MODBUS RS 485, M-BUS, LAN Gateway
Communication Modules

3-349-668-03
1/1.12

Communication modules for Compact Line energy meters

- Compact design (1 to 2 DIN modules)
- Easy linking at the side via infrared interface
- Selection of M-Bus, Modbus or LAN communication module depending on application
- Reset key for restoring factory default settings
- LED for supply power indication
- 2-color LED for indicating communication states

Applications

The communication modules allow for use of Compact Line energy meters in the following applications:

- Industrial energy logging for individual production lines or machines
- Measurement of renewable energy from photovoltaic systems and wind power turbines
- Logging and billing of energy consumption at campsites, shopping centers, housing developments and wharfs
- Energy logging for hotels, convention centers and trade fair facilities
- Internal cost distribution for timesharing-condos and sub-leased industrial buildings
- Consumption billing for business centers
- Setup of energy logging systems
- Long distance transmission of consumption values and billing
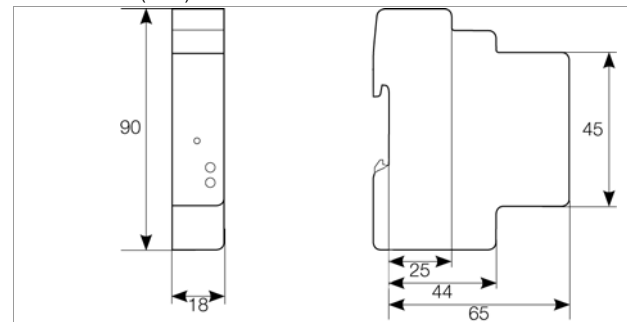
Communication Modules

Compact communication modules for using the energy meter in industrial and building management applications. Linking via the infrared interface at the side renders communication simple, and quickly available.

The module can be returned to its factory default settings at any time with the reset key. This is especially helpful in the event that the selected addresses have been forgotten. Two status LEDs provide information regarding supply power and communications.
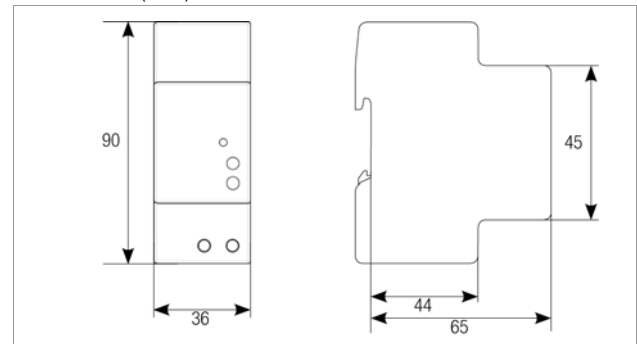
General Data

Dimensional Drawings / Installation

Dimensions (mm)

*1   DIN Module*

Dimensions (mm)

2   DIN Module

The communication modules have a window at the right-hand side with an infrared interface. The energy meters have a window at the left-hand side with an infrared interface. The communication module is installed to the left of the meter such that the two optical windows are precisely aligned to each other.

MODBUS RS 485, M-BUS, LAN Gateway
Communication Modules

Serial Bus	
Type	Infrared interface
Transmission speed	38,400 bps

Stripping / Wiring

Wires are connected to the terminals.

0,5 Nm

5 mm
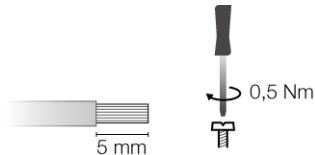
Use a 0.8 x 3.5 mm flat-head screwdriver.

Connections	
Terminals	0.14 to 2.5 square mm

Ambient Conditions

Ambient Conditions	
Operating temperature range	15 to +60° C
Storage temperature range	-25 to +75° C
Relative atmospheric humidity	Max. 80% without condensation
Protection	IP 20

## Applicable Regulations and Standards

DIN EN 13757-1-2-3, DIN EN 61000-6-2, Interference Immunity (industrial):

| DIN EN 61000-4-2	Electromagnetic Compatibility
DIN EN 61000-4-3	Radiated radio-frequency
DIN EN 61000-4-4	Fast transient / burst
DIN EN 61000-4-5	Surge immunity
DIN EN 61000-4-6	Conducted disturbances induced by radio-frequency fields
DIN EN 61000-4-11	Voltage dips in AC auxiliary voltage
DIN EN 55011, class A	Radiated and conducted interference
EN 60950	Safety regulations

Modbus RS 485

The Modbus module transmits data from the energy meter to a logging system via an RS 485 interface using the Modbus RTU or ASCII protocol. Modbus is the most popular means of transmission for communication amongst industrial devices. Modbus master software for configuring the module and the display of measured values is included in the scope of delivery free of charge.

A CD with a description of the Modbus register is included.
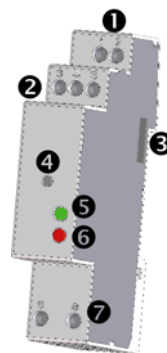
1 Terminal jumper for activating the terminating resistor (RT)
2 Terminals for RS 485 connection
3 Infrared interface
4 Reset key
5 Auxiliary voltage LED
6 Communication LED
7 Auxiliary voltage terminals

Wiring

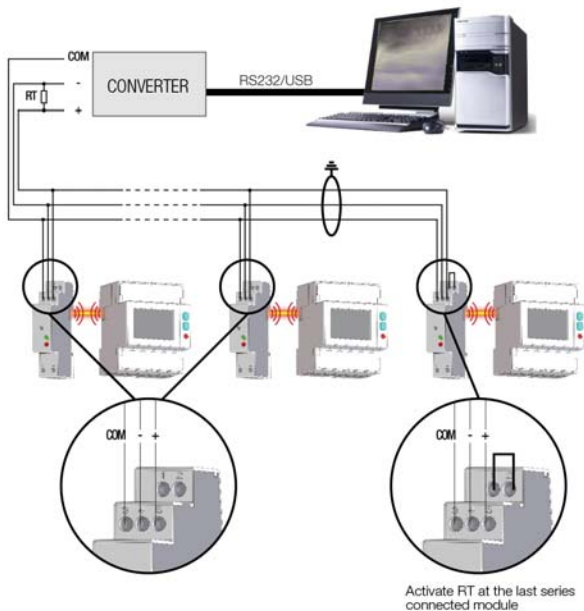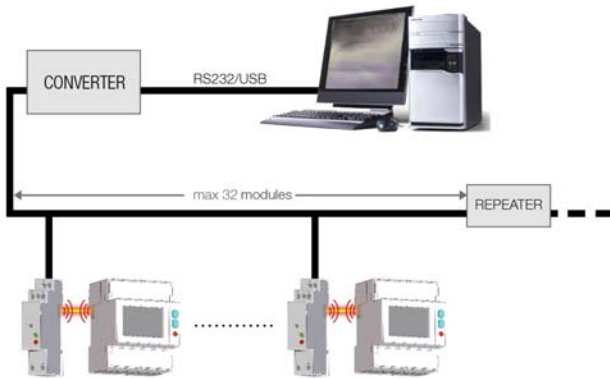Jumper for activating terminating resistor "RT"
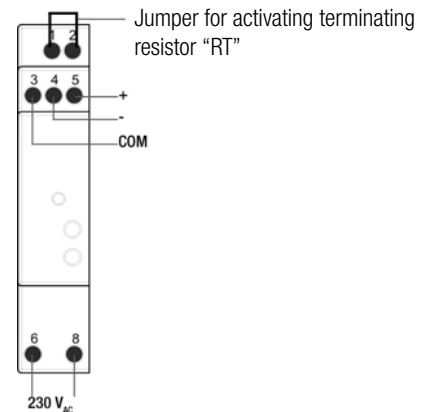
An interface converter is required between the PC and the RS 485 network for adapting RS 232 / USB signals. A signal repeater is required if more than 32 modules are connected. Each repeater can manage up to 32 devices.

The connection shown in the diagram includes a third wire at the terminal, which assures the same reference level for all devices within the network. In the case of powerful electromagnetic disturbances which might impair communication, use of a double-shielded, twisted cable is recommended. The module is equipped with a terminating resistor (RT), which is activated when a jumper is inserted between the corresponding terminals. Install a terminating resistor at the PC, and activate it at the last series connected module.

The maximum recommended length of the connection is 1200 m at 9600 bps. It is advisable to use a lower baud rate, a cable with less attenuation or a signal repeater for longer networks.

GMC-I Messtechnik GmbH

A description of the Modbus protocol is provided on the included CD. The RS 485 parameters can be changed at the interconnected meter, as well as by sending suitable Modbus commands.
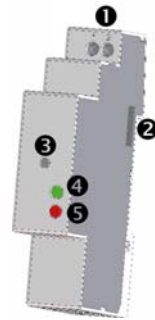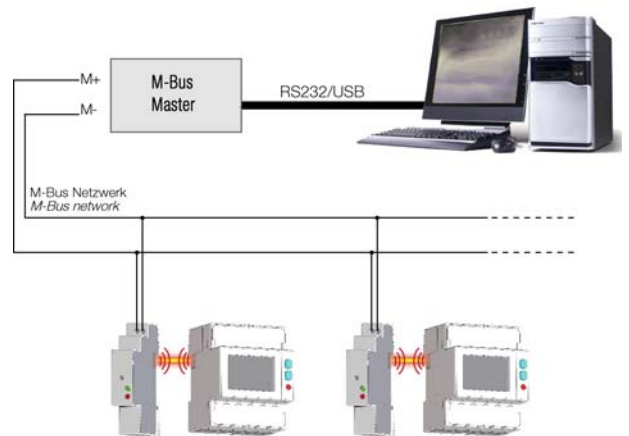

M-Bus

The M-Bus module transmits data from the energy meter to a logging system using the M-Bus protocol. The M-Bus (meter bus) is a European standard in accordance with EN 13757-2/3 for reading out consumption meters. M-Bus master software for configuring the module and the display of measured values is included in the scope of delivery free of charge.

1 Terminals for M-Bus connection
2 Infrared interface
3 Reset key
4 Auxiliary voltage LED
5 Communication LED

Wiring

A master interface is required between the PC and the M-Bus network for adapting RS 232 / USB signals. The number of modules which can be connected depends on the utilized master. Wire the various modules to each other using shielded, twisted cables.

Technical Data, Modbus RS 485

Specifications per EIA RS 485 directive

Auxiliary Voltage	
Nominal voltage	230 V AC ±20% / 50 Hz
Max. periodic voltage	300 V AC
Max. non-periodic voltage	320 V AC (20 ms)
Consumption	Max. 5 VA
Back-up fuse	Type T, 100 mA (to be installed externally)

RS 485 Communication	
Protocol	MODBUS RTU (8N1) and ASCII (7E2)
Interface	RS 485
Transmission speed	300 to 115,200 bps
Terminating resistor integrated into the module	120 Ω

Technical Data, M-Bus

Auxiliary Voltage	
Power supply	Via the M-Bus
Bus load	2 per module

M-Bus Communication per DIN EN 13757-2/3	
Protocol	M-Bus
Interface	2-wire, M-Bus
Transmission speed	300 to 38,400 bps
Terminating resistor integrated into the module	120 Ω

MODBUS RS 485, M-BUS, LAN Gateway
## Communication Modules

LAN Gateway

The LAN gateway module makes it possible to access an energy meter via a web browser from any PC with Internet/LAN access. The integrated web interface is laid out for Internet Explorer 7, Internet Explorer 8, Mozilla Firefox 3.xx, Apple Safari, Google Chrome, Opera and Netscape Navigator.

Password protected access to the module is possible at two levels. Whereas the administrator is able to adjust all settings, users (up to 20) can only retrieve measured values and status information.

The LAN gateway has an integrated data logger with adjustable sampling rate and selectable measured quantities. Memory content, as well as momentary measured quantities, can be downloaded as a CSV file.

Alternatively, communication can be managed by means of a Modbus TCP protocol. A CD with a description of the Modbus register is included.
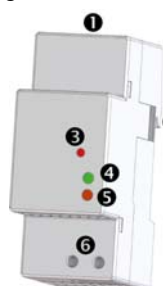
1 LAN interface
2 Infrared interface
3 Reset key
4 Status LED
5 Link activity LED
6 Auxiliary voltage terminals

Technical Data, LAN Gateway

| Auxiliary Voltage	
Nominal voltage	230 V_{AC} ±20% / 50 Hz
Max. periodic voltage	300 V_{AC}
Max. non-periodic voltage	320 V_{AC} (20 ms)
Consumption	Max. 5 VA
Back-up fuse	Type T, 100 mA (to be installed externally)

Ethernet Communication	
Protocol	HTTP, FTP, TCP, IP, MODBUS TCP
Modbus TCP interface	502
Network interface	10/100 Base-T
Transmission speed	10/100 Mbps
Plug	RJ-45

Memory	
Data storage	Integrated non-volatile memory
Memory capacity	~35 MB
Recording duration	3 days at 5 s / all values
	1 month at 60 s / all values

Real-Time Clock	
Real-time clock	Integrated
Synchronization	Possible via NTP server

Wiring
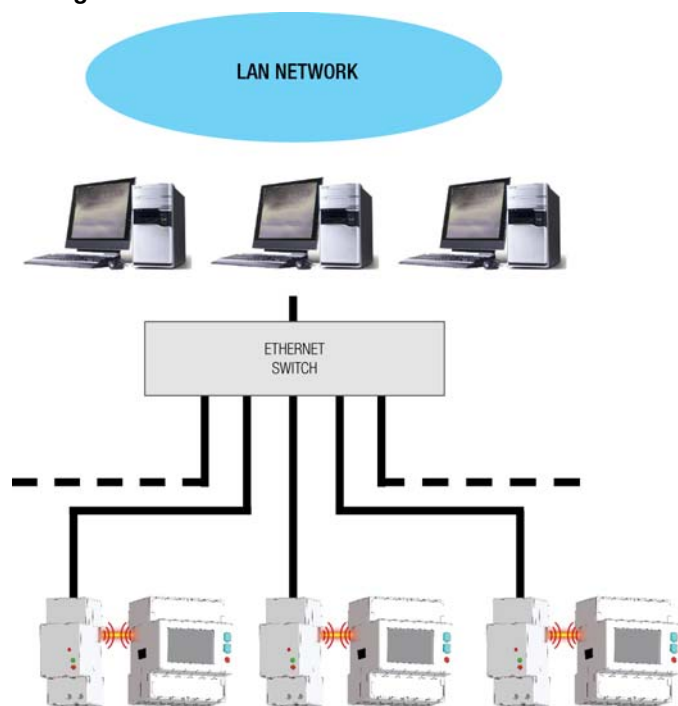
Order Information

Modbus RS 485 communication module with Modbus master software	U180A
M-Bus communication module with M-Bus master software	U180B
TCP/IP LAN gateway communication module with web interface	U180C

Edited in Germany • Subject to change without notice • PDF version available on the Internet