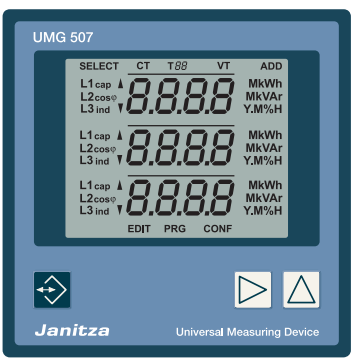
Art. no. 33.03.063

Universal Measuring Device

UMG 507

Installation and Initial Startup

See back page for brief instructions



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Dok Nr. 1.032.027.2m Firmware Rel.: 0.99

Contents

Incoming Inspection

Meaning of the symbols used

The following pictograms are used in this manual:

Warning, dangerous electrical voltage.

This symbol is intended to warn you about possible dangers, which can occur during the assembly, initial startup and during use.

Protective conductor terminal

Incoming inspection

Error-free and safe operation of this device requires proper transport and storage, setup and assembly and careful operation and maitennance. If it can be assumed that safe operation is no longer possible, the device must be immediately taken out of service and secured against accidental startup.

The device must be packed and unpacked with the usual care without force and only using suitable tools. The devices are to be visually inspected for faultless mechanical condition. Please note the installation instructions enclosed with the device.

It is to be assumed that safe operation is no longer possible if the device e.g.

- has visible damage,
- no longer works despite an intact power supply,
- has been exposed to unfavourable conditions for a lengthy time (e.g. storage outside the permissible climate limits without adjustment to the room climate, condensation, etc.) or transport loads (e.g. fall from a large height even without visible external damage, etc.).

Please check for complete scope of delivery before starting to install the device.

Incoming Inspection

Scope of delivery

Number	Product No.	Name
1	52 15 xxx[1)]	UMG507 XX[2)]
1	33 03 xxx[1)]	Installation and startup instructions,
1	52 12 104	2 clips
1	51 00 116	CD with the following contents: - „GridVis“ programming software. - Supplementary device descriptions.

1) Refer to delivery note for product number.
2) Design options.

Accessories available

	Product No.	Name
	0801505	Patch cable 2m, **twisted,** grey, (UMG - PC/switch connection)
	5210207	Connection cable, RS232, 2m, DSUB
	2901903	Seal, 144x144
	2101102	Battery, lithium CR2450N, 3V/540mAh

Model options available

Option	UMG507 model options					
	L	AD	P	EL	E	EP
1 RS232, Modbus RTU	x	x	x	x	x	x
1 RS485, Modbus RTU	x	x	x	x	x	x
1 RS485, Modbus RTU/Profibus DP V0	-	-	x	-	-	x
1 Ethernet, 10baseT	-	-	-	x	x	x
1 Temperature input (e.g. PT100)	-	x	x	-	x	x
1 Analog input, 0 - 20mA	-	x	x	-	x	x
2 Analog outputs, 0/4 - 20mA	-	x	x	-	x	x
6 Digital inputs	x	x	x	-	x	x
6 Digital outputs	x	x	x	-	x	x
1 additional memory, 16MB (flash)	-	-	-	x	x	x

x = option available in this model

⚠ The installation and startup instructions also describe options which are not part of the scope of delivery.

⚠ All the delivered options and model options are described on the delivery note.

⚠ Master/Slave operation via RS485 only possible with UMG 96S, UMG 503, UMG 505, Prophi and ProData.

Product Description

Practical guidance on use

This device is only to be deployed and used by qualified personnel in accordance with the safety provisions and regulations.
When using the device, the necessary legal and safety regulations for the respective use are also to be observed.
Qualified personnel are persons who are familiar with the setup, installation, putting into service and operation of the product and have the necessary qualifications for their work, e.g.
- Training or instruction and/or authorisation to switch electric circuits and devices on and off, to isolate them, earth and label them in accordance with the safety standards.
- Training or instruction in accordance with the safety standards for the maintenance and use of appropriate safety equipment.

Intended use

Installation

The UMG507 is suitable for installation in fixed and weatherproof control panels. Conductive control panels must be earthed. Due to its high immunity the UMG507 is suitable for continuous, unmonitored operation.

Measurement

The UMG507 is inetnded for the measurement of electrical variables such as voltage, current, power, etc. in low-voltage switchgear. Measured values are saved adn can be read out through serial interfaces. The voltage and current measurement inputs are continuously scanned. Brief interruptions up to a half-wave are reliably detected.
The applied voltages must lie within the measuring and supply voltage range given on the rating plate.
The measuring and supply voltages must be connected to the UMG507 via a disconnecting device (switch or circuit-breaker) and an overcurrent protection device (2-10A) in the building installation. The disconnecting device must be near the UMG507 and be easily reached by the user. The disconnecting device must be labelled for the device.
Either ../5A or ../1A current transformers can be optionally connected to the current measurement inputs.

Medium and high-voltage systems

Measurement in medium and high-voltage systems is generally carried out using current and voltage transformers. Special safety provisions are applied to these, which are not discussed in any greater detail here.

⚠ **Attention!**
If the device is not operated in accordance with the operating instructions, protection is no longer ensured and the device can cause hazards.

TN and TT systems
Measurement is designed for 3-phase systems with neutral conductors (TN and TT systems).

Supported nominal voltage (in volts) in 3-phase-4-wire systems:
66/115, 120/208, 127/220, 220/380, 230/400, 240/415, 260/440, 277/480, 347/600, 380/660, 400/690, 417/720, 480/830

Measuring range:
L - N 50V .. 500V (max. 550V)
L - L 90V .. 870V (max. 950V)

IT systems
The UMG507 is only conditionally suitable for use in IT systems, as the measurement voltage is measured at the housing potential and the input impedence of the device causes a leakage current to the earthing. The leakage current can cause the insulation monitoring in IT systems to respond. It must also be ensured that the maximum permissible voltage at the inputs of the UMG507 are not exceeded to earth (e.g. in case of a phase-to-earth fault). The connection options shown in Fig. 4.1b (with PEN conductor) or Fig. 4.6a (without a PEN conductor) are suitable for IT systems without restriction. Here the IT system is insulated through the use of voltage transformers.

Supported nominal voltage (in volts) in 3-phase-3-wire systems:
115, 120, 127, 220, 230, 240, 260, 277, 347, 380, 400, 415, 440, 480, 500.

Measuring range:
L - PE 50V .. 500V (max. 550V)
L - L 90V .. 500V (max. 550V)

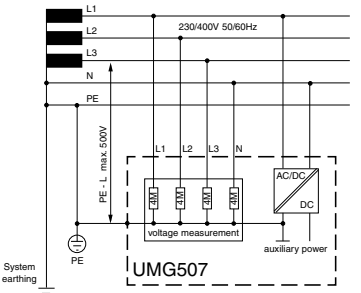


Fig. Block diagram, UMG507 in the TN system.

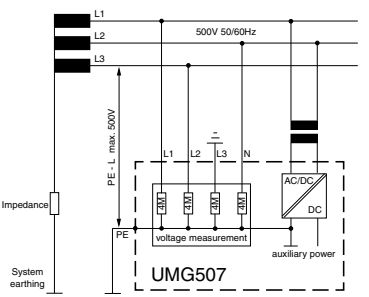


Fig. Block diagram, UMG507 in the IT system without N.

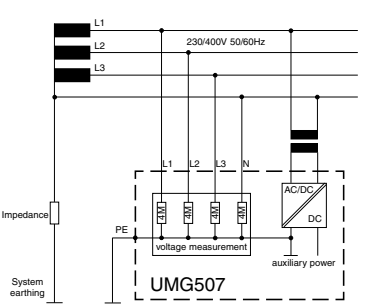


Fig. Block diagram, UMG507 in the IT system with N.

⚠ It is absolutely necessary to connect the **PEN conductor N**.

Installation

Installation location

The UMG507 is intended for permanent installation in low and medium-voltage switchgear. It can be installed in any position.

Protective conductor

A protective conductor according to the valid safety regulations must be connected at the screw provided on the rear of the device before the remaining connections with the device can be made.

Supply voltage

An operating voltage is required to run the UMG507. The type and strength of the operating voltage required for the UMG507 is noted on the rating plate.

230V Standard version
120V Special version
63V Special version

Higher voltages between the terminals 31/32 and earth (PE) can severely damage the UMG507. In order to prevent an overvoltage the operating voltage should be earthed.
The operating voltage is connected at terminals 31 and 32. A maximum voltage of 300VAC may occur between the terminals 31 and 32 (operating voltage) and earth (PE).

Attention!

- The wiring cables for the operating voltage must be suitable for nominal voltages up to 300VAC to earth.

- The operating voltage must be fused. The fuse must lie within the range from **2A to 10A**.

- The building installation must include a **switch** or **circuit-breaker** for the operating voltage.

- The **switch** must **be installed close** to the device and be easy for the user to reach.

- The switch must be **labelled** as a **disconnecting device** for this device.

- Before applying the operating voltage ensure that the voltage and frequency comply to the values given on the **rating plate**!

- The device may only be run with an **earthed housing**!

- Conductors with **soldered** individual wires are **not suitable** for connections at screw-type terminals**!**

-The pluggable screw terminals may only be plugged in when no voltage is applied.

- Only pluggable screw terminals with the same number of poles **and** the same type (with/without threaded connection) may be connected with each other.

⚠ Voltages which lie above the permissible voltage range can severely damage the device.

Connection options

The UMG507 can measure in systems with N and even in systems without N through two voltage transformers. Measurement in systems with L1/L2/L3 and **N** (PEN) is called **four-wire measurement** here. Measurement in systems with L1/L2/L3 but **without** N is called **three-wire measurement**.
The UMG507 is preset in the factory for measurement in systems with N (four-wire measurement).

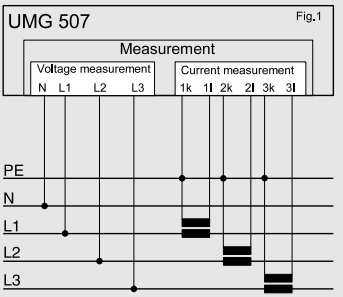


Fig.1 Three-phase measurement with PEN conductor. (four-wire measurement)

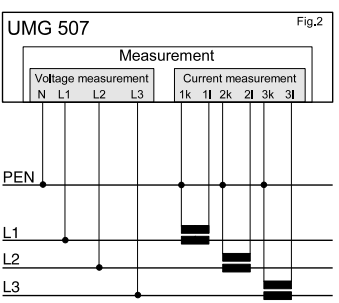


Fig.2 Three-phase measurement without PEN conductor. (four-wire measurement)

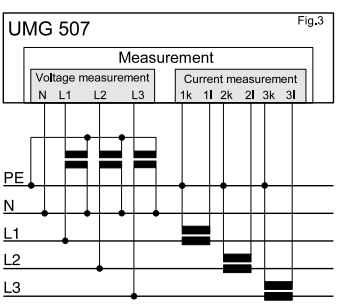


Fig.3 Measurement with three current transformers and three voltage transformers. (four-wire measurement)

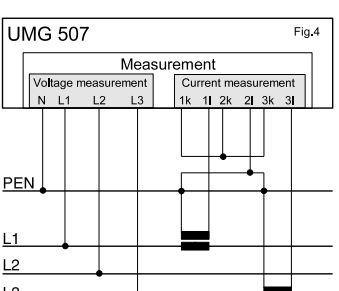


Fig.4 Measurement with two current transformers. (four-wire measurement)

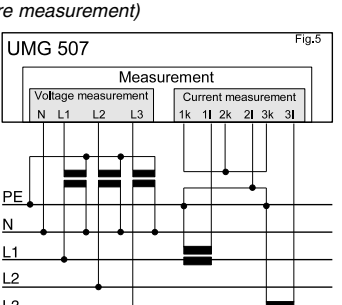


Fig.5 Medium-voltage measurement with two current and three voltage transformers. (four-wire measurement)

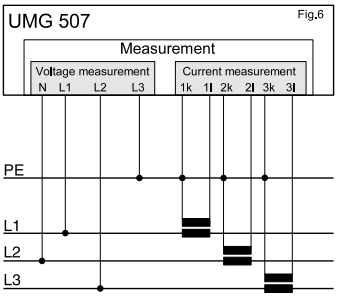


Fig.6 Three-phase measurement without PEN conductor with three current transformers. (three-wire measurement)

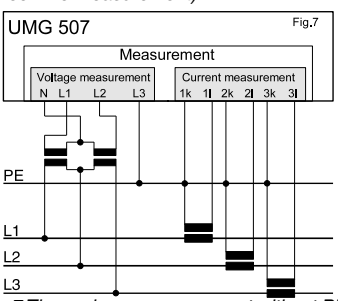


Fig.7 Three-phase measurement without PEN conductor with two voltage transformers and three current transformers. (three-wire measurement)

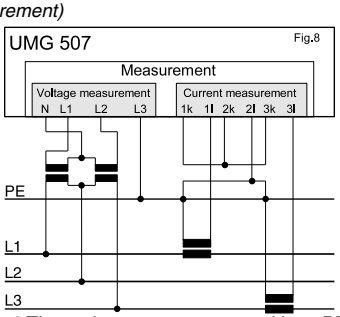


Fig.8 Three-phase measurement without PEN conductor with two voltage transformers and two current transformers. (three-wire measurement)

Voltage measurement

The UMG507 is suitable for measuring alternating voltages of up to 500VAC to earth and 870VAC phase-to-phase. The wiring cables for the measured voltages must be suitabel for voltages up to 500VAC to earth and 870VAC phase-to-phase.

Attention!
The UMG507 is **not** suitable for measurement of **direct voltages**.

Voltages over 500VAC to earth must be connected through a voltage transformer .

The supply conductors for voltage measurement in UMG507 must be protected by an overcurrent protective device.

Current measurement

The UMG507 is designed for the connection of current transformers with secondary currents of ../1A and ../5A. Only alternating currents can be measured, not direct currents.
Each current measurement input can be permanently loaded with 6A or loaded for 1 second with 60A. In systems with voltages up to 150VAC (CATIII) or 300VAC (CATII) to earth currents of up to 5A can also be directly connected to the UMG507 and measured.

If the current has to be measured with an ammeter in addition to the UMG507, this must be connected in series with the UMG507.

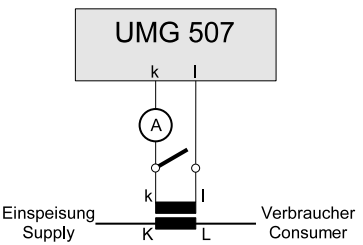


Fig.: Example, current measurement using additional ammeter.

Total current measurement

If the current measurement takes place through two current transformers, the total conversion ratio of the current transformers must be programmed in the UMG507.

Example: summation current transformer
Current measurement takes place using one current transformer with a conversion ratio of 1000/5A and one current transformer with a conversion ratio of 200/5A. The total measurement is carried out using a summation transformer 5+5/5A.
The UMG507 must then be set as follows:
Primary current: 1000A + 200A = **1200A**
Secondary current: **5A**

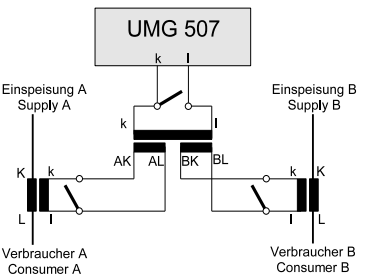


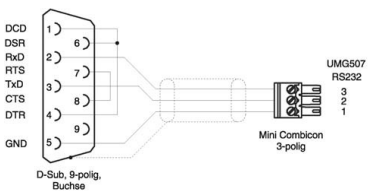
Fig.: Example, current measurement using summation transformer.

⚠ The secondary connections of the current transformer must be short-circuited at it before the current supply conductors to the device are disconnected!
If a test switch is available, which automatically short-circuits the current transformer supply conductors, it is sufficient to place in in the „Test“ position, provided that the short-circuiters have been previously tested.

Interfaces

RS232

The achievable distance between two RS232 devices depends on the cable used and the baud rate. As a rule of thumb, for a transfer rate of 9600 baud the distance should not exceed 15m to 30m.
The permissible ohmic load must be greater than 3kOhm and the capacitive load caused by the transmission cable must be smaller than 2500pF.
With the PC cable for the RS232 interface (2m) (optionally available) the maximum baud rate is 38,4kBit/s.



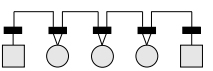
Diagr. Connection diagram RS232 cable

RS485

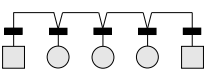
Terminal resistors

All devices are connected in a bus structure (line). Up to 32 stations can be connected together in one segment. The cable is terminated with resistors at the start and end of a segment.
If there are more than 32 stations, repeaters must be used in order to connect the individual segments.

Correct



Wrong



- Terminal strip in the control cabinet.
- Device with RS485 interface. (Without terminating resistor)
- Device with RS485 interface. (With terminating resistor at the device)

Shielding

A twisted-conductor and shielded cable must be provided for connections through the RS485 interface. In order to achieve sufficient screening effectiveness, the screening must be connected to large areas of the housing or cabinet parts at both ends of the cable.

Cable type

Recommended cable types:
Unitronic Li2YCY(TP) 2x2x0.22 (Lapp cable)
Unitronic BUS L2/FIP 1x2x0.64 (Lapp cable)

Cable length

1200m for a baud rate of 38.4k.

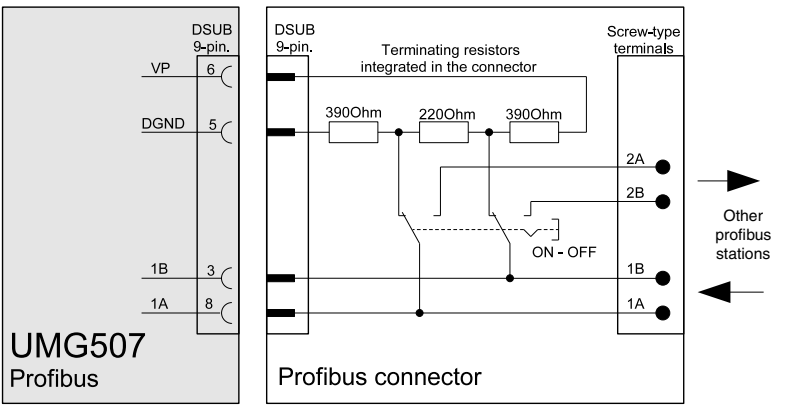
⚠ For the wiring of the Modbus connection, CAT cables are not suitable. Please use the recommended cables.

RS485 Profibus

The profibus connection of the UMG507 is designed as a 9 pin DSUB socket. We recommend a 9 pin profibus connector e.g. from the firm Phoenix, type „SUBCON-Plus-ProfiB/AX/SC“ with the product number 2744380 for the connection.

Connection of the bus cables

The incoming bus cable is connected at the terminals 1A and 1B. The bus cable for the next device in the line is connected at the terminals 2A and 2B. If there are no more devices in the line, the bus cable must be terminated with resistors (switch to ON).
In the switch setting ON the terminals 2A and 2B are switched off for the continued bus cable.



Digital inputs and outputs

Digital outputs

The UMG507 has 6 transistor switch outputs. These outputs are separated from the evakluation electronics by optocouplers. The transistor collectors are connected together with plus potential (terminal 23). Each transistor can switch a maximum of 28V and 30mA. The transistor outputs are not short-circuit proof.

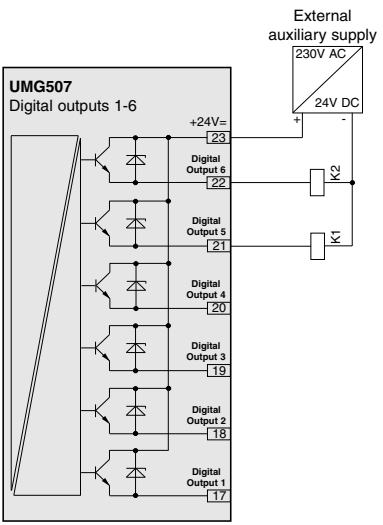


Fig. Connection of two relays at the digital outputs.

Digital inputs

The UMG507 has a total of 6 digital inputs which can be connected to transducers. An input signal is detected at a digital input if a voltage of at least 10V and maximum 28V is applied. A current of at least 1mA and maximum 6mA then flows.

S0 Pulse input

Each input can also be used as an S0 pulse input to DIN EN62053-31. An external auxiliary voltage of 20..28V DC and an external 1.5kOhm resistor each is required for this.

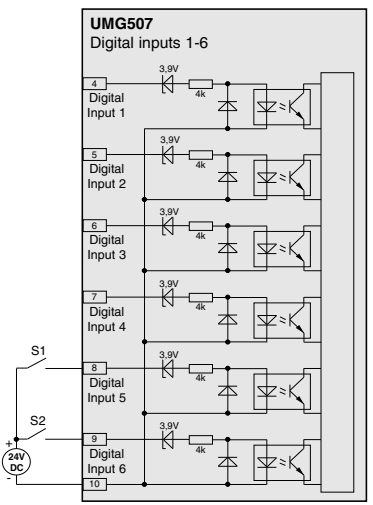


Fig.: Example for connection of the external main switching contacts S1 and S2 to the digital inputs 5 and 6.

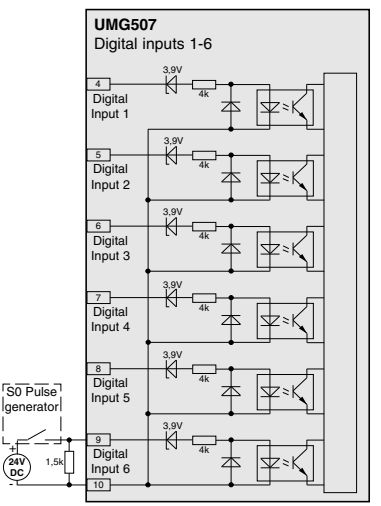


Fig.: Example for connection of an S0 pulse generator at the digital input 6.

Analog inputs and outputs

Temperature measurement input „PT100“

Temperature sensors with a resistance range of 400 Ohm to 4kOhm can be connected to the „analog input PT100“.
The total burden (sensor + cable) of 4kOhm must not be exceeded.

Sensor type	Temperature range	Resistance range
KTY83	-55 ° .. +175 °C	500 Ohm .. 2.6 kOhm
KTY84	-40 ° .. +300 °C	350 Ohm .. 2.6 kOhm
PT100	-99 ° .. +500 °C	60 Ohm .. 180 Ohm
PT1000	-99 ° .. +500 °C	600 Ohm .. 1.8 kOhm

Analog input

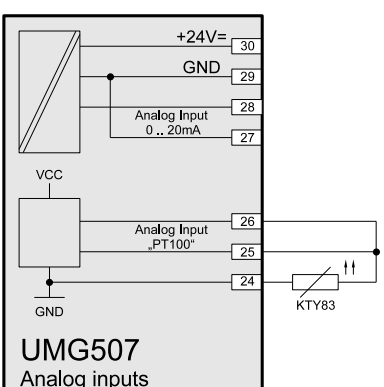


Fig. Example, temperature measurement using a KTY83.

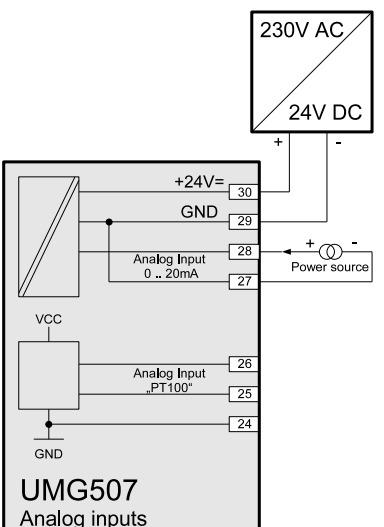


Fig. Example, connection of a 0..20mA power source.

Analog outputs

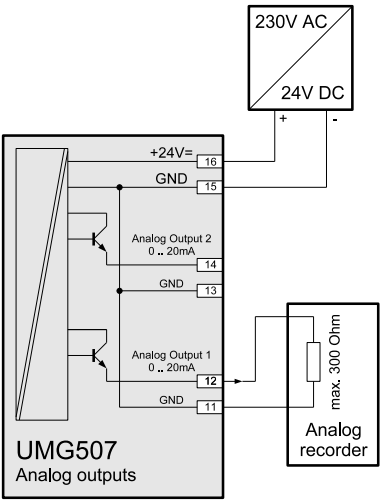


Fig. Connection of an analog output to an analog recorder.

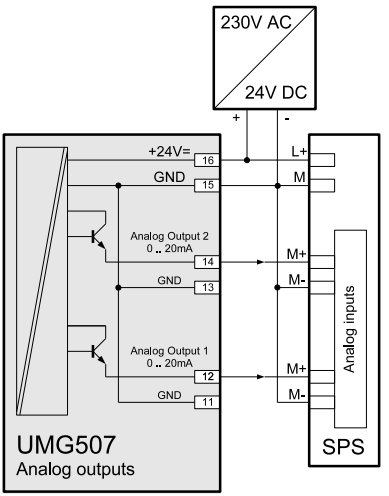


Fig. Connection of the analog outputs at an SPS Programmable controller).

Install device

The UMG507 is intended for installation in low-voltage distribution boards, in which maximum overvoltages in the overvoltage category III occur.

It can be installed in any position. The enclosed fixing branckets are to be used in the front panels or switchgear cabinet doors.

Connect device

Apply supply voltage

The size of the measuring and operating voltage for the UMG507 is given on the rating plate.

Measurement and operating voltages, which do not correspond to the values given on the rating plate, malfunctions and severe damage to the device can result.

The wiring cables for the measuring voltages to the UMG507 must be suitable for voltages up to 300V to earth and 520V phase-to-phase.

After switching on the measuring and operating voltage specified on the rating plate of the UMG507, all the segments appear in the display. About two seconds later the UMG507 switches to the first measured value display.

If no display appears, check whether the operating voltage lies within the nominal voltage range.

Apply measurement voltage

The UMG507 is suitable for the measurement of voltages of up to 500VAC to earth and 870VAC phase-to-phase.

The UMG507 is not suitable for the measurement of direct voltages. Voltages over 500VAC to earth must be connected through voltage transformers.

After connecting the measurement voltage, the measured values for the voltages L-N and L-L displayed by the UMG507 must be compared with those at the voltage measurement input. If a voltage transformer factor is programmed, this must be taken into account in the comparison.

Apply measurement current

The UMG507 is designed for the connection of ../1A and ../5A current transformers.

Only alternating currents can be measured through the current measurement inputs, not alternating currents. Current transformer terminals must be earthed on the secondary side.

Current transformers which are not loaded on the secondary side can result in dangerous contact voltages and must therefore be short-circuited.

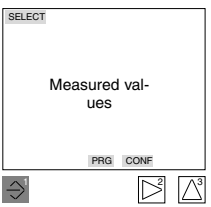
Connect the individual current transformers to the UMG50 and compare the current displayed with the applied current. The current displayed by the UMG507 must correspond to the input current, taking into account the current transformer transformation ratio.

The current transformer rator is set in the factory to 5/5A and may have to be adapted to the current transformers used.

If the current transformer is short-circuited on the secondary side, the UMG507 must display approx. zero amperes in the corresponding external conductor.

Operation and display

After the power supply has been restored the UMG507 is always in the first programed measured value display. The UMG507 is controlled using the three keys in the front.



Key	press briefly	press continuously
1	Select menu	Return to the first measured value-display (panel)
2	Panel right	Panel left
3	Panel up	Panel down

Key	**EDIT** symbol active press briefly	press continuously
1	Next digit	previous digit
2	Number * 10	Number / 10
3	Digit + 1	Digit - 1

The keys have different meetings in the various displays. If you are in a measured value display, you can use the *Key 1* to switch between

the measured value display,
the **SELECT** mode,
the configuration menu **CONF** and
the programming menu **PROG**

as shown in the figure below.

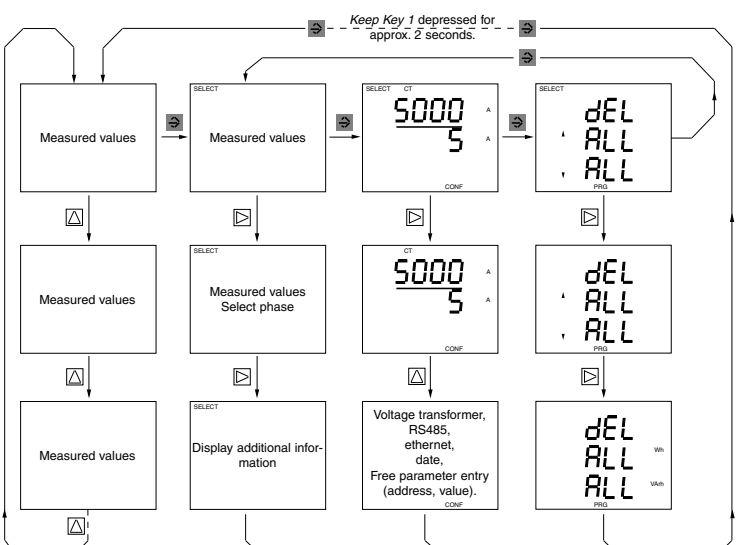


Fig. Menu overview

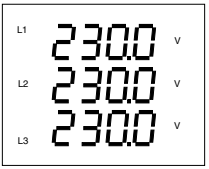
Measured value displays

After the power supply has been restored the UMG507 always displays the first programmed measured value display. Up to three measured values can be shown simultaneously in the UMG507's display.

The *Keys 2* and *3* can be used to page between the measured value displays. In order to keep the display of the selection of measured values to be displayed clear, only part of the avaialable measured values are preprogrammed for call up in the measured value display in the factory.

If other measured values are required in the UMG507's display, these can be selected on a PC using the programming and readout software **GridVis** included in the scope of supply and can then be transferred to the UNG507 through the serial interface.

Display example: Voltages L1-N, L2-N, L3-N.



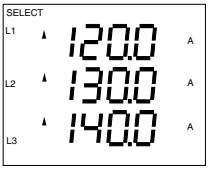
SELECT mode

Additional information such as the Date and Time can be called up directly in the measured value displays for various values and the min and max values can be individually deleted.

Mean value	▷2	Display averaging time.
	△3	Delete mean value.
Min value	▷2	Display Date and Time.
	△3	Delete min value.
Max value	▷2	Display Date and Time.
	△3	Delete max value.
Power demand	▷2	Display running time.

Example: Delete max current value in L3.

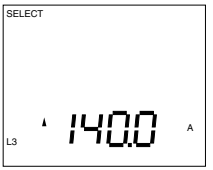
▷2 △3 Use keys 2 and 3 to page up to the max current value.

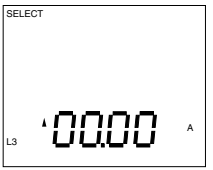


▷2 Press once. Select display.

Press 2 times. Select phase.

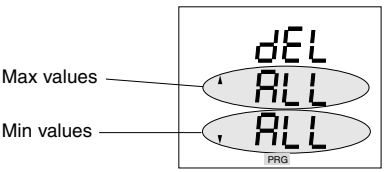
△3 Press once. Delete max value.

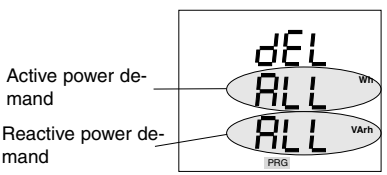




PRG menu

The active power demand, min values and max values can be deleted in groups using the PRG progamming menu.

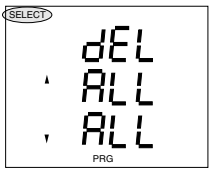




Example: Delete reactive power demand counter.

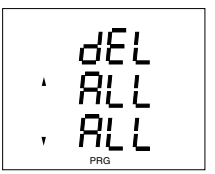
Press 3 times.

The SELECT symbol flashes.



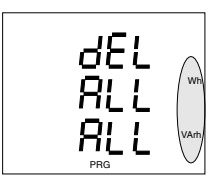
Press once.

The SELECT symbol disappears.



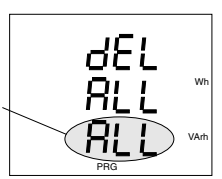
Press once.

Delete the active and reactive power demands has been selected.



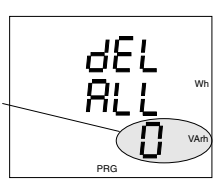
Press 2 times.

Delete reactive power demand flashes.



Press once.

The reactive power demand has been deleted.



CONF menu

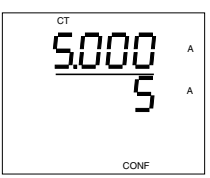
The settings required for operation of the UMG507 are stored in the configuration menu **CONF**. Among others, these are the settings for the current transformer, the device address and the programming of the interfaces.
When delivered, these settings are not protected and can be changed. Accidental changing of the settings can be prevented by using the „Password“ setting.

Overview

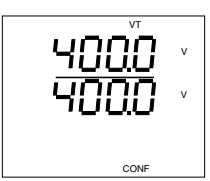
Press 2 times.

Press once.

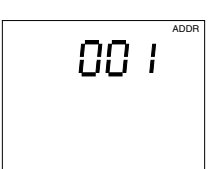
Current transformer



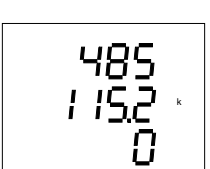
Voltage transformer



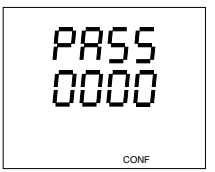
RS485, Device address



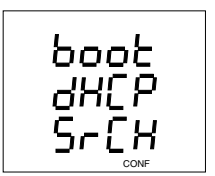
RS485, baud rate



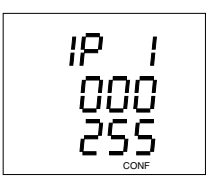
Password



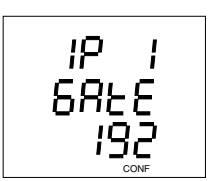
Ethernet, type of address determination



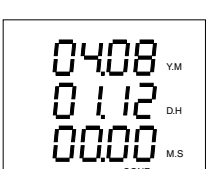
Ethernet, address



Ethernet, gateway



Date



Free parameter input (address, value)

LCD contrast

The preferred viewing direction for the LCD display is from „below“. The user can adjust the LCD contrast for the LCD display. The contrast settimg can be changed within the range of 10 to 50 in steps of 1.

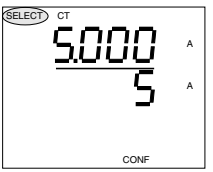
10 = Characters very light
50 = Characters very dark

Factory setting: 20

Program LCD contrast

The value for the LCD contrast is entered directly in the address 3561.

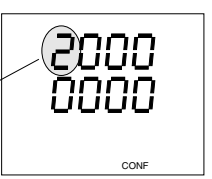
Press 2 times.
The Select **text** flashes.
The current transformer setting is displayed.



Press once.
The Select **text** disappears.
The device is in **Programming** mode.

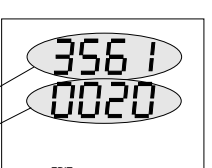
Switch to the „**Free parameter input**“ menu item.

Press 9 times.
Press once.
The first digit flashes.



Enter the address 3561 first and then the required value.

Change digit.
Select digit.
Address
Value



Connection options

In the factory the UMG507 is preset for measurement in systems with N (four-wire measurement).

0 = Four-wire measurement
1 = Measurement without N

Factory setting: 0

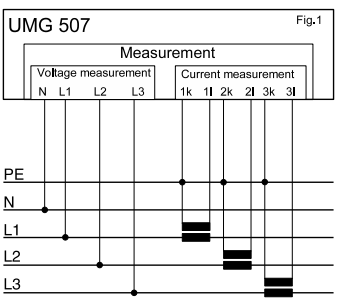
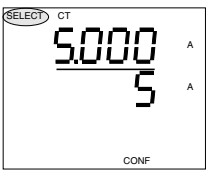


Fig.1 Three-phase measurement with PEN conductor. (four-wire measurement)

Programm connection options
The value for the connection options is directly transferred to the address 6289.

Press 2 times.
The **Select** text flashes.
The current transformer setting is displayed.

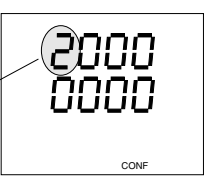


Press once.
The **Select** text disappears.
The device is in **Programming** mode.

Switch to the „**Free parameter input**“ menu item.

Press 9 times.

Press once.
The first digit flashes.



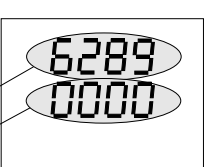
Enter the address 6289 first and then the required value.

Change digit.

Select digit.

Address

Value



Current transformer

Current transformers with either a secondary current of 1A or 5A can be connected to the UMG507.

Current transformer	Adjustment range	Preset
Primary	1A .. 999.9MA	5A
Secondary	1A .. 5A	5A

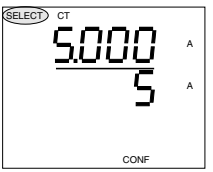
Example: summation current transformer
Current measurement takes place through one current transformer with a conversion ratio of 1000/5A and a current transformer with a conversion ratio of 200/5A. The total measurement is carried out by a summation transformer 5+5/5A.
The UMG507 must then be programmed with the following values:

Primary current: 1000A + 200A = **1200A**
Secondary current: **5A**

Program current transformer

Press 2 times.

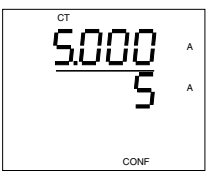
The **Select** text flashes.



Confirm selection.

Press once.

The **Select** text disappears.



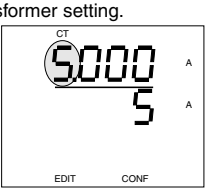
Change current transformer setting.

Press once.

The first digit of the primary current flashes.

Change digit.

Move decimal point.



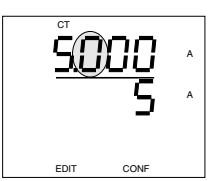
Select next digit.

Press once.

The second digit of the primary current flashes.

Change digit.

Move decimal point.



If none of the digits are flashing any more, you can use Key 3 to switch to the voltage transformer displays.

Voltage transformer

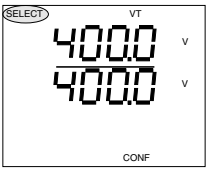
The pre-programmed voltage transformer ratio only has to be changed if voltage transformers are connected. The **outer conductor to outer conductor (L-L)** voltage is given as the secondary and primary voltage in the display of the UMG507.

Voltage transformer (L-L)	Set range	Preset
Primary	100V .. 999.9MV	400V
Secondary	100V .. 500V	400V

Program voltage transformer

Press 2 times.

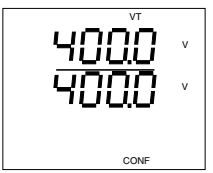
The **Select** text flashes.



Auswahl bestätigen.

Press once.

The Select **text** disappears.



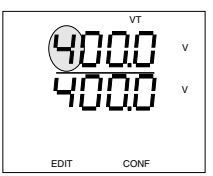
Change voltage transformer setting.

Press once.

The first digit of the primary current flashes.

Change digit.

Move decimal point.



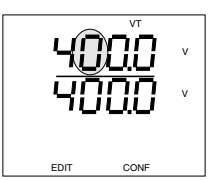
Select the next digit.

Press once.

The second digit of the primary current flashes.

Change digit.

Move decimal point.



If none of the digits are flashing any more, you can use Key 3 to switch to the voltage transformer display.

Network setting

Each device in a system must have its own address. The ethernet and RS485 are independent systems and have their own addresses.

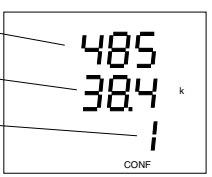
RS485

Modbus protocol

Address setting range for use of the **Modbus protocol**:

001 ... 247

The factory setting for the address is 001.



Interface

Baud rate

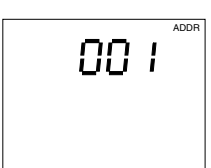
transfer protocols:
0=Modbus slave
1=Modbus master
2=Profibus

Profibus protocol

Address setting range for use of the **Profibus protocol**:

000 ... 126

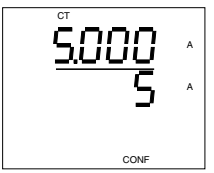
The factory setting for the address is 001.



RS485 Network address = 1

Program network address

Press 2 times.
The **Select** text flashes.
The current transformer setting is displayed.

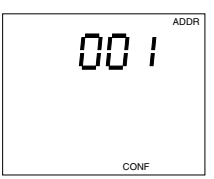


Press once.
The **Select** text disappears.
The device is in **Programming** mode.

Switch to the „**Network address**“ menu item.

Press 2 times.

The current network address is displayed



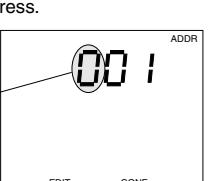
Change network address.

Press once.

The first digit flashes.

Change digit.

Select digit.



Ethernet (TCP/IP)

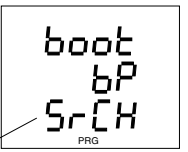
The network settings for the ethernet are specified by the network administrator and set at the UMG507 accordingly.
If the setting is unknown, do not plug the patch cable into the UMG507.

boot	Meaning
oFF	The IP address must be entered at the UMG507.
bP	The UMG507 obtains the IP address and network configuration (sub-network/gateway) from the **boot server**.
dHCP	The UMG507 obtains the IP address and network configuration (sub-network/ gateway) from the **DHCP server**.

Factory setting: dHCP

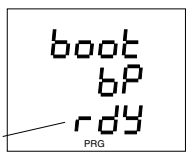
Boot bP

The UMG507 obtains the IP address and network configuration (sub-network/gateway) from the **boot server**.



Search

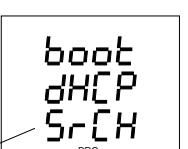
The UMG507 has been assigned a network address.



Ready

Boot DHCP

The UMG507 obtains the IP address and network configuration (sub-network/gateway) from the **DHCP server**.



Search

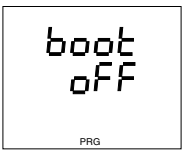
The UMG507 has been automatically assigned a network address.

Ready

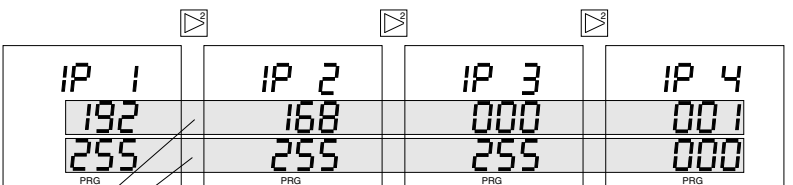
Configuration

Boot oFF

The IP address and network configuration (sub-network/gateway) must be entered directly at the UMG507.

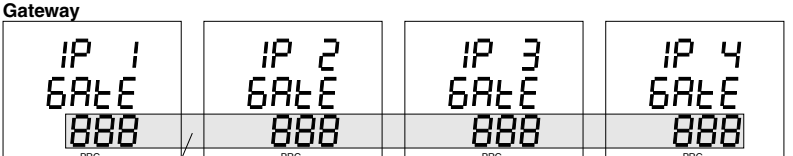


Address and netmask



Address
Netmask

Gateway



Gateway-address

Password

In order to make it difficult to accidentally change the programmed data using the keyboard or the WEB interface, a password and a password mode can be programmed. It is only possible to switch to the pramming menus and to change the programmed data after the password has been correctly entered.

In the factory, no password (0000) and no password mode (0000) are preset. In this case the password query is skipped.

Setting range:
Password = 0 .. 9999
Password mode = 0, 1, 2, 128, 129, 130

Factory setting:
Password = 0
Password mode = 0

Password = 0000 => no password
= 1-9999 => with password

Password mode

The password mode controls access to the UMG507 over the ethernet. The UMG507 has six password modes:

0 - Anybody can access the UMG507 over the ethernet.

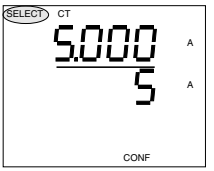
1 - Only the host names stored in the UMG507 can access the UMG507 over the ethernet.

2 - The UMG507 can only be accessed over the ethernet with a password.

0/1/2 + 128 => **128, 129, 130**
If 128 is added to the password mode 0, 1 or 2 the password is queried for each change to a configuation side.

Program password

Press 2 times.
The **Select** text flashes.
The current transfomer setting is displayed.



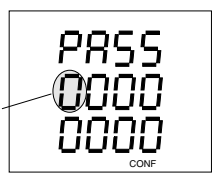
Press once.
The **Select** text disappears.
The device is in **programming** mode.

Switch to the password menu **PASS**.

Press 5 times.

Press once.

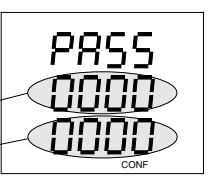
The first digit flashes.



Change password and password mode.

Change digit.

Select digit.



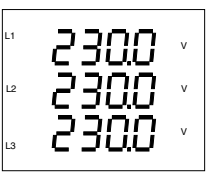
If a **password** has been changed and is no longer known, the device must be sent to the manufacturer.

Checking the Measured Values

Voltage

In the voltage display you should check the L-N and/or L-L voltages. If one or several voltages are missing here, there is possibly a wiring error.

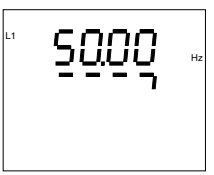
If the displayed values do not correspond to the actual voltages, check the voltage transformer setting.



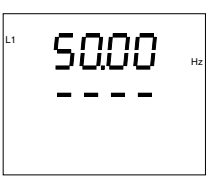
Phase sequence

If all the voltage circuits have been connected, the UMG507 displays the phase sequence.

If all the segments in the display run in a clockwise direction, a right-hand rotating field exists. If the segments in the display run in an anti-clockwise direction, a left-hand rotating field exists.



If the segments in the display are at a standstill there is not rotating field. In this case the voltage circuits have probably not all been properly connected.



Checking the Measured Values

Current

Switch to the currents display. The read off balues should agree with the currents actually flowing. If not, check the wiring and the currency transformer setting.

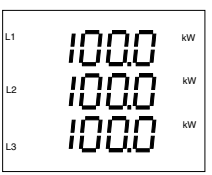
Check the current direction

Short-circuit two current transformers on the secondary side. The active power displayed in the remaining phase of the UMG507 must now be positive (+) for drawing of active power and negative (-) for supply (generator operation) of active power.

If no active power is displayed the assignment of the voltages to the currents may be wrong.

Power

Select the display of the active power of the three phases. Assuming that there is no generator operation, positive active powers of a similar size should be displayed for each phase. If not, the current transformers are probably reversed or assigned to the wrong phase.



Check the individual powers

If a current transformer has been assigned to the wrong outer conductor, the corresponding power will be incorrectly measured and displayed.

The assignment of the outer conductor to the current transformer at the UMG507 is correct if there is no voltage between the outer conductor and the corresponding current transformer (primary).

In order to ensure that an outer conductor at the voltage measurement input is assigned to the correct current transformer, the respective current transformer can be short-circuited on the secondary side. The apparent power displayed by the UMG507 must then be approx. zero in this phase.

If the apparent power is correctly displayed but the active power is displayed with a „-“ sign then the current transformer terminals are reversed or power is supplied to the power supply company.

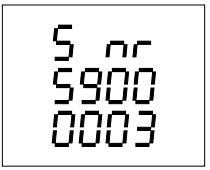
Check the total power outputs

If all voltages, currents and outputs for the respective outer conductors are correctly displayed, the total power outputs measured by the UMG507 must also be correct. To confirm this, the total outputs measured by the UMG507 should be compared with the work of the active and reactive power meters located in the incoming supply.

System Informationen

Serial number

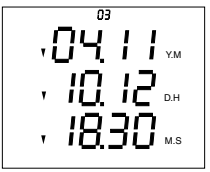
Each device has its own, unchangeable 8 digit serial number. The serial number is on the rating plate and can also be called up via the display.



In the example shown the series number 5900 0003 is displayed.

Date and time

The UMG507 displays the local time. The UTC time is used for data storage. The date and time in the UMG507 can be set using hte GridVis software (scope of supply) or using an NTP time server in the net work.



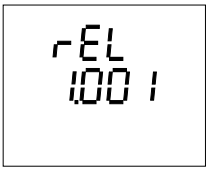
Date = 10. Nov. 2004
Time = 12h 18m 30s

UTC
UTC (Universal Time Coordinated) is the international time standard.

NTP server (time server)
The time between various computers can be precisely synchronised to approx. +/- 10ms using an NTP server (Network Time Protocol) which support broadcasts.

Software release

The software for the UMG507 is continuously improved and extended. The software status in the device is identified with a 4 digit number, the software release. The software release cannot be changed by the user.



In the example shown the software release 1.001 is displayed.

Service and Maintenance

Service

If questions arise, which are not described in this manual, please contact us directly.
In order to deal with questions, we will need the following information:

- Device designation (see rating plate),
- Serial number (see rating plate),
- Auxiliary voltage (see rating plate),
- Software release (display) and
- Precise description of the error.

You can contact us:

Mo to Th 07:00h to 15:00h
Fr 07:00h to 12:00h

Janitza electronics GmbH
Vor dem Polstück 1
D-35633 Lahnau
Support: Tel. **(0 64 41) 9642-22**
Fax (0 64 41) 9642-30
e-mail: **info@janitza.de**

Maintenance

The device is subjected to various safety tests before being delivered and is marked with a seal. If a device is opened the safety tests must be repeated.
We only provide a warranty for unopened devices.

Repair and calibration

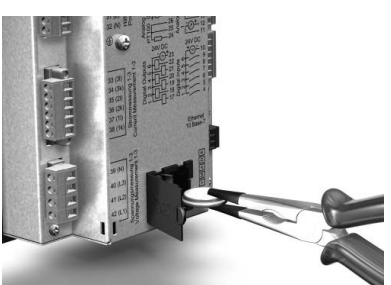
Repair and calibration work can only be carried out in the manufacturing factory.

Front foil

The front foil can be cleaned with a soft cloth and the usual domestic cleaning agents.
Never use acids or cleaning agents containing acids to clean the device.

Battery

The life expectancy of the battery at a storage temperature of +45°C is at least 5 years. The typical life expectancy of the battery is 8 to 10 years.
The battery (type CR2450N 3V/540mAh) can be replaced by the user.



Disposal

The device can be disposed of as electronic scrap in accordance with the legal provisions for recycling. The lithium battery installed must be disposed of separately.

What to do in case of faults

Possible fault	Cause	Remedy
No display.	External fuse has tripped. Internal fuse has tripped. Device defective.	Replace fuse. Fuse cannot be replaced by the user. Send the device to the manufacturer for repair. Send the device to the manufacturer for repair.
Poorly legible display.	Contrast setting too dark or too light.	Adjust contrast.
No current display.	Measuring voltage not connected. Current transformer not connected.	Connect measurement voltage. Connect current transformer.
Current too small.	Current measurement in the wrong phase. Current transformer factor incorrectly programmed.	Check connection and correct if necessary. Read off and program the current transformer conversion ratio at the current transformer.
Current too large.	Measuring range exceeded. The peak current value at the measurement input has been exceeded by harmonic components.	Install larger current transformer. **Attention!** It must be ensured that the measurement inputs are not overloaded.
Voltage L-N too small.	Measurement in the wrong phase. Voltage transformer factor incorrectly programmed.	Check connection and correct if necessary. Read off and program the voltage transformer conversion ratio at the voltage transformer. If the voltage is not measured through a voltage transformer, program the voltage transformer conversion ratio as 400/400. Install smaller voltage transformer.

Possible fault	Cause	Remedy
Date skips to 1.1.1970	The battery is dead.	Send the device to the manufacturer for a battery replacement.
Programming data or saved data is lost.	The device has been exposed to electromagnetic interferences, which are greater than those given in the technical specifications.	Take external protective measures, e.g. screening, filtering, earthing or spatial separation.
Active power too small / too large.	The current transformer conversion ratio is incorrectly programmed. Current circuit assigned to the wrong voltage circuit. Current at the measurement input lies outsite the measuring range. Voltage transformer conversion ratio is incorrectly programmed. Voltage at the measurement input lies outside the measuring range.	Read off and program the current transformer conversion ratio at the current transformer. Check the connection and correct if necessary. Install larger or smaller current transformer. Read off and program the voltage transformer conversion ratio at the voltage transformer. If the voltage is not measured using a voltage transformer, program voltage transformer 400/400. Install larger or smaller voltage transformer.
Active power drawing / supply reversed.	At least one current transformer connection is reversed. Current circuit is assigned to the wrong voltage circuit.	Check the connection and correct if necessary. Check the connection and correct if necessary.
„**EEEE A**“ in the display.	The current measuring range has been exceeded.	Check the measured current and if necessary install a suitable current transformer.
„**EEEE V**“ in the display.	The voltage measuring range has been exceeded.	Check the measured voltage and if necessary install a suitable voltage transformer.
Digital output or pulse output do not react.	No source has been assigned to the output.	Program the output.
Despite the above measures the device still doesn‘t work.	device defekt.	Send the device to the manufacturer for checking, with a precise description of the fault.

Technical Specifications

Overview of measured values

Designation	Measured values	Mean-values	Max-values	Min-values
Voltage				
U_{L1-N}, U_{L2-N}, U_{L3-N}	x	x	x	x
U_{L1-L2}, U_{L2-L3}, U_{L3-L1}	x	x	x	x
Current				
I_{L1}, I_{L2}, I_{L3}, I_N	x	x	x	
Mean current values I_{L1}, I_{L2}, I_{L3}, I_N			x	
Phase position				
CosPhi$_{L1}$, CosPhi$_{L2}$, CosPhi$_{L3}$, CosPhi$_{Sum}$,	x	x	x	x
Power output				
P_{L1}, P_{L2}, P_{L3}, P_{sum},	x	x	x	
Q_{L1}, Q_{L2}, Q_{L3}, Q_{sum},	x	x	x	
S_{L1}, S_{L2}, S_{L3}, S_{sum},	x	x	x	
Mean output values P_{L1}, P_{L2}, P_{L1}, P_{sum}				x
Frequency in L1	x	x	x	x
Negative, positive, zero phase sequence sys.	x	x	x	x
Voltage symmetry	x	x	x	x
Phase sequence	x	x	x	x
K-factor L1, L2, L3,	x	x	x	x
Fourier analysis DFT(1, 3, 5, 7, 9, .. 15)				
Voltage U_{L1-N}, U_{L2-N}, U_{L3-N}	x	x	x	x
Current I_{L1}, I_{L2}, I_{L3},	x	x	x	x
THD				
U_{L1-N}, U_{L2-N}, U_{L3-N}	x	x	x	
I_{L1}, I_{L2}, I_{L3}	x	x	x	
Work				
Active energy (without backstop)	x			
Active energy (drawn)	x			
Active energy (supply)	x			
Tarrifs 1 .. 4				
Active energy(without backstop)	x			
Active energy (drawn)	x			
Active energy (supply)	x			
EMAX active power	x		x	
EMAX trend value	x			
Inputs and outputs				
Temperature measurement input	x	x	x	x
Temperature measurement, internal	x	x	x	x
Analog input (0/4 .. 20mA)	x	x	x	x
Analog outputs (0, 1)	x			
Digital outputs (1 .. 6)	x			
Digital inputs (1 .. 6)	x			
Active power, S0-inputs (1 .. 6)	x			
Meters (1 .. 6)	x			

Technical Specifications

Measurement uncertainty

The measurement uncertainty of the UMG507 applies to the use of the following measuring ranges. The measured value must lie within the given limits. Outside of these limits the measurement uncertainty is not specified. The ambient temperature must lie within the range 18 ... 28°C. Outside of this temperature range an additional measuring error must be taken into account.

Measured value	Measuring range	Crest factor for max. RMS-Measured value
Voltage	50 ... 500V_{rms}	1.1
Current	0.005 ... 6A_{rms}	1.4

The power measuring range is calculated from the current and voltage measuring ranges chosen. (*rng P = rng U * rng I*).

Measured value	Frequency	Measurement uncertainties
Voltage	45 .. 65Hz	±(0.2% rdg + 0.02% rng)
Current L	45 .. 65Hz	±(0.2% rdg + 0.05% rng)
Current N	45 .. 65Hz	±(0.6% rdg + 0.05% rng)
Phase	45 .. 65Hz	±0.5°
Power	45 .. 65Hz	±(0.4% rdg + 0.1% rng
Frequency	45 .. 65Hz	±(0.2% rdg + 0.75% rng

The specification applies under the following conditions:

Annual recalibration.

A preheating time of 10 minutes.

An ambient temperature of 18 .. 28°C.

If the device is operated outside the range from 18 .. 28°C , an additional measurement error of ±0.01% of the measured value per °C deviation must be taken into account.

Accuracy class to EN61036:1996, VDE0418 Part 7: May 1997, IEC1036:1996

with current transformer ../5A : Class 1

with current transformer ../1A : Class 2

Measured value	Measurement uncertainties
Accuracy of the internal clock	±2 minutes/month (18°C ... 28 °C)

Abbreviations used:

rng = of the measured range

rdg = of the measured value

Technical Specifications

Weight	: 850g
Calorific value	: 2.2MJ (610Wh)
Installed location	: any
Connectable conductors	
Solid , stranded, flexible	: 0.08 - 2.5mm2
Plug connector, wire end ferrule	: 1.5mm2 only one conductor may be connected for each terminal connection!

Ambient conditions

Operating temperature range	: -10°C .. +55°C
Storage temperature range	: -20°C .. +70°C
Relative air humidity	: 15% .. 95% without condensation
Operating altitude	: 0 .. 2000m above sea level

Degree of protection

Front	: IP50 to IEC529
Front with seal (option)	: IP65 to IEC529
Rear	: IP20 to IEC529
Pluggable screw terminal	: IP20 to IEC529

Auxiliary power (see rating plate)	: 300V CATIII
Test voltage	: 3150V DC
Range 1 (standard)	: 85 .. 265V AC, 120 .. 370V DC
Range 2 (option)	: 40 .. 115V AC, 55 .. 165V DC
Range 3 (option)	: 15 .. 50V AC, 20 .. 70V DC
Back-up fuse	: 4A .. 10A (medium time lag)
Power consumption	: max. 5W, max. 9VA

Measurement

Current measurement

Overvoltage category	: 300V CATII, 150V CATIII
Test voltage	: 2000V DC
Power consumption	: approx. 0.2 VA
Nominal current for ../5A (../1A)	: 5A (1A)
Limit current	: 9.5A (sinusoidal)
Overload, continuous	: 6A (sinusoidal)
Overload	: 60A for 1 sec.

Voltage measurement

Overvoltage category	: 500V CATIII
Test voltage	: 4200V DC
Impedance	: 4MOhm/Phase
Power consumption	: approx. 0.1 VA
Measuring range L-N	: 50 .. 500V AC
Measuring range L-L	: 90 .. 870V AC
Frequency of the fundamental component	: 45Hz.. 65Hz

Technical Specifications

Inputs and outputs

Digital inputs and outputs

Overvoltage category	: 32V CATI
Refreshment rate	
inputs, outputs, flags	: 50Hz 200ms; 60Hz 167ms
6 Digital inputs	
Maximum counting frequency (S0)	: 20Hz
Current input	: approx 1mA .. 6mA
6 Digital outputs, positive switching (not short-circuit proof)	
As switching output	
Switching voltage	: max. 28VDC
Switching current	: max. 30mA
Switching frequency (50Hz system)	: max. 2.5Hz
Switching frequency (60Hz system)	: max. 3Hz
Auxiliary voltage, external	: 20V .. 28VDC
As pulse output (S0)	
Switching frequency	: max. 20Hz
Switching current	: max. 30mA
Max. cable length	: 100m
Auxiliary voltage, external	: 20V .. 28VDC

Analog inputs and outputs (options)

Overvoltage category	: 32V CATI
Accuracy	: +-1.5% vMb.
2 analog outputs	: 0/4 .. 20mA
Burden	: max. 300 Ohm
External auxiliary power	: 20V .. 28V DC
Residual ripple	: max. 2V, 50Hz
1 analog input „0 .. 20mA“	: 0 .. 20mA
1 analog input „PT100“	: PT100, PT1000, KTY83, KTY84

Interfaces (options)

Overvoltage category	: 32V CATI
RS232	: 3-pin screw-plug in terminals.
Protocol	: Modbus RTU
Transfer rate	: 38.4kbps
RS485 (option)	: Connector, SUB D 9-pin
Protocol, profibus (option)	: Profibus DP/V0 to EN 50170
Transfer rate	: 9.6kBaud up to 1.5MBaud
Protocoll, Modbus RTU	: Modbus RTU/Slave, RTU/Master
Transfer rate	: 9600bps, 19.2kbps, 38.4kbps, 115.2kbps
Ethernet 10/100Base-TX (option)	
Connection	: RJ-45
Functions	: Modbus gateway, embedded webserver
Protocols	: TCP/IP, EMAIL(SMTP), DHCP(BootP), Modbus-TCP, Modbus over Ethernet, Ping, NTP.

Master/Slave operation via RS485 only possible with UMG 96S, UMG 503, UMG 505, Prophi and ProData.

Dimensioned drawings

Burst size: $138^{+0.8}$ x $138^{+0.8}$ mm

Rear

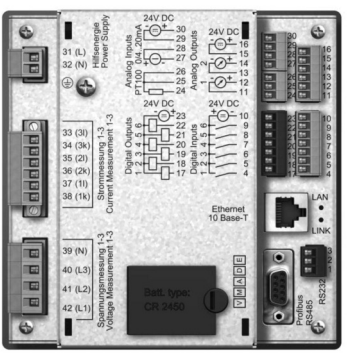
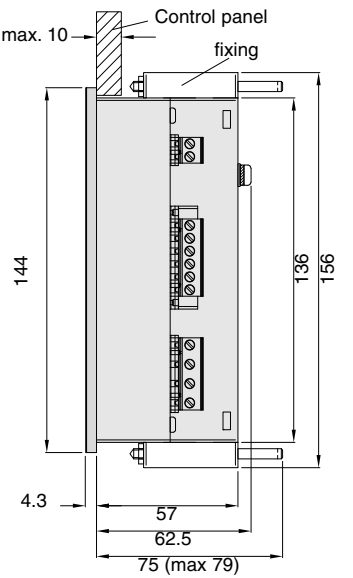


Fig. View of the rear of the device. Shows all options.

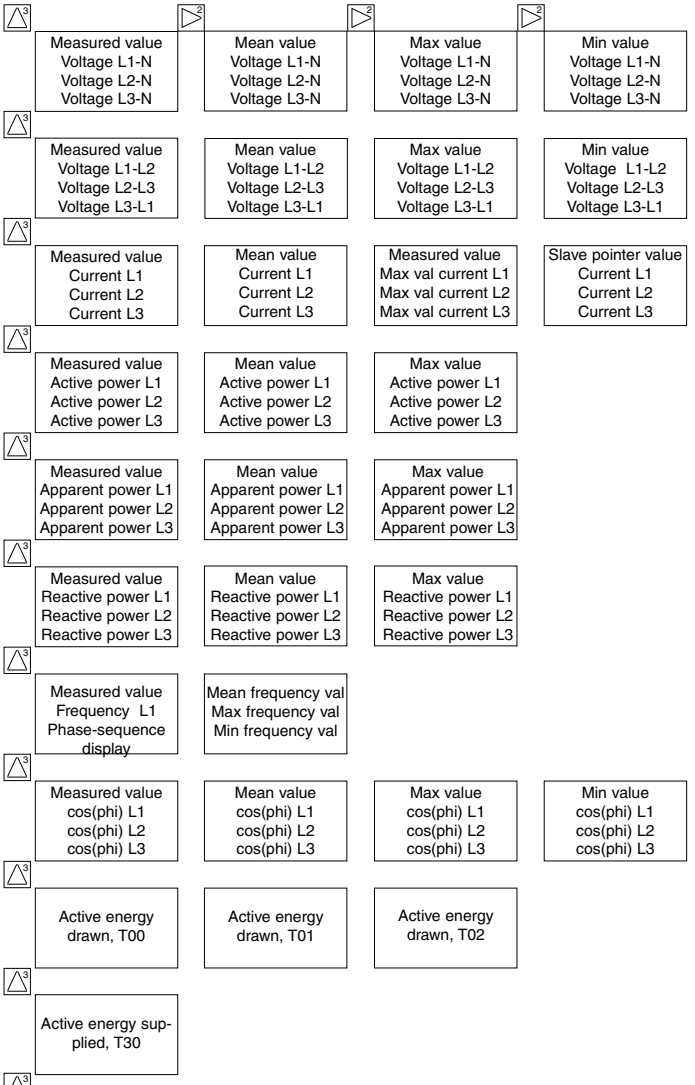
Side view



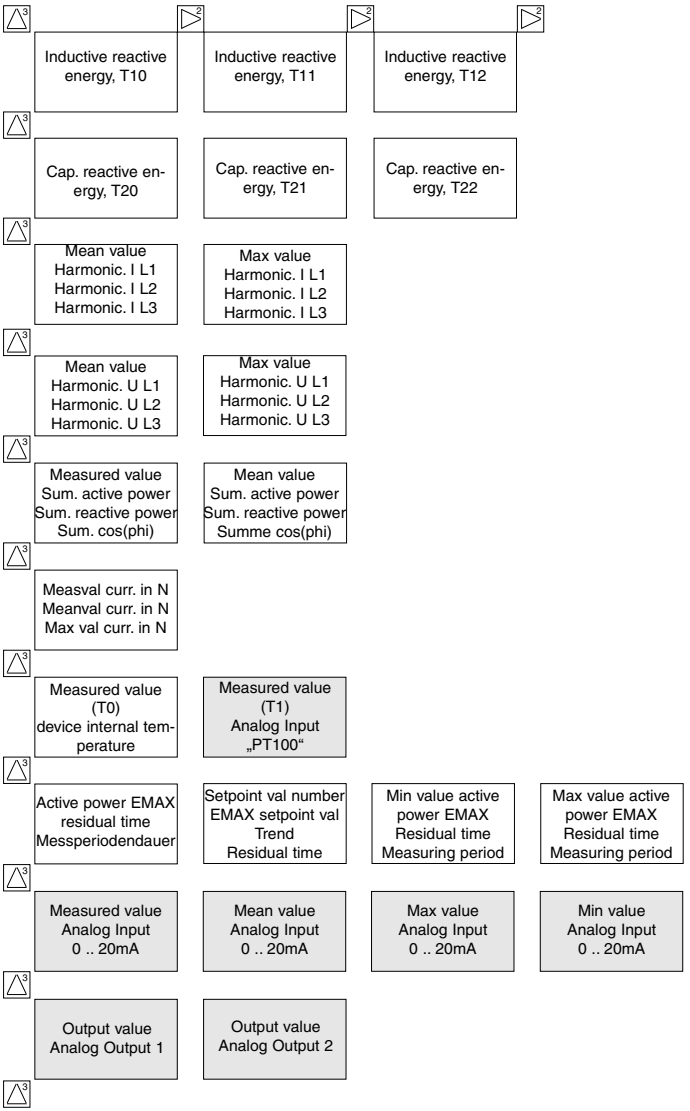
All dimensions in mm

Appendix

Measured value displays (factory default settings)

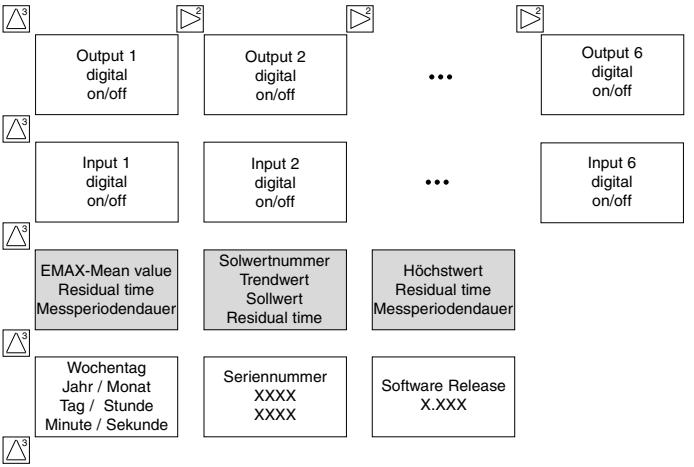


Appendix



These measured value displays are **not** available in all device options.

Appendix



Diese Messwertanzeigen stehen **nicht** in allen Gerätevarianten zur Verfügung.

Appendix

Declaration of conformity

The UMG507 fullfils the safety requirements of the:
Directive 89/336/EEC in conjunction with **DIN EN61326 (2002-03)** and the
Directives 73/23/EEC and **93/68/EEC** in conjunction with **EN 61010-1** (2002-08)

Safety regulations

Safety regulations for electrical measurement, control and laboratory equipment	: EN61010-1 08:2002, IEC 61010-1:2001
Class of protection	: I (device with protective conductor)

EMC requirements

Emitted interference,	
residential area	: DIN EN61326:2002-03, Table 4 Class B
Noise immunity, industrial area	: DIN EN61326:2002-03, Table A.1
Housing	: Electrostat. discharge, IEC61000-4-2(4kV/8kV)
	: Electromagn. fields, IEC61000-4-3:2002 (10V/m)
	: Electromagn. fields, IEC61000-4-8:2000 (100A/m)
Operating voltage	: Voltage dip, IEC61000-4-11 (0.5 period.)
	: Bursts, IEC61000-4-4 (2kV)
	: Impulse voltages, IEC61000-4-5 (1kV L to N)
	: Conducted HF signals, IEC61000-4-6 (3V)
Measured inputs	: Impulse voltages, IEC61000-4-5 (2kV)
	: Conducted HF signals, IEC61000-4-6 (3V)
	: Bursts, IEC61000-4-4 (2kV)
RS485, dig. inputs and outputs	: Conducted HF signals, IEC61000-4-6 (3V)
	: Bursts, IEC61000-4-4 (1kV)

Connection example

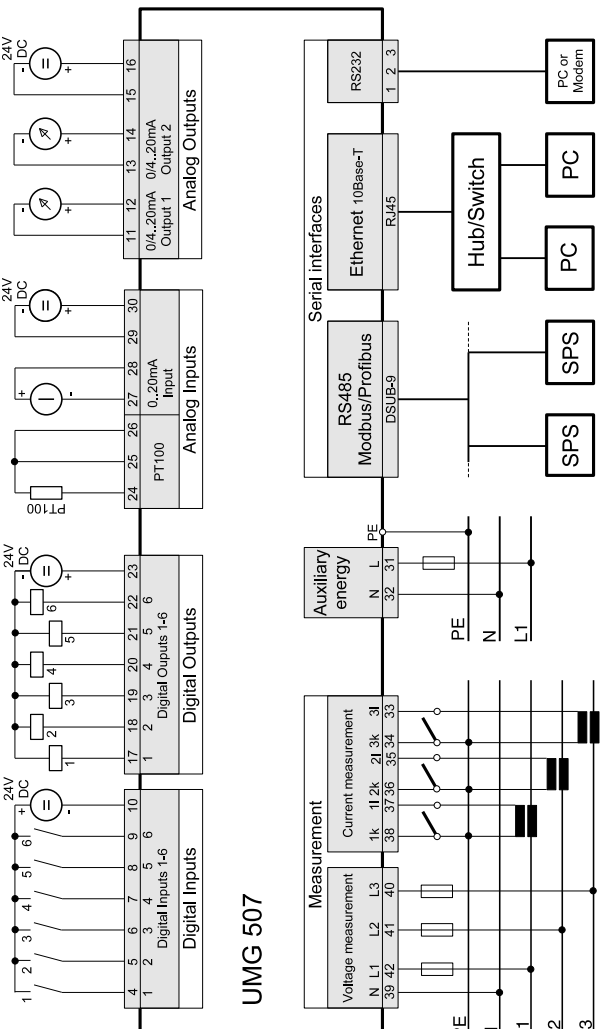
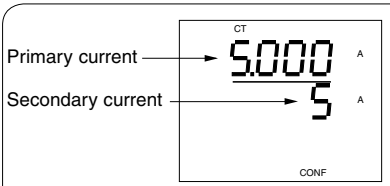


Fig. UMG507 Connections overvbiew with all options.

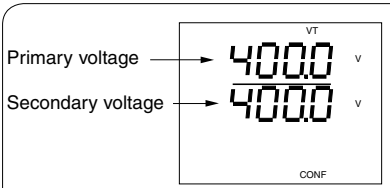
Brief Instructions

Set current transformer



1	2 x	Select programming menu.
2	1 x	Select current transformer.
1		Select digit.
3		Change digit.
2		Shift decimal point.
1	2 sec.	Save and display measured value.

Set voltage transformer



1	2 x	Select programming menu.
2	1 x	Confirm selection.
3	1 x	Select voltage transformer.
1		Select digit.
3		Change digit.
2		Shift decimal point.
1	2 sec.	Save and display measured value.