56-EX500-TF2Z330EN

ORIGINAL INSTRUCTIONS

Instruction Manual

Gateway unit – PROFIBUS-DP compatible

Series 56-EX500-GPR1A

Ⅱ 3G Ex ec IIC T4 Gc 5ºC ≤ Ta ≤ 45ºC
Ⅱ 3D Ex tc IIIC T57ºC Dc IP65

The intended use of the Gateway unit is for connection to SI units and input devices for the control of pneumatic valves.

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) [*1)], and other safety regulations.

[*1)] ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots -Safety. etc.

- 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.

⚠ **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.

⚠ 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.

ATEX Marking Description

Ⅱ 3G Ex ec IIC T4 Gc 5ºC ≤ Ta ≤ 45ºC
Ⅱ 3D Ex tc IIIC T57ºC Dc IP65

Equipment Group II	tc - protected by enclosure
Category 3	IIIC - for all types of dust
Gas (G) and Dust (D) environment	T57ºC - Max. surface temperature
Ex - European standards apply	Gc/Dc - Equipment Protection Level
ec – Increased safety	Ta - ambient temperature
IIC - for all types of gas	IP65 - Protection structure
T4 - Temperature classification	

Based on the conformity assessment carried out by SMC Corporation.

Certificate Number: SMC 20.0004 X

If the Certificate number includes an X, special conditions for safe use apply as follows:-

- Protect the product from sources of heat which can generate surface temperatures greater than the temperature classification.
- Protect the product and cable connections against all impact or mechanical damage using a suitable ATEX compliant enclosure.

1 Safety Instructions (continued)

- Protect the product from direct sunlight or UV light using a suitable protective cover.
- Do not disconnect the M12 connectors before first switching OFF the power supply.
- Use only ATEX approved connectors and use shielded cable to provide grounding.
- Use only a damp cloth to clean the product to avoid an electrostatic charge.

2 Specifications

General specifications

Item	Specifications
Ambient temperature	5 to 45 ºC
Ambient humidity	35 to 85% RH (no condensate)
Ambient storage temperature	−25 to +70 ºC
Withstand voltage	1000 VAC applied for 1 minute
Insulation resistance	500 VDC, 2 MΩ or more
Weight	470 g

Electrical specifications

Item	Specifications
Power supply for control and input	24.0 VDC ±10%, 3.0 A
Power supply for solenoid valves	24.0 VDC +10%/-5%, 3.0 A
Current consumption	Input device and SI unit control: 2.8 A Gateway internal circuit: 0.2 A
No. of Inputs / Outputs	32 Inputs / 64 Outputs

Communication specifications

Item	Specifications
Protocol	PROFIBUS-DP (EN 50170)
Device type	Slave
Communication speed	9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbps 1.5 / 3.0 / 6.0 / 12 Mbps
Occupied area	64 inputs / 64 outputs max.
Configuration file	GSD file
ID number	1405h (Hex)

Low level bus specifications

Item	Specifications
No. of branches for inputs	4 branches for input (8 per branch)
No. of branches for outputs	4 branches for output (16 per branch)
Communication method	Dedicated protocol for SMC, 750 kbps
Branch current for inputs	0.7 A max. per branch
Branch current for outputs	0.65 A max. per branch (for EX500-S#01) 0.75 A max. per branch (for EX500-Q#01)
Branch cable length	5 m max. per branch (10 m total max.)

3 Name and function of Individual parts

No	Part	Description
1	Fieldbus connector	Connection to PROFIBUS-DP
2	Power supply connector	Connection for power supply.
3	Connector (COM A)	Connection to SI units (manifold valve) or input units using a branch cable.
4	Connector (COM B)	
5	Connector (COM C)	
6	Connector (COM D)	
7	LED Display	Displays the unit status.
8	Switch cover	Setting switches under the cover.
9	Ground terminal	Functional Earth (FE)

4 Installation

4.1 Direct mounting

Secure in position using 4 x M5 screws, 15 mm minimum thread length.

4.2 Wiring connections

- **Communication Connector**

Select the appropriate cables to mate with the connectors on the SI unit. The PROFIBUS-DP connection has 2 ports, BUS IN and BUS OUT, and both ports can be used for connection.

M12 5-pin Plug / Socket (B-coded)

Connector		Pin No.	Signal name
BUS IN	BUS OUT		
		1	N.C.
		2	RxD/TxD-N
		3	N.C.
		4	RxD/TxD-P
Plug	Socket	5	Shield

- **Power Supply Connector**

Connect the power supply to the power supply connector on the Gateway unit. With this cable, power is supplied to the output devices (such as solenoid valve) and the input devices and for control.

M12 5-pin Socket (A-coded)

Connector	Pin No.	Signal name
	1	0 V (solenoid valves)
	2	24 V (solenoid valves)
	3	0 V (control and input)
	4	24 V (control and input)
	5	FE

The M12 connector cable for fieldbus and power supply connections has two types, Standard M12 and SPEEDCON compatible. If both plug and socket have SPEEDCON connectors, the cable can be inserted and connected by turning it a 1/2 rotation.
A standard connector can be connected to a SPEEDCON connector.

- Both single and two power supply systems can be adopted, however the wiring should be made separately (for solenoid valves / outputs and for input and control) for either system.

- **Branch Connector**

Connect SI units (solenoid valves) and input devices to the communication connectors (COM A - D) using an M12 (8 pin) connector cable.
As each cable contains power supply wiring, there is no need to supply power to the SI unit (solenoid valves) or input devices separately.

⚠ Warning

- Be sure to fit a seal cap (EX9-AWTS) on any unused connectors. Proper use of the seal cap enables the enclosure to maintain IP65 specification. Tightening torque: 0.1 N•m.

4.3 Ground Connection

- Connect the ground terminal (FE) to ground.
- Individual grounding should be provided close to the product with a short cable to assure the safety and noise resistance of the system.
- Resistance to ground should be 100 Ω or less.

4 Installation (continued)

4.4 Environment

⚠ Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- 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.

5 Setting

5.1 Switch setting

- The switches should only be set with the power supply turned OFF.
- Open the switch protection cover and set the switches with a small flat blade screwdriver.
- Be sure to set the switches before use.
- After setting the switches close the protective cover and tighten the screws with the specified tightening torque of 0.6 N•m.

- **Address setting**

SW3 (x100)		SW2	SW1	Node Address
1	2	x10	x1	
N.C.	0	0	0	0 (default)
		0	1	1
		0	2	2
		:	:	:
		9	8	98
		9	9	99
	1	0	0	100
		0	1	101
		:	:	:
		2	5	125

- The node address can be set in the range 0 – 125.
- The number of available nodes is up to 32 stations per branch, or 126 stations with a repeater.

- **Bus terminator switch (SW4)**

Set the switch to select the bus terminator.

5.2 Configuration

An applicable GSD file is required to configure the Gateway unit for the PROFIBUS-DP network. Download the latest GSD file from the SMC website (URL: https://www.smcworld.com).

Product number	GSD files
56-EX500-GPR1A	Smc_1405.gsd

Technical documentation giving detailed configuration information can be found on the SMC website (URL: https://www.smcworld.com).

6 LED Display

- Gateway unit status

LED		Description
RUN	Green ON	Power for control and input is ON.
	OFF	Power for control and input is not supplied.
SOL	Green ON	Power for SI units (solenoid valves) is ON.
	OFF	Power is not supplied to SI units (solenoid valves), or voltage < 20 V.
BF	Red ON	PROFIBUS-DP communication is abnormal.
	OFF	PROFIBUS-DP communication is normal.
DIA	Red ON	DIA is abnormal.
	OFF	DIA is normal.
COM A	Green ON	COM A is receiving data.
	OFF	COM A is not receiving data.
COM B	Green ON	COM B is receiving data.
	OFF	COM B is not receiving data.
COM C	Green ON	COM C is receiving data.
	OFF	COM C is not receiving data.
COM D	Green ON	COM D is receiving data.
	OFF	COM D is not receiving data.

7 Outline Dimensions (mm)

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

8 How to Order

Refer to the operation manual on the SMC website (URL: https://www.smcworld.com) for How to order information.

9 Maintenance

9.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- 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
- Stop operation if the product does not function correctly.

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 or www.smc.eu for your local distributor / importer.

SMC Corporation

URL: https://www.smcworld.com (Global) https://www.smc.eu (Europe)
SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan
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