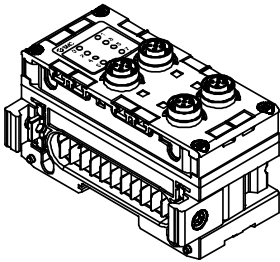




Instruction Manual
Fieldbus device – IO-Link Master unit
Series EX600-LAB1 / LBB1



The intended use of the IO-Link Master unit is to connect IO-Link devices to an SI unit for the control of pneumatic valves and I/O.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) ^{*1}, and other safety regulations.

^{*1}) ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots –Safety, etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

	Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

The EX600 range of units can be connected to a fieldbus to realize the reduction of input or output device wiring and a distributed control system. The system communicates with the fieldbus through the SI unit. One SI unit can be connected to manifold valves with up to 32 outputs, and to input, output, I/O and IO-Link master units to a maximum of 10 units. The maximum number of connected IO-Link master units is 4.

2.1 General specifications

Item	Specifications
Ambient temperature	-10 to +50 °C
Ambient humidity	35 to 85%RH (No condensate)
Ambient storage temperature	-20 to +60 °C
Withstand voltage	500 VAC applied for 1 minute
Insulation resistance	500 VDC, 10 MΩ or more
Enclosure rating	IP67 (manifold assembled) ^{*1}

*1: All unused connectors must have a seal cap fitted.

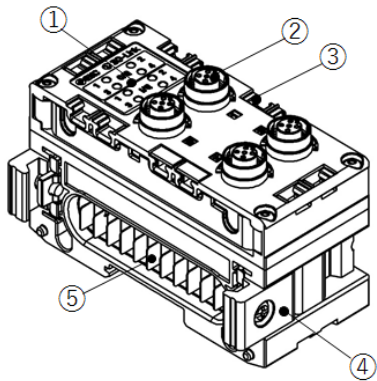
2 Specifications (continued)

2.2 Electrical specifications

Model		EX600-LAB1		EX600-LBB1
Port class		Class A		Class B
Transmission speed		COM1 (4.8 kbps) COM2 (38.4 kbps) COM3 (230.4 kbps) Automatically switches depending on the device connected		
IO-Link version		Version 1.1		
Number of ports		4		
Power supply for control and inputs Max. supply current (between L+ and L-)		0.5 A / connector (2 A / unit)		0.5 A / connector (1 A / unit)
Power supply for output Max. supply current (between P24 and N24)		-		1.6 A / connector 3 A / unit
Digital input	Pin No.	2	4	4
	Input polarity	PNP		
	Protection	Short circuit protection		
	ON input current	Typ. 2.5 mA	Typ. 5.8 mA	Typ. 5.8 mA
	ON voltage	13 V or more		
Digital output	OFF voltage	8 V or less		
	Pin No.	4		
	Output type	PNP		
	Max. load current (C/Q line)	0.25 A / output (supplied from power supply for control / input)		
	Over current protection	Short circuit prevention		
Current consumption		50 mA or less		

3 Name and function of Individual parts

EX600-LAB1 / LBB1



No	Part	Description
1	LED display	Displays the status of the unit.
2	Connector	Connector for IO-Link devices
3	Marker groove	Groove for identification marker.
4	Joint bracket	Bracket for joining to adjacent units.
5	Unit connector	Connector for signal/power to next unit.

4 Assembly

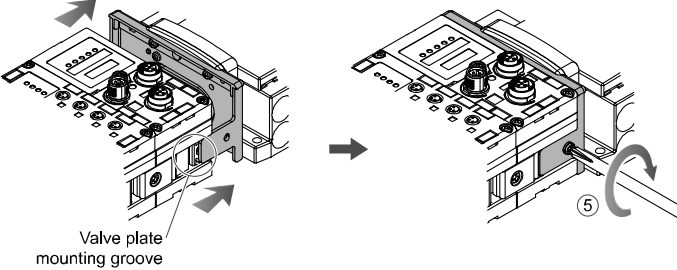
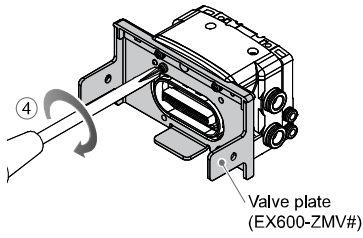
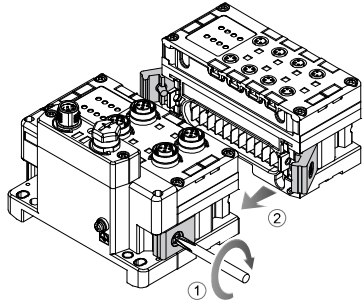
4.1 Assembling the unit



Warning

Do not install the product unless the safety instructions have been read and understood.

- (1) Connect an I/O unit to the end plate. Digital and analogue units can be connected in any order. Joint bracket screw tightening torque: 1.5 to 1.6 N•m.
- (2) Add more I/O units. Up to 9 I/O units can be connected to one manifold.
- (3) Connect the SI unit. After connecting the required I/O units, connect the SI unit. The connection method is as above.
- (4) Mount the valve plate (EX600-ZMV#) to the valve manifold using the valve screws (M3 x 8) supplied. (Tightening torque: 0.6 to 0.7 N•m).
- (5) Connect the SI unit assembly to the valve manifold. Insert the valve plate into the valve plate mounting groove. Then fix using the valve plate mounting screws (M4 x 6) supplied (Tightening torque: 0.7 to 0.8 N•m).

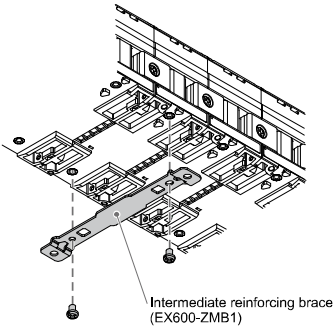


5 Installation

- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.

• Direct mounting

- (1) When assembling six or more units, the middle part of the assembly must be fitted with an intermediate reinforcing brace (EX600-ZMB1) before mounting using 2-M4 x 5 screws (Tightening torque: 0.7 to 0.8 N•m).

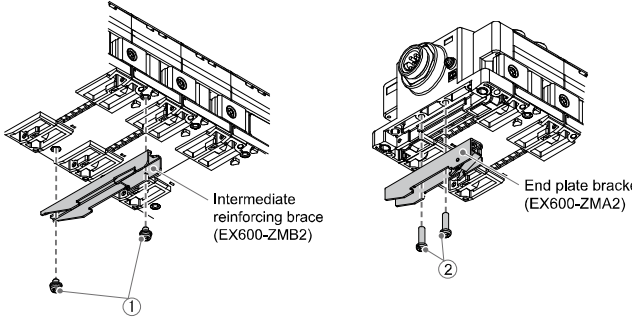


- (2) Mount and tighten the end plate at one end of the unit and mount the intermediate reinforcing brace if required using M4 screws (Tightening torque: 0.7 to 0.8 N•m). Fix the end plate at the valve side while referring to the operation manual for the applicable valve series.

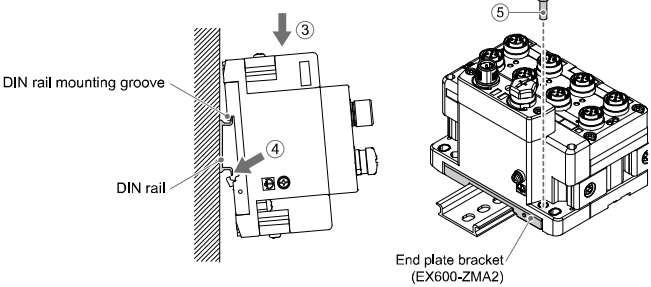
5 Installation (continued)

• DIN rail mounting

- (1) When assembling six or more units, the middle part of the complete assembly must be fitted with an intermediate reinforcing brace for DIN rail mounting (EX600-ZMB2), using 2-M4 x 6 screws. (Tightening torque: 0.7 to 0.8 N•m).
- (2) Mount the end plate bracket (EX600-ZMA2) to the end plate using 2-M4 x 14 screws (Tightening torque: 0.7 to 0.8 N•m). For the SY series, use end plate bracket (EX600-ZMA3).



- (3) Hook the DIN rail mounting groove on to the DIN rail.
- (4) Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked onto the DIL rail.
- (5) Fix the manifold by tightening the DIN rail fixing screws (M4 x 20) on the end plate bracket (Tightening torque: 0.7 to 0.8 N•m).



Refer to the Operation Manual for the applicable valve series on the SMC website (URL: <https://www.smcworld.com>) for the mounting method of the valve manifold.

5.1 Wiring connections

Select the appropriate cables to mate with the connectors on the unit.

• EX600-LAB1 – M12 5 pin socket

Connector	Pin No.	Signal	Details
	1	L+	24 V (control and input)
	2	I/Q	Digital Input (PNP)
	3	L-	0 V (control and input)
	4	C/Q	IO-Link communication, Digital input (PNP) or Digital output (PNP) ^{*1}
	5	N.C.	Not used

• EX600-LBB1 – M12 5 pin socket

Connector	Pin No.	Signal	Details
	1	L+	24 V (control and input)
	2	P24	24 V (output)
	3	L-	0 V (control and input)
	4	C/Q	IO-Link communication, Digital input (PNP) or Digital output (PNP) ^{*1}
	5	N24	0 V (output)

*1: Can be changed using parameters. Digital output power supply is used for control / input.

5 Installation (continued)

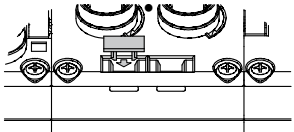
The M12 connector cable for fieldbus and power supply connections has two types, Standard M12 and SPEEDCON compatible. If both plug and socket have SPEEDCON connectors, the cable can be inserted and connected by turning it a 1/2 rotation.
A standard connector can be connected to a SPEEDCON connector.

Warning

- Be sure to fit a seal cap (EX9-AWTS) on any unused connectors. Proper use of the seal cap enables the enclosure to maintain IP67 specification.

5.2 Identification marker

The signal name of the input or output devices and unit address can be written on the marker and can be installed on each unit.
Mount a marker (EX600-ZT1) into the marker groove as required.



5.3 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.

6 How to Order

Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for How to order information.

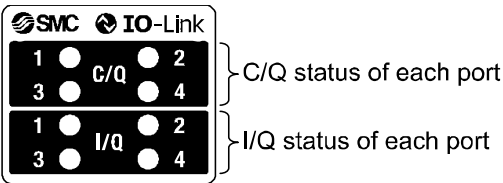
7 Outline Dimensions (mm)

Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

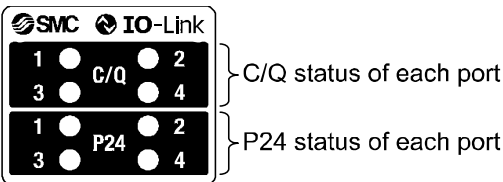
8 LED Display

The LED displays the status of Pin No.4 (C/Q) and Pin No.2 (I/Q or P24) of each IO-Link port of the SI unit.
The figures below show the status of each port.

EX600-LAB1



EX600-LBB1



8 LED Display (continued)

Common for IO-Link port No. 1, 2, 3 and 4 (C/Q: Pin No.4) of EX600-LAB1 and EX600-LBB1

The LED status varies depending on the setting of Pin No.4 (disabled, IO-Link communication, digital I/O) of ports No. 1 to 4.

Pin function	LED status	Details
Deactivated (Port disabled)	OFF	Port disabled
	Red ON	Short circuit detection (L+)
IO-Link (IO-Link communication)	Green flashing (ON/OFF: 1 Hz)	IO-Link device disconnected
	Green flashing (ON/OFF: 2 Hz)	Connected device matching error Device process data mapping error
	Green ON	IO-Link device communicating
	Red ON	Short circuit detection (L+ or C/Q)
DI (Digital input)	OFF	Input signal OFF
	Orange ON	Input signal ON
	Red ON	Short circuit detection (L+)
DO (Digital output)	OFF	Output signal OFF
	Orange ON	Output signal ON
	Red ON	Short circuit detection (L+ or C/Q)

LED 1, 2, 3, 4 (I/Q: Pin No. 2) for EX600-LAB1

The LED displays the status of Pin No.2 (Digital input) of each IO-Link port of the SI unit.

Pin function	LED status	Details
DI (Digital input)	OFF	Input signal OFF
	Orange ON	Input signal ON

LED 1, 2, 3, 4 (P24: Pin No. 2) for EX600-LBB1

The LED displays the status of Pin No.2 (Power supply for output) of each IO-Link port of the SI unit.

Pin function	LED status	Details
P24 (Power supply for output)	OFF	Power supply for output OFF
	Green ON	Power supply for output ON
	Red ON	Short circuit detection (P24)

All LEDs - Common for EX600-LAB1 and EX600-LBB1

Pin function	LED status	Details
Condition of all pins	Red/green flashing alternately	Internal memory error

9 Maintenance

9.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions
- Stop operation if the product does not function correctly.

How to reset the product for power cut or forcible de-energizing

Supply power to the product.
The output status just before the power failure is not maintained when power supply is recovered.
Start operation after confirming safety of the entire equipment.

10 Limitations of Use

10.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

11 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

12 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL : <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)
SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan
Specifications are subject to change without prior notice from the manufacturer.
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