EX500-TFJ04GB-B

Installation & Maintenance Manual

DeviceNet Compatible Gateway Unit

Type 56-EX500-GDN1-X8

CE Ex II 3G Ex nA II T4 X 5ºC≤Ta≤45ºC
II 3D tD A22 IP65 T53ºC X

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 5ºC≤Ta≤45ºC
II 3D tD A22 IP65 T53ºC 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	T53ºC - Max. surface temperature
II - for all types of gas	X - special conditions apply, see instructions
T4 - temperature classification	

⚠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.

⚠WARNING

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.

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

③ This product is a component which is to be built into a piece of completed equipment. The compatibility with the EMC directive after the product is installed, should be checked by you.

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 torqe, 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.

② Ground the reduced wiring system to a secure, safe and noise-proof place.
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-GDN1-X8

56: ATEX Category 3

X8: Special specification
•Branch disconnection diagnostic data transmission function.
•Input memory data reset function
•Valve power supply drop data transmission function.

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.

Specification

Basic specifications

Rated voltage	24VDC
Range of power supply voltage	Power supply for input and controlling GW/SI: 24VDC ± 10% Power supply for output: 24VDC+10%/-5% (Voltage drop warning at around 20V)
Rated current	Power supply for input and controlling GW/SI: Max. 3.0A (Inside GW unit: 0.2A Input device and SI control section: 2.8A) Power supply for solenoid valves and output: Max. 3.0A
Number of input/ output points	Input point: Max. 64/Output point: Max. 64
I/O message size	Input : 10 byte (Diagnostic information data : including 2 byte) Output : 8 byte

Higher-level bus

Protocol	DeviceNet Release 2.0
Slave (slave station) type	Group2 only server
MAC ID setting range	0 - 63
Device information	Vender code:7 (SMC Corp.) Product type:12 (communication adapter) Product code:103
Applicable message	Duplicate MAC ID check message Group2 only unconnected explicit message Explicit message Poll I/O message
I/O message size	Input:10 bytes Output:8 bytes
Data rate	125kbps, 250kbps, 500kbps
Insulation method	Photocoupler

Lower-level bus

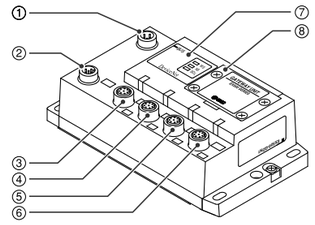
Number of branches for input/output	4 branches (16 points/branch) for input 4 branches (16 points/branch) for output
Communication method	Protocol: Dedicated for SMC Speed: 750kbps
Branch current for input (Note)	Max. 0.5 [A] per branch (when SI unit and input devices are connected)
Branch current for output	Max. 0.65 [A] per branch (when SI unit EX500-S□01 is connected) Max. 0.75 [A] per branch (when SI unit EX500-Q □O^{1}_{2} is connected)
Branch cable length	5m or less between connect units. (total extended length per branch: 10m or less)

Note: Total value of maximum current consumption and maximum load current of input devices to connect.

Diagnosis function

Function	Contents
Solenoid valve power supply voltage monitoring	Detects that solenoid valve voltage has decreased to approx. 20V or less.
Communication port monitoring	Detects that Communication port A to D has not received data.

Names and Functions of individual parts

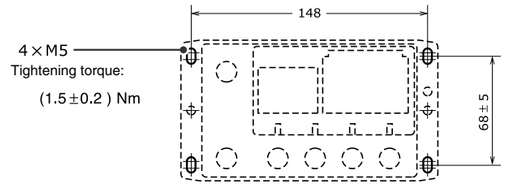


No.	Name	Application
1	Communication connector	Connect with DeviceNet line.
2	Power supply connector	Supply power for output devices such as solenoid valve, for input devices such as sensor, and for controlling GW/SI by using power supply connector cable.
3	Communication port A (COM A)	Connect SI unit (manifold valve) or Input unit by using branch cable with M12 connectors.
4	Communication port B (COM B)	
5	Communication port C (COM C)	
6	Communication port D (COM D)	
7	Display	Display the power supply status and communication status with PLC.
8	Station number switch protective cover	Set address and data rate by using the switches under this cover.

Installation (unit : mm)

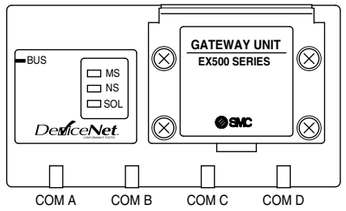
Screw mounting

Secure at four positions with screws with head diameter of 5.2 or more and thread length of 15mm or more.



Cutout Dimensions for Mounting (Tolerance : ± 0.2)

Display



Display	Description	
MS	Lights on in green: Lights on in red: Lights off:	Normal status. Fatal failure occurred. Power is OFF.
NS	Lights off: Blinks in green: Lights on in green: Blinks in red: Lights on in red:	Offline/Power is OFF. Online/Communication is not established. Online/Communication is established. Minor communication error occurred. Fatal communication error occurred.
SOL	Lights on: Lights off:	Power is supplied to solenoid valves/output at specified voltage. Power is not supplied to solenoid valves/output at specified voltage. (Voltage dropped to lower than 20V.)
COM A	Lights on: Lights off:	COM A is receiving data. COM A has no received data.
COM B	Lights on: Lights off:	COM B is receiving data. COM B has no received data.
COM C	Lights on: Lights off:	COM C is receiving data. COM C has no received data.
COM D	Lights on: Lights off:	COM D is receiving data. COM D has no received data.

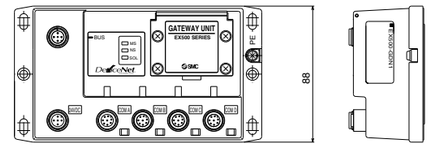
NOTE
When connecting only manifold valve but not input unit manifold, or connecting nothing to the communication port, LED on COM A to D doesn't light up. (diagnosis function of the communication port will work). If needed to light it up, (when the diagnosis function should not be operated), connect terminal plug to unused connector of GW and SI unit

●Layout of the GW unit diagnosis

	Contents (2 bytes)
Word 0	Input data from Communication port A
Word 1	Input data from Communication port B
Word 2	Input data from Communication port C
Word 3	Input data from Communication port D
Word 4	External diagnosis Bit b7 b6 b5 b4 b3 b2 b1 b0 R R R * * * * * b0 : If Communication port A does not receive data : "1" b1 : If Communication port B does not receive data : "1" b2 : If Communication port C does not receive data : "1" b3 : If Communication port D does not receive data : "1" b4 : If Solenoid valve power supply voltage drops : "1" b5-b7 : Reserved (Allways "0")

Outline with Dimensions (in mm)

EX500 body



Manufacture's batch marking

56-EX500-GDN1-X8
※ ※
Year — Month

Mark	Year
J	2005
K	2006
L	2007
M	2008
⋮	⋮

Mark	Month
O	January
P	February
Q	March
R	April
S	May
T	June
U	July
V	August
W	September
X	October
Y	November
Z	December

Contact

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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
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