

metacentre<sup>TM</sup>

# System Modbus Gateway

## Safety Precautions

### ALWAYS EMPLOY SAFE WORKING PRACTISE AND PROCEDURES



**WARNING: Risk of Danger**



**WARNING: Risk of Electric Shock**



**WARNING: Risk of High Pressure**



**WARNING: Consult Manual**

When installing, commissioning, operating or carrying out service or maintenance on a product, personnel must use safe working practise and observe all relevant local health and safety requirements and regulations. Attention of users in the UK is drawn to the Health and Safety at Work Act, 1974, and to the Regulations and Recommendations of the Institution of Electrical Engineers (IEE).

Lethal voltages are used within the product. Use extreme caution when carrying out electrical checks. Isolate the power supply before starting any maintenance work.

It is not possible to anticipate every circumstance that might represent a potential hazard. If the user employs an operating procedure, an item of equipment or a method of working which is not specifically recommended the user must ensure the product will not be damaged or made unsafe and that there is no risk to persons or property. Failure to observe safety precautions or implement safe working practises may be considered dangerous practice or misuse of the product.

#### 1.1 Installation

Installation work must only be carried out by a competent person under qualified supervision.

A fused isolation switch must be fitted between the main power supply and the product.

The product should be mounted in such a location as to allow operational and maintenance access without obstruction or hazard and to allow clear visibility of indicators at all times.

If raised platforms are required to provide access to the product they must not interfere with normal operation or obstruct access. Platforms and stairs should be of grid or plate construction with safety rails on all open sides.

#### 1.2 Operation

The product must only be operated by competent personnel under qualified supervision.

Never remove or tamper with safety devices, guards or insulation materials fitted to the unit.

The product must only be operated at the supply voltage and frequency for which it is designed.

When mains power is switched on, lethal voltages are present in the electrical circuits and extreme caution must be exercised whenever it is necessary to carry out any work on the unit.

Do not open access panels or touch electrical components while voltage is applied unless it is necessary for measurements, tests or adjustments. This work must only be carried out by a qualified electrician or technician equipped with the correct tools and appropriate protection against electrical hazards.

All air compressors and/or other machine equipment connected too, and controlled by, the product should have a warning sign attached stating 'THIS UNIT MAY START WITHOUT WARNING' next to the display panel.

If an air compressor and/or other machine equipment connected too, and controlled by, the product is to be started remotely, attach warning signs to the machine stating 'THIS UNIT CAN BE STARTED REMOTELY' in a prominent location, one on the outside of the machine, the other inside the machine control compartment.

#### 1.3 Service Maintenance and Repair

Service, maintenance, repairs or modifications must only be carried out by competent personnel under qualified supervision.

If replacement parts are required use only genuine parts from the original equipment manufacturer, or an alternative approved source.

Carry out the following operations before opening or removing any access panels or carrying out any work on the product :-

- Isolate from the main electrical power supply. Lock the isolator in the 'OFF' position and remove the fuses.
- Attach a label to the isolator switch and to the product stating 'WORK IN PROGRESS - DO NOT APPLY VOLTAGE'. Do not switch on electrical power or attempt to start the unit if such a warning label is attached.

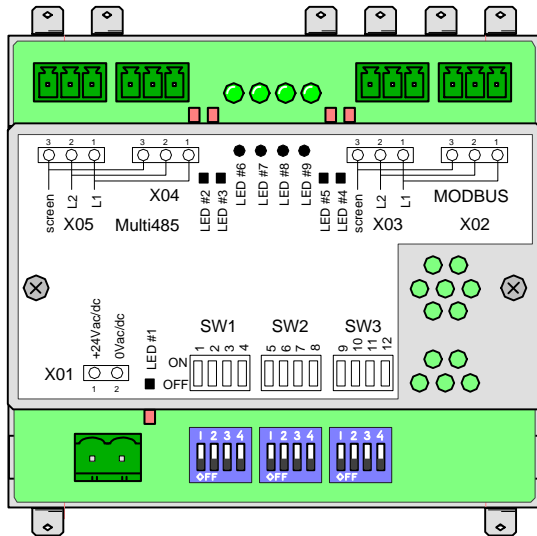
Ensure that all instructions concerning operation and maintenance are strictly followed and that the complete product, with all accessories and safety devices, is kept in good working order.

The accuracy of sensor devices must be checked on a regular basis. They must be renewed when acceptable tolerances are exceeded. Always ensure any pressure within a compressed air system is safely vented to atmosphere before attempting to remove or install a sensor device.

The product must only be cleaned with a damp cloth, using mild detergents if necessary. Avoid the use of any substances containing corrosive acids or alkalis.

Do not paint the control facial or obscure any indications, controls, instructions or warnings.

## Y07ENER03.00: System Modbus Gateway Module

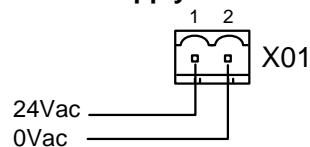


### Location

The System Gateway is DIN Rail mounting and must be located within a protective enclosure.

❗ Avoid mounting the System Gateway near high voltage cables or high voltage devices or equipment.

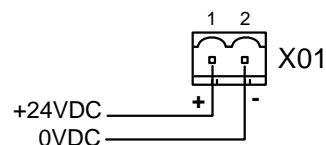
### Power Supply



24Vac (+/-15%) @ 35mA, 50/60Hz

❗ wire polarity is important if 0Vac is earthed.

❗ Never use the same 24Vac power supply, derived from the same transformer secondary winding, as used for other devices/controllers connected to the RS485 network - this may result in permanent damage to the RS485 communications port.

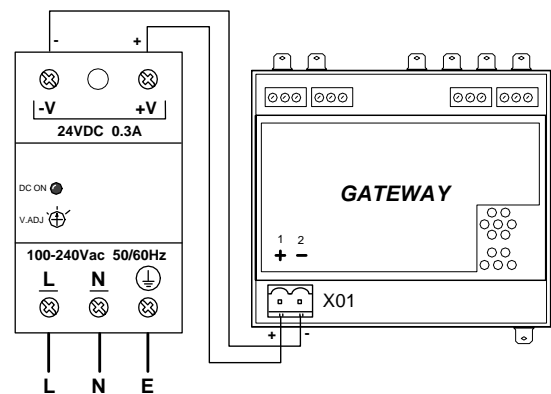
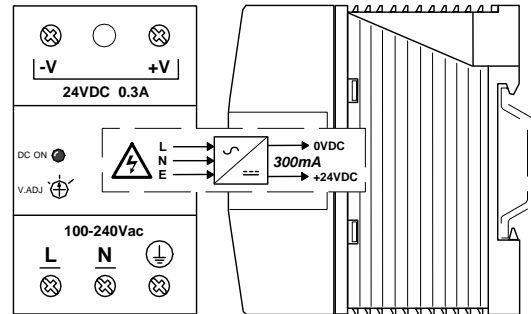


24VDC (+/-15%) @ 35mA, 1W

❗ wire polarity is important

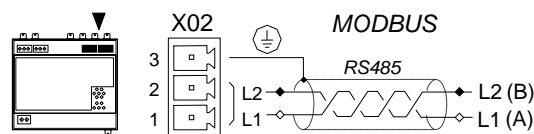
## 24VDC Power Supply

Use a 2W minimum, AC to DC, power supply module; for example CMC Part Number: Y07CMB6.00



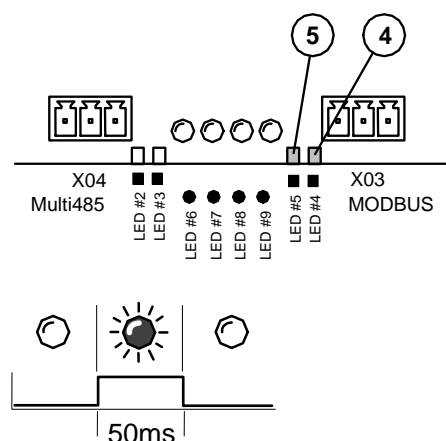
## Modbus RS485 Connection

Remote Modbus Device



! wire polarity is important

Use 2-wire, 0.3-0.5mm<sup>2</sup>, twisted pair, earth shielded, data cable with a total system network length no greater than 1.0km (3280ft).



### Modbus Communication Indicators:

RX – Data Received:

④ A valid Modbus communication has just been received from a remote source.

TX – Data Transmitted:

⑤ A Modbus message has just been sent to a remote source.

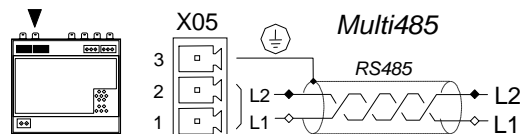
### Modbus Communications:

Baud Rate: 9600  
Parity: None  
Start Bit: 1  
Stop Bit: 1

! After power-up initialisation; allow a minimum of ten (10) seconds for management system initialisation before attempting to request Modbus information.

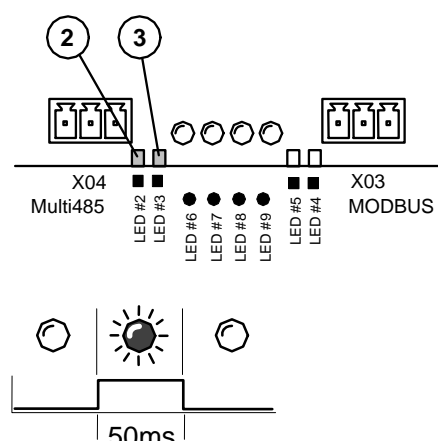
## Multi485 System Connection

Compressor Management System Network



! wire polarity is important

Use 2-wire, 0.3-0.5mm<sup>2</sup>, twisted pair, earth shielded, data cable with a total system network length no greater than 1.0km (3280ft).



### Multi485 Protocol Communications:

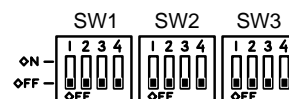
RX – Data Received:

② A valid Multi485 communication has just been received from the management system network. In normal operation this event should occur at least every two seconds.

TX – Data Transmitted:

③ A Multi485 message has just been sent to a management system network device.

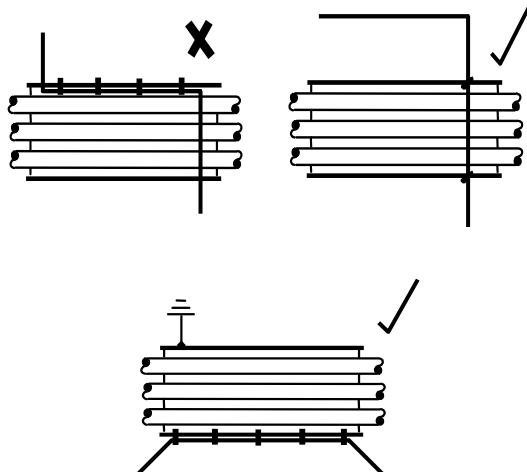
### Selector Switches:



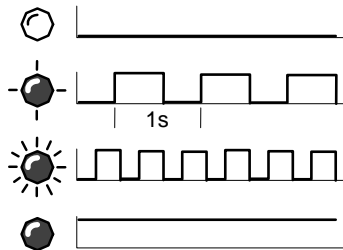
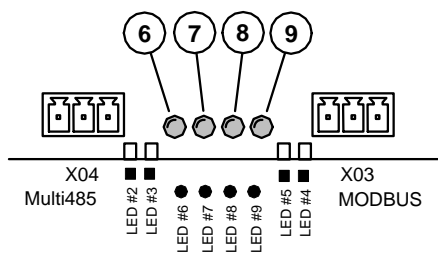
! Ensure all System Gateway selector switches are set to the OFF position.

⚡))) RS485 data communications and other low voltage signals can be subject to electrical interference. This potential can result in intermittent malfunction or anomaly that is difficult to diagnose. To avoid this possibility always use earth shielded cables, securely bonded to a known good earth at one end. In addition, give careful consideration to cable routing during installation.

- 1) Never route an RS485 data communications or low voltage signal cable alongside a high voltage 3-phase power supply cable. If it is necessary to cross the path of a power supply cable(s), always cross at a right angle.
- 2) If it is necessary to follow the route of power supply cables for a short distance (for example: from a compressor unit to a wall along a suspended cable tray) attach the RS485 or signal cable on the outside of an earthed cable tray such that the cable tray forms an earthed electrical interference shield.
- 3) Where possible, never route an RS485 or signal cable near to equipment or devices that may be a source of electrical interference (for example: 3-phase power supply transformer, high voltage switchgear unit, frequency inverter drive module, radio communications antenna).



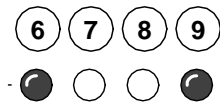
Operational Indications



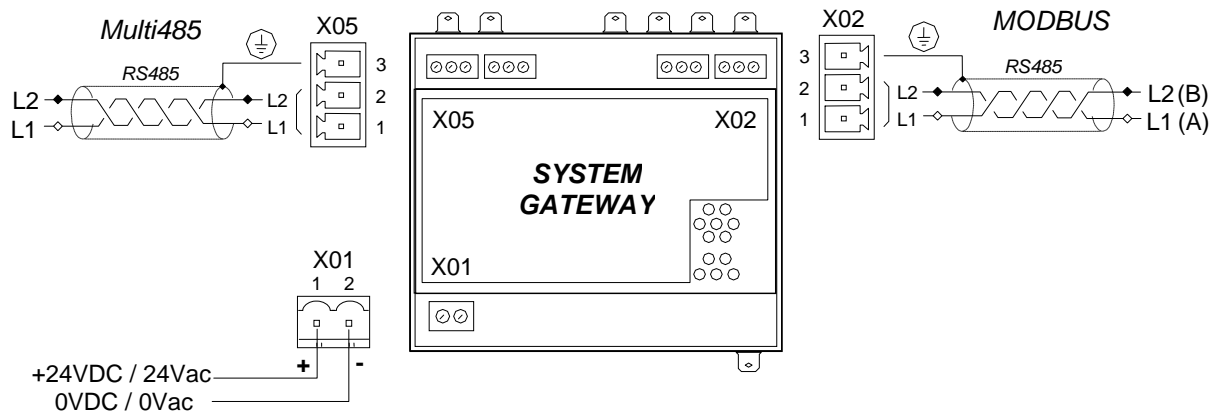
At power on initialisation, or when power has been removed, all operational indicators will fast flash for several seconds.

Normal Operation Example:

Valid communications with compressor management system network and remote Modbus device.



- 6 Multi485 Communications
- OFF
  - No valid communications with the compressor management system network
  - ON; communicating
- 7 OFF; no function
- 8 OFF; no function
- 9 Modbus Communications
- OFF
  - No valid communications with remote Modbus device
  - ON; communicating



## Parts List

### Module - System Modbus Gateway

Item	Part No.	Description
	Y07ENER03.00	Module, Modbus Gateway

## Technical Data

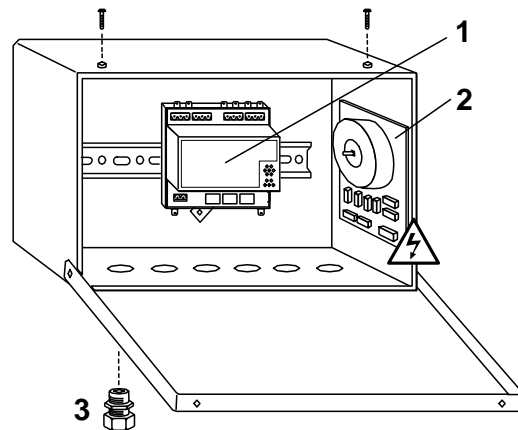
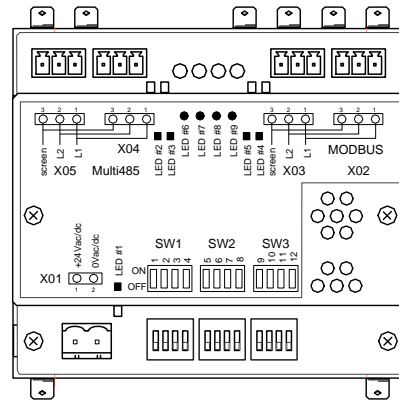
### Module - System Modbus Gateway

Dimensions	96mm x 85mm x 55mm 3.8" x 3.4" x 2.2"
Weight	0.25kg (0.6lb)
Mounting	DIN, 35mm
Enclosure	IP20
Supply	24VDC/ac +/-15%
Power	1.0VA
Temperature	0°C to 46°C (32°F to 115°F)
Humidity	95% RH non-condensing

### Metacentre Modbus Gateway Box

Item	Part No.	Description
	Y08ENER01.00	System Gateway Box
-	Y07ENER14.00	Manual, User CD
1	Y07ENER03.00	Gateway Module
2	Y05CM31.00	Unit, XPM-TAC24
3	Y07CM49.00	Gland, Set - Pg13.5

Dimensions	291mm x 241mm x 152mm
Weight	6.5kg (14lb)
Mounting	wall, 4 x screw fixings
Enclosure	IP54, NEMA 12
Supply	230Vac +/- 10% 115Vac +/- 10%
Power	100VA
Temperature	0°C to 45°C (32°F to 112°F)
Humidity	30% to 90% RH non-condensing



### Mounting Dimensions:

