MITSUBISHI ELECTRIC

Programmable Controllers

MELSEC L series

Installation Manual for IO-Link Master Module ME1IOL6-L

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Safety Information

For qualified staff only

This manual is only intended for use by properly trained and qualified electrical technicians who are fully acquainted with automation technology safety standards. All work with the hardware described, including system design, installation, setup, maintenance, service and testing, may only be performed by trained electrical technicians with approved qualifications who are fully acquainted with the applicable automation technology safety standards and regulations.

Proper use of equipment

The programmable controllers (PLC) of the MELSEC-L series are only intended for the specific applications explicitly described in this manual or the manuals listed below. Please take care to observe all the installation and operating parameters specified in the manual. All products are designed, manufactured, tested and documented in agreement with the safety regulations. Any modification of the hardware or software or disregarding of the safety warnings given in this manual or printed on the product can cause injury to persons or damage to equipment or other property. Only peripherals and expansion equipment specifically recommended and approved by Mitsubishi Electric may be used with the programmable controllers of the MELSEC-L series. Any other use or application of the products is deemed to be improper.

Relevant safety regulations

All safety and accident prevention regulations relevant to your specific application must be observed in the system design, installation, setup, maintenance, servicing and testing of these products.
In this manual special warnings that are important for the proper and safe use of the products are clearly identified as follows:

DANGER:
Personnel health and injury warnings.
Failure to observe the precautions described here can result in serious health and injury hazards.

CAUTION:
Equipment and property damage warnings.
Failure to observe the precautions described here can result in serious damage to the equipment or other property.

Further information

The following manuals contain further information about the module:

- MELSEC-L IO-Link Master Module ME1IOL6-L User's Manual
- MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
- MELSEC-Q/L Programming Manual
- Safety Guidelines for MELSEC L CPU

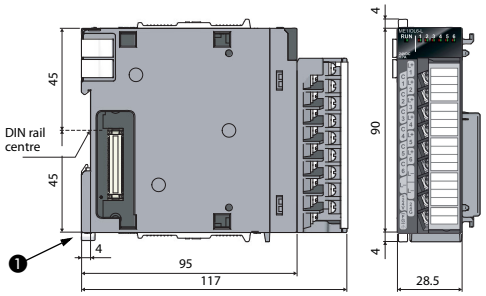
These manuals are available free of charge through the internet (www.mitsubishi-automation.com).

If you have any questions concerning the installation, configuration or operation of the equipment described in this manual, please contact your relevant sales office or department.

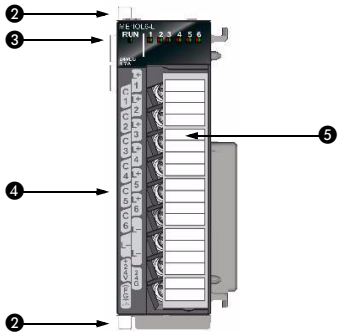
Overview

This manual describes the specifications, handling and programming methods for the IO-Link Master Module ME1IOL6-L which is used with the programmable controllers of the MELSEC-L series.
To a single ME1IOL6-L, up to six IO-Link devices (slaves) or conventional I/O devices can be connected.

External Dimensions and Part Name



All dimensions are in "mm".



No.	Description					
1	DIN rail hook					
2	Module joint lever (for connecting two modules)					
3	LEDs	RUN	Displays the operating status of the ME1IOL6-L.			
			●	Normal operation		
			○	– Internal power supply (5 V DC) is OFF. – External power supply (24 V DC) is OFF. – An internal error has occurred.		
		1 to 6	Indicates the I/O status of each channel of the ME1IOL6-L.			
			SIO mode	●	Red	An error has occurred on this channel.
				●	Green	Input/output signal is ON
				○	Input/output signal is OFF	
			IO-Link mode	●	Red	An error has occurred on this channel.
				◆	Green	Channel does IO-Link communication
				○	Not connected	
4	Terminal block (detachable)	18-point terminal block for connection of the sensors or actuators and the external power supply.				
5	Terminal cover					

●: LED ON, ◆: LED flashing, ○: LED OFF

Installation and Wiring

DANGER

- ***Turn off all phases of the power supply for the PLC and other external sources before starting the installation or wiring work.***
- ***After installation and wiring, attach the included terminal cover to the module before turning it on for operation. Failure to do so may result in electric shock***

CAUTION

- ***Use the product in the environment that meets the "GENERAL SPECIFICATIONS" in the manual "Safety Guidelines" included in the CPU module or head module. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.***
- ***Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.***
- ***Before handling modules, touch a grounded metal object to discharge the static electricity from the human body. Not doing so may cause failure or malfunctions of the module.***

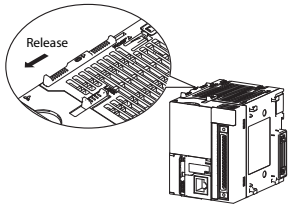
Mounting

CAUTION

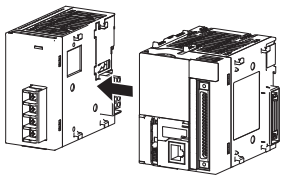
- ***Modules must be mounted on a DIN rail.***
- ***Connect an END cover on the last module on the right side.***
- ***Do not drop the module or subject it to heavy impact.***
- ***Do not open or modify a module. Doing so can cause a failure, malfunction, injury or fire.***
- ***Do not directly touch any conductive parts and electronic components of the module.***
- ***To interconnect modules, engage the respective connectors and securely lock the module joint levers. Incorrect interconnection may cause malfunction, failure, or drop of the module.***

Connecting the modules

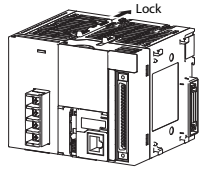
The procedure for connecting modules is shown with an example of how to connect the L02CPU to the power supply module L61P.



① To release the module joint levers located at the top and bottom of the L02CPU:
Slide the levers toward the front side of the module.

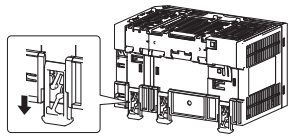


② Insert the connector of the CPU module into that of the power supply so that they are securely engaged.

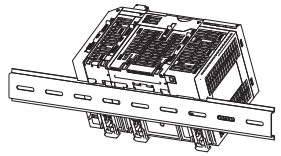


③ To lock the module joint levers:
Slide the levers toward the back side of the module.
Make sure that the modules are securely connected.

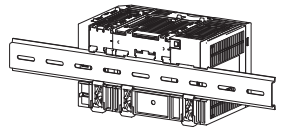
Mounting the Modules on a DIN rail



① Pull down DIN rail hooks on the back of the modules until they click.



② Hang the upper tabs of the modules on a DIN rail, and push the modules in position.



③ Lock the DIN rail hooks to the DIN rail to secure the modules in the position.
Pull the hooks up until they click. If the hooks are beyond the reach, use a tool such as a driver.

④ Mount stoppers on the DIN-rail beside the leftmost and rightmost module, to avoid lateral sliding.

NOTE

Do not slide modules from the edge of the DIN rail when mounting. Doing so may damage the metal part located on the back of the module.

Wiring

CAUTION

Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure

Applicable Cables and Terminal Tightening Torque

For the connection of IO-Link devices, standardized 3-conductor cables or, in the control cabinet, individual leads are used. No shield is required.
The recommended minimum gauge values must be observed. For the maximum cable length of 20 m the minimum cross-section is 0.34 mm^2.
Tighten the screws of the module using torque within the following ranges. Loose screws may cause short circuits, mechanical failures or malfunction.

Screw	Torque
Terminal block screw (M3 screw)	0.42 to 0.58 Nm
Terminal block mounting screw (M3.5 screw)	0.66 to 0.89 Nm

External Wiring

Please observe the following precautions for external wiring:

- Do not lay control lines or communication cables close to the main circuit, high-voltage power lines, or load lines. Otherwise effects of noise or surge induction are likely to take place. Keep a safe distance of more than 100 mm from the above when wiring.
- The FG terminal of the ME1IOL6-L must be connected to the ground certainly.
- Observe the following items for wiring the terminal block. Ignorance of the this items may cause electric shock, short circuit, disconnection, or damage of the product:
  - Use solderless terminals for the connection. Twist the end of stranded wires and make sure there are no loose wires.
  - Solderless terminals with insulating sleeves cannot be used for the terminal block. Covering the cable-connection portion of the solderless terminal with a marked tube or an insulation tube is recommended.
  - Do not solder-plate the electric wire ends.
  - Connect only electric wires of regular size.
  - Fix the electric wires so that the terminal block and connected parts of electric wires are not directly stressed.

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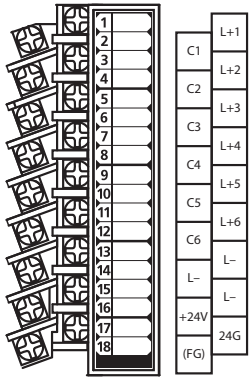
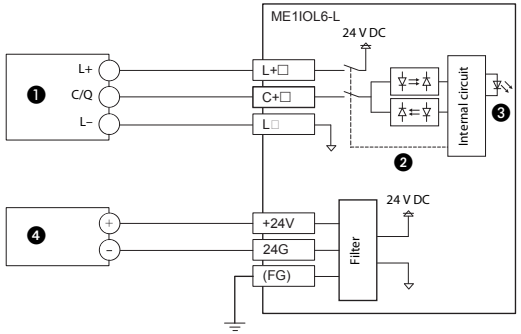
Signal Layout of the Terminal Block



Terminal No.	Signal name		Description	
1	CH1	L+1	+24 V DC	Power supply output for connected sensor/actuator
2		C1	SIO mode	Switching signal DI/DO
			IO-Link mode	"Coded switching" (Communication line)
3	CH2	L+2	+24 V DC	Power supply output for connected sensor/actuator
4		C2	SIO mode	Switching signal DI/DO
			IO-Link mode	"Coded switching" (Communication line)
5	CH3	L+3	+24 V DC	Power supply output for connected sensor/actuator
6		C3	SIO mode	Switching signal DI/DO
			IO-Link mode	"Coded switching" (Communication line)
7	CH4	L+4	+24 V DC	Power supply output for connected sensor/actuator
8		C4	SIO mode	Switching signal DI/DO
			IO-Link mode	"Coded switching" (Communication line)
9	CH5	L+5	+24 V DC	Power supply output for connected sensor/actuator
10		C5	SIO mode	Switching signal DI/DO
			IO-Link mode	"Coded switching" (Communication line)
11	CH6	L+6	+24 V DC	Power supply output for connected sensor/actuator
12		C6	SIO mode	Switching signal DI/DO
			IO-Link mode	"Coded switching" (Communication line)
13	L–		0 V	Power supply output for connected sensors/actuators
14	L–			
15	L–			
16	+ 24V		+24 V DC	External power supply input
17	24G		0 V	
18	(FG)		Frame Ground	

External Wiring



No.	Description
❶	IO-Link device
❷	CH□ Enable/disable (Selection via mode setting in the buffer memory of the ME1IOL6-1)
❸	LED for the corresponding channel
❹	External power supply (24 V DC (+20%, -15%))

NOTES

- *To each channel of the ME1IOL6-L one device can be connected in a point-to-point configuration. Multidrop network connection (more than one device to one channel) is not possible.*
- *In order to keep the specified IO-Link output voltage levels (L+ line) the external supply voltage must be higher than 22 V DC.*
- *Although the ME1IOL6-L is a IO-Link master module, it is possible to mix conventional devices (in SIO mode) with IO-Link devices.*

Specifications

Item			ME1IOL6-1	
Number of ports			6	
Port configuration			•IO-Link •Digital output (SIO mode) •Digital input (SIO mode) •Disabled	
IO-Link mode		Rated voltage	24 V DC	
		Rated output current (C/Q)	15 mA	
		Rated sensor/actuator supply current (L+)	200 mA	
SIO mode	Digital input	Input type	Sink	
		Rated voltage	24 V DC	
		Internal pull-down current (C/Q)	5 mA	
		Input filter (HW and SW)	200 µs	
	Digital output	Rated voltage	24 V DC	
		Rated output current (C/Q)	200 mA	Max. current per port (sum of C and L+): 215 mA
		Rated sensor/actuator supply current (L+)	200 mA	
		Output type	Push-pull	
Port disabled		Communication line (C/Q)	Switched OFF	
		Sensor/actuator supply line (L+)		
Protection functions		Communication line (C/Q)	Over-current, over-load and short-circuit	
		Sensor/actuator supply line (L+)		
Insulation method		Between the I/O terminals and PLC power supply	Photocoupler isolation	
		Between channels	No isolation	
Dielectric withstand voltage		Between I/O terminals and PLC power supply	500 V ACrms for 1 minute	
Insulation resistance			10 MΩ or more (500 V DC insulation resistance tester)	
Number of occupied I/O points			32 points (I/O assignment: Intelligent 32 points)	
External wiring connection system			18-points terminal block	
Cable specification		Cable type	Unshielded cable	
		Maximum length	20 m	
		Applicable wire size	0.3 to 0.75mm^2	
		Overall loop resistance	6 Ω	
		Effective line capacitance	3 nF	
Applicable solderless terminals			R1.25-3 (Solderless terminals with sleeves cannot be used.)	

Item		ME1IOL6-1
External supply power	Voltage	24 V DC (+20%, -15%); ripple, spike within 500mVP-P In order to keep the specified IO-Link output voltage levels (L+ line) the external supply voltage must be higher than 22 V DC.
	Current	The sum current on the L- lines must not exceed 1.7 A.
	Inrush current	8 A within 230 µs
Internal current consumption (5 V DC)		0.4 A
Online module change		Not supported
Weight		180 g