

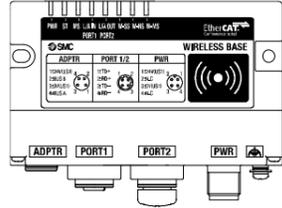


Instruction Manual

SMC Wireless System - Compact Base

EtherCAT compatible

Series EXW1-BEAC



The intended use of this product is to provide a connection from the EtherCAT communication network to a pneumatic valve manifold or I/O system via wireless communication.

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) ^{*)}, and other safety regulations.

- ^{*)} 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.

Warning

- 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

2.1 Electrical specifications

Item	Specification
Power supply voltage for control (US1)	24 VDC ±10%
Current consumption	150 mA or less

2 Specifications (continued)

2.2 General specifications

Item	Specification
Enclosure rating	IP67
Ambient operating temperature	-10 to +50 °C
Ambient storage temperature	-20 to +60 °C
Ambient humidity	35 to 85% RH (no condensation)
Withstand voltage	500 VAC for 1 minute between external terminals (including the FE terminal) and enclosure screws
Insulation resistance	10 MΩ or more (500 VDC between external terminals (including the FE terminal) and enclosure screws)
Vibration resistance	EN61131-2 compliant: 5 ≤ f < 8.4 Hz 3.5 mm 8.4 ≤ f < 150 Hz 9.8 m/s ²
Impact resistance	EN61131-2 compliant: 147 m/s ² , 11 ms
Weight	150 g

2.3 EtherCAT Communication specifications

Item	Specification
Protocol	EtherCAT (conformance test record V2.3.0)
Communication speed	100 Mbps
Communication medium	100-Base-TX Ethernet cable (CAT5)
CoE	Supported for parameter setting and diagnostics, etc.
Configuration (ESI) file ^{*)}	SMC EXW1-BEC_V10
Vendor ID	0x00000114 hex (276 dec)
Product code	0x01000047 hex (16777287 dec)
Occupied area (No. of I/O)	11784 inputs / 11784 outputs maximum

^{*)}1: The configuration file can be downloaded from the SMC website (URL: <https://www.smcworld.com>).

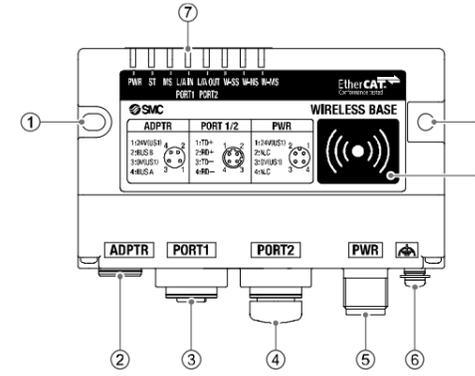
2.4 Wireless Communication specifications

Item	Specifications
Protocol	SMC original protocol (SMC encryption)
Radio wave type (spread)	Frequency Hopping Spread Spectrum (FHSS)
Frequency band	2.4 GHz (2403 to 2481 MHz)
Frequency channel select function (F.C.S.)	Supported
Frequency channels	79 ch max. (Bandwidth: 1.0 MHz)
Communication speed	1 Mbps / 250 kbps ^{*)}
Communication distance	Up to 100 m line of sight (depending on the environment)
Radio Law certificates	Refer to the operation manual on the SMC website

^{*)}1: Select a protocol before performing pairing (V.2.0: 1 Mbps, V.1.0: 250 kbps). Different communication speeds are mutually incompatible.

3 Name and Function of parts

• Compact Base (EXW1-BEAC)



No.	Item	Description
1	Mounting holes	Mounting holes for compact wireless base (2 x M4).
2	Connector for wireless adaptor (ADPTR)	Connection for wireless adaptor cable.
3	Communication connector (PORT1)	Connector for EtherCAT cable (IN side).
4	Communication connector (PORT2)	Connector for EtherCAT cable (OUT side).
5	Power supply connector	Supplies power to the compact wireless Base.
6	FE terminal	To be connected to Ground (for improved noise immunity).
7	LED display	Indicates the status of the compact wireless Base or Remote.
8	NFC antenna area	Area in close contact with the NFC reader / writer ("o" marks the centre).

^{*)}: Grounding should be as close as possible to the product and the grounding wire should be as short as possible.

4 Installation

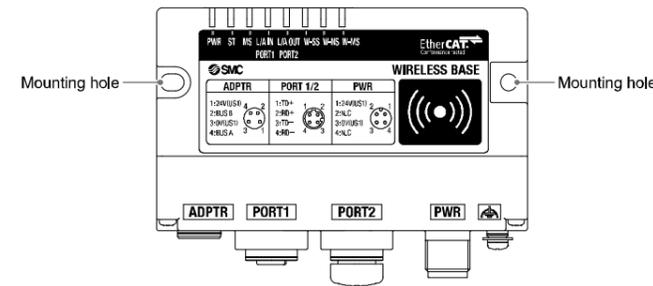
4.1 Installation



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

4.2 Mounting the Compact Base unit

Mount the Base unit with M4 screws (not supplied) using the 2 mounting holes in the unit (Recommended torque: 0.8 ±10% N·m).



4 Installation (continued)

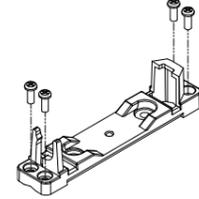
4.3 Mounting the Wireless Adaptor (EXW1-A11#)

• Mounting on a flat surface

- Attachment of installation plate
Attach the installation plate in the required location using either of the following two methods.

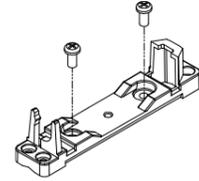
Installation using M3 screws x 4 positions

The recommended tightening torque is 0.4 N·m ± 10% (screws are not included).



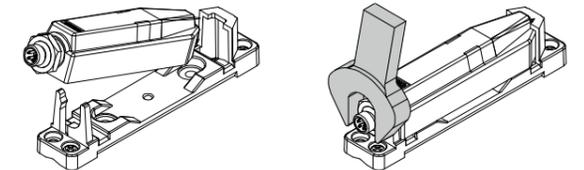
Installation using M4 screws x 2 positions

The recommended tightening torque is 0.6 N·m ± 10% (screws are not included).



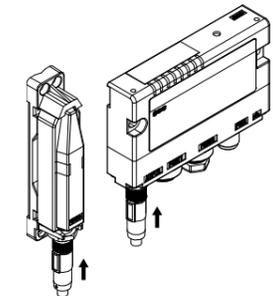
- Installation of wireless adaptor

Clip the wireless adaptor onto the installation plate as shown below and secure the adaptor in place using the M10 nut already fitted to the wireless adaptor. The recommended tightening torque is 0.9 N·m ± 10%.



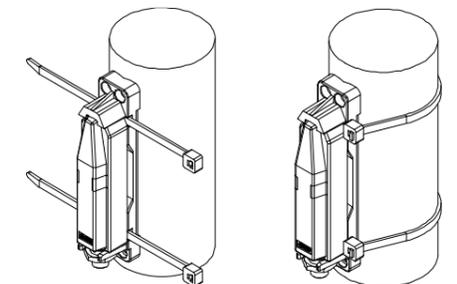
- Connection of the cable for wireless adaptor

Connect the cable between the base / remote and the wireless adaptor.



• Mounting on a curved surface

- Thread 2 x cable ties through the installation plate at the top and bottom.
- Secure the wireless adaptor to the installation plate and then secure in the required position by tightening the cable ties.



4 Installation (continued)

4.4 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- 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.

5 Wiring

5.1 Wiring Connections

Always perform wiring with the power supply turned OFF.

• Power supply connector

No.	Signal	M12, 4-pin, plug A-coded
1	24V (US1)	
2	N.C.	
3	0V (US1)	
4	N.C.	

• EtherCAT connector (PORT1 / PORT2)

No.	Signal	M12, 4-pin, socket D-coded
1	SLD	
2	DB	
3	DG	
4	DA	

• Connector for Wireless Adaptor

No.	Signal	M8, 4-pin, socket A-coded
1	24 V (US1)	
2	Internal BUS B	
3	0 V (US1)	
4	Internal BUS A	

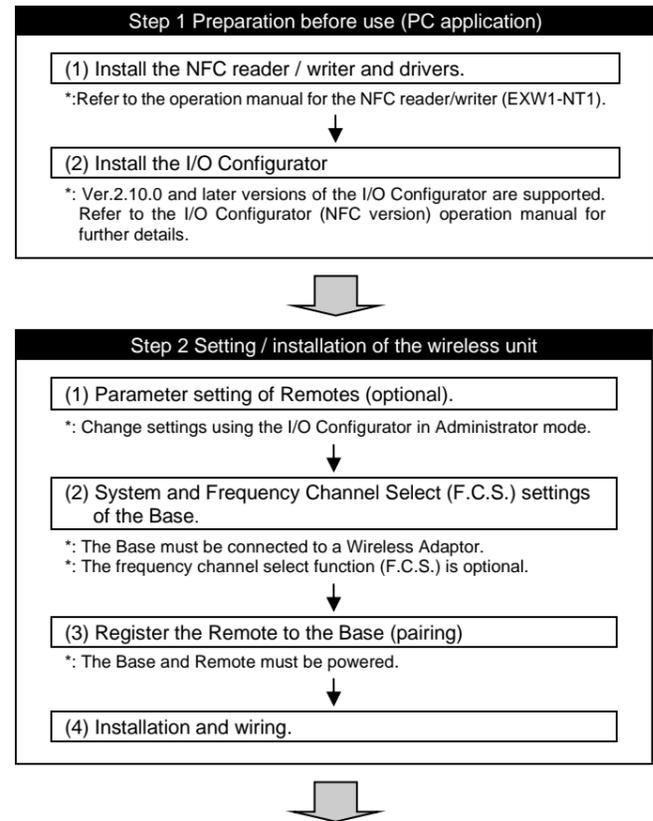
Caution

- Use the dedicated wireless adaptor cable to connect the compact wireless base to the wireless adaptor.

6 Settings

6.1 Flow chart for using the wireless system.

To use SMC wireless units (Base and Remotes), they need to be set up using an NFC reader/writer and the I/O Configurator. The setup procedure using NFC is shown below.



Step 3 Connection to PLC
 Note) Refer to the operation manual of the PLC manufacturer for connection to a 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 for details of the I/O Configurator.

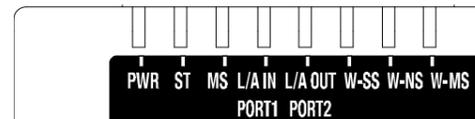
6.2 Configuration

- The EtherCAT address is automatically recognized and allocated to the product during configuration. There is no need for the user to set an address.
- To configure the Compact Wireless Base with the EtherCAT master, an ESI configuration file is required.
- The file can be downloaded from the SMC website (URL: <https://www.smcworld.com>).

Technical documentation giving detailed configuration information can be found on the SMC website (URL: <https://www.smcworld.com>).

7 LED Display

7.1 The LED indicators on the Compact Wireless Base indicate the power supply, communication and diagnostic status.

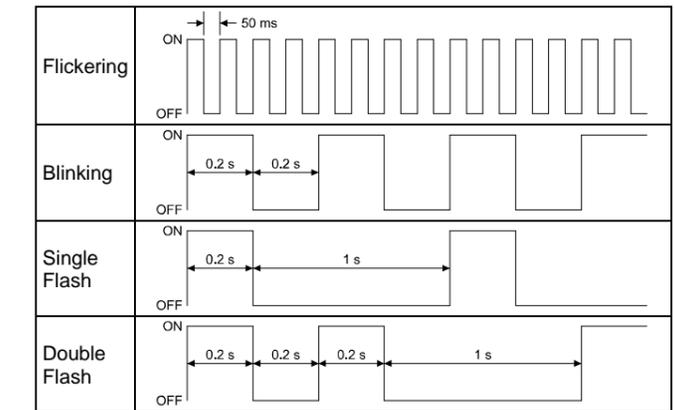


LED	LED status	Operation
PWR	Green LED ON	US1 power supply (for control) is ON.
	OFF	US1 power supply (for control) is OFF.
ST	Green LED ON	EtherCAT communication "OPERATIONAL" state.
	Green LED single flash	EtherCAT communication "SAFE-OPERATIONAL" state.
	Green LED blinking	EtherCAT communication "PRE-OPERATIONAL" state.
	Green LED flickering	EtherCAT communication "BOOTSTRAP" state.
	Red LED single flash	Synchronization error, communication data error.
	Red LED double flash	Communication error (watchdog timeout).
	Red LED blinking	Communication setup error.
	Red LED ON	Fatal error.
MS	OFF	EtherCAT communication "INIT" state or power is OFF.
	Green LED ON	Compact Wireless Base operating normally.
	Red LED flashing	Recoverable error is detected. (LED flashes when more than one diagnostic information item is detected). <ul style="list-style-type: none"> • US1 power supply (for control) voltage level is abnormal. • Number of system inputs / outputs setting error. • Abnormal number of registered Remotes. • Internal communication error between wireless adaptors. • Memory read / write error.
	Red LED ON	Unrecoverable error is detected.
L/A IN	OFF	US1 power supply (for control) is OFF.
	Green LED ON	Link, No Activity
	Green LED flickering	Link, Activity
L/A OUT	OFF	No Link, No Activity
	Green LED ON	Link, No Activity
	Green LED flickering	Link, Activity
W-SS	OFF	No Link, No Activity
	Green LED ON	The level of received radio wave strength of all the connected Remotes is 3.
	Green LED flashing (1 Hz)	The level of received radio wave strength of some connected Remotes is 2.
	Green LED flashing (2 Hz)	The level of received radio wave strength of some connected Remotes is 1.
	Red LED flashing	All the Remotes that support protocol V.1.0 are not connected.
	Orange LED flashing	All the Remotes that support protocol V.2.0 are not connected.
OFF	Remote is not registered.	

7 LED Display (continued)

LED	LED status	Operation
W-NS	Green LED ON	All the Remote connections are normal.
	Green LED flashing	Some Remotes are not connected.
	Red LED flashing	No Remotes are connected.
	Red LED ON	No Remotes are connected (Unrecoverable error in wireless communication).
	Red / Green LED flashing	Wireless communication connection is being configured (Pairing mode).
	Orange LED ON	Forced output mode.
W-MS	OFF	Remote not registered.
	Green LED ON	Wireless Remote is normal. Protocol V.1.0 (pairing mode).
	Orange LED ON	Protocol V.2.0 (pairing mode).
	Red LED flashing	Recoverable error is detected. (LED flashes when more than one diagnostic information item is detected). <ul style="list-style-type: none"> • US1 power supply (for control / input) voltage level is abnormal. • US2 power supply (for output) voltage level is abnormal. • Excessive I/O setting inputs/outputs. • Analog I/O upper setting limit exceeded. • Analog input range upper and lower limits exceeded. • Error in communication between units. • EX600 I/O unit detects diagnostic information. • Valve diagnostic information detected.
	Red LED ON	Unrecoverable error is detected.
	OFF	Remote not registered.

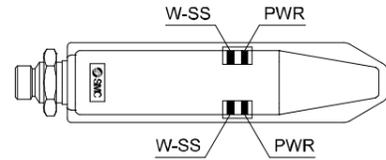
7.1.1 LED flashing pattern



- Refer to the Compact Wireless Base unit operation manual on the SMC website (URL: <https://www.smcworld.com>) for further details.

7 LED Display (continued)

7.2 The LED indicators on the Wireless Adaptor (EXW1-A11#) indicate the power supply, communication and diagnostic status.



LED	LED status	Operation
PWR	Green LED ON	Power supply voltage is ON.
	Orange LED flashing	Internal communication error is detected.
	Red LED ON	Unrecoverable error is detected.
	OFF	Power supply voltage is OFF.
W-SS	Green LED ON	The level of received radio wave strength of all connected Remotes is 3.
	Green LED flashing (1 Hz)	The level of received radio wave strength of some connected Remotes is 2.
	Green LED flashing (2 Hz)	The level of received radio wave strength of some connected Remotes is 1.
	Red LED flashing	No Remotes that support protocol V.1.0 are connected.
	Orange LED flashing	No Remotes that support protocol V.2.0 are connected.
	OFF	Remote not registered.

8 How to Order

Refer to the Operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for How to Order information.

9 Outline Dimensions (mm)

Refer to the Operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for Outline dimensions.

10 Maintenance

10.1 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.

11 Limitations of Use

11.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

• Influence of radio frequency on implantable medical devices:

The radio frequency generated by this product may give an adverse effect on implantable medical devices, such as implantable cardiac pacemakers and implantable cardioverter defibrillators. Please read catalogues or instruction manuals of the equipment and device which may be affected by radio frequencies for any instructions for use or contact their manufacturers.

12 Product Disposal

This product shall 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.

13 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.smceu.com> (Europe)
 SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan
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