![proconX]

GCP-MG Ethernet Modbus gateway
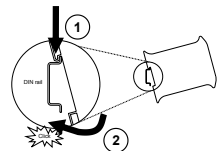
Installation guide

IGGCPMG-0801

SAFETY PRECAUTIONS

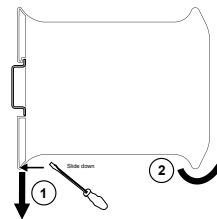**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- This equipment must be installed and serviced only by qualified personnel. Such work should be performed only after reading this entire set of instructions.
- NEVER work alone.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Apply appropriate personal protective equipment and follow safe electrical practices.
- Turn off all power supplying the equipment in which the *GCP-MG* is to be installed before installing and wiring the *GCP-MG*.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Beware of potential hazards, wear personal protective equipment, and carefully inspect the work area for tools and objects that may have been left inside the equipment.
- The successful operation of this equipment depends upon proper handling, installation, and operation. Neglecting fundamental installation requirements may lead to personal injury as well as damage to electrical equipment or other property.

Failure to follow these instructions will result in death or serious injury!

INTRODUCTION

Package Contents

- *GCP-MG* unit
- Installation Guide
- 2-pin terminal block plug
- 6-pin terminal block plug
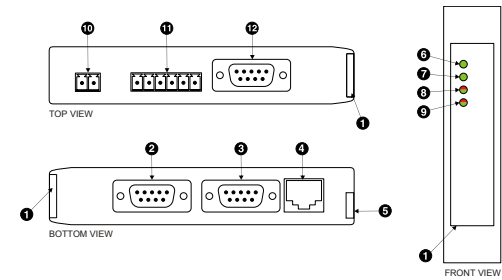
Documentation and Additional Resources

This Installation Guide must be used in conjunction with the *GCP-MG User Manual*.

The *GCP-MG User Manual* and supplemental software packages can be downloaded from the *GCP-MG* web site:
http://www.proconx.com/gcpmg

Quick Start Checklist

- Mount the unit.
- Connect the power. Do not connect yet CAN bus or serial ports.
- Configure the Ethernet communications settings with a web browser (using an Ethernet crossover cable) or with a terminal program like *HyperTerminal* (using a null modem cable)
- Configure the Modbus communications settings.
- Configure the device.
- Wire CAN bus.
- Wire Modbus ports.

DESCRIPTION

❶ Clear front cover
❷ Primary RS-232 (Modbus) connector
❸ Secondary RS-232 (Diagnostic) connector
❹ Ethernet connector
❺ DIN rail clip
❻ Power LED
❼ Ethernet link LED
❽ Device status LED
❾ Modbus/CAN status LED
❿ Power terminal block socket
⓫ Modbus RS-485 terminal block socket
⓬ CAN connector

INSTALLATION

Regulatory notes

1. The *GCP-MG* module is suitable for use in non-hazardous locations only.
2. The *GCP-MG* module is not authorized for use in life support devices or systems.
3. Wiring and installation must be in accordance with applicable electrical codes in accordance with the authority having jurisdiction.
4. The *GCP-MG* is designed for installation into an electrical switchboard or cubical as part of a fixed installation.

Unpacking and handling

1. Please read this set of instructions carefully before opening the module or fitting it into your system.
2. Keep all original packaging material for future storage or warranty shipments of the module.
3. Do not exceed the specified temperatures.

Before connecting anything

1. Before installing or removing the module or any connector, ensure that the system power and external supplies have been turned off.
2. Check the system supply voltage with a multimeter for correct voltage range and polarity.
3. Connect the power supply cable and switch on the system power. Check if the Power LED is lit.
4. Turn off system power.
5. Connect all I/O cables.
6. Once you are certain that all connections have been made properly, restore the power.

DIN rail mounting and removal

To mount the module on a DIN rail, slot the top part of the *GCP-MG* into the upper guide of the rail and lower the enclosure until the bottom of the red hook clicks into place.

To remove the *GCP-MG* from the DIN rail, use a screw driver as a lever by inserting it in the small slot of the red hook and push the red hook downwards. Then remove the module from the rail by raising the bottom front edge of the enclosure.

Mounting rules

- Avoid splash water and water drops
- Avoid aggressive gas, steam or liquids
- Avoid dusty environments
- Make sure there is sufficient air ventilation and clearance to other devices mounted next to the module
- Do not exceed the specified operational temperatures.
- Mount inside a sealed electrical switchboard or cubicle
- Observe applicable local regulations like EN60204 / VDE0113

Powering the GCP-MG

Before connecting power please follow the rules in the section called "SAFETY PRECAUTIONS" and the section called "Before connecting anything".


| 1 | V+ | Positive voltage supply (10 - 30 V DC) |
| 2 | V- | Negative voltage supply, ground |

⚠ Make sure that the polarity of the supply voltage is correct before connecting any device to the serial and CAN ports! A wrong polarity can cause high currents on the ground plane between the V- power supply pin and the CAN port and serial port GND pins, which can cause damage to the device.

Wiring the CAN interface
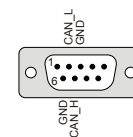
1	NC	
2	CANL	CAN_L bus line
3	GND	CAN ground
4	NC	
5	NC	
6	GND	Optional CAN ground
7	CANH	CAN_H bus line
8	NC	
9	NC	

- The bus must be terminated at both ends with its characteristic impedance, typically a 120 Ohm resistor.
- The cable must be a twisted pair (for CAN_H/CAN_L) and a third wire (for the ground).
- Maximum number of CAN nodes is 64
- Maximum CAN cable length is 250 m (820 ft).

- Stub connections off the main line should be avoided if possible or at least be kept as short as possible.
- The cable must be shielded and the shield must be connected to a protective ground at a single point to assure a high degree of electromagnetic compatibility and surge protection.
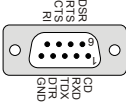- The shield must *not* be connected to the GND pins or the connector shell.

Wiring the Modbus RS-485 interface

1	C/C'	Common	Signal common (GND)
2	B/B'	D1	Non-inverting transceiver terminal 1 (RX/TX+)
3	A/A'	D0	Inverting transceiver terminal 0 (RX/TX-)
4			Signal common (GND)
5			*Reserved for 2nd port, must be left unconnected*
6			*Reserved for 2nd port, must be left unconnected*

- The bus must be terminated at both ends with its characteristic impedance, typically a 120 Ohm resistor.
- The bus lines are to be biased (polarized) at one point, typically at the master connection.
- The cable must be a twisted pair (for B+/A-) and a third wire (for the common).
- Maximum number of RS-485 nodes without repeater is 32.
- Maximum cable length to 1200 m (4000 ft).
- Stub connections off the main line should be avoided if possible or at least be kept as short as possible.
- To assure a high degree of electromagnetic compatibility and surge protection, the RS-485 cable must be shielded and the shield must be connected to a protective ground at a single point.
- The shield must *not* be connected to the GND pin.

MAINTENANCE AND TROUBLESHOOTING

Do not open the GCP-MG enclosure; this will void the product warranty agreement.

Refer to the technical support contacts provided at the end of this document.

Maintenance

The GCP-MG does not require maintenance, nor does it contain any user-serviceable parts. If the GCP-MG requires service, contact us directly for assistance.

Diagnostics and troubleshooting

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- This equipment must be installed and serviced only by qualified personnel.
- Qualified persons performing diagnostics or troubleshooting that require electrical conductors to be energized must comply with and follow safe electrical work practices.

Failure to follow these instructions will result in death or serious injury!

The status web pages served by the GCP-MG, display diagnostic data that may be helpful in troubleshooting communication problems.

In addition the About page contains information about your specific GCP-MG, including the serial number and media access control (MAC) address. Some of these pages show a Clear Counter button. Clicking this button clears all cumulative readings shown on this particular page. If power to the GCP-MG is lost, all values reset to zero.

LED indicators

A LED test is exercised at power-up, cycling each LED off, green and then red for approximately 0.25 seconds. At the same time the power-on self test of the module is performed.

The following table outlines the indicator condition and the corresponding status after the power-on self test has been completed:

Function	LED	Condition	Indication
Power	Power	Off	No power applied to the device.
		Green	Power supply OK
Link	Ethernet link	Off	No Ethernet link
		Green	Ethernet link OK
Status	Device status	Off	The device has an unrecoverable fault; may need replacing.
		Green	The device is operating in normal condition.
		Flashing green at 1 s rate	Device operational but needs commissioning due to configuration missing, incomplete or incorrect.
		Flashing red at 1 s rate	Device operational but has a fault listed which requires acknowledgment.
		Red	The device has an unrecoverable fault; may need replacing. Flashing sequence and rate of Status LED indicates fault class.
Status	Mod-bus/CAN status	Off	CAN connection OK, Connection time-out on Modbus
		Green	Both Modbus and CAN connection OK
		Flashing red-green at 1 s rate	Modbus connection OK, Connection time-out on CAN
		Flashing red at 1 s rate	Connection time-out on both CAN and Modbus
		Red	The device has detected an error that has rendered it incapable of communicating on CAN.

Wiring the Modbus RS-232 interface

Pin	Signal	Description	Dir
1	DCD	unused	in
2	RXD	Receive data	in
3	TXD	Transmit data	out
4	DTR	unused	out
5	GND	Signal ground	
6	DSR	unused	in
7	RTS	unused	out
8	CTS	unused	in
9	RI	unused	in

- The RS-232 cable must be shielded and the shield must be connected to a protective ground at a single point to assure a high degree of electromagnetic compatibility and surge protection.
- The shield must *not* be connected to the GND pin or the connector shell.
- Maximum cable length is 15 m (50 ft) or a length equal to a line capacitance of 2500 pF, both at the maximum standard bit rate of 20 kbps. If operating at higher bit rates the maximum cable length drops to 3 m (10 ft) at a bit rate of 57.6 kbps.

Connecting Ethernet

Pin	Signal	Description
1	TX+	Non-inverting transmit signal
2	TX-	Inverting transmit signal
3	RX+	Non-inverting receive signal
4		Internal termination network
5		Internal termination network
6	RX-	Inverting receive signal
7		Internal termination network
8		Internal termination network

- The shield must *not* be connected to the GND pin or the connector shell.
- The cable must be shielded and the shield must be connected to a protective ground at a single point to assure a high degree of electromagnetic compatibility and surge protection.
- We recommend to use Category 5 shielded twisted pair network cable.
- Maximum cable length is 100 m (3000 ft).

Connecting to the diagnostic port

Pin	Signal	Description	Dir
1		NC	
2	RXD	Receive data	in
3	TXD	Transmit data	out
4		NC	
5	GND	Signal ground	
6		NC	
7		NC	
8		NC	
9		NC	

- The shield must *not* be connected to the connector frame.
- The network cable must be shielded and the shield must be connected to a protective ground at a single point to assure a high degree of electromagnetic compatibility and surge protection.
- Maximum cable length is 15 m (50 ft) or a length equal to a line capacitance of 2500 pF, both at the maximum standard bit rate of 20 kbps. If operating at higher bit rates the maximum cable length drops to 3 m (10 ft) at a bit rate of 57.6 kbps.
- The cable must be shielded and the shield must be connected to a protective ground at a single point to assure a high degree of electromagnetic compatibility and surge protection.
- The shield must *not* be connected to the GND pin or the connector shell.

Configuring and commissioning

The configuration pages are accessed using the integrated web server:

❶ Gateway IP address
❷ Main menu
❸ Configuration sub-menu
❹ Information area

Please consult the GCP-MG User Manual for further details on how to set-up the GCP-MG.

Ethernet & IP configuration

Before configuring the GCP-MG, obtain a unique static IP address, subnet mask, and default gateway address from your network administrator.

Use a web browser or a terminal program like HyperTerminal to configure the GCP-MG's TCP/IP settings with this information.

The factory default IP address of the GCP-MG is 169.254.0.10 which is in the Automatic Private IP Addressing (APIPA) address range. In order to connect to the GCP-MG via TCP/IP, your PC must be on same IP subnet as the gateway.

IP setup using a web browser and a cross-over network cable

1. Disconnect your PC from your corporate network. If your computer is configured for DHCP it should now automatically fall back to use a default IP address from the APIPA range 169.254.x.x (Windows PCs only). If your computer is configured with a static IP address or does not support APIPA, it must be changed manually to be part of the 169.254.0.0/16 subnet, for example to 169.254.0.20.
2. Connect an Ethernet crossover cable from the GCP-MG to the computer.
3. Start Internet Explorer.
4. In the address box, type 169.254.0.10 and then press Enter.
5. Click Configuration and then Ethernet & IP in the menu on the left side of the page.
6. Enter the IP address, subnet mask, and gateway address assigned to your GCP-MG, then click Save.
7. Reconnect your computer to your corporate network. If you assigned a static IP address to your computer in step 1, you must restore your computer's original settings before reconnecting to your network.

IP setup using a terminal program like HyperTerminal

Please consult the GCP-MG User Manual for further details on this method.

SPECIFICATIONS

Enclosure

Material	Self-extinguishing PC/ABS blend (UL 94-V0)
Mounting	35 mm DIN rail (EN 60715)
Classification / Type rating	IP 20 / NEMA Type 1

Power supply

Voltage	10-30 V DC
Current	30 mA typical @ 24 V DC
Intrinsic consumption	750 mW

Environmental

Operating temperature	0 to 60 °C / 32 to 140 °F
Storage temperature	-25 to 85 °C / -13 to 185 °F
Humidity	10 to 95% non condensing
Operating ambience	Free from corrosive gas, minimal dust

Physical

Dimensions	101 x 22.5 x 120 mm / 3.98 x 0.886 x 4.72 in
Weight	0.13 kg / 0.287 lb

CONTACT

This product is designed and manufactured by:

proconX Pty Ltd
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Tel +61-7-3376 3911 Fax +61-7-3102 9206
Email: mail@proconx.com
Website: http://www.proconx.com

Technical Support

We provide an electronic support and feedback system for our proconX products. It can be accessed through the following web link:

http://www.proconx.com/support

Product Returns

Before returning any product for service, repair or warranty, obtain first a RMA (Returned Material Authorization) number by contacting our technical support.