



Installation and Maintenance Manual

SI unit - CC-Link compatible

Type EX140-SMJ1



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 with the labels of "Caution", "Warning" or "Danger", 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.

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.

This product is class A equipment that is intended for use in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbances.

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:**
 - 1) Provide a double interlocking system, for example a mechanical system.
 - 2) Check the product regularly to ensure proper operation.
- **Before performing maintenance, be sure of the following:**
 - 1) Turn off the power supply.
 - 2) 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.

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:
 - (1) where noise due to static electricity is generated.
 - (2) where electro-magnetic field strength is high.
 - (3) where radioactivity is present.
 - (4) 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.

NOTE

- When conformity to UL is necessary the SI unit must be used with a UL 1310 Class2 power supply.

Specifications

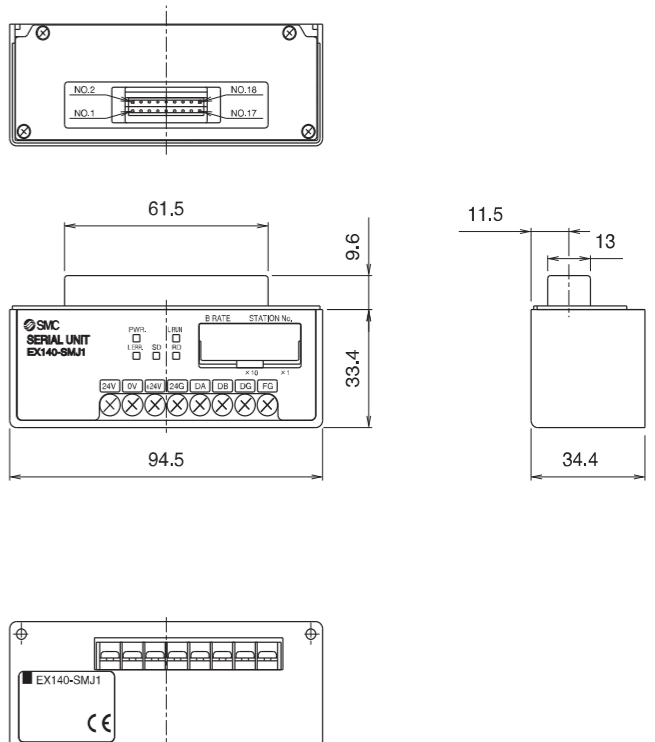
Communication and General Specification

Item	Description					
Communication specification	Applicable system	CC-Link Ver. 1.10				
	Occupied station	1 station				
	Station number setting range	1 to 64 (Set with a rotary switch)				
	Station type	Remote I/O				
	Communication speed	156 k bps	625 k bps	2.5 M bps	5 M bps	10 M bps
	Cable length between stations	20 cm or more				
	Max. cable length	1200 m	900 m	400 m	160 m	100 m
Communication power voltage	15 VDC to 30 VDC					
Solenoid valve voltage	24 VDC + 10%/5%					
Output channels	16 points					
Output type	NPN (positive common)					
Current consumption	Com./internal power supply: 24 VDC/0.1 A or less Solenoid valve power valve: 24 VDC/1.4 A or less					
Environment resistance	Enclosure	IP20				
	Withstand voltage	1500 VAC 1 min. (Between FG and external)				
	Insulation resistance	2 MΩ or more (500 VDC between FG and external terminal)				
	Ambient temperature	Operating temperature: 0 °C to + 55 °C (When 8 points are on) 0 °C to + 50 °C (When 16 points are on) Storage: -10 °C to 60 °C				
	Ambient humidity	35% to 85%RH (No due condensation)				
Operation atmosphere	No corrosive gas					
Standard	CE marked					
Weight	80 g or less					

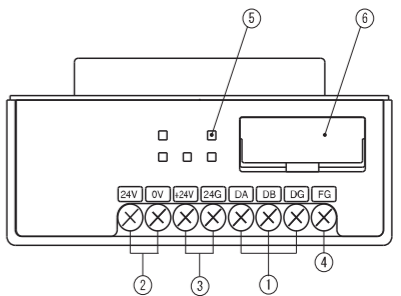
Applicable solenoid valve series

Representative series	Applicable series
SQ series	SQ1000,2000 series
SZ series	SZ3000 series

Outline dimensions (mm)



Names and Functions of Individual Parts

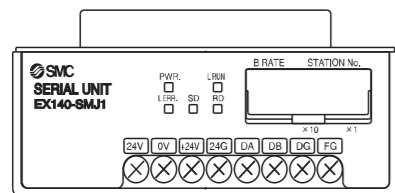


No.	Parts	Purpose
1	Communication terminal (DA, DB, DG)	To connect the CC-Link line with a CC-Link-dedicated cable.
2	Power supply terminal (24V, 0V)	To supply power to the Solenoid Valves.
3	Power supply terminal (+24V, 24G)	To supply power to the SI unit controller.
4	FG terminal	For connection to Functional Ground.
5	Display	The status of the SI unit is indicated using LED's.
6	Setting switch area	The station number and transmission speed are set.

Names and Functions of Individual Parts (continued)

No.	Term	Definition
1	Total of station	Total number of occupied stations among all slaves connected by the CC-Link.
2	Station number	Number from 01 to 64, assigned to the slave stations. Number 0 is assigned to the master CC-Link. Slave stations must be assigned numbers according to the number of occupied stations so that they are not duplicated.
3	Slave station	General term for any station except the master station.
4	Number of occupied slaves	Number of networked stations in use by a slave. Depending on the data, 1 to 4 stations can be set. The remote I/O only occupies one station.
5	Remote I/O	A station which can only use digital data. Occupies only 1 station. (Example: digital units, solenoid valves, sensors, etc)

LED indication



Display	Meaning
PWR.	LED is ON when the communication power is connected
L RUN	Check whether SI unit is communicating with the master station correctly. LED is ON when SI unit is receiving normal data from the master station. LED is OFF for time-out.
SD	LED is ON when data is being sent
RD	LED is ON when data is being received
L ERR.	LED is ON during communication errors (CRC errors). LED is also ON during a time-out (the L RUN light goes OFF). LED is ON for station number setting and communication speed setting errors (the light goes OFF when the setting has been corrected and power has been restored). LED flashes when the station number and communication speed settings have changed during communication. (the L RUN LED illuminates and the SI unit operates according to the station number and communication speed settings input when power is applied.)

Wiring

LED indication

The connection between a CC-Link-dedicated cable and an SI unit communication terminal for CC-Link is shown below.

- Be sure to connect a signal line to its dedicated terminal. (Refer to Fig.1)
A suitable screwdriver is a #2 pozi head screwdriver, with a body diameter of 6 mm or less.
Tighten the terminals securely with a torque of 0.5 to 0.6 [Nm]

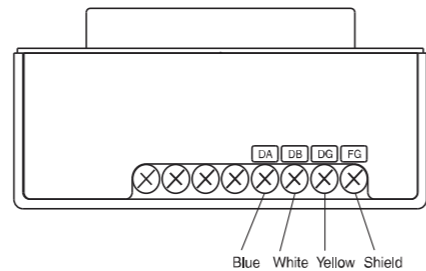


Fig.1

- Be sure to connect a terminating resistor between "DA" and "DB" at both ends of the CC-Link system (Refer to Fig.2). Use a cable with the same specifications as a CC-Link-dedicated cable. If a cable with any other specifications is used, normal data transmission cannot be guaranteed.

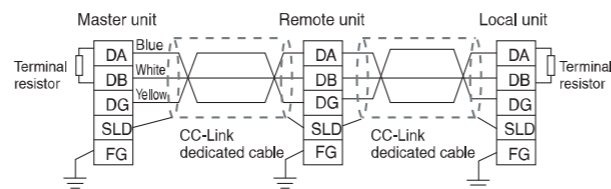


Fig.2

- The appropriate termination resistor differs depending on the CC-Link cable used (Refer to the table and Fig. 3 below.)
The CC-Link-dedicated cable's shield line should be connected to the "FG" terminal of the SI unit.

Cable type	Terminal resistor
CC-Link dedicated cable	110Ω 1/2W
CC-Link dedicated cable compatible to Ver.1.10	(Brown, Brown, Brown)
CC-Link dedicated high performance cable	130Ω 1/2W
	(Brown, Orange, Brown)

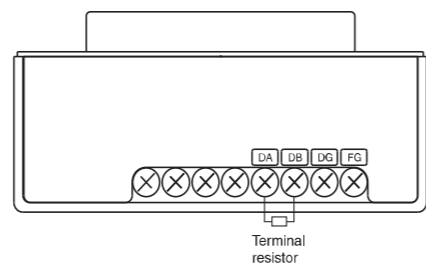


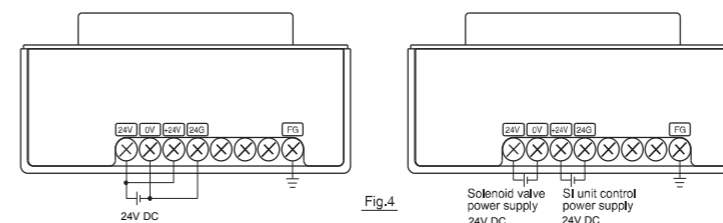
Fig.3

Wiring (continued)

Power supply wiring

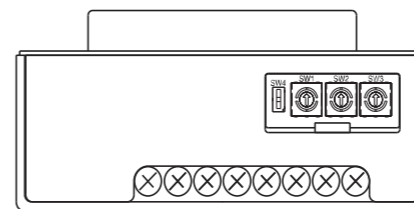
Connect the power wiring to the SI unit's solenoid valve and communication power supply terminals.
Though the power supply consists of two systems, it can operate with either a single or separate power supplies.
Be sure to connect a signal line to its dedicated terminal. (Refer to Fig.4)
A suitable screwdriver is a #2 pozi head screwdriver, with a body diameter of 6 mm or less.
Tighten the terminals securely with a torque of 0.5 to 0.6 [Nm]

*: Note-D-type Ground (3rd type ground) for the FG terminal (the SLD and FG terminals in CC-Link are connected within the SI units.)



Switch Setting

- The setting for station number and communication speed can be carried out with the rotary switches in the SI unit cover.
- The setting for HOLD/CLEAR can be carried out with the DIP switch in the SI unit cover.
- The settings should be carried out when the power for the SI unit is turned off.



Station number setting

STATION NO.

SW2

× 10

SW3

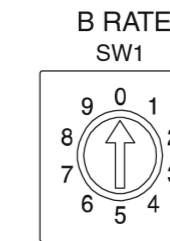
× 1

Setting	Setting range
×10	0 to 6
×1	0 to 9

- The station number should be any number from 01 to 64.
When number 00 to 65 or more are set, "LERR" LED will turn ON.
- The station number cannot be duplicated. It will an installation error.
- The setting at shipment is 00.

Switch Setting (continued)

Setting of Transmitting speed



Setting	Transmitting speed
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

- The setting for communication speed should be in the range of 0 to 64.
If the setting is out of this range, "LERR" LED will turn ON.
After turning the power off, correct the number.
- Set the same communication speed as the master station.
- The setting at shipment is 0 (156 kbps).

HOLD/CLEAR setting

*: The setting at shipment is CLEAR.



HOLD/CLEAR	Function
CLEAR	Clear the output when errors occur.
HOLD	Hold the output when errors occur.

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
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)

Specifications are subject to change without prior notice from the manufacturer.
© 2011 SMC Corporation All Rights Reserved.