SMC Automation Controls Process

Wireless System

Noise resistance

Uses the 2.4 GHz ISM frequency band
Frequency hopping: Every 2 ms (Fastest)

Communication cables not required

Reduced wiring work, space, and cost
Minimized disconnection risk

Communication distance/speed, Response time*1

	Communication distance	Communication speed	Response time
Compact Type EXW1	100 m	1 Mbps	2 ms
		250 kbps	5 ms
Modular Type EX600-W	10 m	250 kbps	5 ms

*1 For the EXW1 construction, it depends on the operating environment.

New Applicable to DIN rail mounting (A DIN rail adapter has been added.)

Compact Type EXW1 Series

Compact and lightweight

■ Compared with the EX600-W series (remote)

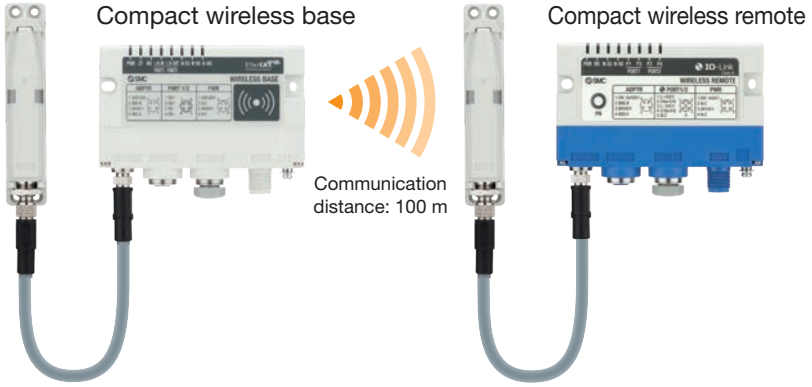
Volume Approx. 81% reduction*1

Weight Approx. 79% reduction*1

*1 For the existing remote, M12 connector/8 digital outputs specification

Compatible protocols

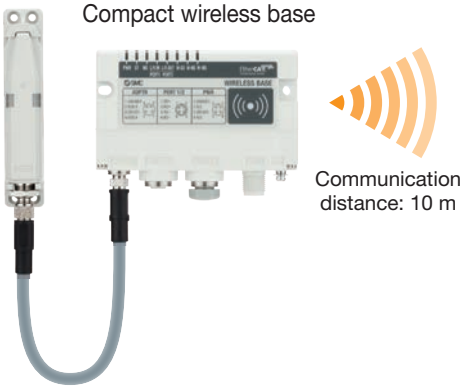
EtherNet/IP, EtherCAT, DeviceNet, PROFINET, CC-Link, OPC UA, IO-Link



Modular Type EX600-W Series

Modular connection is possible.

- Up to 9 stations can be connected to the digital/analog unit.
- Connector type: M12/M8, D-sub, Spring type terminal block



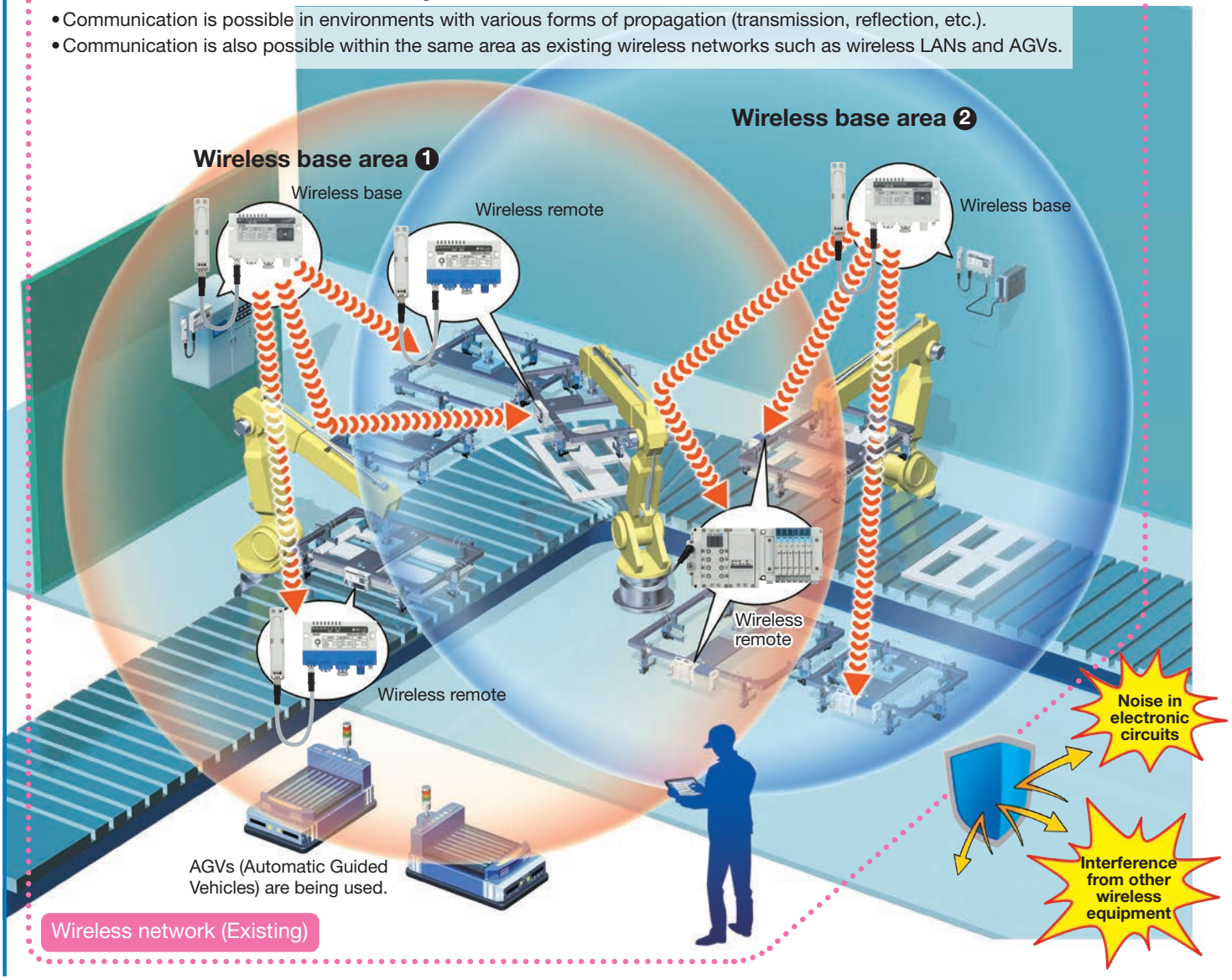
For countries/regions in which wireless is supported
This product cannot be used in countries/regions where wireless is not supported. Refer to page 69 for details on countries/regions in which the product can be used.

EXW1/EX600-W Series

Compact **EXW1** | Modular **EX600-W**

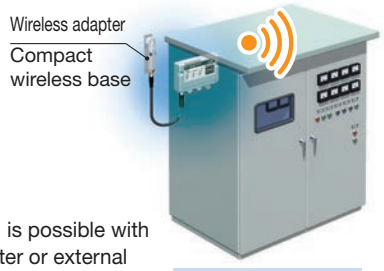
Stable communication is possible.

- Communication is possible in environments with various forms of propagation (transmission, reflection, etc.).
- Communication is also possible within the same area as existing wireless networks such as wireless LANs and AGVs.



Antenna support

Compact **EXW1**



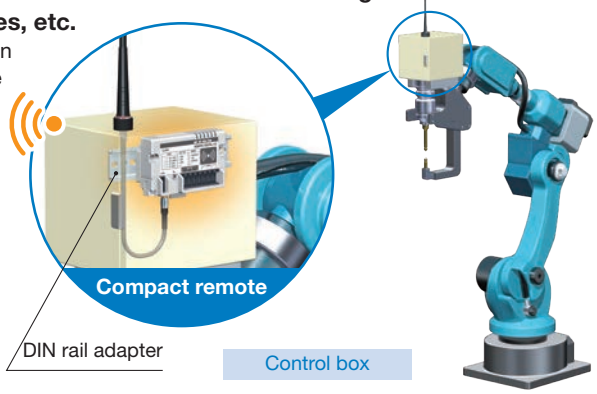
Communication is possible with a wireless adapter or external antenna even when the wireless base/remote is installed in a metal-shielded location such as in a control panel/box.

Applicable to DIN rail mounting

Compact **EXW1** | Modular **EX600-W**

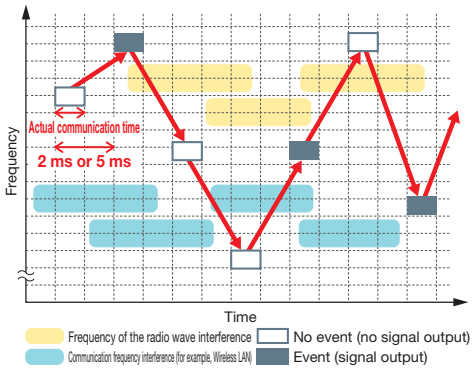
The DIN rail adapter allows for the DIN rail mounting of control panels, control boxes, etc.

* When mounting within a panel, note that the EX600-W modular type does not support antennas.



Frequency hopping/Event communication system

Compact EXW1 | Modular EX600-W



Frequency hopping

A stable wireless environment is established using an original protocol which is not affected by interference. Interference from other wireless equipment is reduced.

Frequency hopping cycle
2 ms＊1 **or 5 ms**

＊1 For the EXW1 only

Event communication system

Wireless communication is performed only when there is a variation in the information, thereby suppressing the frequency of radio wave output in wireless communication and reducing interference with other wireless devices.

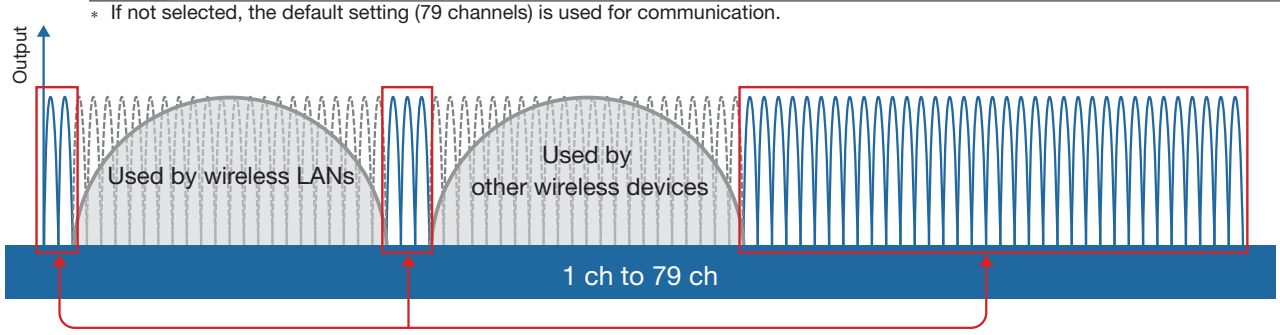
F.C.S. (Frequency channel select) function supported

Compact EXW1

This is a function that allows for the selection of the frequency channel to be hopped to via frequency hopping. When the frequency used by wireless LANs, AGVs, or other wireless devices is known, selecting a different frequency channel will allow for hopping only to the selected frequency channel, thereby reducing communication collisions with other wireless devices and stabilizing communication. ＊ The number of selectable frequency channels varies depending on the country of use.

Symbol	Number of selectable frequency channels	Applicable countries
E	Min. 5/Max. 79 channels	Radio Law certified countries other than the U.S., Canada, South Korea, Brazil, Taiwan, Argentina, and Mexico
N	Min. 15/Max. 79 channels	Radio Law certified countries including the U.S., Canada, South Korea, Brazil, Taiwan, Argentina, and Mexico

＊ If not selected, the default setting (79 channels) is used for communication.

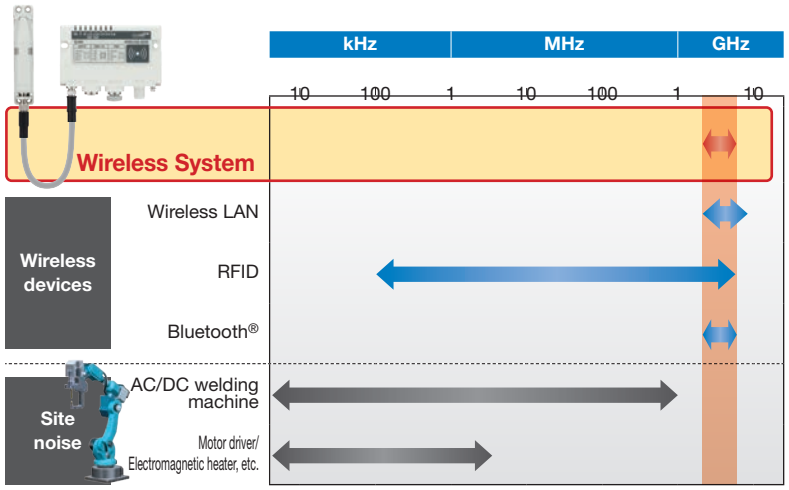


Hopping/communicating with the frequency channel within the selected red frame

Frequency band used

Compact EXW1 | Modular EX600-W

Uses the 2.4 GHz ISM frequency band

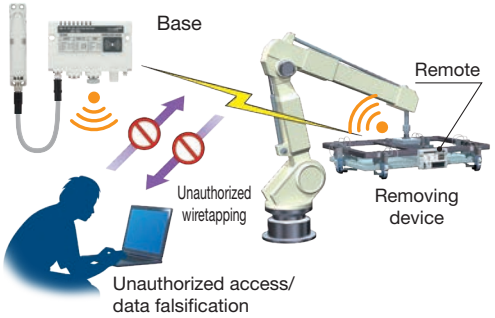


＊ ISM (Industrial, Scientific, and Medical) radio bands: Frequency bands allocated for industrial, scientific, and medical applications

High security using encryption

Compact EXW1 | Modular EX600-W

Unauthorized access from outside is prevented by using data encryption.



Remote high-speed connection

Compact EXW1 | Modular EX600-W

To start of communication: Min. **250 ms**

＊ Depends on the communication environment

■Trademark

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc.

Product diagnosis

Compact EXW1 | Modular EX600-W

Diagnostic signals, **LEDs on the base/remote**, **Web function**, and **setting software (IO Configurator)** can be used for product diagnostics.


Web screen example

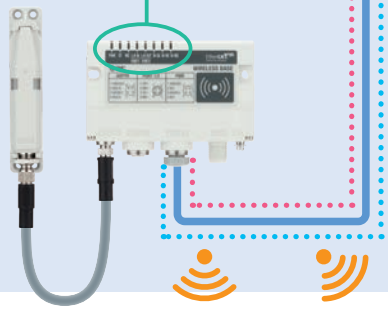
Diagnostic signal

Web function EtherNet/IP and PROFINET only

Fieldbus

Wireless base

Compact Type **EXW1**



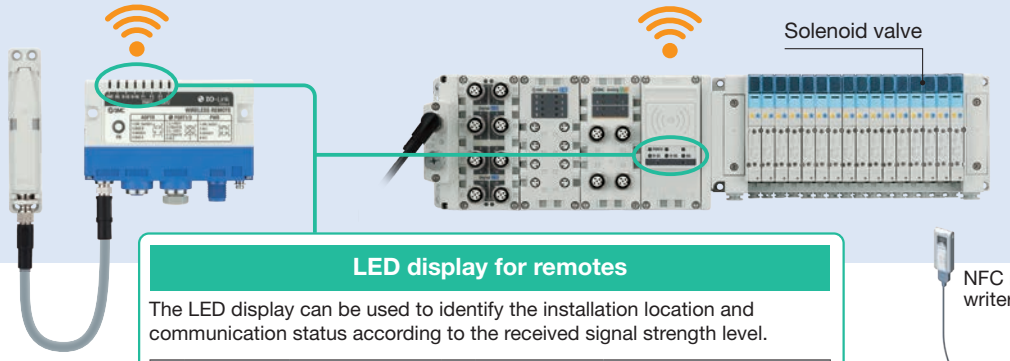
LED display for bases

The LED display can be used to identify the installation location and communication status according to the received signal strength level.

W-SS (Radio wave receiving intensity (For communication from remote to base))	
Green LED is ON.	The received power level of all remotes is 3.
Green LED flashes. (1 Hz)	There are connected remotes with a received power level of 2.
Green LED flashes. (2 Hz)	There are connected remotes with a received power level of 1.
Red LED flashes.	All the remotes that support protocol V.1.0 are not connected.
Orange LED flashes.	All the remotes that support protocol V.2.0 are not connected.
OFF	The remote module is not registered.

Wireless remote

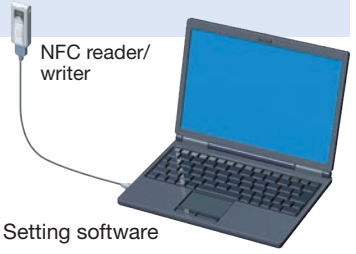
Compact Type **EXW1** Modular Type **EX600-W**



LED display for remotes

The LED display can be used to identify the installation location and communication status according to the received signal strength level.

W-SS (Radio wave receiving intensity (For communication from base to remote))			
Green LED is ON.	The received power level is 3.	Red LED flashes.	The base that supports protocol V.1.0 is not connected.
Green LED flashes. (1 Hz)	The received power level is 2.	Orange LED flashes.	The base that supports protocol V.2.0 is not connected.
Green LED flashes. (2 Hz)	The received power level is 1.	OFF	The base module is not registered.



PC + Setting software

Setting software (IO Configurator)

Diagnostic signal

The connection status of the wireless system can be judged by the PLC during operation by the diagnostic signal.
<Diagnostic signal output conditions>
- When an error occurs in the wireless system (base or remote)
- When communication from the remote cannot be received

Web function (When the base and PC are connected)

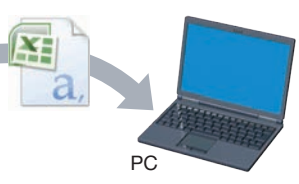
Via the EXW1-BEN/BPN web screen, you can change the wireless communication protocol, OPC UA, and pairing settings. Wireless/diagnostic logs and wireless system configuration information can be checked, and the log data can be generated and then downloaded as a CSV file.

* Refer to the logging function on page 4.

The log files showing the number of retries or the received radio wave intensity can be downloaded in the form of a CSV file.

EtherNet/IP PROFINET


Web screen example



Product diagnosis

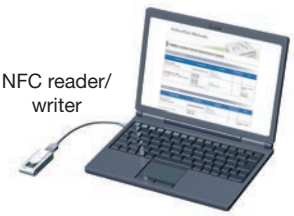
Compact EXW1 | Modular EX600-W

Setting software (IO Configurator)

The NFC reader/writer can be used with the setting software to perform various checks and setting without contact.
(NFC: Near Field Communication)

- Base communication configuration
- Setting of the I/O points for the system, base, and remote
- Pairing of the base and remote
- I/O monitoring
- Monitoring of diagnostic data

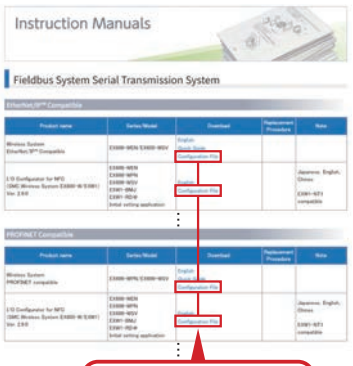
＊ Refer to the logging function.



PC + Setting software

Setting software

Download the setting software from the "configuration file."



From the SMC website
Product Information
⇩
Documents/Download
⇩
Operation Manuals
⇩
Fieldbus System Serial Transmission System
⇩
DeviceNet® Compatible
or
CC-Link Compatible
or
EtherNet/IP™ Compatible
or
EtherCAT Compatible
or
PROFINET Compatible
⇩
I/O Configurator for NFC
⇩
Configuration File

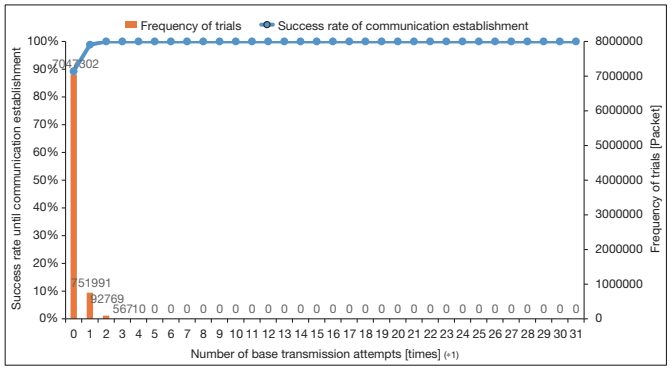
Logging function

Compact EXW1 | Modular EX600-W

The following information is saved in the internal memory of the product. It can be downloaded and visualized from the web function or the setting software (IO Configurator).

Number of retries

The number of retries (communication attempts) can be checked.

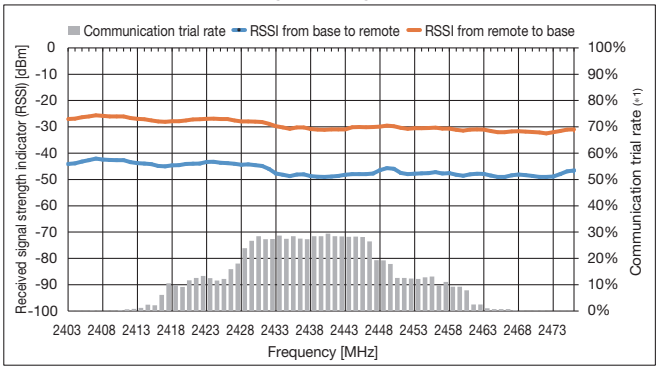


*1 Characteristics of base-to-remote transmission packets

Graph 1. Communication response characteristics

Received signal strength indicator

The communication trial rate and received signal strength indicator (RSSI) can be checked for every frequency channel.
Number of retries, Received signal strength indicator, Operation status



*1 Characteristics of base-to-remote transmission packets

Graph 2. Received signal strength indicator and communication trial rate characteristics with respect to frequency

Operation status

Error details, time information (timestamp), and remote numbers can be checked.

＊ Up to 30 pieces can be displayed.

Information | I/O monitor | Properties | Event | Wireless

ALL | CLEAR | Export | Refresh

Power on
R/W detected

Timestamp	WCh	TAG	Unit	Channel	Status
2020/12/28 10:26:25	5	EX600-WSV1	3	5	0x00000001
2020/12/26 8:00:00	3	LINE4-S5-R-HAND	1	2	0x00000002
2020/12/24 5:33:35	2	LINE4-S5-L-HAND	1	2	0x00000002
2020/12/22 3:07:10	3	LINE4-S5-R-HAND	1	4	0x00000003
2020/12/20 0:40:45	1	LINE4-S2-R-HAND	1	4	0x00000004
2020/12/17 22:14:20	5	EX600-WSV1	3	5	0x00000005
2020/12/15 19:47:55	4	LINE4-S3-R-HAND	3	5	0x00000006

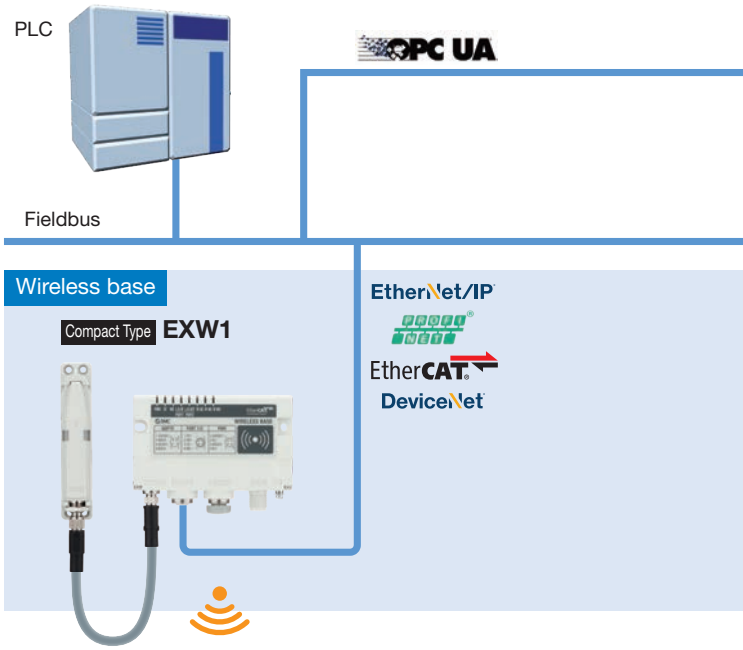
Scroll bar

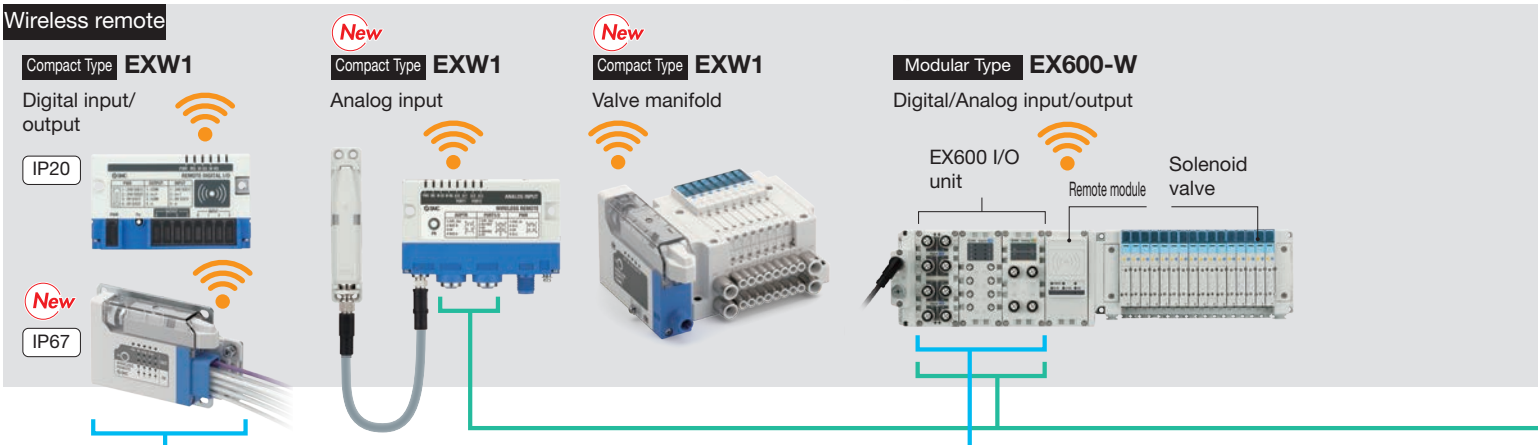
System Examples

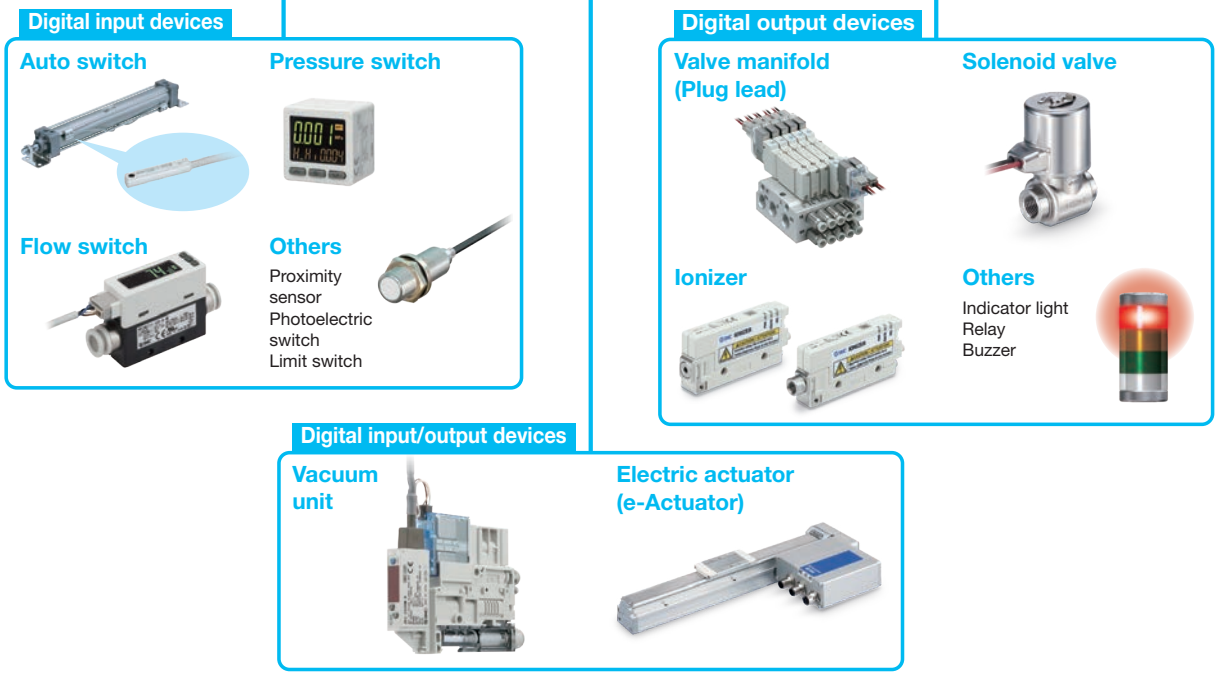
Reduced wiring of Digital-, analog-, and IO-Link components

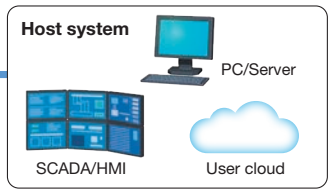
Air management system connection by wireless*1

1 Using the compact type EXW1 base only







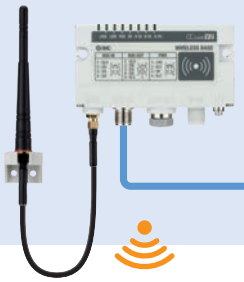


The compact type EXW1 and modular type EX600-W can be used in combination.*1

*1 When used in combination, the communication speed and response time are limited to the specifications of the EX600-W. (See the sample system configuration.)

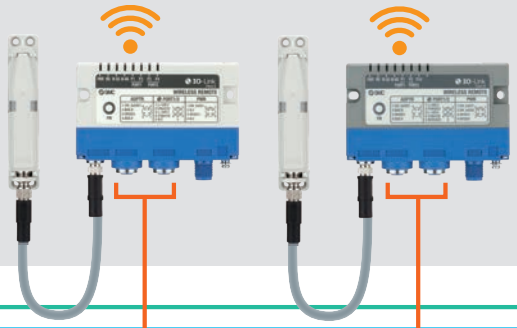
CC-Link

EtherNet/IP
EtherCAT
CC-Link IE Field

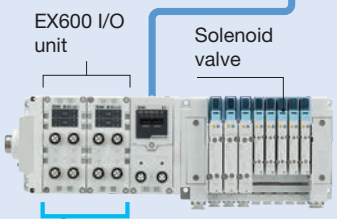


Air Management System
AMS□-SA

Compact Type **EXW1**
Port class A/B
IO-Link

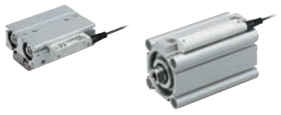


Fieldbus system (Wired)
Integrated Input-Output Type **EX600**
IO-Link



Analog input devices

Actuator position sensor



Pressure switch Flow switch

Analog input sensor

IO-Link devices

Actuator position sensor

Pressure switch

Gap checker

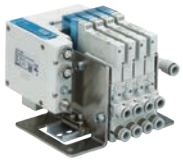
SI unit for valve

Flow switch

Terminal unit

Electro-pneumatic regulator
Electronic vacuum regulator

Vacuum manifold



Ionizer

Vacuum unit

Step motor controller (Electric actuator)

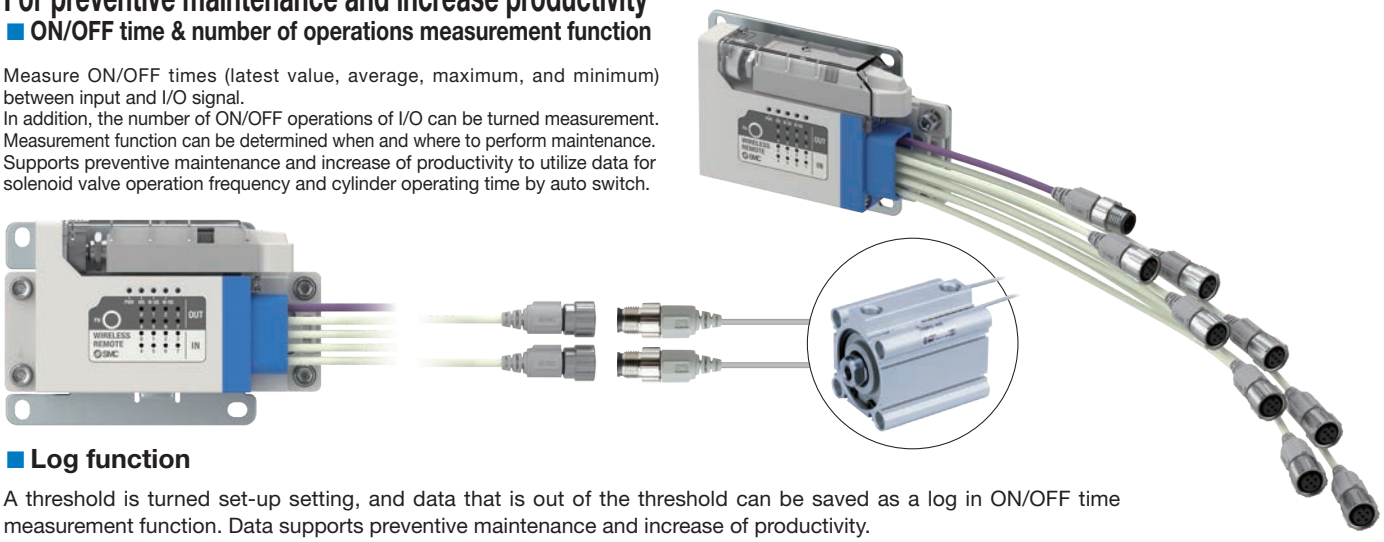
New Compact Wireless Remote Digital Input/Output

Compact EXW1

For preventive maintenance and increase productivity

■ ON/OFF time & number of operations measurement function

Measure ON/OFF times (latest value, average, maximum, and minimum) between input and I/O signal.
In addition, the number of ON/OFF operations of I/O can be turned measurement.
Measurement function can be determined when and where to perform maintenance.
Supports preventive maintenance and increase of productivity to utilize data for solenoid valve operation frequency and cylinder operating time by auto switch.



■ Log function

A threshold is turned set-up setting, and data that is out of the threshold can be saved as a log in ON/OFF time measurement function. Data supports preventive maintenance and increase of productivity.
It can be saved up to 40 logs in Timer 0 to Timer 15, and the logs include the following data:

- Timer Ch No.
- Latest value
- Total number of measurements (the total number of times that the thresholds are in and out of range)
- Measurement count that the thresholds are out of range
- Time stamp

* Log is saved to the memory element at 60 minutes interval from the moment when power supply is turned on. No storage from the last save to power supply OFF, so caution it.

New Compact Wireless Remote Valve Manifold

Compact EXW1

Lightweight and compact—easy to mount on robot hands and moving parts

Installation area **63% reduction**

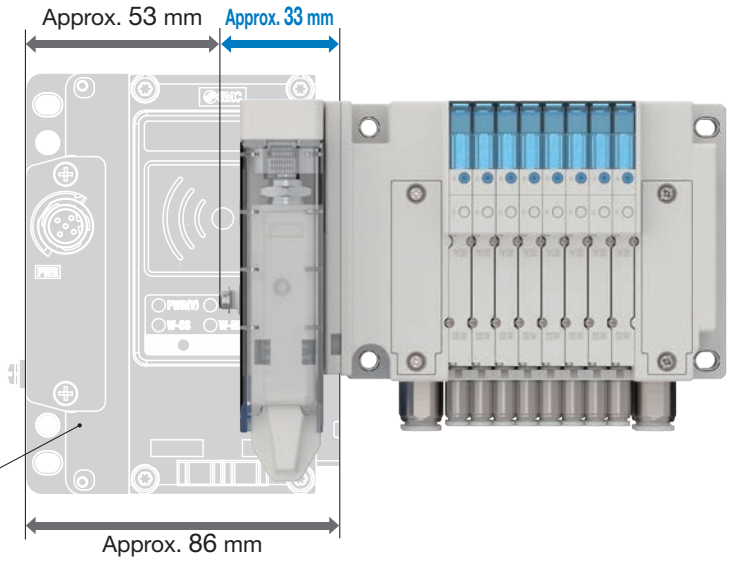
New product: 3,342 mm² Existing model: 9,052 mm²

Weight **66% reduction**

New product: 200 g Existing model: 580 g

Comparison conditions

Excludes the valve manifold
The existing model consists of a wireless remote and an end plate.



Connectable Solenoid Valve Series

IP67

SY3000/5000/7000

IP67 *1

JSY1000/3000/5000

IP67

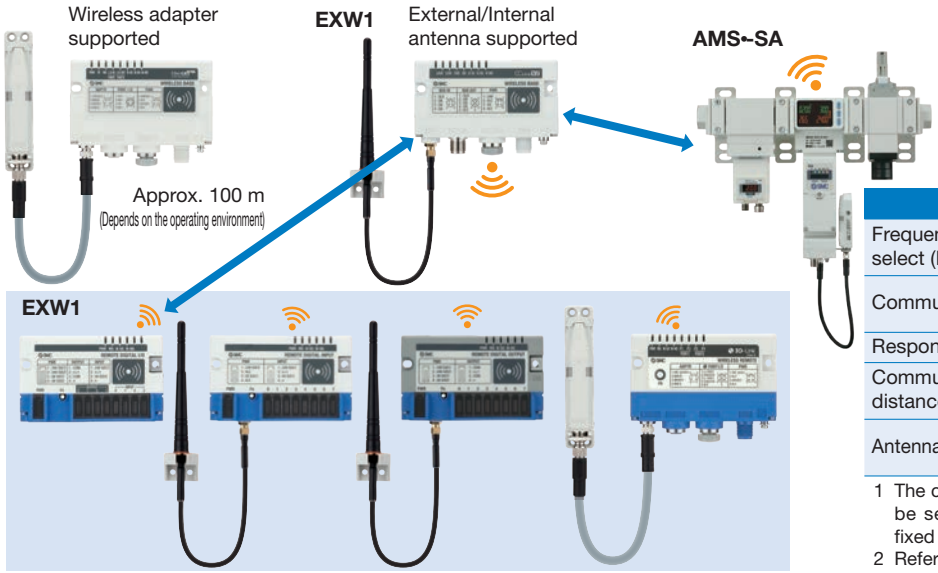
VQC1000/2000/4000/5000

*1 The JSY1000 is IP40.

System Configuration Examples

Compact Type Configuration example when using the EXW1 series base ①

(When the remote configuration is for the EXW1 series or air management hub only)

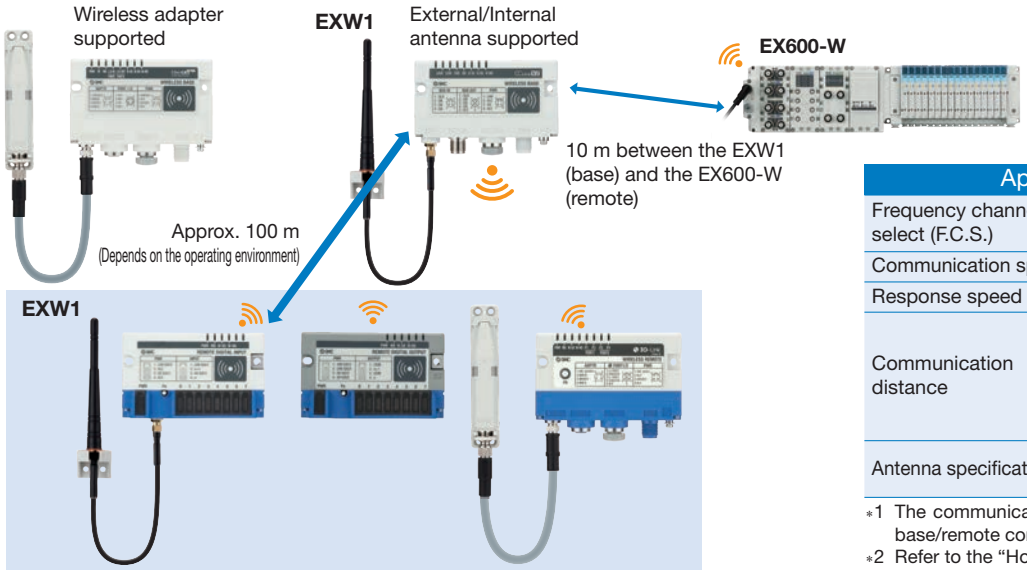


Applicable functions	
Frequency channel select (F.C.S.)	Applicable
Communication speed	Select from 1 Mbps or 250 kbps. [1]
Response speed	Select from 2 ms or 5 ms. [1]
Communication distance	Approx. 100 m (Depends on the operating environment)
Antenna specification [2]	Wireless adapter and External/ Internal antenna supported

1 The communication speed and response speed cannot be selected for the Air Management Hub. They are fixed at 1 Mbps and 2 ms, respectively.
2 Refer to the "How to Order" section.

Compact Type Configuration example when using the EXW1 series base ②

(When the remote configuration is for the EX600-W and the EXW1 series)

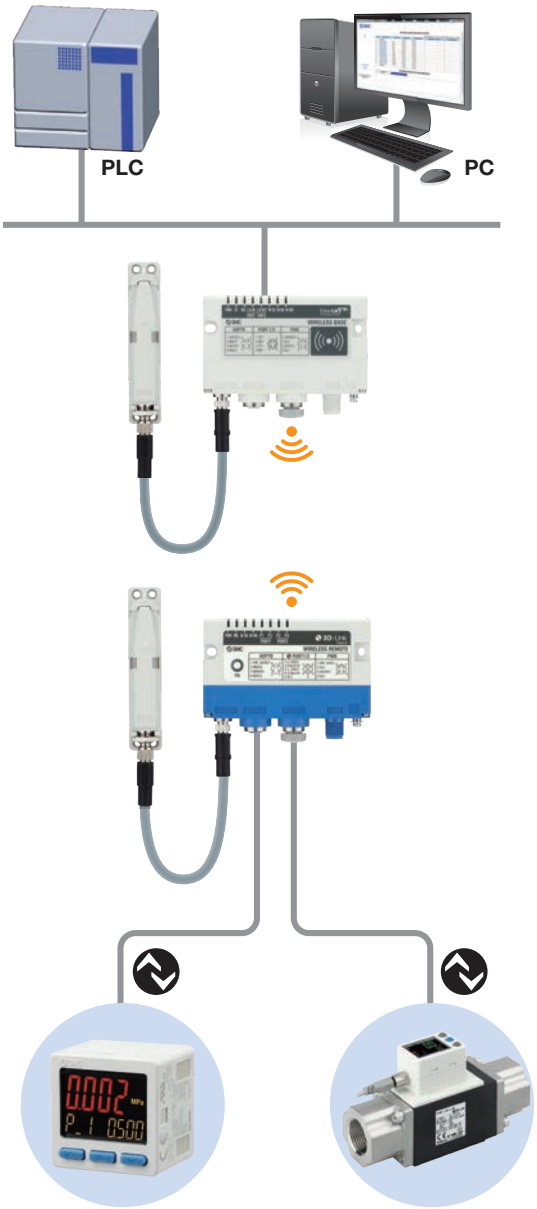


Applicable functions	
Frequency channel select (F.C.S.)	Not applicable
Communication speed	250 kbps
Response speed	5 ms
Communication distance	Approx. 100 m between the EXW1 base and remote (Depends on the operating environment) 10 m*1 between the EXW1 (base) and the EX600-W (remote)
Antenna specification*2	Wireless adapter and External/ Internal antenna supported

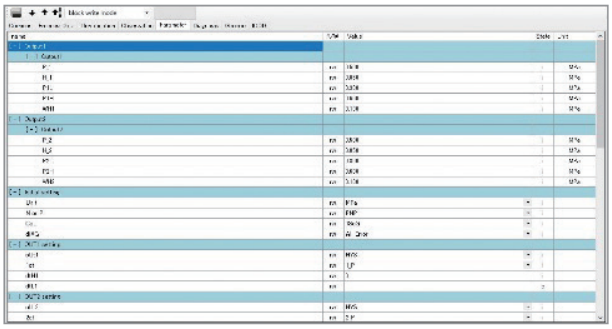
*1 The communication distance varies depending on the base/remote combination.
*2 Refer to the "How to Order" section.

The data can be accessed from via PC (IO-Link setting tool).

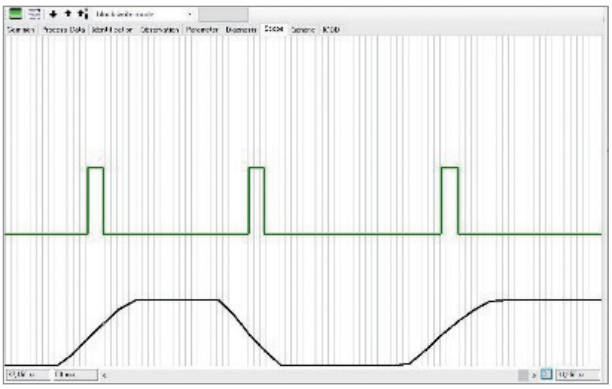
Compact
EXW1



Setting screen



Monitoring screen



IO-Link devices can be set and monitored from a PC without going through a PLC.

Process data
Device parameters
Device information
Device diagnosis

The IO-Link setting tool (IO-Link Device Tool) is a software used for the setting and monitoring of IO-Link unit/device.

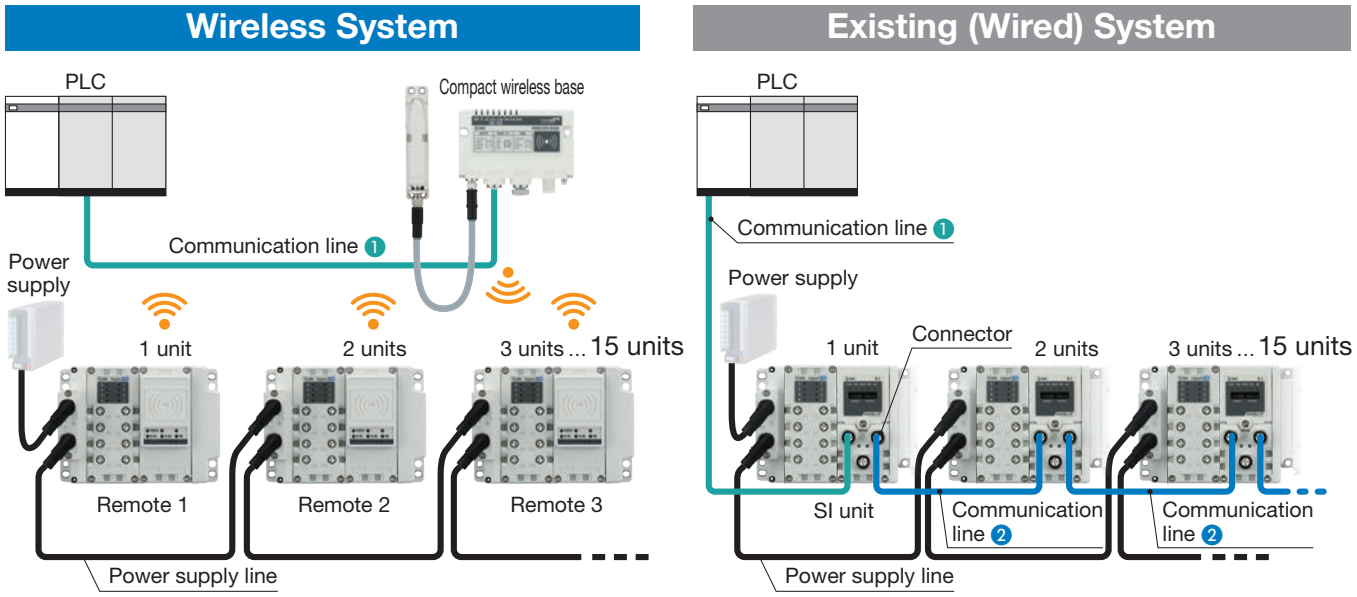
· A setting tool compatible with the IO-Link units of every manufacturer is used for the SMC EXW1 series and EX600 series IO-Link unit. (IO-Link Device Tool V5-PE (V5 or later only) manufactured by TMG Technologie und Engineering GmbH (hereinafter referred to as TMG))

· It can be downloaded for free from TMG's website. However, to use it for more than 30 days, a license key for the IO-Link Device Tool is required. (Refer to page 54 for details.)

Wiring material cost and installation time can be reduced.*1

Compact EXW1 | Modular EX600-W

*1 For the EX600-W modular type



SI unit: Comparison when 15 units are connected	Number of communication devices	Communication line		Communication connectors required
		1	2	
Wireless system	Base: 1 unit Remote: 15 units	1 line (Connector at one end)	—	1 location
Existing (Wired) system	SI unit: 15 units	1 line (Connector at one end)	14 lines (Connector at both ends)	29 locations

Interchangeability maintained

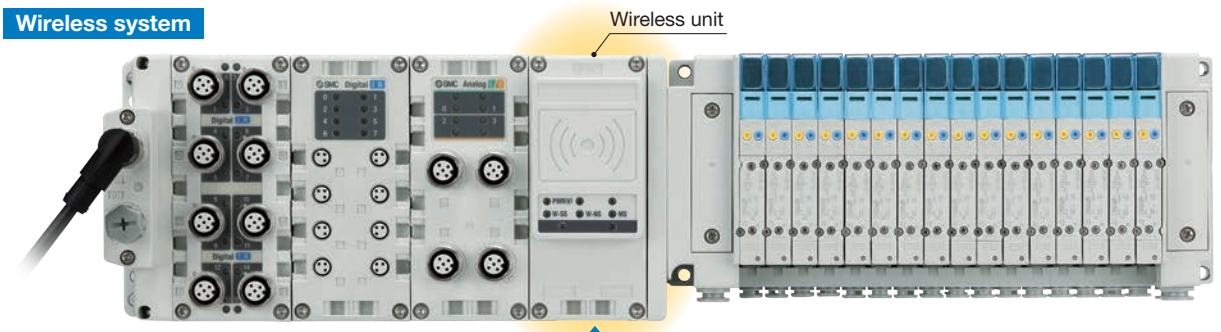
Modular EX600-W

Connection interchangeability between EX600 series SI units is maintained.

The replacement of wireless and wired systems is possible.

* The max. I/O points of the remote module is limited to 128 points.

Wireless system

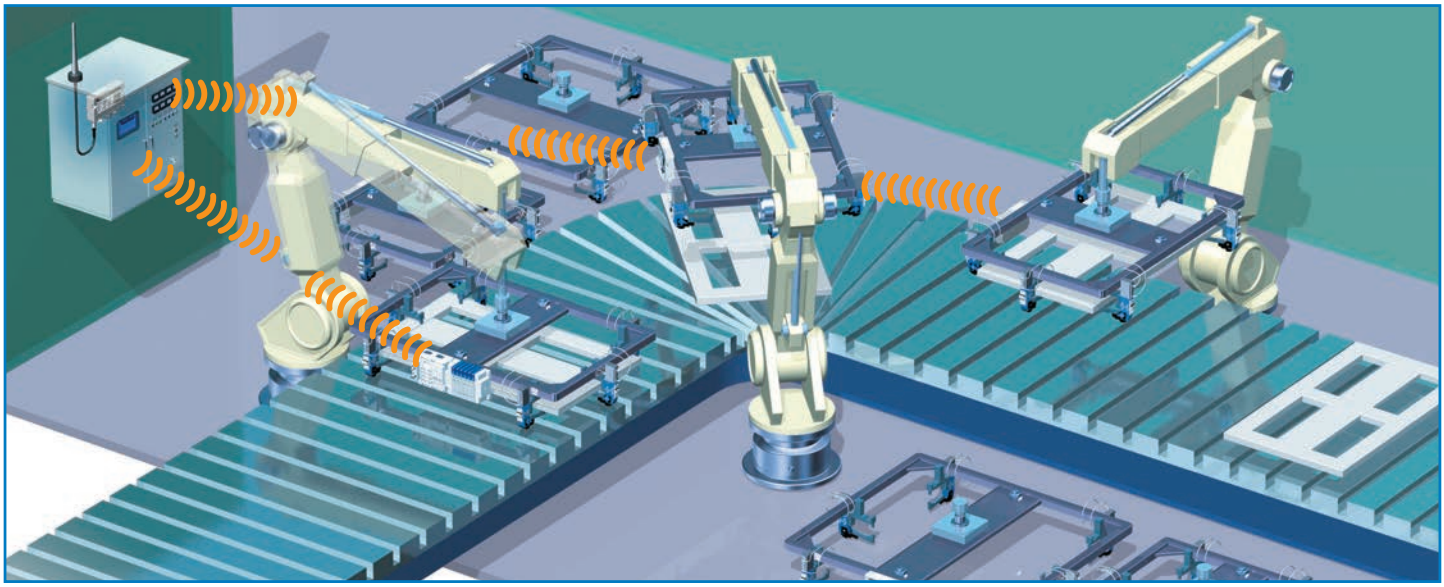


Wired system

Application Examples

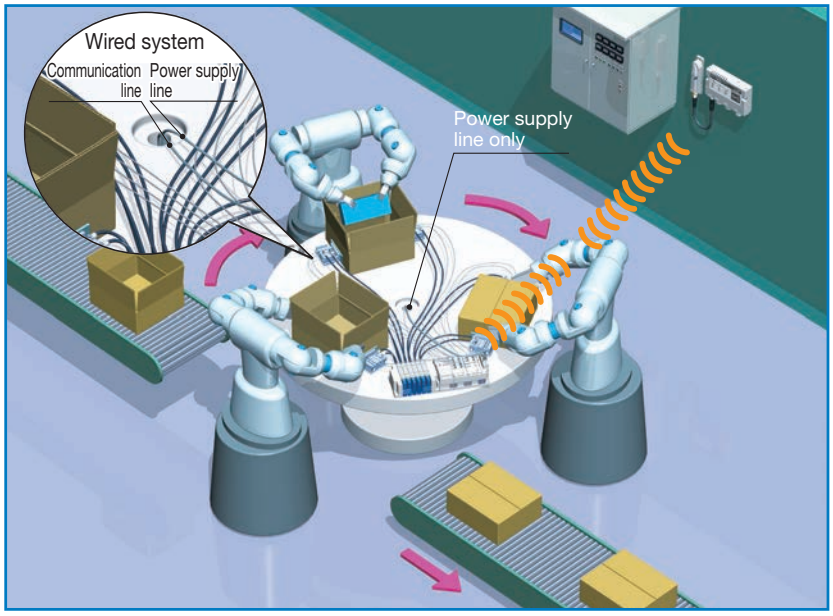
For tool changing

- A communication cable is not necessary for moving parts.
- Minimized disconnection risk
- Shorter time for establishing communication (startup time)



For rotary tables

- Minimized disconnection risk
- Smaller diameter communication cable/tubing



For the blocking of radio waves

Communication is possible by placing the external antenna outside the control panel when the unit is installed in a metal box, etc.