

# MELSEC iQ-F FX5-40SSC-S

## Hardware Manual



Manual Number	BCN-B62008-337
Revision	C
Date	March 2015

This manual describes the part names, dimensions, installation, 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.

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Effective March 2015

Specifications are subject to change without notice.

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

This manual classifies the safety precautions into two categories:

**WARNING** and **CAUTION**

<b>WARNING</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 minor or moderate injury or property damage.

Depending on the circumstances, procedures indicated by **CAUTION** may also cause severe injury.

It is important to follow all precautions for personal safety.

### STARTUP AND MAINTENANCE PRECAUTIONS



- Do not touch any terminal while the PLC's power is on. Doing so may cause electric shock or malfunctions.
  - Before cleaning or retightening terminals, cut off all phases of the power supply externally. Failure to do so in the power ON status may cause electric shock.
  - Before modifying the program in mid-operation, forcing output, running or stopping the PLC, read through this manual carefully, and ensure complete safety.  
An operation error may damage the machinery or cause accidents.
  - Do not change the program in the PLC from two or more peripheral equipment devices at the same time. (i.e. from an engineering tool and a GOT)  
Doing so may cause destruction or malfunction of the PLC program.
  - Use the battery for memory backup in conformance with the MELSEC iQ-F FX5 User's Manual (Hardware).
    - Use the battery for the specified purpose only.
    - Connect the battery correctly.
    - Do not charge, disassemble, heat, put in fire, short-circuit, connect reversely, weld, swallow or burn the battery, or apply excessive force (vibration, impact, drop, etc.) to the battery.
    - Do not store or use the battery at high temperatures or expose to direct sunlight.
    - Do not expose to water, bring near fire or touch liquid leakage or other contents directly.
- Incorrect handling of the battery may cause excessive heat, bursting, ignition, liquid leakage or deformation, and lead to injury, fire or failures and malfunction of facilities and other equipment.

### Associated Manuals

Manual name	Manual No.	Description
MELSEC iQ-F FX5 Simple Motion Module User's Manual (Startup)	IB-0300251	Explains Simple Motion module specifications, functions list and wiring.
MELSEC iQ-F FX5 Simple Motion Module User's Manual (Application)	IB-0300253	Explains Simple Motion module functions, programming and troubleshooting.
MELSEC iQ-F FX5 Simple Motion Module User's Manual (Advanced Synchronous Control)	IB-0300255	Functions, programming and buffer memory for the synchronous control of the Simple Motion module.
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)	JY997D61301	Explains FX5UC CPU module specification details for I/O, wiring, installation, and maintenance.
GX Works3 Operating Manual	SH-081215ENG	System configuration, parameter settings, and online operations (common to simple project and structured project) of GX Works3.

### How to obtain manuals

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

### Certification of UL, cUL standards

FX5-40SSC-S comply with the UL standards (UL, cUL).

UL, cUL File Number: E95239

### 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. Compliance to EMC directive and LVD directive for the entire mechanical module should be checked by the user / manufacturer. For more information please consult with your nearest Mitsubishi product provider.

#### 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 Nagoya Works  
1-14, Yada-minami 5-chome, Higashi-ku, Nagoya, Japan
- Authorized Representative in the European Community:  
Mitsubishi Electric Europe B.V.  
Gothaer Str. 8, 40880 Ratingen, Germany

#### 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 (2004/108/EC) when used as directed by the appropriate documentation.

**Type:** Programmable Controller (Open Type Equipment)

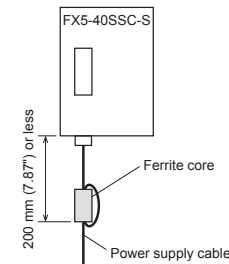
**Models:** MELSEC iQ-F series manufactured

from October 1st, 2014 FX5-40SSC-S

Standard	Remark
EN61131-2: 2007 Programmable controllers - Equipment requirements and tests	Compliance with all relevant aspects of the standard. EMI <ul style="list-style-type: none"> <li>Radiated Emission</li> <li>Conducted Emission</li> </ul> EMS <ul style="list-style-type: none"> <li>Radiated electromagnetic field</li> <li>Fast transient burst</li> <li>Electrostatic discharge</li> <li>High-energy surge</li> <li>Voltage drops and interruptions</li> <li>Conducted RF</li> <li>Power frequency magnetic field</li> </ul>

### Caution for EC Directive

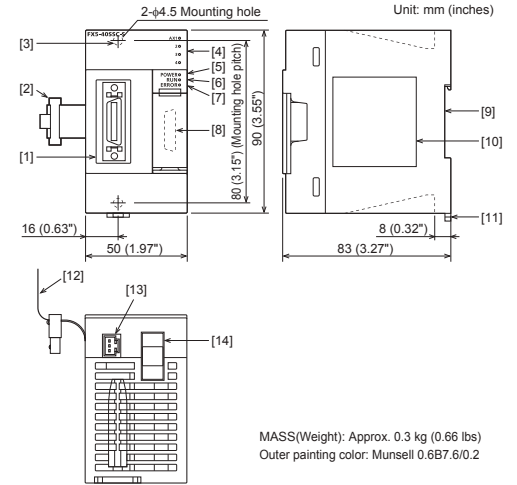
Attach the ferrite core to the power supply cable (FX5-40SSC-S side).  
Attach the ferrite core in 200 mm (7.87") or less from connector on the FX5-40SSC-S side.



The ferrite core should use the following equivalent product. (2 turns necessary)

Model name: ZCAT3035-1330  
(Manufactured by TDK co., Ltd.)

### 1.2 External Dimensions and Part Names



- [1] External input connection connector
- [2] Extension cable
- [3] Direct mounting hole: 2 holes of  $\phi 4.5$  (0.18") (mounting screw: M4 screw)
- [4] Axis display LED (AX1, AX2, AX3, AX4)
- [5] POWER LED
- [6] RUN LED
- [7] ERROR LED
- [8] Extension connector
- [9] DIN rail mounting groove (DIN rail: DIN46277, 35 mm (1.38") wide)
- [10] Name plate
- [11] DIN rail mounting hook
- [12] Pullout tab
- [13] Power supply connector
- [14] SSCNETIII cable connector

MASS(Weight): Approx. 0.3 kg (0.66 lbs)  
Outer painting color: Munsell 0.6B7.6/0.2

### 1.3 Power and Status LED

□: OFF, ■: ON, ◆: Flashing  
(Flashing interval ON: 200 ms/OFF: 200 ms)

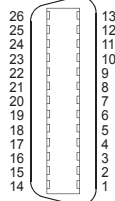
LED display		Description
POWER LED is Off	AX1□, AX2□, AX3□, AX4□ POWER□, RUN□, ERROR□	Power of simple motion module is OFF
RUN LED is On ERROR LED is Off AX LED is Off (Stop or standby axial AX is off)	AX1■, AX2■, AX3■, AX4■ POWER■, RUN■, ERROR■	The axes stopped The axes on standby
AX LED is On (Operating axial AX is on)	AX1■, AX2■, AX3■, AX4■ POWER■, RUN■, ERROR■	The axis in operation
ERROR LED is On AX LED is Flashing (Axis AX in which error occurred is flashing)	AX1◆, AX2□, AX3□, AX4□ POWER■, RUN■, ERROR■	Minor error
ERROR LED is Flashing	AX1□, AX2□, AX3□, AX4□ POWER■, RUN■, ERROR◆	Moderate error Watchdog timer error

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### 1.4 Signal Layout for External Input Connection Connector

For further information on the input wiring and input cable, refer to the following manual.

→ MELSEC IQ-F FX5 Simple Motion Module User's Manual (Startup)



Front view of the module

Pin No.	Signal name	Pin No.	Signal name
1	No connect	14	No connect
2	SG Signal ground*1	15	SG Signal ground*1
3	HA Manual pulse generator/ Incremental synchronous encoder A phase/PULSE*1	16	HB Manual pulse generator/ Incremental synchronous encoder B phase/SIGN*1
4	HAH Manual pulse generator/ Incremental synchronous encoder	17	HBH Manual pulse generator/ Incremental synchronous encoder
5	HAL A phase/PULSE*2	18	HBL B phase/SIGN*2
6 to 9	No connect	19 to 22	No connect
10	EMI Forced stop input signal	23	EMI.COM Forced stop input signal common
11	DI1 External command/ Switching signal	24	DI2 External command/ Switching signal
12	DI3	25	DI4
13	COM Common (COM)	26	COM Common (COM)

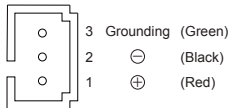
\*1 Voltage-output/open-collector type

\*2 Differential-output type

### 1.5 Power supply connector

For further information on the power supply wiring and power cable, refer to the following manual.

→ MELSEC IQ-F FX5 Simple Motion Module User's Manual (Startup)



- 3 Grounding (Green)
- 2 (Black)
- 1 (Red)

## 2. Installation

INSTALLATION PRECAUTIONS	⚠ WARNING
<ul style="list-style-type: none"> <li>Completely turn off the externally supplied power used in the system before installing or removing the module. Not doing so could result in electric shocks, an operation failure or damage to the module.</li> </ul>	

INSTALLATION PRECAUTIONS	⚠ CAUTION
<ul style="list-style-type: none"> <li>Never try to disassemble or modify the modules. It may cause product failure, operation failure, injury or fire.</li> <li>Use the programmable controller in an environment that meets the general specifications in the manual supplied with the CPU module. Using the programmable controller in an environment outside the range could result in electric shock, fire, operation failure, and damage to or deterioration of the product.</li> <li>Do not directly touch the module's conductive parts and electronic components. Doing so may cause an operation failure or give damage to the module.</li> <li>Lock the control panel and prevent access to those who are not certified to handle or install electric equipment.</li> </ul>	

### 2.1 Arrangements

The product connects on the right side of CPU module or extension module. For further information of installation arrangements, refer to the following manual.  
→ MELSEC IQ-F FX5U User's Manual (Hardware)  
→ MELSEC IQ-F FX5UC User's Manual (Hardware)

### 2.2 Mounting

The product is mounted by the following method.

- Direct mounting (Mounting screw: M4 screw)
- DIN rail mounting

For further information on mounting, refer to the following manual.  
→ MELSEC IQ-F FX5U User's Manual (Hardware)  
→ MELSEC IQ-F FX5UC User's Manual (Hardware)

## 3. Specification

DISPOSAL PRECAUTIONS	⚠ CAUTION
<ul style="list-style-type: none"> <li>Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.</li> </ul>	

TRANSPORTATION AND STORAGE PRECAUTIONS	⚠ CAUTION
<ul style="list-style-type: none"> <li>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.</li> </ul>	

### 3.1 Applicable PLC

Model name	Applicability
FX5U PLC	Ver. 1.000 or later (from first production)
FX5UC PLC	Ver. 1.000 or later (from first production)

### 3.2 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 FX5U User's Manual (Hardware)  
→ MELSEC IQ-F FX5UC User's Manual (Hardware)

Items	Specifications
Operating ambient temperature	0 to 55 °C (32 to 131 °F)
Dielectric withstand voltage	500 V AC for 1 minute
Insulation resistance	10 M $\Omega$ or higher by 500 V DC insulation resistance tester

Between all terminals and ground terminal

## 3.3 Power Supply Specifications

Items	Specifications	
External power supply	Power supply voltage	24 V DC +20% -15%
	Permitted instantaneous power failure time	Operation continues when the instantaneous power failure is shorter than 5 ms.
	Power consumption	6 W
	Power fuse	1 A
Internal power supply	PLC power supply	Not used.

## 3.4 Performance Specifications

Items	Specifications	
Number of control axes	4 axes	
Operation cycle	1.777 ms	
External wiring connection system	26-pin connector	
Applicable wire size	AWG30 to 24 (0.05 to 0.2 mm <sup>2</sup> )*1	
External input wiring connector	LD77MHIOCON	
SSCNETIII cable	MR-J3BUS_M*2	<ul style="list-style-type: none"> <li>40SSC-S ⇔MR-J4(W)-B/MR-JE-B/MR-J3(W)-B</li> <li>MR-J4(W)-B/MR-JE-B/MR-J3(W)-B ⇔MR-J4(W)-B/MR-JE-B/MR-J3(W)-B</li> <li>Standard cord for inside panel 0.15 m (0.49 ft.), 0.3 m (0.98 ft.), 0.5 m (1.64 ft.), 1 m (3.28 ft.), 3 m (9.84 ft.)</li> </ul>
	MR-J3BUS_M-A*2	<ul style="list-style-type: none"> <li>40SSC-S⇔MR-J4(W)-B/MR-JE-B/MR-J3(W)-B</li> <li>MR-J4(W)-B/MR-JE-B/MR-J3(W)-B ⇔MR-J4(W)-B/MR-JE-B/MR-J3(W)-B</li> <li>Standard cable for outside panel 5 m (16.40 ft.), 10 m (32.81 ft.), 20 m (65.62 ft.)</li> </ul>
	MR-J3BUS_M-B*2*3	<ul style="list-style-type: none"> <li>40SSC-S ⇔MR-J4(W)-B/MR-JE-B/MR-J3(W)-B</li> <li>MR-J4(W)-B/MR-JE-B/MR-J3(W)-B ⇔MR-J4(W)-B/MR-JE-B/MR-J3(W)-B</li> <li>Long distance cable 30 m (98.43 ft.), 40 m (131.23 ft.), 50 m (164.04 ft.)</li> </ul>
Flash memory (Flash ROM) write count	Max. 100000 times	
No. of occupied I/O points	8 points	

\*1 AWG24 (0.2 mm<sup>2</sup>) is recommended.

\*2 \_ = Cable length (015: 0.15 m (0.49 ft.), 03: 0.3 m (0.98 ft.), 05: 0.5 m (1.64 ft.), 1: 1 m (3.28 ft.), 3: 3 m (9.84 ft.), 5: 5 m (16.40 ft.), 10: 10 m (32.81 ft.), 20: 20 m (65.62 ft.), 30: 30 m (98.43 ft.), 40: 40 m (131.23 ft.), 50: 50 m (164.04 ft.)

\*3 For the cable of less than 30 m (98.43 ft.), contact your nearest Mitsubishi sales representative.

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.

**MITSUBISHI ELECTRIC CORPORATION**

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**FX5SSC-U-HW**