



Installation & Maintenance Manual

Profibus-DP compatible Gateway Unit

Series 56-EX500-GPR1A



Read this manual before using this product.

For future reference, please keep this manual in a safe place.

This manual should be read in conjunction with the current catalogue.

Safety Instructions

● General recommendation

These safety instructions are intended to prevent a hazardous situation and/or equipment damage.

These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger".

- ⚠ 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 possible result of serious injury or loss of life.

⚠ WARNING

- A system designer or a person who decides a system specification should judge the compatibility of a reduced wiring system.
 - Since the products specified here are used in various operating conditions, their compatibility for the specific wire saving system must be based on specifications or after analysis and/or tests to meet your specific requirements.
- Only trained personnel should operate pneumatically operated machinery and equipment.
 - Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of wire saving systems should be performed by trained and experienced operators.
- Do not service machinery/equipment or attempt to remove component until safety is confirmed.
 - 1) Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
 - 2) When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies.
 - 3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of actuators etc. (Supply air into the system gradually to create backpressure, i.e. incorporate a soft-start valve).
- Contact SMC if the product is to be used in any of the following conditions:
 - 1) Conditions and environments beyond the given specifications, or if product is used outdoors.
 - 2) Installations in conjunction with atomic energy, medical equipment, food and beverage, or safety equipment.
 - 3) Applications which have the possibility of having negative effects on people, property or animals. Special safety analysis is required.

Safety Instructions (continue)

ATEX Marking Description

	II 3G Ex nA II T4 X 5°C≤Ta≤45°C
	II 3D tD A22 IP65 T57°C X
Equipment Group II	tD - protected by enclosure
Category 3	A22 - for zone 22
Gas (G) and Dust (D) environment	IP65 - Protection structure
Ex - European standards apply	Ta - Ambient temperature
nA - Non-sparking apparatus	T57°C - Max. surface temperature
II - for all types of gas	X - special conditions apply, see
T4 - temperature classification	instructions

⚠ WARNING

Design and selection

- ① Operate the unit only within the specified supply voltage limits. If the supply voltage exceeds the rated voltage the unit and connected equipment might malfunction or could be damaged. It could also become a fire hazard.
- ② Do not operate beyond specification range. Fire, malfunction or unit and connected equipment damage can result.
- ③ Please construct a backup system, such as making the equipment or unit a multiple system, or designing a fail-safe in advance to prevent damage due to the breakdown and the malfunction of this product.
- ④ Mount the emergency stop outside of the enclosure so that it can stop the system operation immediately and intercept the power supply.
- ⑤ These instructions must be followed when using the Gateway unit in an interlocking circuit:
 - Provide valve interlocking by another system such as mechanical protection.
 - Check the Gateway unit regularly to ensure mechanical protection.
 There is a risk of getting injured if the interlock does not operate correctly.

Wiring

- ① Perform wiring correctly. There is a possibility that a unit and connected equipment will be destroyed if incorrectly wired.
- ② Do not perform wiring while power is on. If there is an explosive atmosphere present there is a risk of an explosion. There is also a possibility of failure of operation due to the damage of a unit and connected equipment.
- ③ Do not lay wires or cables with power cable or high-voltage cable in the same wiring route. There is a possibility of failure of operation due to electrical noise on the signal cable or a surge in the power cable. Separate the wiring of reduced wiring system from power cables.
- ④ Confirm proper insulation of wiring. With insulation failure (contact with other circuits, insulation failure between terminals, etc), there is a risk of explosion if an atmosphere is present. There is also a possibility of damage to a unit and connected equipment due to the applied excess pressure or current.

⚠ WARNING

Operating environment

- ① Do not use in an environment where water, chemicals, or oil are present. Prevent dust and particles collecting on or around the unit. It will cause failure or malfunction.
- ② Do not use in an area where a magnetic field is generated. It will cause malfunction.
- ③ Do not connect or disconnect cables when the unit is powered. Fire or an explosion may result if an explosive or combustible gas is present.
- ④ Do not use in an environment with temperature cycle. Heat cycles other than that of daily change of the temperature can effect inside of the units.
- ⑤ Do not expose the wiring system to heat radiation from a heat source located nearby. It will cause failure or malfunction.
- ⑥ Do not use in an environment where a surge source more than the CE marking standard allow is present. Internal circuit elements can deteriorate or break when equipment generating a large surge (electromagnetic lifter, high frequency induction furnace, motor, etc.) is located near the wiring system. Provide surge preventives, and avoid interface.
- ⑦ Use the wiring system equipment with surge absorber when a surge-generating load such as relay or solenoid valve is driven directly.
- ⑧ Do not expose the wiring system to vibration and impact. It will cause failure or malfunction.

Adjustment and Operation

- ① Do not open the case or adjust settings while energised. Fire or an explosion may result if an explosive or combustible gas is present.
- ② Do not allow short circuit of loads. Connected equipment may be damaged by excess current flow if a load is short circuit. Input unit fuse will break. Output and SI unit have protective function for excess current flow, but it is possible that they will be damaged, as the protective function does not cover all modes.
- ③ Do not carry out operation or setting of this equipment with wet hands. It may cause an electric shock to the operator.

Maintenance

- ① Do not disassemble, modify (including change of printed circuit board) or repair. An injury or failure can result.
- ② Perform the following maintenance periodically in order to prevent possible danger due to the unexpected. Confirm wiring and screws are not loose. Loose screws or wires may cause unintentional malfunction.
- ③ These instructions must be followed while in maintenance:
 - Turn off the power supply.
 - Stop the supplied fluid, exhaust the residual pressure and verify the release of fluid before performing maintenance. Otherwise it can cause injury.

⚠ CAUTION

Design and selection

- ① Ensure there is sufficient clearance for maintenance activities. When designing an application, be sure to allow sufficient clearance for maintenance and inspections. The direct current power supply to be used should be UL1310 class 2 power supply when conformity to UL is necessary.

⚠ CAUTION

Mounting

- ① Do not drop, bump or apply excessive impacts while handling. Otherwise it can result in damage to the Gateway unit causing failure or malfunction.
- ② Hold the body for handling. Otherwise it can result in damage to the Gateway unit causing failure or malfunction.
- ③ Mount units using the proper tightening torque. If a unit is tightened beyond the range of tightening torque, the mounting screws, mounting brackets or unit may be damaged.
- ④ Do not mount the unit where it may be stepped on. If the unit is stepped on it will be damaged.

Wiring

- ① Avoid repeatedly bending or stretching the lead wires. Do not crush or strain the wire. It will cause the wire to break and make the unit malfunction. Ground the reduced wiring system to a secure, safe and noise-proof place.
- ② Grounding should be performed near the unit to shorten the grounding distance.

Adjustment and Operation

- ① Set DIP switch and rotary switch with a thin clock driver etc.

Maintenance

- ① Only clean the product with a damp cloth. Do not wipe the product with chemicals such as benzene or thinners. It will cause damage to the product.

Model Indication Method

56-EX500-GPR1A

└ ATEX Category 3

Intended conditions of use

The Gateway unit should be used within the range of specifications given below and in the product catalogue.

If labelled with X: special conditions apply:

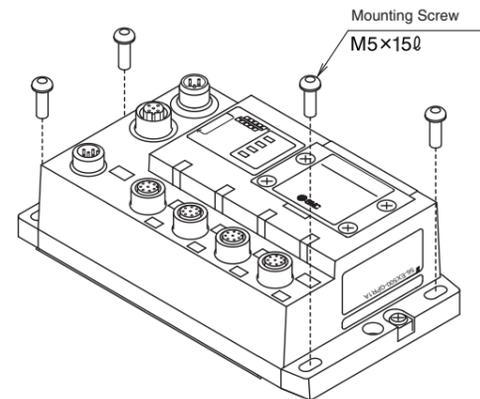
1. Protect the Gateway unit from sources of heat which can generate surface temperatures higher than the ATEX temperature classification.
2. Protect the Gateway unit and cables against all impact or mechanical damage using a suitable ATEX compliant enclosure.
3. Protect the Gateway unit from direct sunlight or UV light using a suitable protective cover.
4. Do not disconnect the M12 connectors before first switching off the power supply.
5. Use only ATEX approved M12 connectors and use only shielded cable to provide grounding.
6. Use only a damp cloth to clean the Gateway unit body, to avoid an electrostatic charge.
7. The maximum number of input which can be used for ATEX applications is 32 inputs. If more input points are connected, the temperature of the Gateway unit may rise above the maximum temperature permitted by the ATEX temperature classification. Please consult SMC for further information.

Specification

Applicable PLC / Protocol	Profibus-DP (EN50170)
Communication speed	9.6/19.2/45.45/93.75/187.5/500 kbit/sec 1.5/3/6/12 Mbit/sec
Rated voltage	24VDC
Power supply voltage	Input and control power supply : 24VDC ± 10% Solenoid valve power supply : 24VDC+10% / -5% (Warning of voltage drop at approx.20V or less)
Current consumption	200mA or less (Gateway Unit only)
Input / Output points	Maximum 32 inputs / Maximum 64 outputs
Input / Output branches	4 branches (8 inputs / 16 outputs per branch)
Branch cable	8-cores cable
Length of branch cable	5m or less (Max. total Length 10m or less)
Communication connector	M12 connector (8 pin, socket)
Power supply connector	M12 connector (5 pin, plug)
Ambient temperature / humidity	+5°C to 45°C / 35% to 85%RH (without condensation)
Protection structure	IP65
Weight	470g
Pollution Degree	Pollution Degree 2

Installation

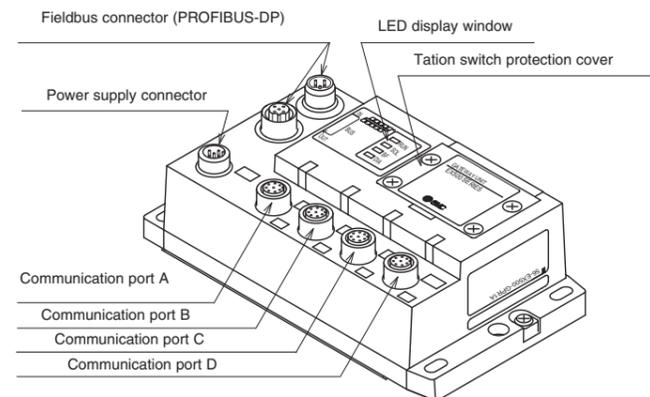
M5 mounting screw tightening torque shall be 1.5Nm



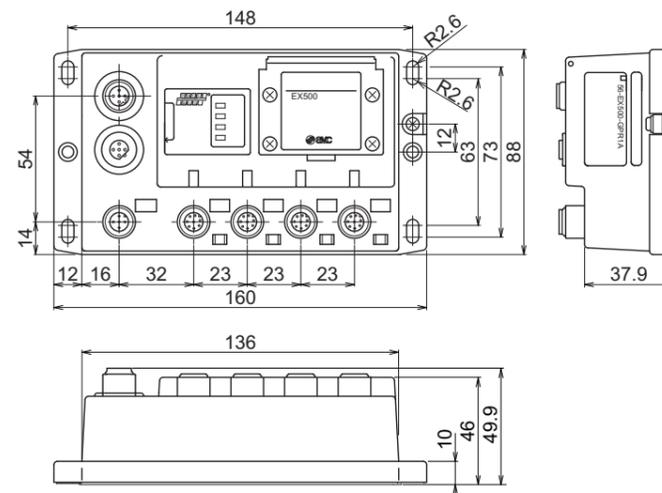
Display

No.	Display	Description
1	RUN LED lights off.	•Check the power supply is supplying 24VDC.
2	BF LED lights on.	•Check the signal line from PLC is properly connected. •Check wiring and connector pin out. •Check Address setting switch is correctly set. •Check the terminating resistance is correctly set.
3	DIA LED lights on.	•Check the power supply for the solenoid valve is connected. •Check the power supply for the solenoid valve is not less than 20VDC.
4	SOL LED lights off.	•Check the power supply for the solenoid valve is connected. •Check the power supply for the solenoid valve is not less than 20VDC.

Names and Functions of individual parts



Outline with Dimensions (in mm)



Manufacture's batch marking

56-EX500-GPR1A

Mark	Year	Mark	Month
H	2003	O	January
I	2004	P	February
J	2005	Q	March
K	2006	R	April
⋮	⋮	S	May
		T	June
		U	July
		V	August
		W	September
		X	October
		Y	November
		Z	December

Contact

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