Before Use

Wireless System

EX600-WEN#/EX600-WSV#

SMC

CE

EtherNet/IP™

Thank you for purchasing an SMC EX600-WEN#/EX600-WSV# SMC Wireless 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 and control unit, 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

◆ This 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 this 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 or set with wet hands.**
This may lead to an electric shock.

■**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 noise resistance of the product.**
Individual grounding should be provided close to the product with a short cable.

#### ⚠ Caution

「Limited warranty and Disclaimer」

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

<Important>
●This product is a wireless unit in accordance with the Radio Act.
  Be sure to comply with the following precautions.
  •Do not disassemble or modify the product. Disassembly and modification are prohibited by law.
  •This product is compliant with the Radio Act in Japan, European countries and the US.
  For use in other countries, please consult SMC. Refer to the product catalog or SMC website (URL https://www.smcworld.com) for the latest information.
●This product communicates by radio waves, and the communication may stop instantaneously due to ambient environments and operating methods. SMC will not be responsible for any secondary failure which may cause an accident or damage to other devices or equipment.
●When several units are installed closely to each other, slight interference may occur due to the characteristics of the wireless product.
●Do not use this product close to any equipment which may cause malfunction due to radio waves from this product.
●The communication performance is affected by the ambient environment, so please perform the communication testing before use.
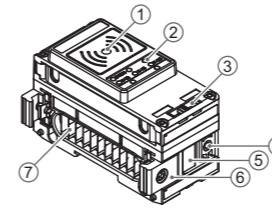
Summary of Product elements

•Base
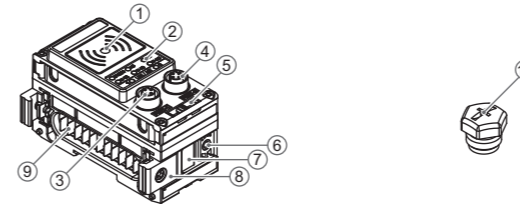
| No.	Item	Application
1	Area close to NFC antenna	This area is in close contact with the NFC reader/writer. "O" is the center of the NFC antenna.
2	Status indication LED	LED display to indicate the unit status.
3	Connector (PORT-1)	Fieldbus input/output cable connection.
4	Connector (PORT-2)	Fieldbus input/output cable connection.
5	Marker groove	Marker (EX600-ZT1) can be mounted.
6	Screw hole for valve plate mounting	For fixing the valve plate.
7	Valve plate mounting groove	Groove to insert the valve plate.
8	Joint bracket	Bracket for mounting adjacent units.
9	Unit connector (plug)	Transfers signals to the next unit and supplies power.
10	Seal cap (1 pc.)	To be mounted on unused connectors (PORT 1 or PORT 2).

•Remote

No.	Item	Application
1	Area close to NFC antenna	This area is in close contact with the NFC reader/writer. "O" is the center of the NFC antenna.
2	Status indication LED	LED display to indicate the unit status.
3	Marker groove	Marker (EX600-ZT1) can be mounted.
4	Screw hole for valve plate mounting	For fixing the valve plate.
5	Valve plate mounting groove	Groove to insert the valve plate.
6	Joint bracket	Bracket for mounting adjacent units.
7	Unit connector (plug)	Transfers signals to the next unit and supplies power.

Assembly

○**Assembling the unit as a manifold**

(1) Connect the unit to the end plate.
   Digital and analogue units 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 9 units can be connected to one manifold.

(3) Connecting the wireless unit.
   After connecting the required I/O units, connect the wireless unit.
   The connection method is as above.

(4) Mounting the valve plate.
   Mount the valve plate (EX600-ZMV#) to the valve manifold using the set screws. (M3 x 8)
   Apply 0.6 to 0.7 Nm tightening torque to the screws.

(5) Connect the wireless unit to the valve manifold.
   Insert the valve plate into the valve plate mounting groove on the side of the wireless unit, and then fix both surfaces of the plate using the valve plate mounting screws (M4 x 6) provided with the product.
   Tightening torque for set screws 0.7 to 0.8 Nm.

Valve plate (EX600-ZMV#)
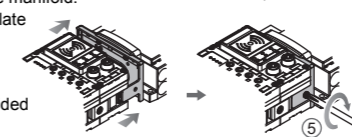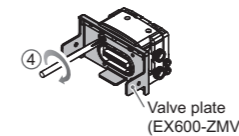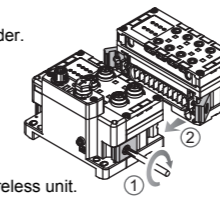
## Mounting and Installation

■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-M4 x 5 screws.
   Tightening torque: 0.7 to 0.8 Nm

(2) Mount and tighten the end plate and the valve manifold (intermediate reinforcing brace if necessary) at one end of the unit. (M4)
   Tightening torque: 0.7 to 0.8 Nm
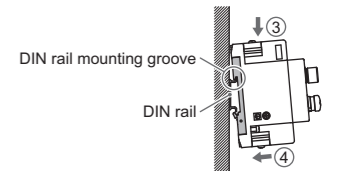   Refer to the Operation Manual of the applicable valve manifold for the mounting method of the valve side.

Intermediate reinforcing brace (EX600-ZMB1)
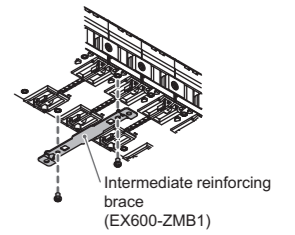
•DIN rail mounting
(Available for series other than SY series. Refer to the catalog for SY series.)
(1) When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB2) for DIN rail before mounting, using 2-M4 x 6 screws.
   Tightening torque: 0.7 to 0.8 Nm

(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 Nm

Intermediate reinforcing brace (EX600-ZMB2)

End plate bracket (EX600-ZMA2)
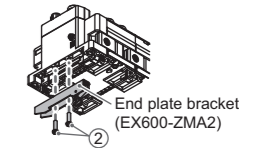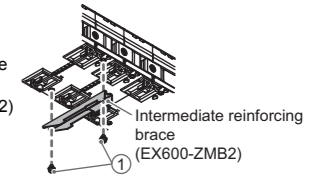
(3) Hook the DIN rail mounting groove on to the DIN rail.

(4) Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked.

DIN rail mounting groove

DIN rail

(5) Fix the end plate bracket (EX600-ZMA2) to the manifold using the M4 x 20 screws provided with the product.
   Tightening torque: 0.7 to 0.8 Nm
   Refer to the Operation Manual of the applicable valve manifold for the mounting method of the valve side.

End plate bracket (EX600-ZMA2)
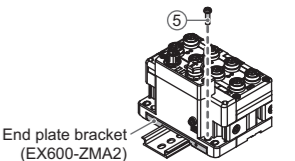
■Connector (Base only)

The base is connected to the upper level communication (Ethernet). The connector has 2 ports, PORT-1 and PORT-2, and both ports can connect to Ethernet.
The Ethernet/IP topology corresponds to star, line, tree and DLR (Device Level Ring).

•Connector pin No.
M12 4-pin Socket, D-code

Configuration		Pin No.	Signal name
PORT-1	PORT-2		
		1	TX+
		2	RX+
		3	TX–
		4	RX–

Ethernet connector of base

■Power supply connector

•Connector pin No.
(1) EX600-ED2-#
PWR IN: M12 5-pin Plug, B-code

Configuration	Pin No.	Signal name
	1	24 V (Output)
	2	0 V (Output)
	3	24 V (Control and input)
	4	0 V (Control and input)
	5	FE

(2) EX600-ED3-#
PWR IN: 7/8 inch 5-pin Plug

Configuration	Pin No.	Signal name
	1	0 V (Output)
	2	0 V (Control and input)
	3	FE
	4	24 V (Control and input)
	5	24 V (Output)

(3) EX600-ED4-#
PWR IN: M12 4-pin Plug, A-code

Configuration	Pin No.	Signal name
	1	24 V (Control and input)
	2	24 V (Output)
	3	0 V (Control and input)
	4	0 V (Output)

PWR OUT: M12 5-pin Socket, A-code

Configuration	Pin No.	Signal name
	1	24 V (Control and input)
	2	24 V (Output)
	3	0 V (Control and input)
	4	0 V (Output)
	5	Not used

(4) EX600-ED5-#
PWR IN: M12 4-pin Plug, A-code

Configuration	Pin No.	Signal name
	1	24 V (Output)
	2	0 V (Output)
	3	24 V (Control and input)
	4	0 V (Control and input)

PWR OUT: M12 5-pin Socket, A-code

Configuration	Pin No.	Signal name
	1	24 V (Output)
	2	0 V (Output)
	3	24 V (Control and input)
	4	0 V (Control and input)
	5	Not used

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

Setting and Adjustment

■Flow chart for using the wireless system

Step 1 Preparation before use (PC, Application)
(1) Install the NFC reader, writer and driver.
(2) Install the I/O Configurator for NFC.

Step 2 Setting / installation of the wireless unit
(1) Set the number of occupied I/O points for the module and each parameter of the "remote".
(2) Set the number of occupied I/O points for the module and each parameter of the "base".
∗: Different from the I/O points of the whole system.
(3) Set the "base" system.
(4) Registration of remote to the base. (pairing)
(5) I/O unit assembly.
(6) Installation and wiring.
(7) Set the Ethernet port

Step 3 Connection to PLC
Note) Refer to the operation manual of the PLC manufacturer for connection to PLC and Configurator.
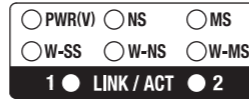
With the above settings, it is possible to control the upper level controller.
Refer to the operation manual for each manufacturer for how to set the controller and the PLC.
Refer to the I/O Configurator for NFC operation manual and I/O Configurator (Web) operation manual for details of the I/O Configurator.

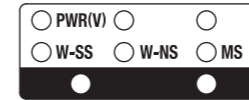
LED Display

■LED indication of base

LED indication of base

•LED indication of base

LED name	Function	Colour of LED	Operation
PWR(V)	Power supply voltage for output (US2)	Green LED is ON.	Power supply voltage for output (US2) is normal.
		Red LED flashes.	Power supply voltage for output (US2) is abnormal. (Indication only. The product can be operated.) (power supply voltage monitor (Output) is valid)
		OFF	Power supply for control and input (US1) is not supplied.
NS	EtherNet/IP™ connection status	Green LED is ON.	EtherNet/IP™ communication is established.
		Green LED flashes.	EtherNet/IP™ communication is not established.
		Red LED flashes.	EtherNet/IP™ communication time out.
		Red LED is ON.	Duplicated IP addresses are detected.
		OFF	IP address not set.
MS	Base system status	Green LED is ON.	Base is normal.
		Green LED flashes.	EtherNet/IP™ communication is not connected.
		Red LED flashes.	Restorable error is detected. (LED flashes when more than one diagnostic information item is detected.) •Abnormal power supply voltage level for control and input (US1) (Power Supply voltage monitor (Control/Input) is valid) •Excessive I/O setting inputs/outputs •Analogue I/O upper and lower set limit exceeded •Analogue Input range upper and lower limit exceeded •Abnormal number of remote connections •Error in communication between units •EX600 I/O unit detects diagnostic information •Valve diagnostic information detected
		Red LED is ON.	Non-restorable error is detected. (e.g. Hardware failure)
		OFF	Power supply for control and input (US1) is not supplied.
W-SS	Radio wave receiving intensity (For communication from remote to base)	Green LED is ON.	Received power level of all remote is 3.
		Green LED flashes. (1Hz)	There are connected remote with received power level 2.
		Green LED flashes. (2Hz)	There are connected remote with received power level 1.
		Red LED flashes.	No remote connected.
		OFF	Remote is not registered.
W-NS	Wireless communication connection status	Green LED is ON.	All remote are connected correctly.
		Green LED flashes.	There are unconnected remote.
		Red LED flashes.	All remote are unconnected.
		Red LED is ON.	All remote are unconnected. (non-restorable error in wireless communication)
		Red/green	Wireless communication connection is under construction. (Pairing)
		Orange LED is ON.	Forced output mode
		OFF	Remote is not registered.
W-MS	Remote connection system status	Green LED is ON.	Remote is normal.
		Red LED flashes.	Restorable error is detected (LED flashes when more than one diagnostic information item is detected) •Abnormal power supply voltage level for control and input (US1) •Abnormal power supply voltage level for output (US2) •Excessive I/O setting inputs/outputs •Analogue I/O upper and lower set limit exceeded •Analogue Input range upper and lower limit exceeded •Error in communication between units •EX600 I/O unit detects diagnostic information •Valve diagnostic information detected
		Red LED is ON.	Non-restorable error is detected. (e.g. Hardware failure)
		OFF	No remote connected.
LINK/ACT1 LINK/ACT2	Communication status of EtherNet/IP™ ports 1 and 2	Green LED is ON.	Link, No Activity (100 Mbps)
		Green LED flashes.	Link, Activity (100 Mbps)
		Orange LED is ON.	Link, No Activity (10 Mbps)
		Orange LED flashes.	Link, Activity (10 Mbps)
		Red LED is ON.	IP address has been duplicated.
		OFF	EtherNet/IP™ is not connected.

100 Mbps: Green
10 Mbps: Orange

∗: If there are multiple conditions for LED ON/Flashing, the detailed information can be seen only when the setting of the diagnostic information is "Simple" or "Detailed".

■LED indication of remote

LED indication of remote

•LED Indication of remote

LED name	Function	Colour of LED	Operation
PWR(V)	Power supply voltage for output (US2)	Green LED is ON.	Power supply voltage for output (US2) is normal.
		Red LED flashes.	Power supply voltage for output (US2) is abnormal (Indication only. The product can be operated.) (Power Supply voltage monitor (Output) is valid)
		OFF	Power supply for control and input (US1) is not supplied.
W-SS	Radio wave receiving intensity (Communication from base to remote)	Green LED is ON.	Received power level is 3.
		Green LED flashes. (1 Hz)	Received power level 2.
		Green LED flashes. (2 Hz)	Received power level 1.
		Red LED flashes.	Wireless communication is not connected.
		OFF	Base is not registered.
W-NS	Wireless communication connection status	Green LED is ON.	Remote is connected correctly.
		Red LED flashes.	No remote connected.
		Red LED is ON.	No remote connected. (non-restorable error in wireless communication)
		Red/green	Wireless communication connection is under construction. (Pairing)
		Orange LED is ON.	Forced output mode
		OFF	Base is not registered.
MS	Remote system status	Green LED is ON.	Remote is normal.
		Red LED flashes.	Restorable error is detected. (LED flashes when more than one diagnostic information item is detected.) •Abnormal power supply voltage level for control and input (Power Supply voltage monitor (Control/Input) is valid) •Excessive I/O setting inputs/outputs •Analogue I/O upper and lower set limit exceeded •Analogue Input range upper and lower limit exceeded •Error in communication between units •EX600 I/O unit detects diagnostic information •Valve diagnostic information detected
		Red LED is ON.	Non-restorable error is detected. (e.g. Hardware failure)
		OFF	Power supply for control and input (US1) is not supplied.

∗: If there are multiple conditions for LED ON/Flashing, the detailed information can be seen only when the setting of the diagnostic information is "Simple" or "Detailed".

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

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.

Troubleshooting

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

Specification

Remote (EX600-WSV#) can be used regardless of the communication specification of the base.

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

Commissioning

•Parameter Setting
•Hardware Configuration (EDS file)
•I/O Map

Refer to the SMC website (URL https://www.smcworld.com) to obtain more detailed information about these setting above.

Diagnostic

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

Outline with Dimensions

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

Contacts