



Installation and Maintenance Manual

SI unit - INTERBUS compatible

Type EX240-SIB1



1 Safety Instructions

- This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.
- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "DANGER", "WARNING" or "CAUTION", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

DANGER	In extreme conditions, there is a possibility of serious injury or loss of life.
WARNING	If instructions are not followed there is a possibility of serious injury or loss of life.
CAUTION	If instructions are not followed there is a possibility of injury or equipment damage.

WARNING

- Do not disassemble, modify (including change of printed circuit board) or repair the product.**
An injury or product failure may result.
- Do not operate the product beyond the specification range.**
Fire, malfunction or equipment damage may result. Use the product only after confirming the specifications.
- Do not use the product in the presence of flammable, explosive or corrosive gas.**
Fire, explosion or corrosion may result. This product does not have an explosion proof construction.
- When using the product as part of an interlocking system:**
 - Provide a double interlocking system, for example a mechanical system.
 - Check the product regularly to ensure proper operation.
- Before performing maintenance, be sure of the following:**
 - Turn off the power supply.
 - Stop the air supply, exhaust the residual pressure and verify the release of air from the system.

CAUTION

- Always perform a system check after maintenance.**
Do not use the product if any error occurs.
Safety cannot be assured if caused by un-intentional malfunction.
- Provide grounding to ensure correct operation and to improve noise resistance of the product.**
This product should be individually grounded using a short cable.
- Follow the instructions given below when handling the product. Failing to do so may result in product damage.**
 - Maintenance space should always be provided around the product.
 - Do not remove labels from the product.
 - Do not drop, hit or apply excessive shock to the product.
 - Follow all specified tightening torques.

1 Safety Instructions (continued)

- Do not bend, apply tensile force, or apply force by placing heavy loads, on the cables.
- Connect wires and cables correctly, and do not connect while the power is ON.
- Do not route wires and cables together with power or high-voltage cables.
- Check the insulation of wires and cables.
- Take proper measures against noise, such as noise filters, when the product is incorporated in equipment or devices.
- Select the required protection (IP) rating according to the environment of operation.
- Take sufficient shielding measures when the product is to be used in the following conditions:
 - where noise due to static electricity is generated.
 - where electro-magnetic field strength is high.
 - where radioactivity is present.
 - where power lines are located.
- Do not use the product in a place where electric surges are generated.
- Use suitable surge protection when a surge generating load such as a solenoid valve are to be directly driven.
- Prevent any foreign matter from entering this product.
- Do not expose the product to vibration or impact.
- Use the product within the specified ambient temperature range.
- Do not expose the product to any heat radiation.
- Use a precision screwdriver with flat blade to adjust the DIP switch.
- Close the cover over the switches before power is applied.
- Do not clean the product with chemicals such as benzene or thinners.

Power Supply selection

A UL approved direct current (DC) power supply should be used with this product, as follows:

- A limited voltage / current supply in accordance with UL508.
A circuit from which power is supplied by the secondary coil of a transformer according to the following:
Maximum voltage (no load) : Less than 30Vrms (42.4V peak)
Maximum current : (1) Less than 8A (including when short circuited)
(2) Limited by circuit protection (such as a fuse) with the following rating.

No load voltage (V peak)	Max. current (A)
0 to 20 [V]	5.0
20 to 30 [V]	100 / peak voltage

- A Class 2 power supply unit in accordance with UL1310, or a power supply circuit of maximum 30Vrms (42.4V peak) or less, using a Class 2 transformer in accordance with UL1585 as power source.

2 Specifications

Communication specifications

Protocol	INTERBUS (EN50254)
Bus Interface	EIA RS-485
Communication speed	500kbps
Input	Input
Output	Output
Occupied byte	Occupied byte
ID code	DIO:03 (HEX) DI:02 (HEX) DO:01 (HEX)

General specifications

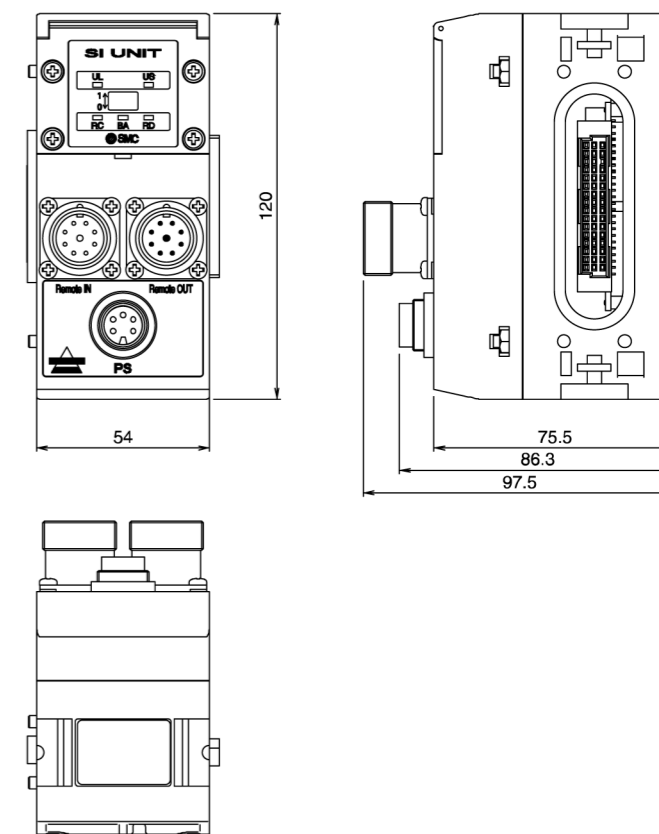
Dimension (W x H x D)	54x97.5x120 *1
Weight	450g *1
Ambient temperature	0 to 50°C
Ambient humidity	30 to 95%RH (without condensation)
Dimension (W x H x D)	10 to 57Hz 0.35mm (constant amplitude) 57 to 150Hz 50m/s ² (constant speed)
Dimension (W x H x D)	Peak value :150m/s ² /11ms, 3 times each in directions of ± X, Y and Z
Enclosure	IP65

*1) Attachments excluded.

Electrical specifications

Rated voltage	24VDC
Power supply voltage	Power supply for solenoid valve: 24VDC ± 10% Power supply for SI units: 24VDC ± 10%
Current consumption	200mA or less (SI unit) + sensor supply current
Withstand voltage	1500VAC 50/60Hz 1 min. (between terminal and case)
Insulation resistance	10MΩ or more (500VDC mega, between terminal and case)
Applicable load	24VDC, Solenoid valve with lamp-surge voltage protection circuit of 2.1W or less
Residual voltage	0.3V or less
Driving circuit	P-ch MOS-FET open drain (PNP)

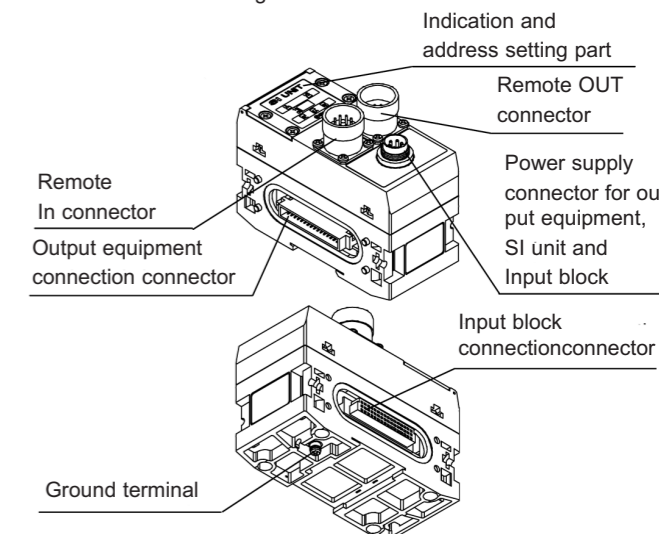
3 Outline dimensions (mm)



4 Names / Functions of Individual Parts

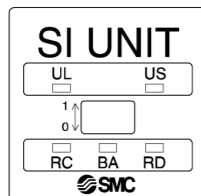
Body

- Remote In/Remote OUT connector**
To send and receive communication signals through INTERBUS line.
- Power supply connector for output equipment, SI unit and Input block**
To supply power to the output equipment such as a solenoid valve, and output block, SI unit and Input block.
- Output equipment connector**
To connect the output equipment such as a solenoid valve and output block.
- Input block connection connector**
To connect the input block.
- Indication and address setting part**
To provide LED's to indicate the condition of the unit, and the setting of address and HOLD/CLEAR functions.
- Ground terminal**
To be connected to the ground.



4 Names / Functions of Individual Parts (continued)

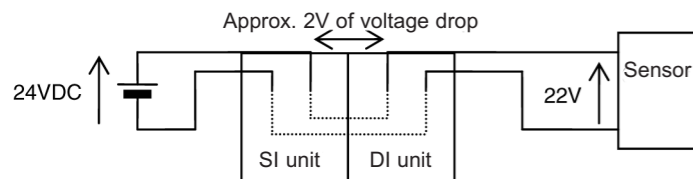
LED indication



Indication	Color	Contents
UL	Green	LED is ON when power for SI/DI unit turned ON.
US	Green	LED is ON when power for solenoid valve is turned ON.
RC	Green	LED is ON when bus is normal
BA	Green	LED is ON when transmission is normal.
RD	Red	LED is ON when transmission is not normal.

5 Wiring

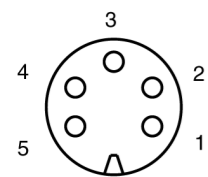
Power for SI/DI units is also distributed to sensor connected with DI unit. Select sensor concerning voltage drop inside the unit. It may reach approximately 2V at the maximum. If sensor requires 24V, it is necessary to lower power supply voltage for SI/DI unit slightly or secure power supply for sensor separately without going through SI unit so that sensor input voltage can be 24V with actual loading (allowable voltage of SI/DI unit power supply: 19.2V to 28.8V).



Power supply connector

DIN type 5 pins (Plug)

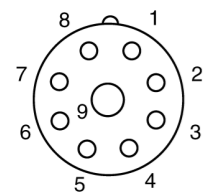
Connector example for cable: Franz Binder 72309-0114-70-15 etc.



No.	Description	Function
1	SV24V	+ 24V for solenoid valve
2	SV0V	0V for solenoid valve
3	FG	Protection earth
4	SI/DI24V	+ 24V for SI/DI unit
5	SI/DI0V	0V for SI/DI unit

Remote IN connector (Plug)

Connector example for cable: Remote bus cable PHOENIX CONTACT etc.



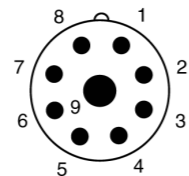
N.C: No Connection

No.	Description	Function
1	DO	Receive data +
2	/DO	Receive data -
3	DI	Send data +
4	/DI	Send data -
5	GND	Ground
6	N.C	-
7	N.C	-
8	N.C	-
9	N.C	-
Housing	Shield	Shield

5 Wiring (continued)

Remote OUT connector (Socket)

Connector example for cable: Remote bus cable PHOENIX CONTACT etc.



No.	Description	Function
1	DO	Send data +
2	/DO	Send data -
3	DI	Receive data +
4	/DI	Receive data -
5	GND	Ground
6	N.C	-
7	N.C	-
8	N.C	-
9	RBSTL	Input for Bus connector
Housing	Shield	Shield

6 Switch Setting

Switch setting

1) Setting of input and output byte (DIO,BYTE setting)

It is set whether SI unit is used input and output(DIO), output(DO) or input(DI). Number of occupied bites (BYTE) can be selected either from 4 byte, 2 byte or 1 byte. 1 byte is 8 points. Setting should be done with power off. Open the cover and set DIP switch with minus driver and so on. Address for SI unit is automatically layout by master unit. Please refer to manual or others of master unit for the details.

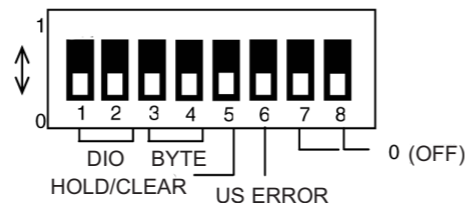
2) Setting HOLD/CLEAR

When the communication abnormality occurs, if the output condition of SI unit solenoid valve should be maintained or all OFF is set.

3) Setting of power source detection for solenoid valve (US ERROR setting)

When DIO setting is DIO or DO, it sets whether to use or not use the function detection if the power is supplied for output of solenoid valve.

This function is invalid for DI as it does not need power source for solenoid valve.



DIO setting	SW1	SW2	BYTE setting	SW3	SW4
DIO	0	0	4 BYTE	0	0
DO	1	0	-	1	0
DI	0	1	2 BYTE	0	1
-	1	1	1 BYTE	1	1

HOLD/CLEAR setting	SW5	US ERROR setting	SW6
CLEAR	1	Use	0
HOLD	1	Not use	1

Keep 0(OFF) the SW7 and SW8.

When shipped from factory, SW1~8 are all OFF.

When BYTE setting is 1 byte, it needs firmware version of PHOENIX CONTACT Co.'s master is more than version 4.0. Please refer to the manual of each product manufacture for details.

7 Contacts

AUSTRIA	(43) 2262 62280	NETHERLANDS	(31) 20 531 8888
BELGIUM	(32) 3 355 1464	NORWAY	(47) 67 12 90 20
CZECH REP.	(420) 541 424 611	POLAND	(48) 22 211 9600
DENMARK	(45) 7025 2900	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1 6476 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945 184 100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8 603 1200
HUNGARY	(36) 23 511 390	SWITZERLAND	(41) 52 396 3131
IRELAND	(353) 1 403 9000	UNITED KINGDOM	(44) 1908 563888
ITALY	(39) 02 92711		

SMC Corporation

URL <http://www.smworld.com> (Global) <http://www.smceu.com> (Europe)

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