, etc. can be used. Use stranded wires instead of single core wires.
- wires instead of single core wires.

 Use a crimping tool to connect a bar solderless terminal to a cable.

 Before inserting a bar solderless terminal, check the shapes of the wire insertion opening and bar solderless terminal. Then, insert the terminal in the correct orientation. A bar solderless terminal wider than the wire insertion opening may damage the terminal block.
- Signal names are not printed on the transmission cable terminal block. To avoid damage of the device by incorrect wiring, wire cables to the terminal block attached to the FXS-ASL-M.
- Do not insert multiple bar solderless terminals into one wire insertion opening. Doing so may cause damage on the terminal block or cable, or malfunction.

3.4 External Wiring Example of external wiring 24 V DC Ťη 100Ω or less ÷ 24V 0V LG FX5U CPU module FX5-ASL-M

3.4.2 Power on timing
The AnyWireASLINK system external power supply should be turned ON simultaneously with or before the power supply of the CPU module it is connected to.
(The order is inverted when the system is powered off.)

3.5 Grounding Ground the PLC as stated below

Perform class D grounding. (Grounding resistance: 100 Ω or less) Ground the PLC independently if possible.

If the PLC cannot be grounded independently, perform the "Shared grounding" shown below.

For details, refer to the following manual.

→ MELSEC iQ-F FX5UJ User's Manual (Hardwa

→ MELSEC iQ-F FX5U User's Manual (Hardware)

→ MELSEC iQ-F FX5U User's Manual (Hardware)

PLC Other equipment PLC equipment PLC equipment Shared grounding (Good condition) Independent grounding (Best condition) to the PLC as much as p

Bring the grounding point close 4. Specification

	ESIGN RECAUTIONS	<u></u> MARNII	NG	
•	An AnyWireASLIN	IK system has no control fund	ction for ensuring safety.	Ī
٠	Make sure to set	up the following safety circui	its outside the PLC to ensure s	í
	system operation	even during external power s	upply problems or PLC failure.	

- System operation reten until greatering power supply proteins or FLC raintie.

 Otherwise, malfunctions may cause serious accidents.

 Most importantly, set up the following: an emergency stop circuit, a protectior circuit, an interlock circuit for opposite movements (such as normal vs. revers rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positions limits). Note that when the CPU module detects an error, such as a watchdog timer isis, all outputs are turned off. Also, when an error that
- cannot be detected by the CPU module occurs in an input/output control block output control may be disabled. External circuits and mechanisms should be designed to ensure safe
- External circuits and mechanisms should be designed to ensure safe machinery operation in such a case.

 Construct an interlock circuit in the program so that the whole system always operates on the safe side before executing the control (for data change) of the PLC in operation. Read the manual thoroughly and ensure complete safety before executing other controls (for program change, parameter change, forcible output and operation status change) of the PLC in operation. Otherwise, the machiner may be damaged and accidents may occur due to erroneous operations. Especially, when a remote programmable controller is controlled by an externa device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this configure an interlock circuit in the program and determine corrective actions to configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of communication failure.

ESIGN PRECAUTIONS **∴** CAUTION

- Configure safety circuits, such as an emergency stop circuit and interlock circuit external to the AnyWireASLINK system. Install module so that excessive force will not be applied to the terminal blocks
- Failure to do so may result in wire damage/breakage or PLC failure. Simultaneously turn on and off the power supplies of the CPU module an

∴CAUTION Do not disassemble or modify the PLC. Doing so may cause fire, equipmer failures, or malfunctions. For repair, contact your local Mitsubishi Electric

Do not drop the product or exert strong impact to it. Doing so may cause damage.

ACAUTION

Please contact a certified electronic waste disposal company for environmentally safe recycling and disposal of your device.

∴CAUTION The product is a precision instrument. During transportation, avoid impacts large than those specified in the general specifications by using dedicated packagin boxes and shock-absorbing palettes. Failure to do so may cause failures in the product. After transportation, verif

4.1 Applicable CPU Module

FX5UC CPU module

Model name	Applicability
FX5UJ CPU module	From first production
FX5U CPU module	Ver. 1.050 or later
FX5UC CPU module*1	Ver. 1.050 or later

operation of the product and check for damage of the mounting part, etc

4.2 General Specifications

The items other than the following are equivalent to those of the CPU module. For the general specification, refer to the following manual.

— MELSEC IQ-F FX5UJ User's Manual (Hardware) → MELSEC iQ-F FX5U User's Manual (Hardware)

*1 FX5-CNV-IFC or FX5-C1PS-5V is necessary to connect FX5-ASL-M to the

	→ MELSEC iQ-F FX5UC User's I	Manual (Hardware)
Items	Specifications	
Operating ambient temperature*1	-20 to 55°C, non-freezing*2	
Storage ambient temperature	-25 to 75°C, non-freezing	
Operating ambient humidity	5 to 95%RH, non-condensation*3	
Storage ambient humidity	5 to 95%RH, non-condensation	
Operating altitude*4	0 to 2000 m	
Dielectric withstand voltage	500 V AC for 1 minute	Between all
Insulation resistance	10 MΩ or higher by 500 V	terminals and ground terminal

- erature. For details, refer to the following manual.

 → MELSEC iQ-F FX5UJ User's Manual (Hardware)

 → MELSEC iQ-F FX5U User's Manual (Hardware)
- → MELSEC iQ-F FX5UC User's Manual (Hardware *2 In the case where operating ambient temperature is lower than 0°C, specifications are different from the above description. For details, refer to the following manual. → MELSEC iQ-F FX5UJ User's Manual (Hardware)

→ MELSEC iQ-F FX5U User's Manual (Hardware

- → MELSEC iQ-F FX5UC User's Manual (Hardware) *3 When used in a low-temperature environment, use in an environn sudden temperature changes.

 If there are sudden temperature changes because of opening/closing of the control panel or other reasons, condensation may occur, which may cause a fire, fault, or malfunction. Furthermore, use an air conditioner in dehumidifier mode to
- The PLC cannot be used at a pressure higher than the atmospheric pressure to

4.3 Power Supply Specifications

Items		Specifications	
External power	Power supply voltage	24 V DC +15%, -10%, ripple voltage 0.5 Vp-p or lower Recommended voltage: 26.4 V DC (24 V DC +10%) *Please use a UL Class 2 power supply	
supply	Current consumption	100 mA	
	Transmission cable supply current	MAX 2 A	
power	Power supply voltage	5 V DC	
	Current consumption	200 mA	

4.4 Performance Specifications

Transmission cable (DP, DN)

Power supply cable (24V, 0V

Items	Specifications	
Transmission clock	27.0 kHz	
Maximum transmission distance (total length)	200 m*1	
Transmission system	DC power superimposed total frame cyclic system	
Connection type	Bus topology (multidrop system, T-branch system, tree branch system)	
Transmission protocol	Dedicated protocol (AnyWireASLINK)	
Error control	Checksum, double-check system	
Number of connected I/O points	FXSUJ CPU module 216 points maximum '2 (input: maximum 192 points, output: maximum 192 points) FXSU/FXSUC CPU module 448 points maximum '2'3 (input: maximum 256 points, output: maximum 256 points)	
Number of connected slave modules	128 maximum (varies depending on the current consumption of each slave module)	
External interface (power supply part/communication part)		
RAS function	Disconnected transmission cable location detection function Transmission cable short detection function Transmission cable voltage drop detection	

Number of occupied I/O points 8 points Number of connectable units 1 module*4 *1 For slave modules with integrated transmission cables (DP_DN), the length For slave modules with integrated transmission cables (DF, DN), the length of the transmission cables (DP, DN) is included in the total length. For wiring of 50m or more with 4 wires (DP, DN, 24V, 0V), insert the noise filter for power supply cables between the power supply and cables. For details, refer to the manual for the ASLINK FILTER (ANF-01) manufactured by Anywire Corporation.

function

Dedicated flat cable

*2 The number The number of available remote I/O points per system varies depending or the number of I/O points of the extension devices. For the limit of I/O points refer to the following manual

→ MELSEC iO-E EXSULTISor's Manual (Hardware MELSEC iQ-F FX5U User's Manual (Hardware) → MELSEC iQ-F FX5UC User's Manual (Hardware)

 UL-listed general-purpose 2-wire cable UL-listed general-purpose wire

Built-in EEPROM (Number of times of overwrite: 100000 times)

*3 The maximum number of points that can be used differs depending on the version of the CPU module used. For details, refer to the following manual. → MELSEC iQ-F FX5 User's Manual (AnyWireASLINK)

*4 FX5-ASL-M and FX3U-128ASL-M cannot be used together

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accidents, and compensation for damages to products other than Mitsubishi products. (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

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 incorpo 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.

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