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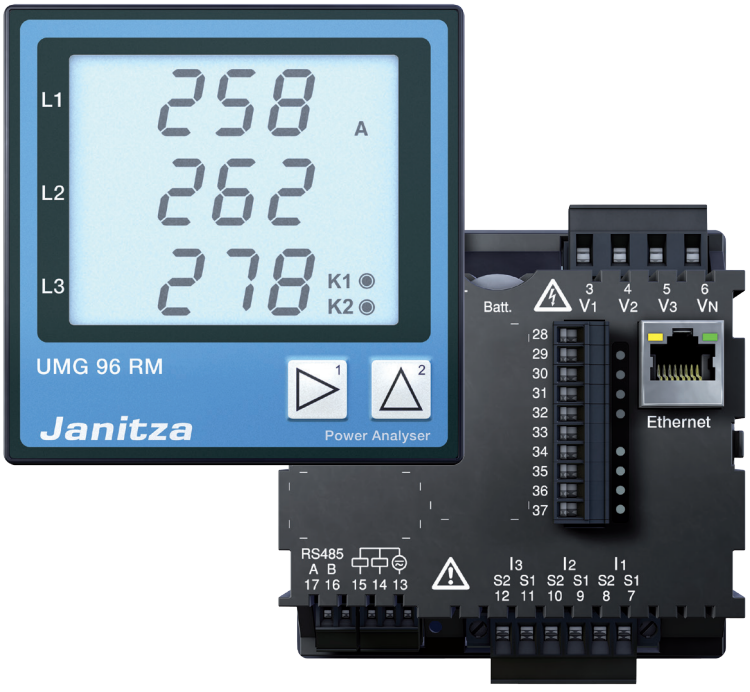
Functional description

BACnet
UMG96RM-E



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Introduction

As of version 2.84[*1], the firmware of the UMG96RM-E supports the BACnet function certified by BACnet.

- To use the BACnet function, it must be activated on the device using the GridVis software.
- The activation code is dependent on the serial number of your device and can be ordered by specifying item number 52.22.081 and the device serial number.
- It is NOT possible to enter the activation code directly on the device with the keys. As opposed to the UMG 604, UMG 605, UMG 508 and UMG 511, the UMG96M-E does not have a modbus to BACNet gateway function, i.e. devices connected to the RS485 interface - such as the UMG 103 - are not displayed on BACnet. This function is only available from the UMG604.
- Please see the BACNet PICS list for which BACNet functions are supported by the UMG96RM-E.

[*1]: The firmware may be modified according to the BACnet standard. The internal BACnet stack may not be modified after certification or must be recertified after any change. The BACnet stack is at version 2.09 and can only be read by BACnet.

Please note
Without the paid BACnet option, the BACnet-specific expansion cannot be used!

Name	Item no.
BACnet activation code UMG 96RM-E	52.22.081

BACnet activation

BACNet activation requires the GridVis software and an ethernet connection to the device. Before entering the activation code, check the serial number of the device. You can find it right on the DASHBOARD, on the left-hand side. The activation code can, in turn, be found on the delivery note that is received upon ordering the BACnet option.

Integrating the power analyser into GridVis

To integrate the power analyser into the GridVis analysis and configuration software, an ethernet connection must be established to the device, and the device TCP/IP address must be determined.

- Establish a connection between a PC and the device, either by direction connection or via a switch/router (see example connection topologies). We recommend using CAT5 cables.
- Determine which addressing mode to use ("Static IP" **or** "DHCP") and select it. If you have chosen "Static IP" mode, enter the device's TCP/IP address.

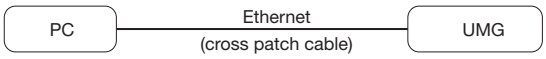


Fig. Example connection topology: direct connection between UMG and PC. Both devices require a static IP address.

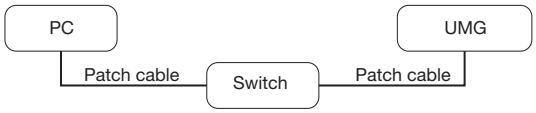


Fig. Example connection topology: established using a switch. The UMG and PC require a static IP address.

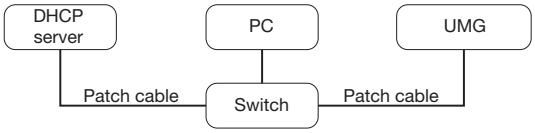


Fig. Example connection topology: integration into a network with DHCP server. The UMG and PC are assigned an IP address automatically by a DHCP server.

Static IP address

In simple networks with no DHCP server, the network address must be set right on the device itself.

When making a direct connection from a PC to the UMG, please note the following:

- Use a cross patch cable
- The first three segments of the IP address and the computer should be the same. The last segment must be different! All four blocks of the subnet mask must match.

  Example:

  IP address of the computer: 192.168.000.020 with subnet mask: 255.255.255.0

  IP address of the UMG: 192.168.000.021 with subnet mask: 255.255.255.0

Please note

Connection of the UMG to an existing ethernet may only be carried out after consulting the network administrator!

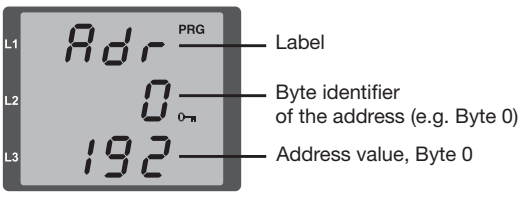
Dynamic IP address assignment (DHCP mode)

DHCP makes it possible integrate a UMG into an existing network automatically without the need for any additional configuration. When started, the UMG automatically obtains the IP address, the subnet mask and the gateway from the DHCP server.

Setting a static IP address manually

- Switch to programming mode. To do so, press buttons 1 and 2 at the same time and hold for approx. 1 second. With the password prompt deactivated, programming mode is then started, and the label "PRG" is displayed.
- Pressing the 2 button three times takes you to the TCP/IP settings for device addressing.
- Select the desired digit using the 1 button. Selection is indicated by the digit flashing. The selected digit can be adjusted with the 2 button.
- Use the 1 button to select the next digit and set it with the 2 button again.
- Once Byte 0 of the TCP/IP address is set, Bytes 1 to 3 of the address can be set with the 1 button. Then the display jumps back to Byte 0 (**none** of the digits are flashing).

Example display when setting an IP address



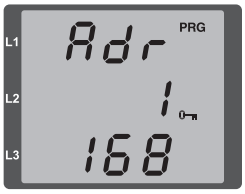
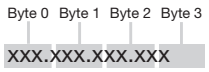


Fig. TCP/IP address, Byte 1
A TCP/IP address consists of 4 Bytes with the following structure:



Example:192.168.000.021

Fig. TCP/IP address Byte 2, value 000

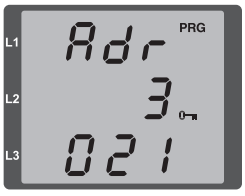


Fig. TCP/IP address Byte 3, value 021

Once the TCP/IP address is set on the device, the subnet mask (SUb) and the gateway address (GAt) must be set:

- Setting the subnet mask manually (SUb on display):
  In programming mode, the 2 button takes you to the subnet mask settings (SUb on the display).
  Use the 1 button to select the desired digit and set it with the 2 button. Repeat this step for every digit in Byte 0 to 3, the same as when setting the device's TCP/IP address. Once the display returns to Byte 0 (none of the digits flashing) you can set the gateway.

- Setting the gateway address manually (GAt on display):
  In programming mode, the 2 button takes you to the gateway address settings (GAt on the display). Use the 1 and 2 buttons to set the desired gateway address in Byte 0 to 3, in the same way as the above descriptions.

In order that the manual settings for device TCP/IP address, subnet mask and gateway address cannot be overwritten by a DHCP server, dynamic IP address assignment must be deactivated (dYN IP, oFF)!

Dynamic IP address assignment (dyn)

- Switch to programming mode. To do so, press buttons 1 and 2 at the same time and hold for approx. 1 second. With the password prompt deactivated, programming mode is then started, and the label "PRG" is displayed.
- Switch through the screens to display dynamic IP address assignment (dYn IP) by pressing the 2 button multiple times.
- Use the 1 button to activate the "on" or "oFF" parameter (parameter flashes).
  on = Dynamic IP address assignment activated
  off = Dynamic IP address assignment deactivated
- Use the 2 button to change the parameter and confirm with the 1 button. Quit programming mode or wait for around 60 seconds.
- The addresses can be viewed in programming mode in the same way as the manual settings.

Example display when setting an IP address

Fig. Dynamic assignment (dYn IP) of the TCP/IP address activated

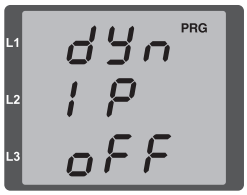


Fig. Dynamic assignment (dYn IP) of the TCP/IP address deactivated

When the key symbol is displayed next to the IP address, dynamic IP address assignment is activated. The device/gateway address and subnet mask are provided by the DHCP server and applied automatically!

Changes are only applied after exiting programming mode.

The addresses can be viewed in programming mode in the same way as the manual settings.

Setting the IP address of the computer for direction connection

Normally PCs on company networks are run with DHCP activated. If you want to assign a static IP address to the PC (e.g. for a direct connection between PC and UMG) proceed as follows:

Please note
The settings on a company network may differ from this.

Please note
Connection of the UMG to an existing ethernet may only be carried out after consulting the network administrator!

- Open the Network and Sharing Center in the Control Panel.
- Click on LAN Connection to open the status window (Fig. Network and Sharing Center).
- By clicking on Properties you can assign a static IP address to the PC
  (see Fig. Procedure for defining a static IP address in Windows 7)

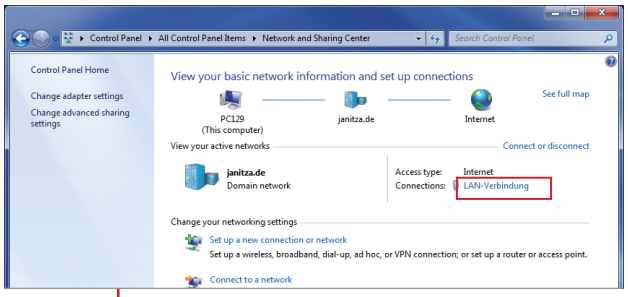


Fig.: Network and Sharing Center

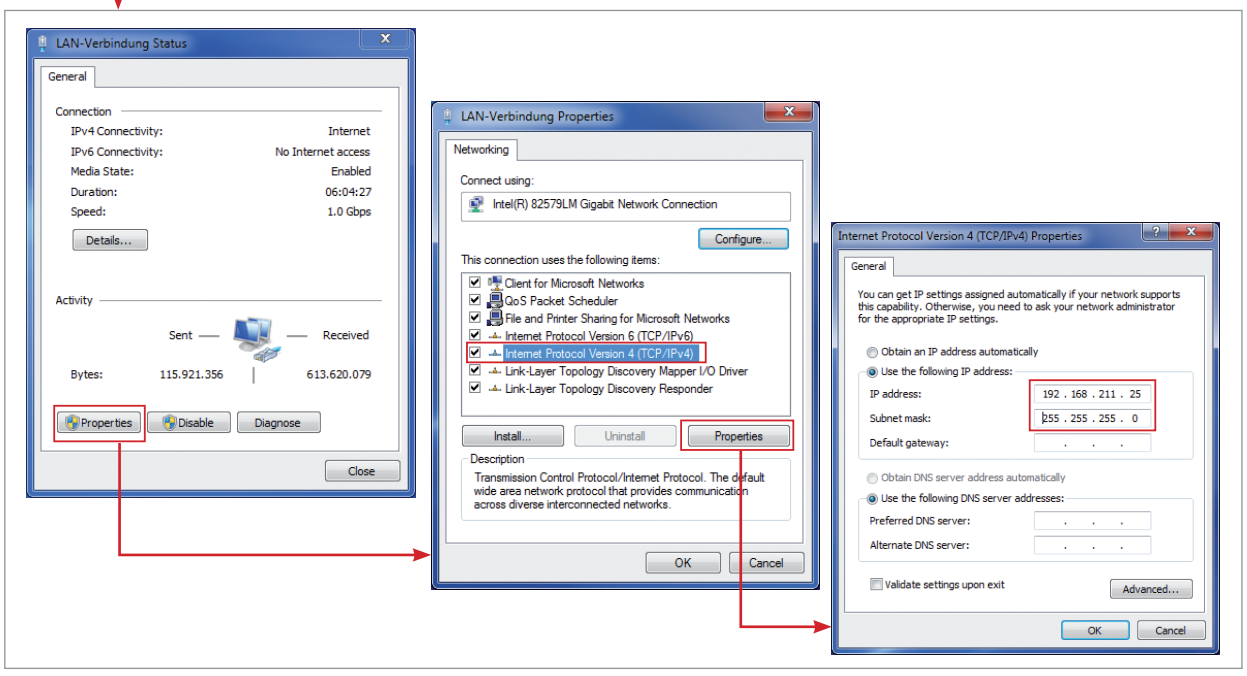


Fig.: Procedure for defining a static IP address in Windows 7.

Carrying out BACNET activation with GridVis

- BACNet activation requires the GridVis software. Before entering the activation code, check the serial number of the device. You can find it right in the overview window, on the left-hand side. To do so, select the appropriate device in the project window.
- The activation code can, in turn, be found on the delivery note that is received upon ordering the BACnet option.

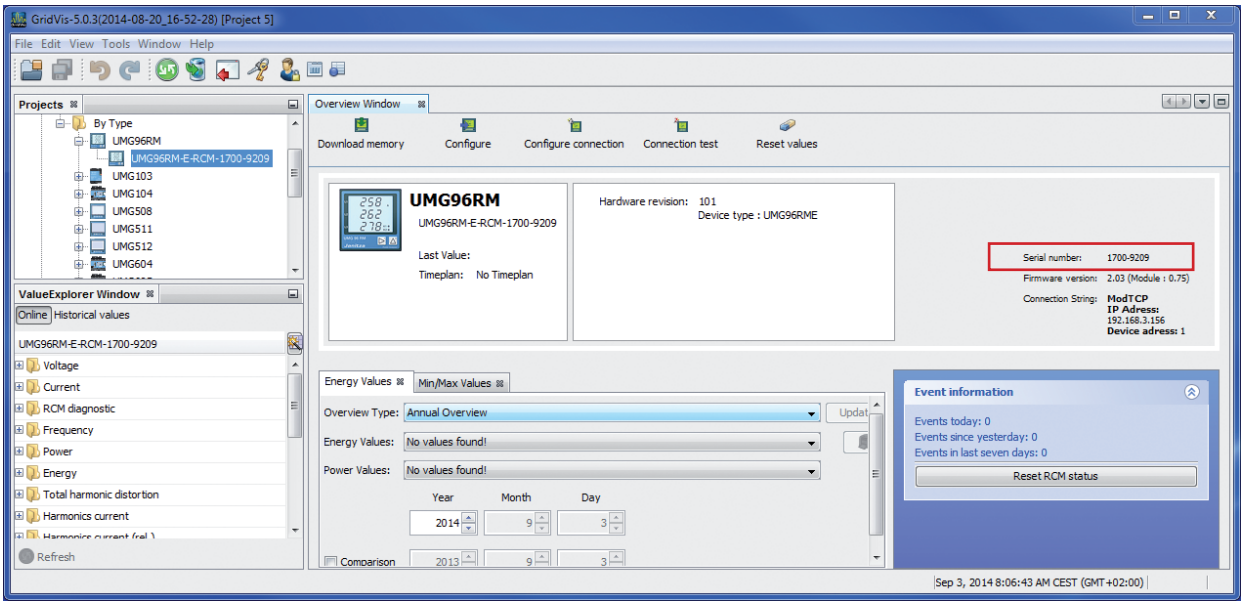


Fig.: Overview window with display of the serial number

- To enter the activation code, open the device configuration via the *Configuration* button in the overview window. In the Passwords tab, you can enter the activation code. After it is entered and the configuration is sent to the device, BACnet is available immediately. There is currently no additional visual check!

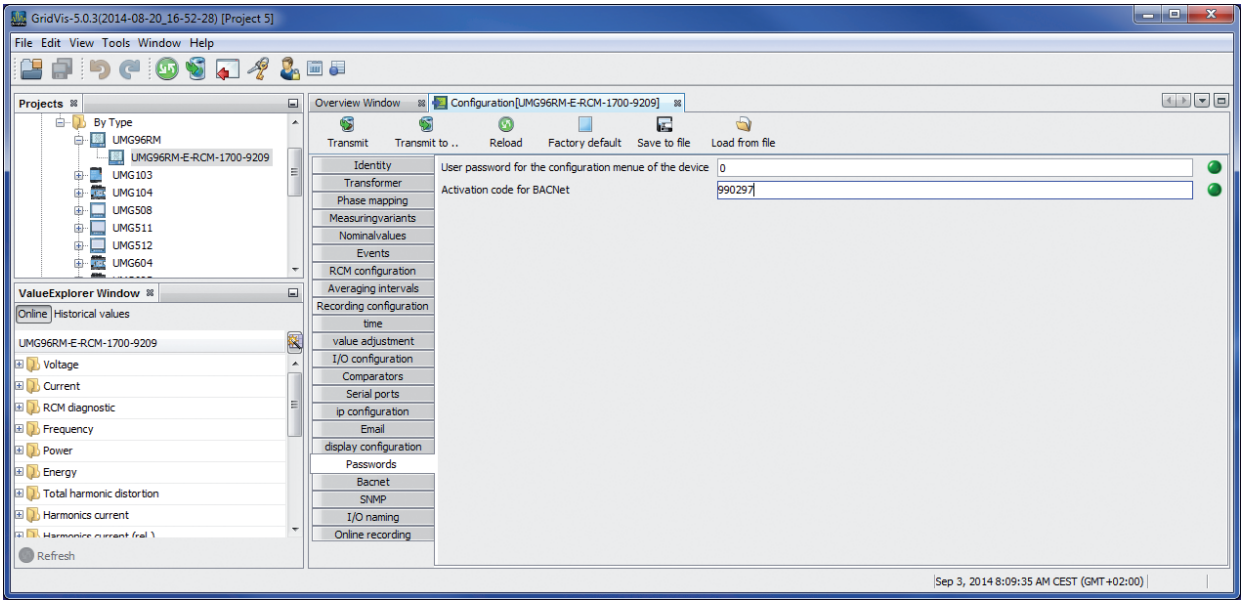


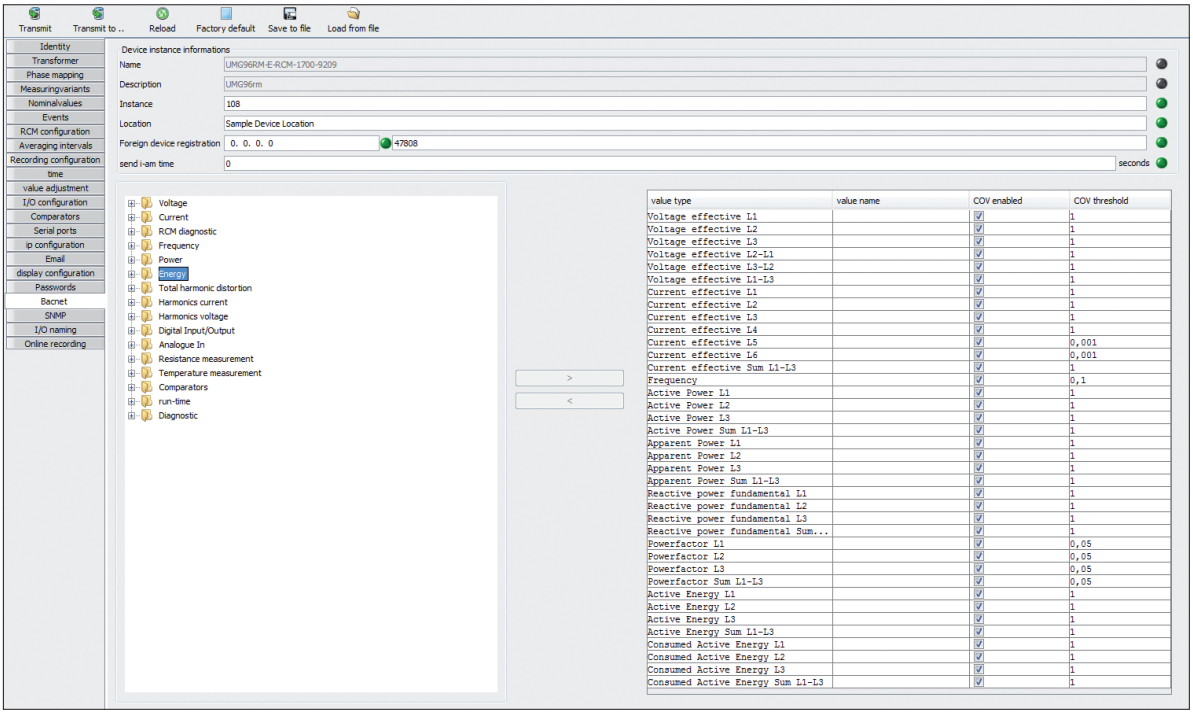
Fig.: Configuration window with password selection

Performing BACNet configuration

BACNet configuration is carried out in the "BACNet" tab. The following settings can be configured:

- Instance: BACNet instance of the measuring device
- Location: Installation location (length: 64 characters, according to ANSI X3.4, e.g. no umlauts in German)
- Foreign device registration: IP address of the "foreign device" for BBMB
- Send i-am time: Setting for the send time for an I-AM message
- BACNet port: 47808

- Which parameters are available to be configured is determined by the project, and is generally specified by BMS experts.
- The default BACNet port is 47808; it **cannot** be changed.
- A "send i-am time" of 10 seconds **and higher** can be selected. Values below 10 seconds are not considered. Minor deviations in the send interval of the I-AM message can occur and do not represent an error. A setting of 0 seconds deactivates sending I-AM messages entirely.
- In the bottom of the configuration window, you can freely select BACNet measured values. The value name (length: 64 characters, according to ANSI X3.4, no umlauts in German), which is to be displayed in BACNet, can be adapted to suit the project. The COV threshold and activation can also be set in this window.
- Please note that the measured values are ALWAYS in the base unit, i.e. A, V, W, Wh. It is not possible to switch to kW or kWh. Scaling to kW or kWh, etc. must be performed in the BACNet GLT. An EDE list of the default measured values is available.



Measured value transmission upon delivery

• Voltage L1	Voltage effective L1
• Voltage L2	Voltage effective L2
• Voltage L3	Voltage effective L3
• Voltage L2-L1	Voltage effective L2-L1
• Voltage L3-L2	Voltage effective L3-L2
• Voltage L1-L3	Voltage effective L1-L3
• Current L1	Current effective L1
• Current L2	Current effective L2
• Current L3	Current effective L3
• Current L4	Current effective L4
• Current L5	Current effective L5
• Current L6	Current effective L6
• Current Sum L1-L3	Current effective sum L1-L3
• Frequency	Frequency
• Active Power L1	Active power L1
• Active Power L2	Active power L2
• Active Power L3	Active power L3
• Active Power Sum L1-L3	Active power sum L1-L3
• Apparent Power L1	Apparent power L1
• Apparent Power L2	Apparent power L2
• Apparent Power L3	Apparent power L3
• Apparent Power SUM L1-L3	Apparent power sum L1-L3
• Reactive Power L1	Reactive power fundamental oscillation L1
• Reactive Power L2	Reactive power fundamental oscillation L2
• Reactive Power L3	Reactive power fundamental oscillation L3
• Reactive Power SUM L1-L3	Reactive power fundamental oscillation sum L1-L3
• Power factor L1	Power factor L1
• Power factor L2	Power factor L2
• Power factor L3	Power factor L3
• Power factor Sum L1-L3	Power factor sum L1-L3
• Active Energy L1	Active energy L1
• Active Energy L2	Active energy L2
• Active Energy L3	Active energy L3
• Active Energy Sum L1-L3	Active energy sum L1-L3
• Consumed Active Energy L1	Consumed active energy L1

• Consumed Active Energy L2	Consumed active energy L2
• Consumed Active Energy L3	Consumed active energy L3
• Consumed Active Energy sum L1-L3	Consumed active energy sum L1-L3
• Supplied Active Energy L1	Supplied active energy L1
• Supplied Active Energy L2	Supplied active energy L2
• Supplied Active Energy L3	Supplied active energy L3
• Supplied Active Energy sum L1-L3	Supplied active energy sum L1-L3
• Apparent Energy L1	Apparent energy L1
• Apparent Energy L2	Apparent energy L2
• Apparent Energy L3	Apparent energy L3
• Apparent Energy Sum L1-L3	Apparent energy sum L1-L3
• Reactive Energy L1	Reactive energy L1
• Reactive Energy L2	Reactive energy L2
• Reactive Energy L3	Reactive energy L3
• Reactive Energy Sum L1-L3	Reactive energy sum L1-L3
• Inductive Reactive Energy L1	Inductive reactive energy L1
• Inductive Reactive Energy L2	Inductive reactive energy L2
• Inductive Reactive Energy L3	Inductive reactive energy L3
• Inductive Reactive Energy Sum L1-L3	Inductive reactive energy sum L1-L3
• Capacitive Reactive Energy L1	Capacitive reactive energy L1
• Capacitive Reactive Energy L2	Capacitive reactive energy L2
• Capacitive Reactive Energy L3	Capacitive reactive energy L3
• Capacitive Reactive Energy Sum L1-L3	Capacitive reactive energy sum L1-L3
• Temperature1	External temperature 1
• Temperature2	External temperature 2
• Digital-Out1	Status of Digital output 1 (Terminal 14, Group 1)
• Digital-Out2	Status of Digital output 2 (Terminal 15, Group 1)
• Digital-Out3	Status of Digital output 3 (Terminal 29, Group 2)
• Digital-Out4	Status of Digital output 4 (Terminal 30, Group 2)
• Digital-Out5	Status of Digital output 5 (Terminal 31, Group 2)
• Digital-In3	Status of Digital input 1 (Terminal 29, Group 2)
• Digital-In4	Status of Digital input 2 (Terminal 29, Group 2)
• Digital-In5	Status of Digital input 3 (Terminal 29, Group 2)
• Diff1 Alarm	Residual current alarm 1
• Diff2 Alarm	Residual current alarm 2
• Diff1 Overcurrent	Residual current overcurrent event 1
• Diff2 Overcurrent	Residual current overcurrent event 2

• Diff1 Warn	Residual current warning 1
• Diff2 Warn	Residual current warning 2
• Diff1 Overcurrent Time	Residual current overcurrent event 1 time
• Diff2 Overcurrent Time	Residual current overcurrent event 2 time
• Diff1 Transformer broken	Connection to Residual current transformer 1 broken
• Diff2 Transformer broken	Connection to Residual current transformer 2 broken