



ORIGINAL INSTRUCTIONS

Instruction Manual  
Gateway (GW) unit  
PROFIBUS DP compatible  
Series LEC-GPR1\*



The intended use of the gateway unit is to connect to step motor controllers which control the movement of an electric actuator, while connected to the PROFIBUS DP network.

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) <sup>(1)</sup>, and other safety regulations. IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements) ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.

- 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.

	<b>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	<b>Warning</b>	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	<b>Danger</b>	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.

Refer to the operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for further Safety Instructions.

2 Specifications

2.1 General specifications

Item	Specifications
Rated voltage	24 VDC ±10%
Current consumption	200 mA max. (with no teaching box) 300 mA max. (with teaching box)
I/O occupation area	Input 57 words / Output 57 words
Applicable controller	Electric actuator controller (LECP6, LECA6)
Connected product	5 pcs. maximum
Cooling method	Natural air-cooling
Operating temperature	0°C to 40°C (no freezing)
Storage temperature	-10°C to 60°C (no freezing)
Operating humidity	90% RH or less (no condensation)
Vibration resistance	4.9 m/s <sup>2</sup>
Enclosure rating	IP20
Insulation resistance	50 MΩ (500 VDC) between housing (radiation fin) and FG
Weight	200 g (Direct mounting type) 220 g (DIN rail mounting type)

2 Specifications (continued)

2.2 PROFIBUS DP specifications

Item	Specifications
Fieldbus	PROFIBUS DP - V1
Device type	DP slave
Communication speed	Auto baud rate
Address setting range	0 to 125
ID number	1414
Configuration file	GSD file (download it from the SMC website)
Terminating resistor	None
Connector type	D-sub connector
Maximum cable length	Comms. speed (kbps) Total cable length (m)
	9.6 19.2 45.45 93.75 187.5 500 1500 12000
	1200 1000 400 200 100

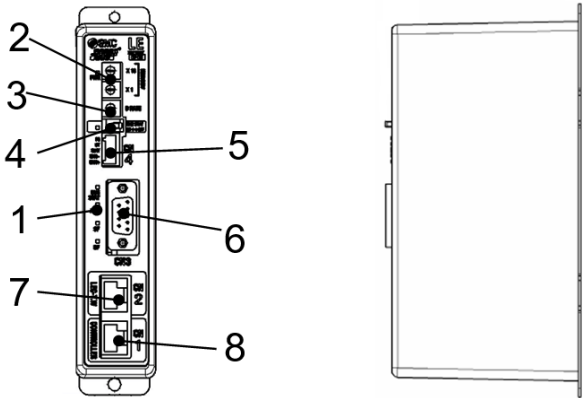
2.3 Controller I/F communication specifications

Item	Specifications
Serial communication	RS485 (Modbus protocol compatible)
Communication speed	115.2 kbps or 230.4 kbps (select 115.2 kbps when the teaching box is connected)
Cable length	The cable for the teaching box (3 m) and the electric actuator controller (3 m x 5) = 18 m. This is the maximum allowable cable length.

**Warning**

Special products (-X) might have specifications different from those shown in this section. Contact SMC for specific drawings.

3 Name and function of parts



No.	Name	Description
1	LED display	LED to indicate the gateway status.
2	ADDRESS setting switch	Switch to set address X1 and X10.
3	B RATE communication speed switch	Switch to set the communication speed to the controller IF.
4	CN2 SW communication switch	To enable communication with equipment on CN2 and disable communication with controller IF.
5	CN4 power connector	Connection for power supply / EMG.
6	CN3 bus connector	Connection for PROFIBUS DP.
7	CN2 TB / PC connector	Connection for teaching box or PC with controller setting software.
8	CN1 CONT connector	Connection for controller IF.

4 Installation

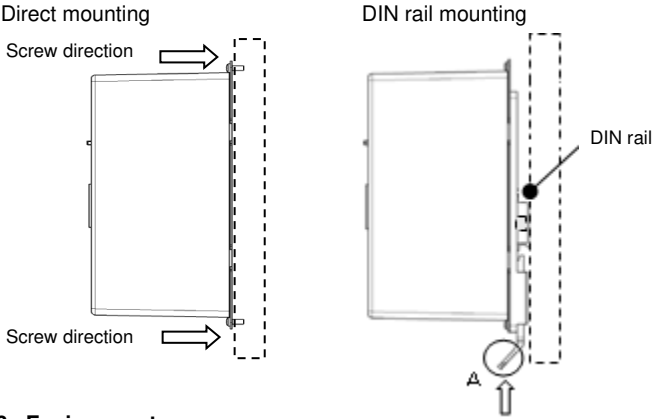
4.1 Installation

**Warning**

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

4.2 Mounting

- The gateway can be direct mounted (model LEC-GPR1) using 2 x M4 screws or mounted on a DIN rail (model LEC-GPR1D).
- When using DIN rail mounting, hook the gateway on the DIN rail and press the lever in the direction of Arrow A to lock it.



4.3 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.

- Avoid mounting the gateway near a vibration source, such as a large electromagnetic contactor or circuit breaker on the same panel.
- Do not use in an environment with strong magnetic fields present.

5 Wiring

5.1 Wiring

**Caution**

- Do not perform wiring while the power is on.
- Confirm proper insulation of wiring.
- Do not route wires and cables together with power or high voltage cables.
- Keep wiring as short as possible to prevent interference from electromagnetic noise and surge voltage.
- Do not use an inrush current limited type of power supply for the gateway.
- Do not connect multiple wires to one connector terminal.

5.2 Power Supply Connector (CN4)

Wire the power supply cable to the power supply plug connector, then insert it into connector CN4 on the gateway.

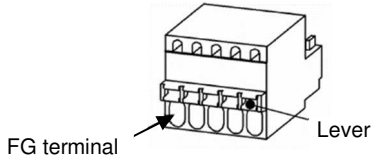
- Use special screwdriver (Phoenix Contact No. SZS0.4x2.0) to open / close the lever and insert the wire into the connector terminal.
- Applicable wire size: 20 AWG (0.5 mm<sup>2</sup>).

No.	Terminal	Description
5	FG	FG terminal
4	0V	Power supply -
3	24V	Power supply +
2	EMG-	EMG output -
1	EMG+	EMG output +

5 Wiring (continued)

5.3 Ground connection

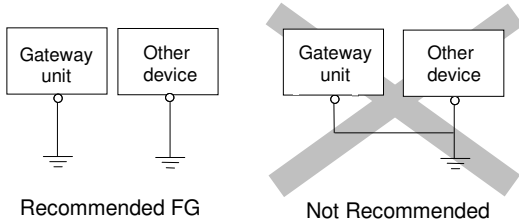
- Connect a ground wire to the FG terminal (pin 5) on the power supply connector (CN4).



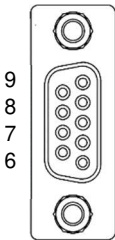
**Caution**

The M4 screw, cable with crimped terminal and shakeproof washer must be prepared by the user. The gateway must be connected to Ground to shield it from electrical noise.

- A dedicated Ground connection must be used. Grounding should be to a D-class ground specification (resistance of 100 Ω maximum).
- The cross-sectional area of the ground cable shall be 2 mm<sup>2</sup> minimum.
- The Grounding point should be as near as possible to the gateway. Keep the grounding cable as short as possible.



5.4 Bus connector (CN3)



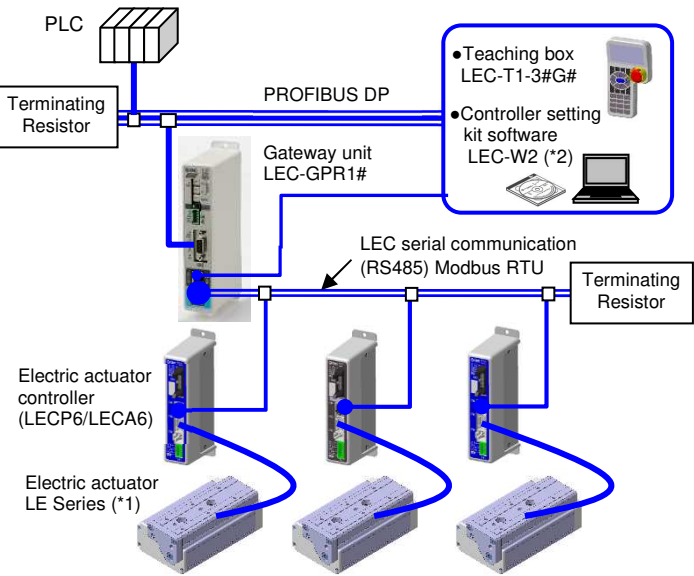
No.	Signal	Description
1	-	Not used
2	-	Not used
3	RXD/TXD-P	Receive / transmit data, positive
4	-	Not used
5	DGND	Data ground (reference potential to VP)
6	VP	Power supply plus (P5V)
7	-	Not used
8	RXD/TXD-N	Receive / transmit data, negative
9	-	Not used

**Caution**

- Use the PROFIBUS DP connector with bus cable.
- A shielded twisted pair cable for PROFIBUS DP should be used.
- A terminating resistor must be connected to the branch connector at the terminal. Please use a connector with built-in terminating resistor.

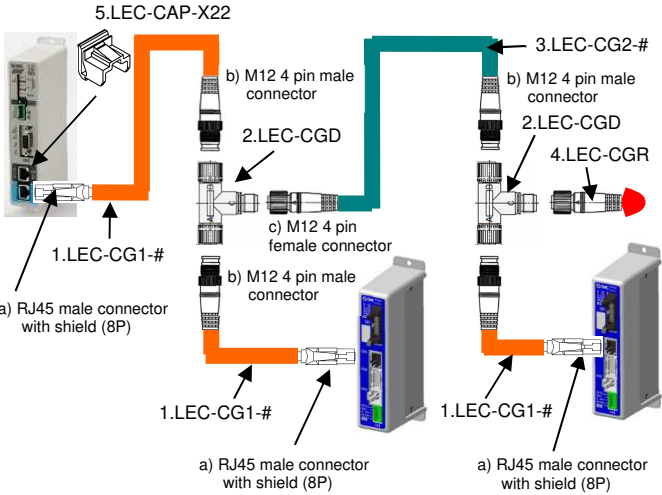
6 Wiring Diagram

The system structure for using the Gateway unit is shown below.



(\*1) These items are included only when specified by the ordering code.  
(\*2) The latest version of controller setting software must be used.  
Software for upgrade is available for download on the SMC website.  
(URL: <https://www.smcworld.com>).

An example of a link connection consisting of telecommunication cable LEC-CG1-1 and cable LEC-CG2-1 between branches is shown below.



No.	Description	Part number	Content
1	Communication cable	LEC-CG1-#	Cable to connect the gateway unit CN1, or controller (LEC) CN4, to the branch connector.
2	Branch connector	LEC-CGD	Junction cable to connect the gateway and the controller.
3	Cable between branches	LEC-CG2-#	Cable to connect the branch connector.
4	Terminating Resistor	LEC-CGR	Termination resistor on RS485 bus (120 ohms)
5	RJ45 connector dust cover	LEC-CAP-X22	Dust will adhere to the RJ45 connector CN1 and CN2 when not connected. Please attach a cover to the connector to prevent the entry of dust.

7 How to Order

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

8 Outline Dimensions (mm)

Refer to the drawings / operation manual on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

9 Maintenance

9.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- Before performing maintenance, turn off the power supply. Check the voltage with a tester 5 minutes after the power supply is turned OFF.
- 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.

Caution

- Maintenance should be performed according to the procedure indicated in the Operation Manual.
- When equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc, then cut the power supply to the system. When machinery is restarted, check that operation is normal with actuators in the correct position.

Warning

- Perform maintenance checks periodically.
- Conduct an appropriate functional inspection and test after completing

maintenance. In case of any abnormalities (if the actuator does not move, etc.), stop the operation of the system. Otherwise, an unexpected malfunction may occur and it will become impossible to ensure safety. Operate an emergency stop instruction to confirm safety.

- Do not put anything conductive or flammable inside of the gateway.
- Ensure sufficient space around the gateway for maintenance.

10 Limitations of Use

10.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

11 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.

12 Contacts

Refer to [www.smcworld.com](https://www.smcworld.com) or [www.smc.eu](https://www.smc.eu) for your local distributor / importer.

SMC Corporation

URL: <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)  
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Specifications are subject to change without prior notice from the manufacturer.  
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