

Fieldbus system Operation Manual

EX600-LAB1/EX600-LBB1



Thank you for purchasing an SMC EX600 Series Fieldbus system. Please read this manual carefully before operating the product and make sure you understand its capabilities and limitations. Please keep this manual handy for future reference.

To obtain the operation manual about this product, please refer to the SMC website (URL <https://www.smcworld.com>) or contact SMC directly.

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) and other safety regulations.

- 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.

Operator

- ◆ The operation manual is intended for those who have knowledge of machinery using pneumatic equipment, and have sufficient knowledge of assembly, operation and maintenance of such equipment. Only those persons are allowed to perform assembly, operation and maintenance.
- ◆ Read and understand the operation manual carefully before assembling, operating or providing maintenance to the product.

Safety Instructions

Warning

- Do not disassemble, modify (including changing the printed circuit board) or repair. An injury or failure can result.
- Do not operate the product outside of the specifications. Do not use for flammable or harmful fluids. Fire, malfunction, or damage to the product can result. Verify the specifications before use.
- Do not operate in an atmosphere containing flammable or explosive gases. Fire or an explosion can result. This product is not designed to be explosion proof.
- If using the product in an interlocking circuit:
 - Provide a double interlocking system, for example a mechanical system.
 - Check the product regularly for proper operation. Otherwise malfunction can result, causing an accident.
- The following instructions must be followed during maintenance:
 - Turn off the power supply.
 - Stop the air supply, exhaust the residual pressure and verify that the air is released before performing maintenance. Otherwise an injury can result.

Caution

- When handling the unit or assembling/replacing units:
 - Do not touch the sharp metal parts of the connector or plug for connecting units.
 - Take care not to hit your hand when disassembling the unit. The connecting portions of the unit are firmly joined with seals.
 - When joining units, take care not to get fingers caught between units. An injury can result.
- After maintenance is complete, perform appropriate functional inspections. Stop operation if the equipment does not function properly. Safety cannot be assured in the case of unexpected malfunction.
- Provide grounding to assure the noise resistance of the Fieldbus system. Individual grounding should be provided close to the product with a short cable.

NOTE

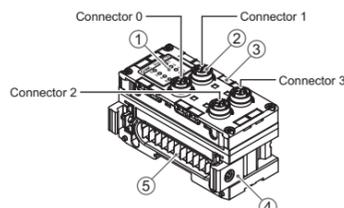
- ◆ The direct current power supply to combine should be UL1310 Class 2 power supply when conformity to UL is necessary.

Maintenance

- Maintenance should be performed according to the Safety Instructions.
- Perform regular maintenance and inspections. There is a risk of unexpected malfunction.
- Do not use solvents such as benzene, thinner etc. to clean each unit. They could damage the surface of the body and erase the markings on the body. Use a soft cloth to remove stains. For heavy stains, use a cloth soaked with diluted neutral detergent and fully squeezed, then wipe up the stains again with a dry cloth.

Refer to the SMC website (URL <https://www.smcworld.com>) to obtain more detailed information about maintenance.

Summary of Product parts



| No. | Description | Function | |
|-----|-----------------------|---|--|
| 1 | Status display LED | Displays the status of the unit. | |
| 2 | Connector | Connect with the IO-Link device. | Connector 0: IO-Link Port 1 Connector 1: IO-Link Port 2 Connector 2: IO-Link Port 3 Connector 3: IO-Link Port 4 |
| 3 | Marker groove | Groove for an indication marker. | |
| 4 | Joint bracket | Bracket for joining to adjacent units. | |
| 5 | Unit connector (Plug) | Connector for signals and power supplies to adjacent units. | |

Assembly

Composing the unit as a manifold

- (1) Connect the unit to the end plate. The Digital unit, Analog unit can be connected in any order. Tighten the bracket of the joint using tightening torque 1.5 to 1.6 Nm.
- (2) Add more units. Up to 10 units (including the SI unit) can be connected to one manifold.
- (3) Connecting the SI unit. After connecting the necessary units, connect the SI unit. Connecting method is the same as above (1), (2).
- (4) Mounting the valve plate. Mount the valve plate (EX600-ZMV□) to the valve manifold using the valve set screws. (M3x8) Apply 0.6 to 0.7 Nm tightening torque to the screws.
- (5) Connect the SI unit and the valve manifold. Insert the valve plate to the valve plate set groove on the side of SI unit. Then, tighten it with the valve plate set screws (M4x6) to fix the plate. Tightening torque for set screws 0.7 to 0.8 Nm.

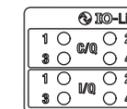
Mounting and Installation

Installation

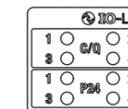
- Direct mounting
 - (1) When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB1) before mounting using 2-M4x5 screws. Tightening torque: 0.7 to 0.8 Nm.
 - (2) Fix and tighten the end plates at one end of the unit. (M4) Tightening torque: 0.7 to 0.8 Nm. Fix the end plate at the valve side while referring to the operation manual of the corresponding valve manifold.
- DIN rail mounting (Available for series other than SY series. Refer to the catalog for SY series.)
 - (1) When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB2) before mounting, using 2-M4x6 screws. Tightening torque: 0.7 to 0.8 Nm.
 - (2) Mount the end plate bracket (EX600-ZMA2) to the end plate at the opposite end to the valves, using 2-M4x14 screws. Tightening torque: 0.7 to 0.8 Nm.
 - (3) Hook the DIN rail mounting groove to the DIN rail.
 - (4) Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked.
 - (5) Fix the manifold by tightening the DIN rail fixing screws of the EX600-ZMA2. (M4x20) Tightening torque: 0.7 to 0.8 Nm. The tightening torque at the valve side depends on the valve type. Refer to the operation manual of the corresponding valve manifold.

LED Display

The status display LED displays the power supply and communication status.



EX600-LAB1 (Class A)



EX600-LBB1 (Class B)

•LED 1, 2, 3, 4 for C/Q

| Function | LED status | Description |
|-------------|------------------------|---|
| Deactivated | OFF | Port invalid |
| IO-Link | Flashing Green at 2 Hz | No device (communication lost) Falling back to SIO mode |
| | Flashing Green at 4 Hz | Incompatible device detected Process data mapping mismatch |
| | Green ON | In communication |
| | Red ON | Short circuit at L+ or C/Q |
| DI | OFF | Input OFF |
| | Orange ON | Input ON |
| | Red ON | Short circuit at L+ |
| DO | OFF | Output OFF |
| | Orange ON | Output ON |
| | Red ON | Short circuit at L+ or C/Q |

•LED 1, 2, 3, 4 for I/Q (EX600-LAB1)

| Function | LED status | Description |
|----------|------------|---------------------|
| I/Q | OFF | Input OFF |
| | Orange ON | Input ON |
| | Red ON | Short circuit at L+ |

•LED 1, 2, 3, 4 for P24 (EX600-LBB1)

| Function | LED status | Description |
|----------|------------|----------------------|
| P24 | OFF | Output power missing |
| | Green ON | Output power ON |
| | Red ON | Short circuit at P24 |

Refer to the SMC website (URL <https://www.smcworld.com>) to obtain more detailed information about LED display.

Troubleshooting

Refer to the LED Display. Refer to the SMC website (URL <https://www.smcworld.com>) to obtain more detailed information about troubleshooting.

Specification

| Model | | EX600-LAB1 | EX600-LBB1 |
|---|---|--|-----------------------------|
| IO-Link port type | | Class A | Class B |
| Communication mode | | COM1 (4.8 kbps) COM2 (38.4 kbps) COM3 (230.4 kbps) Depending on connected sensor/actuator | |
| IO-Link version | | Version 1.1 | |
| Number of IO-Link ports | | 4 | |
| Sensor supply current per connector ("L+" and "L-") | | 0.5 A/connector 2 A/unit | 0.5 A/connector 1 A/unit |
| Output supply current per connector ("P24" and "N24") | | - | 1.6 A/connector 3 A/unit |
| Digital Input | Pin number | 2 | 4 |
| | Input type | PNP | |
| | Rated input current | Typ. 2.5 mA | Typ. 5.8 mA |
| | ON voltage | 13 V or more | |
| Digital Output | OFF voltage | 8 V or less | |
| | Pin number | 4 | |
| | Output type | PNP | |
| Max. load current | 0.25 A/output (Supplied from power supply for control and input) | | |
| Operating temperature range | | -10 to 50 °C | |
| Storage temperature range | | -20 to 60 °C | |
| Weight | | 320 g | |

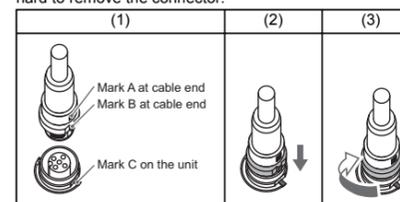
Refer to the product catalog or SMC website (URL <https://www.smcworld.com>) to obtain more detailed information about product specifications.

Outline with Dimensions

Refer to the product catalog or SMC website (URL <https://www.smcworld.com>) to obtain more detailed information about outline dimensions.

Wiring

- Connect the M12 or M8 connector cable. M12 connector is applicable for SPEEDCON connector. SPEEDCON connector wiring method is explained below.
 - (1) Align the mark B on the metal bracket of the cable side connector (plug/socket) with the mark A.
 - (2) Align the mark C on the unit and insert the connector into the unit vertically. If they are not aligned, the connector cannot be joined properly.
 - (3) When the mark B of the connector has been turned 180 degrees (1/2 turn), wiring is completed. Confirm that the connection is not loose. If turned too far, it will become hard to remove the connector.



- Mounting the marker
Signal name of the input or output devices and unit address can be written to the marker, and it can be installed to each unit. Mount the marker (EX600-ZT1) into the marker groove as required.

•Connector pin assignment EX600-LAB1

| Configuration | Pin number | Signal name | Description |
|---------------|------------|-------------|------------------------------|
| | 1 | L+ | 24 VDC (Control and input) |
| | 2 | I/Q | Digital input |
| | 3 | L- | 0 VDC (Control and input) |
| | 4 | C/Q | IO-Link or standard I/O mode |
| | 5 | N.C. | Not connected |

EX600-LBB1

| Configuration | Pin number | Signal name | Description |
|---------------|------------|-------------|------------------------------|
| | 1 | L+ | 24 VDC (Control and input) |
| | 2 | P24 | 24 VDC (Output) |
| | 3 | L- | 0 VDC (Control and input) |
| | 4 | C/Q | IO-Link or standard I/O mode |
| | 5 | N24 | 0 VDC (Output) |

SMC Corporation URL <https://www.smcworld.com>

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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