



Installation & Maintenance Manual
SI unit - INTERBUS compatible
Type EX245-SIB1/2/3-X35



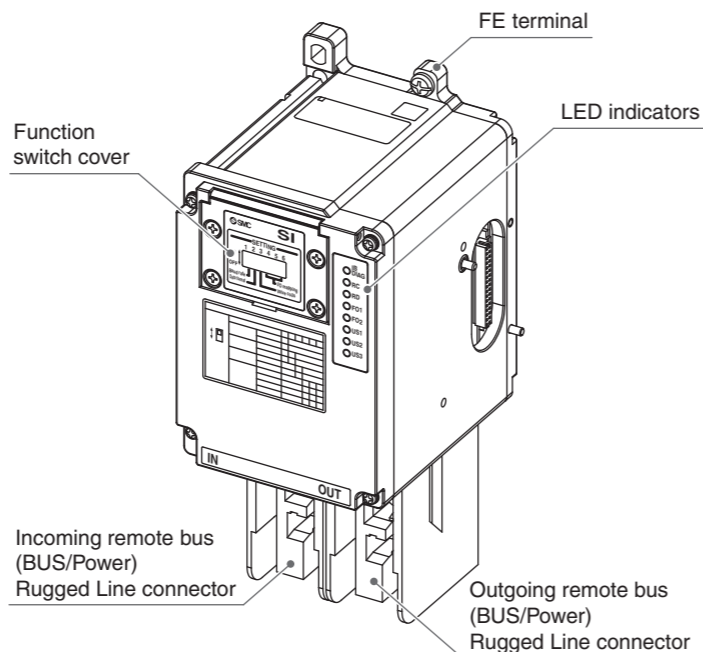
Safety Instructions

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), Japan Industrial Standards (JIS) and other safety regulations. 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.

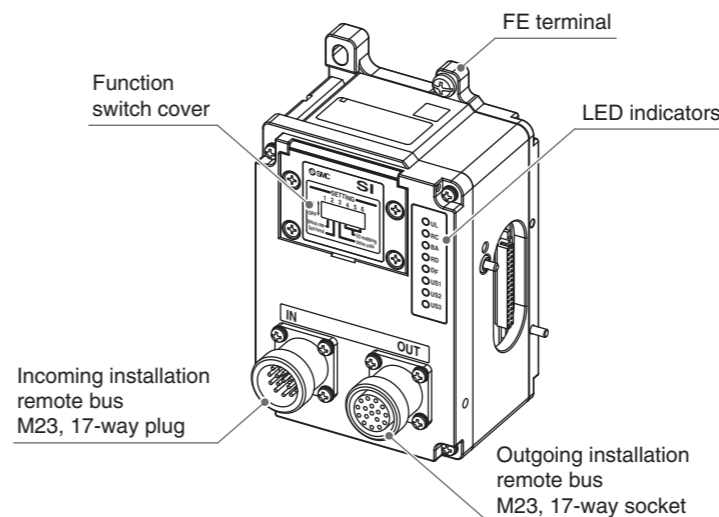
Caution	Operator error could result in injury or equipment damage.
Warning	Operator error could result in serious injury or loss of life.
Danger	In extreme conditions, there is a possibility of serious injury or loss of life.

Names and Functions of Individual Parts

Parts and description
EX245-SIB1-X35



EX245-SIB3-X35



LED indicators for EX245-SIB1/2-X35

The LED indicators are arranged on the SI Unit as shown below.



Designation	Description	Colour
IB DIAG	INTERBUS diagnostics	Green
RC	Remote bus cable check	Green
RD	Remote bus status (remote bus disabled)	Red
FO1	Monitoring the incoming optical fibre path	Yellow
FO2	Monitoring the outgoing optical fibre path	Yellow
US1	Supply for the logic/sensors	Green
US2	Supply for the valves/loads	Green
US3	All the additional supplies for the loads (US3, US4, etc.)	Green

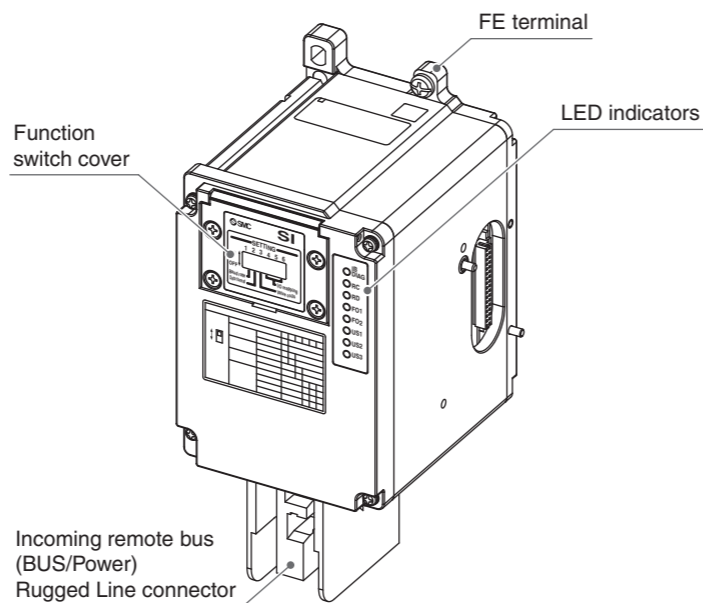
Warning

- Do not disassemble, modify (including changing of 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

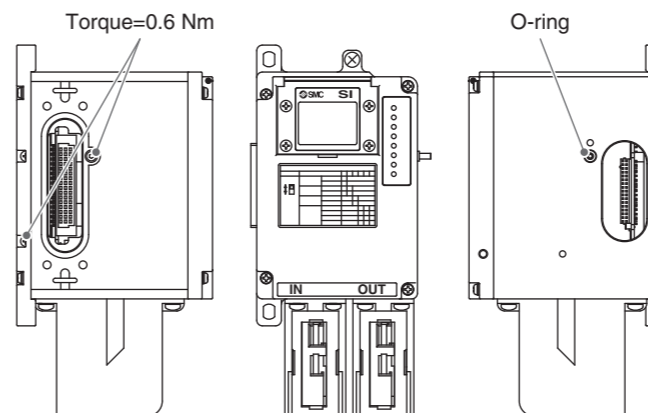
- After maintenance is complete, perform appropriate functional inspections. Stop operation if the equipment does not function properly. Safety cannot be assured in the case of unexpected malfunction.
- Provide grounding to assure the safety and noise resistance of the SI unit. Individual grounding should be provided close to the product with a short cable.

EX245-SIB2-X35



Valve manifold connection

Connect the valve manifold with the 2 screws on the SI Unit. (hexagonal socket wrench size 2.5 mm)



Caution

For a protection rating of IP65 to be ensured, apply the recommended tightening torque and make sure that the O-ring is positioned correctly on the screw.

IB DIAG indicator

IB DIAG	Meaning
OFF	US1 not present.
Flashing at 2 Hz	US1 present, peripheral fault.
Flashing at 0.5 Hz	US1 present, bus not active.
ON	US1 present, bus active, no peripheral fault.

RC indicator

RC	Meaning
OFF	Incoming remote bus connection defective or not active.
ON	Data is sent to the incoming remote bus connection.

RD indicator

RD	Meaning
OFF	Outgoing remote bus switched on.
ON	Outgoing remote bus switched off.

FO1/FO2 indicators

NOTE

In the EX245-SIB2-X35, FO2 indicator is always OFF.

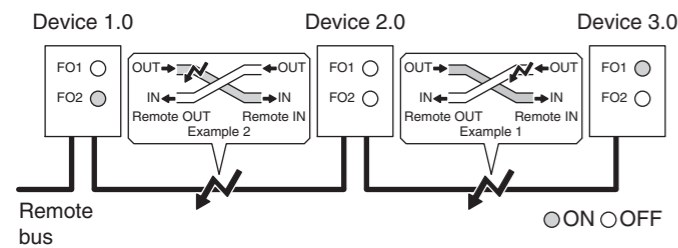
FO1	Meaning
OFF	Incoming optical fibre path OK or not used.
ON	Incoming optical fibre path not OK or system reserve reached in controlled operation.

FO2	Meaning
OFF	Outgoing optical fibre path OK or not used.
ON	Outgoing optical fibre path not OK or system reserve reached in controlled operation.

The FO1 and FO2 indicators indicate at which interface (incoming/outgoing) the transmission is not optimal and also whether the forward data transfer or return data transfer is affected.

Names and Functions of Individual Parts (continued)

Diagnostics example using FO1 and FO2 indicators



Example 1
The FO1 indicator lights up on device 3.0 if the system reserve has been reached or has been exceeded on the return of the incoming interface.

Example 2
The FO2 indicator on device 1.0 indicates that the forward path of the outgoing interface is affected.

US1 indicator

US1	Meaning
OFF	US1 is not present or is below the dropout level (< 17 VDC approx).
Flashing	US1 is below the permissible level but above the dropout level (17 to 20.4 VDC).
ON	US1 is present (> 21.6 VDC approx).

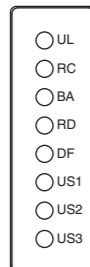
US2 indicator

US2	Meaning
OFF	US2 is not present or is below the dropout level (< 17 VDC approx).
Flashing	US2 is below the permissible level but above the dropout level (17 to 21.6 VDC).
ON	US2 is present (> 22.8 VDC approx).

US3 indicator
If several EX245-DY2-X37 are present in the manifold, this indicator shows the worst status.

US3	Meaning
OFF	At least one of the additional supplies for the loads is not present or is below the dropout level (< 17 VDC approx).
Flashing	At least one of the additional supplies for the loads is below the permissible level but above the dropout level (17 to 21.6 VDC).
ON	All the additional supplies for the loads are present (> 22.8 VDC approx).

LED indicators for EX245-SIB3-X35
The LED indicators are arranged on the SI Unit as shown below.



Designation	Description	Colour
UL	Logic supply for bus interface	Green
RC	Remote bus cable check	Green
BA	Bus Active	Green
RD	Remote bus status (remote bus disabled)	Yellow
DF	Device fault	Red
US1	Supply for the logic/sensors	Green
US2	Supply for the valves/loads	Green
US3	The additional supplies for the loads (US3, US4, etc.)	Green

UL indicator

UL	Meaning
OFF	Logic supply for bus interface is not present.
ON	Logic supply for bus interface is present.

RC indicator

RC	Meaning
OFF	Incoming remote bus connection is defective or not active.
ON	Data is sent to the incoming remote bus connection.

BA indicator

BA	Meaning
OFF	No data transmission.
Flashing	Bus active, but no cyclic data transmission. (The INTERBUS master is in the ACTIVE state.)
ON	Data transmission on INTERBUS active. (The INTERBUS master is in the RUN state.)

RD indicator

RD	Meaning
OFF	Outgoing remote bus switched on.
ON	Outgoing remote bus switched off.

DF indicator

DF	Meaning
OFF	No device faults.
Flashing at 2 Hz	At least one valve coil has a short circuit.
Flashing at 0.5 Hz	At least one valve coil has a short circuit, and at least one connected module has a short circuit or the module layout has changed.
ON	At least one connected module has a short circuit or the module layout has changed.

US1 indicator

US1	Meaning
OFF	US1 is not present or below the dropout level (< 17 VDC approx).
Flashing	US1 is below the permissible level but above the dropout level (17 to 20.4 VDC).
ON	US1 is present (> 21.6 VDC approx).

US2 indicator

US2	Meaning
OFF	US2 is not present or below the dropout level (< 17 VDC approx).
Flashing	US2 is below the permissible level but above the dropout level (17 to 21.6 VDC).
ON	US2 is present (> 22.8 VDC approx).

US3 indicator
This indicator shows the status of all the additional supplies for the loads in common. If several EX245-DY2-X37 exist in the manifold, this indicator shows the worst status of all.

US3 indicator

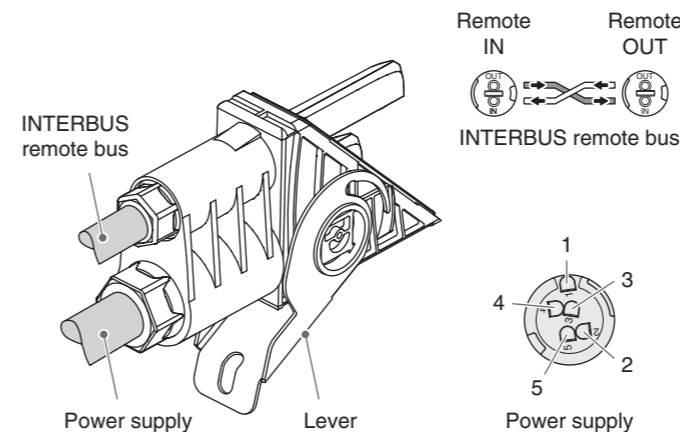
US3	Meaning
OFF	At least one of the additional supplies for the loads is not present or below the dropout level (< 17 VDC approx).
Flashing	At least one of the additional supplies for the loads is below the permissible level but above the dropout level (17 to 21.6 VDC).
ON	All the additional supplies for the loads are present (> 22.8 VDC approx).

Wiring

Bus/Power connection EX245-SIB1/2-X35
The SI Unit is a "remote bus device" and can be connected to a "remote bus line", but the EX245-SIB2-X35 must be the end device of each remote bus level. In the case of EX245-SIB1-X35, if another device does not follow, cover the Bus/Power connector (OUT) with a covering cap so that the protection rating of IP65 is ensured.

- Caution**
- For reasons of EMC, a secure connection to the cable shield must be established on the Power (IN/OUT).
 - Power and bus lines must be installed correctly.
 - To prevent manifold components from being damaged, the supply lines for the electronics and for the load voltage must be protected externally with a fuse.
 - The current carrying capacity for every contact of US1 and US2 is 10A.
 - The Bus/Power connectors can be connected to the SI Unit in two different ways. The lever of the bus connector must not be used to pull the connector into position.

NOTE
Only special cables and connectors are suitable for Rugged Line connection. Contact Phoenix Contact GmbH & Co. about cables and connectors.
Mounting steps:
•Open the lever and insert the connector sufficiently deep into the SI Unit.
•Close the lever.



Connector pin assignment INTERBUS remote bus

Bus connector	Signal	Direction	Splice ring	Wire colour
Incoming bus	Optical fibre Remote IN	Receive data	IN	Orange
		Send data	OUT	Black
Outgoing bus	Optical fibre Remote OUT	Receive data	IN	Black
		Send data	OUT	Orange

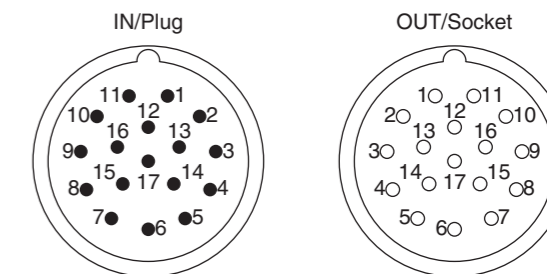
Power supply

Signal	Connection	Wire colour	Identification
24 V (US1)	1	Black	1
0 V (US1)	2	Black	2
24 V (US2)	3	Black	3
0V (US2)	4	Black	4
FE	5	Yellow	5

Bus/Power connection EX245-SIB3-X35
The SI Unit is a "remote bus device" and can be connected to a "remote bus line".
If another device does not follow, cover the outgoing installation remote bus connector with a covering cap so that the protection rating of IP65 is ensured.

- Caution**
- For reasons of EMC a secure connection to the cable shield must be established on the installation remote bus (Incoming/Outgoing).
 - Power and bus lines must be installed correctly.
 - To prevent manifold components from being damaged, the supply lines for the electronics and for the load voltage must be protected externally with a fuse.
 - The installation remote bus connector can carry a maximum of 8 A. (applies only to US1 and US2, Pins 1 to 4)

Pin allocation of installation remote bus connector
The SI Unit supports automatic bus connector recognition, so RBST signal is not required.



Pin	Incoming	Remarks	Outgoing	Remarks
1	0 V (US1)	0 V for logic/sensors	0 V (US1)	0 V for logic/sensors
2	0 V (US2)	0 V for valves/loads	0 V (US2)	0 V for valves/loads
3	24 V (US2)	24 VDC for valves/loads	24 V (US2)	24 VDC for valves/loads
4	24 V (US1)	24 VDC for logic/sensors	24 V (US1)	24 VDC for logic/sensors
5	FE	Functional Earth	FE	Functional Earth
6	N.C.	Not used	N.C.	Not used
7	DO1	Receive data line +	DO2	Send data line +
8	DO1	Receive data line -	DO2	Send data line -
9	DI1	Send data line +	DI2	Receive data line +
10	DI1	Send data line -	DI2	Receive data line -
11	COM1	Data ground 1	COM	Data ground
12	-	Not used	-	Not used
13	-	Not used	-	Not used
14	-	Not used	-	Not used
15	N.C.	Not used	N.C.	Not used
16	N.C.	Not used	N.C.	Not used
17	-	Not used	-	Not used

FE terminal
The SI Unit must be connected to FE (Functional Earth) to divert electromagnetic interference. Connect to the grounding cable with FE terminal screw on the SI Unit (M5, torque=1.5 Nm). The other end of the grounding cable should be terminated to ground potential.

Switch setting

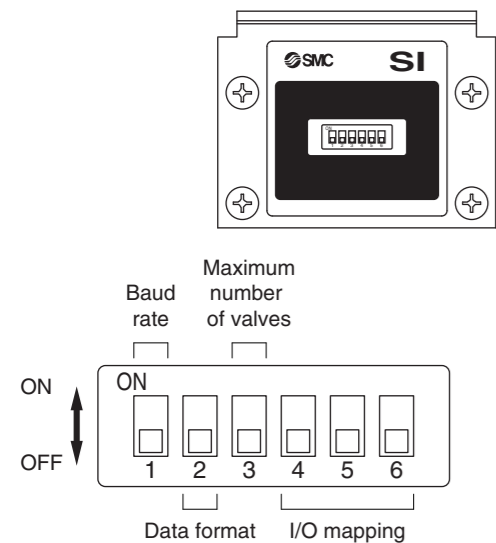
Switch setting

The switches are located inside the SI Unit, behind the function switch cover.

Setting the DIP switches:

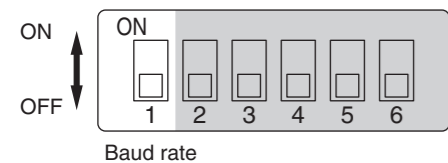
- Unscrew the cover and hinge it upwards.
- The DIP switches can be adjusted with a small flat-blade screwdriver.
- Tighten the cover again, making sure that the seals are positioned correctly (torque=0.3 Nm).

Setting the DIP switches



Switch No.1 for setting the baud rate

Select the baud rate (INTERBUS transmission speed). Changing this setting will not take effect until the SI Unit has been powered OFF and then back ON again.

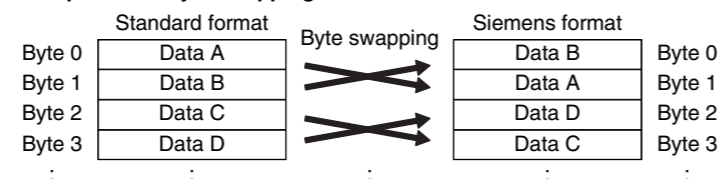


Switch setting	Description
ON	2 Mbps
OFF	500 kbps

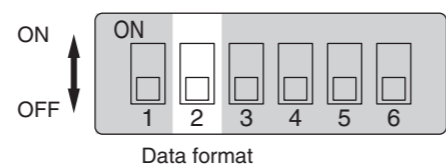
Switch No.2 for setting the data format

The SI Unit supports "Standard" and "Siemens (byte swapped)" formats. With the Siemens format selected, Bytes 0 & 1 are swapped and Byte 2 & 3 are swapped, making it suitable for use with Siemens PLC's.

Example of the byte swapping



Select the required data format. Changing this setting will not take effect until the SI Unit has been powered OFF and then back ON again.



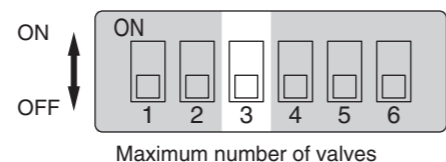
Switch setting	Description
ON	Siemens (byte swapped) format
OFF	Standard format

Switch No.3 for setting the maximum number of valves

Select the maximum number of valves. Changing this setting will not take effect until the SI Unit has been powered OFF and then back ON again.

NOTE

In the case of EX245-SIB2-X35, the maximum number of valves is always 16 coils.



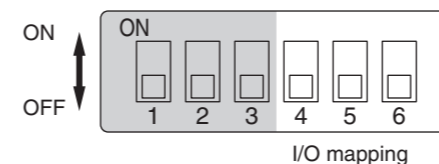
Switch setting	Description
ON	Max. 32 coils
OFF	Max. 16 coils

Switches No.4, 5 and 6 for setting the I/O mapping

The SI Unit supports four I/O mapping modes (refer to the operation manual for this product). Use the switches No.4, 5 and 6 to select the required I/O mapping. Changing this setting will not take effect until the SI Unit has been powered OFF and then back ON again.

Caution

Switch No.4 must always be OFF.



Switch setting			I/O mapping	Description
No.4	No.5	No.6		
OFF	OFF	OFF	Mode 1	No diagnostic data is added to the input data.
OFF	OFF	ON	Mode 2	Detailed diagnostic data (4 bytes) is added to the top of input data.
OFF	ON	OFF	Mode 3	Simple diagnostic data (2 bytes) is added to the input data.
OFF	ON	ON	Mode 4	Detailed diagnostic data (4 bytes) is added to the input data.

Troubleshooting

Refer to the operation manual for this product.

Specifications

Refer to the operation manual for this product.

Outline with Dimensions (in mm)

Refer to the operation manual for this product.

Contact

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
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