

Modbus Module

User Guide



Version 1.0

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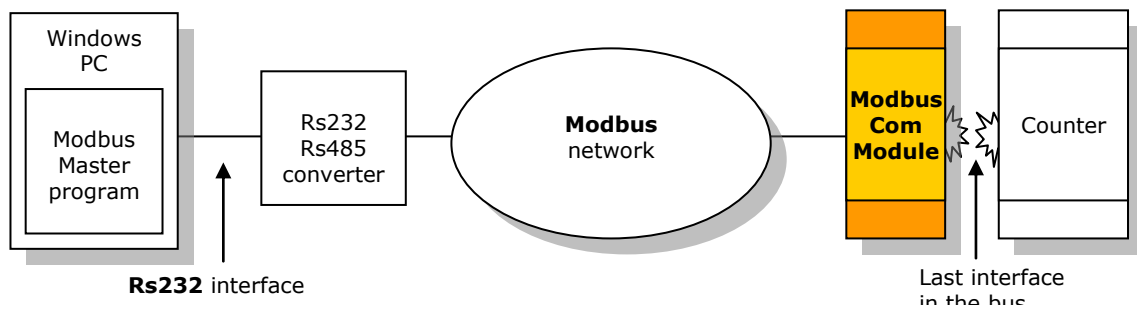
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2. Preface

2.1. System description

This document describes the usage of the **Modbus communication interface**.

Below you have an example of connection for the module. A minimal system configuration require at least one counter beside the module and a master station (in case with a Rs232-Rs485 converter for the hardware compatibility) to control the communication and the configuration.



2.2. Software

In the CD provided with the product, you can find a **Modbus master application** for Ms Windows ®, useful to manage the communication module for:

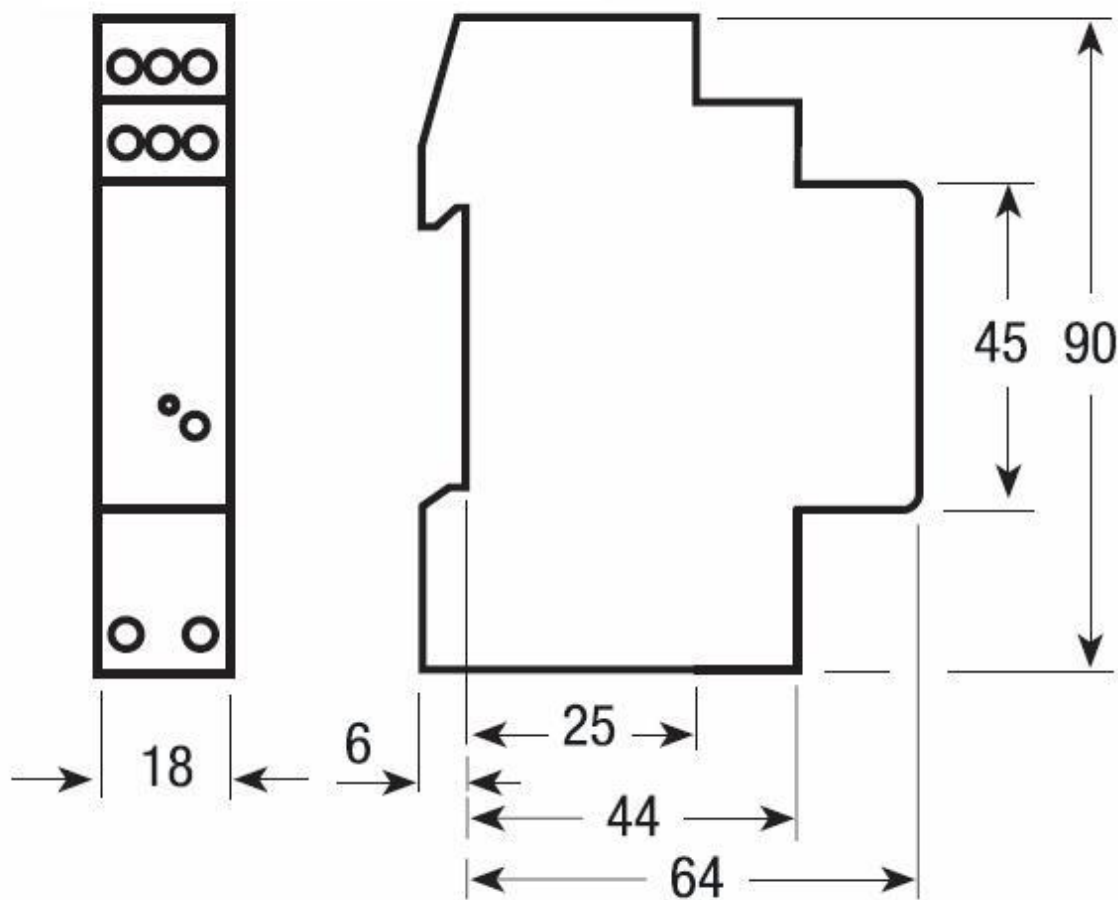
- Configuration of the Modbus device
- Data readings
- Storage of the capture measures
- Diagnostic

A **Data analyzer** Ms Excel ® sheet is also provided to allow the generation of graphic charts starting from the data captured and stored by the Modbus master application.

2.3. Documentation

Quick start guideBasic notes for a quick installation
 Modbus module user guideThis guide
 Modbus master application - user guide ..Manual dedicated to the Modbus master software provided with the module
 Modbus protocol - technical referenceA detailed technical reference for the Modbus protocol implemented on the interface.
 Data analyzer descriptionShorthand guide for the Data analyzer tool.

3. Mechanical reference

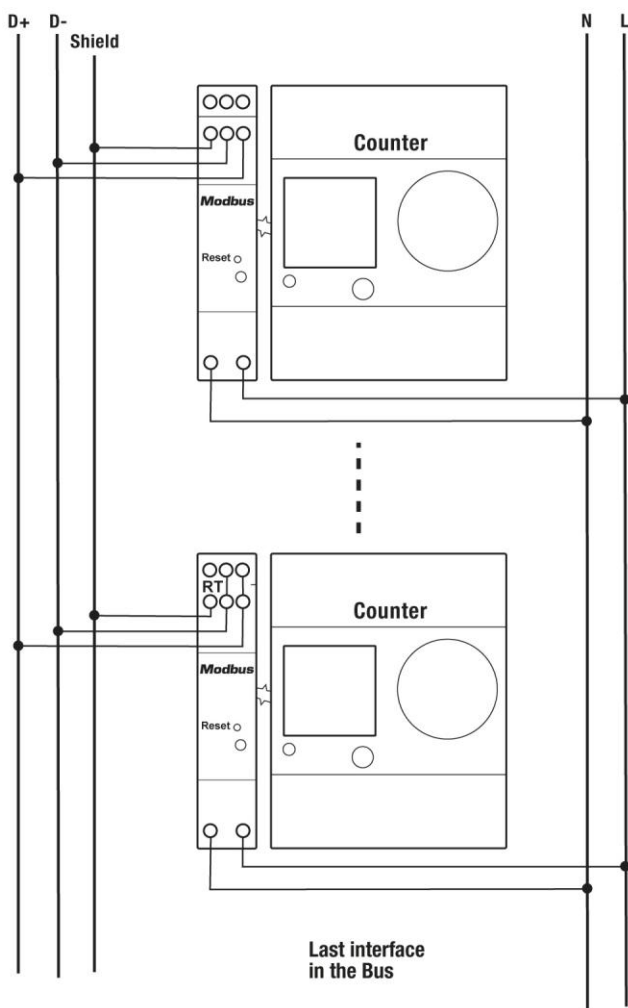


4. Wiring

The cabling of the communication module must consider 2 terminals for power and 5 terminals for the communication:

L,N: line and neutral
D+/D-: terminals for data transmission on the Rs485 bus.
RT: Rs485 bus termination resistor. Have to be connected with D+ only if the interface is the last or the first on the bus.
Shield: terminal to connect the cable shield for protection against noise.
Earth: earth connection.

In the picture shown below a possible connection scheme.



5. Technical reference

Data in compliance with EN 61010-1, EN 61000-6-2, EN 61000-6-3 and EN 61000-4-2

General characteristics - Housing - Mounting - Depth	DIN 43880 EN 60715	DIN 35 mm mm	- 1 module - DIN rail - 70
Auxiliary supply - Auxiliary power rating - Auxiliary voltage rating U_n - Auxiliary voltage range - Frequency rating - Frequency range		VA V(AC) V(AC) Hz Hz	- ≤ 10 - 230 - $(0.80 \text{ to } 1.20) \times U_n$ - 50/60 - 45 ... 65
Operating features - Two models available - Suitable for both single-phase and three-phase energy meters	type 1: for energy and power transmission type 2: for energy, power and additional quantities (V, I, P.F., freq.)		
MODBUS interface - HW interface - SW protocol - Data transfer speed - Parity - Addressing	RS 485 Terminals sw selectable sw selectable	No. baud	- 5 (+/-, cable shield, RT, ground) - Modbus/ASCII - Modbus/RTU - 1200 .. 38,400. Default 19200. - none/even. Default: none - 1 to 247
Instruments Bus Interface - HW interface - SW protocol	Optical IR	No.	- 2 (Tx, Rx) - Property
Safety acc. To EN 61010-1 - Degree pollution - Overvoltage category - Working voltage - Material group - Clearance - Creepage distance - Test voltage - Housing material flame resistance	In equipment On printed wiring boards (not coated) Impulse (1,2/50 s) peak value 50 Hz 1 min UL 94	V mm mm mm KV KV class	- 2 - II - 300 - II - ≥ 1.5 - ≥ 2.1 - ≥ 1.5 - 2.5 - 1.35 - V0
Connection terminals - Type cage - Connection	Screw head Z +/- Solid wire min. (max) Stranded wire with sleeve min. (max)	POZIDRIV mm ² mm ²	- PZ1 - 0.15 (2.5) - 0.15 (4)
Environmental conditions - Operating temperature - Storage limits - Relative humidity - Vibrations (sinusoidal) - Protection class - Degree of protection	Sinusoidal vibration amplitude at 50 Hz Acc.to EN 61010-1 Housing when mounted	°C °C % mm	- 0 ... +55 - -25 ... +70 - ≤ 80 - +/- 0.25 - II - IP50 (IP20)

6. Settings

6.1. Default settings

Baud rate: 19200 bit/s
 Protocol: Modbus RTU
 Address: 001
 Parity: None
 Stop bits: 1

6.2. Interface types

Two types of Modbus interfaces are available. **Type1 (energy-counter)** is for remote reading of all of the energy registers available in the measuring instrument. Additional measurements (voltage, current, power...) are readable with **Type2 (analyzer)** interface only.

Status bytes are available as well, containing information about the status of the energy meter, the load and the tariff in use.

Quantities available by default when connected with a single-phase counter:

Interface type 1 (energy counter)

Active energy imported, tariff 1
 Active energy imported, tariff 2
 Active Power
 Tariff in use
 Status

Interface type 2 (analyzer)

Active energy imported, tariff 1
 Active energy imported, tariff 2
 Active Power
 Voltage
 Current
 Power factor
 Frequency
 Tariff in use
 Status

Quantities available by default when connected with a three-phase counter:

Interface type 1 (energy counter)

Active energy imported, tariff 1, L1
 Active energy imported, tariff 1, L2
 Active energy imported, tariff 1, L3
 Active energy imported, tariff 1, total
 Active energy imported, tariff 2, L1
 Active energy imported, tariff 2, L2
 Active energy imported, tariff 2, L3
 Active energy imported, tariff 2, total
 Active Power L1
 Active Power L2
 Active Power L3
 Tariff in use
 Status

Interface type 2 (analyzer)

Active energy imported, tariff 1, L1
 Active energy imported, tariff 1, L2
 Active energy imported, tariff 1, L3
 Active energy imported, tariff 1, total
 Active energy imported, tariff 2, L1
 Active energy imported, tariff 2, L2
 Active energy imported, tariff 2, L3
 Active energy imported, tariff 2, total
 Active Power L1
 Active Power L2
 Active Power L3
 Voltage L1
 Voltage L2
 Voltage L3
 Current L1
 Current L2
 Current L3
 Power factor L1
 Power factor L2
 Power factor L3
 Power factor total
 Tariff in use
 Status

7. Frontal panel

A **green LED** reports the state of the communication with the measuring instrument:

- LED blinkingcommunication not active
- LED ON.....communication active

It can be used as diagnostic indicator to check whether or not the counter beside the M-Bus interface is sending properly the measures through the IR port.

On the frontal panel there is a **reset button** which can be used to restore the default settings (see 6.1) on the interface.