



INDUSTRIAL DATA COMMUNICATION



Mobile communication modem EasyGateway

Data connection and simple commissioning

- Communication Gateway for wireless and hard-wired communication
- The EasyGateway EG400 connects the UMG measuring devices with Ethernet interface with the PC via mobile network
- The system software GridVis® includes a driver, which enables the simple establishment of a connection with the measuring devices via the EG400
- Connection of the EasyGateway to the measuring device
- Setting up the measuring device in GridVis® and selection of the EasyGateway communication
- Activation of the connection via GridVis® necessary
- Suitable for: UMG 604-PRO, UMG 605-PRO, UMG 96RM-E, UMG 508, UMG 509-PRO, UMG 511 und UMG 512-PRO



Managed Service – Connect-2-Control¹

- Connect-2-Control (C2C) is a simple and secure managed solution
- Simple access to the measuring device (location-independent) is guaranteed via public IP networks (internet, mobile data networks, company networks)
- Certificate-protected security (SSL)
- SSL-encrypted from the PC to the Gateway
- No VPN tunnel required
- Managing static IP addresses

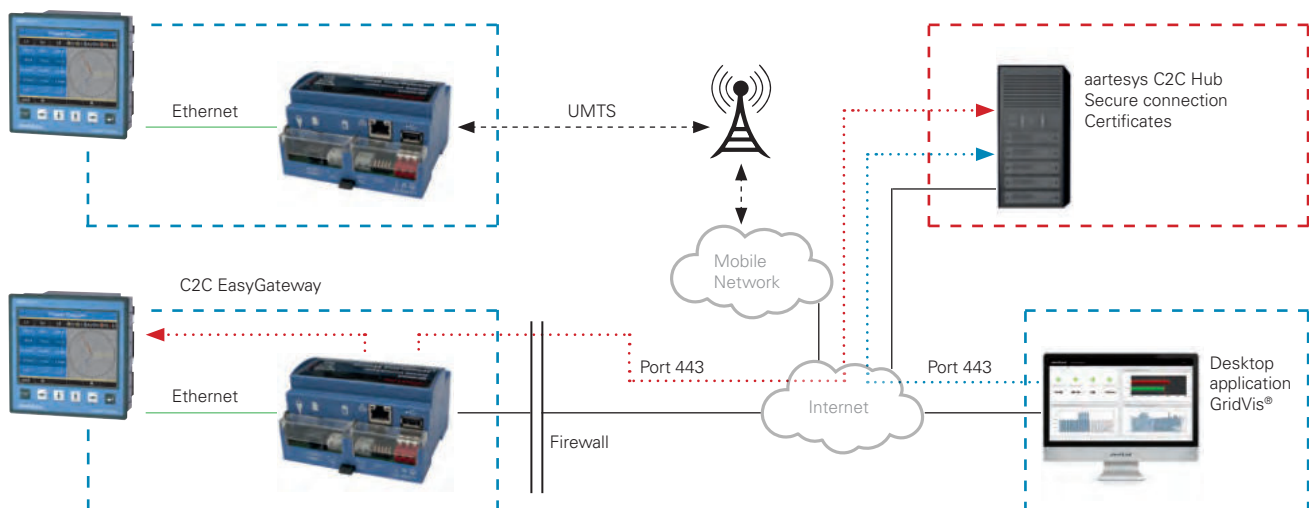


Fig.: Secure SSL-encrypted measurement data transfer

¹ The connect-2-control service for the administration of the local, static IP addresses of our Janitza devices as well as the startup is offered by aartsys. The relevant application form is included to the shipment of the EasyGateway or can be downloaded under <https://www.janitza.com/c2c-service>



Technical data

Communication Gateway for wireless and hard-wired communication	
Item number	15.06.088
Supply voltage	85 – 264 V AC (integrated power supply)
Frequency	44 – 440 Hz
Interfaces	
Ethernet 10 / 100 Base-TX	RJ45 (for hard-wired communication)
Communication	
UMTS / HSPA6+	yes (for fast internet connection via mobile network)
Integrated security module for secure, certificate-protected communication	yes
General data	
Operating system	Embedded LINUX
Processor	ARM 9
Cycle rate	400 MHz
Memory (RAM)	256 MB
Memory (Flash)	256 MB
Hardware	
Screw-on antenna or external antenna via SMA antenna connector	yes
SIM card slot	integrated
Power supply	standard AC
Mechanical data	
Installation	35-mm DIN top-hat rail
Integrated wall fastening	yes
Housing	closed 3-part plastic housing
Protection class	IP20
LED indications	4 units (2-colour for commissioning and operating display)
Weight	280 g
Dimensions in mm (H x W x D)	63 x 106 x 90
Accessories	
AMR rubber antenna, 2 m cable	15.06.089
Extension cable, 5 m	15.06.091
Extension cable, 10 m	15.06.092
Angled antenna	15.06.093
INOX antenna mounting bracket	15.06.094

Gateway MBUS-GEM

M-Bus Gateway on Modbus TCP

- Communication interface for the integration of consumer meters in GridVis®.
- Connection at control level
- Standard per IEC6115
- Supply voltage: 24 V DC +/- 5%, screw-type terminal
- M-Bus per EN 13757-2, screw-type terminal
- Ethernet 100 MBit, RJ45 socket, screened
- High-performance driver for the connection of up to 80 standard loads
- Highly compact design (W x H x D in mm) 35 x 89 x 58
- Spatial requirements 2TE wide for mounting on DIN rail 35 mm
- Galvanic separation from the M-Bus and RJ45
- Suited for use in industrial areas

Commissioning by Janitza is recommended.
For more detailed information please refer to chapter 9.



Technical data

MBUS-GEM Gateway	
Item number	15.06.108
Architecture	Controller-based gateway
Supply	24 V DC, < 300 mA, max. 2.5 mm ²
M-Bus connections	Screw-type terminal, max. 2.5 mm ²
Ethernet connection	100 MBit, RJ45, screened
Dimensions	35 x 89 x 58 (W x H x D in mm)
Assembly	DIN mounting rail 35 mm, IP40
Max. Baud rate	300, 2400 or 9600 bps
Number of slaves	max. 80 standard loads
IP address	freely configurable or by DHCP
TCP port	freely configurable

PowerToStore

Buffer power supply with capacitors

- Typically serves to bridge short term interruptions
- Operates with integrated ultra-capacitors for energy storage
- With a supply voltage interruption, the stored energy of the ultra-capacitors is released on a regulated basis
- A buffer module feeds the load up to full discharge
- The buffer time is dependent on the charge status of the capacitor and the height of the discharge current
- Can be used only with 24-V UMG devices

Main features

- Lifelong maintenance-free
- Compact housing
- Deep-discharge proof consequently unlimited storage time
- Operation possible under extreme temperature conditions
- No gas generation, therefore installation in hermetically-sealed housings possible
- Rapid availability because short charging time after discharging



Technical data

PowerToStore (PTS)	
Item number	15.06.405
Input	
Nominal input voltage	115 – 230 V AC
Stored energy in Ws	1,000
Output	
Output voltage in buffer operation	24 V DC constant
Nominal output current	3 A
Current limiting	1.05 ... 1.2 x INom
Degree of efficiency $U_a = 23.5 \text{ V DC}$, $I_a = I_{Nom}$	> 90 %
General data	
Connection type input U_E	2.5 mm ² cable cross section
Connection type output U_A	2.5 mm ² cable cross section
Connection type I/Os	1 mm ² cable cross section
Protection class	IP20
Type	PTS2403
Storage temperature	-40 ... +60 °C
Ambient temperature	-40 ... +60 °C
Weight	1.2 kg
Dimensions in mm (H x W x D)	153 x 72 x 130

Note:

The power quality analysers UMG 604-PRO / UMG 605-PRO / UMG 96RM are supplied during short term interruptions of up to 225 sec. by the buffer device (item no. 15.06.405). With the power quality analysers UMG 508 / UMG 509-PRO / UMG 511 / UMG 512-PRO, the expansion unit (item no. 15.06.406) is additionally required. With this configuration short term interruptions lasting up to 256 sec can be bridged.

D-SUB bus connector

Main features

- For RS485 (Modbus and Profibus) with the measurement devices UMG 508 and UMG 511
- D-sub connector, 9-pole
- With termination (switch on/off termination resistors)
- Axial design with two cable feeds
- Bus system: PROFIBUS DP up to 12 MBit/s
- Termination resistor can be switched in via Dip switch
- Pin assignment: 3, 5, 6, 8
- Screw-type terminal connection
- With UMG 508 / UMG 511 also for Modbus required



Fig.: SUBCON-PLUS-PROFIB/AX/SC
(item no. 13.10.539)



Technical data

D-SUB bus connector	
Item number	13.10.539
Item number	13.10.543*
Nominal voltage	50 V
Rated current	100 mA
Termination resistor	390 Ω – 220 Ω – 390 Ω (can be switched in)
Bus system	PROFIBUS DP
Max. number of plugin cycles	> 200
Connection	D-SUB plug-in connection
Number of poles	9
Connection	Print connection
Connection type	Screw terminal
Cable diameter max.	8.4 mm
Cable diameter min.	7.6 mm
Operating temperature range	-20 ... +75 °C
Storage / transport temperature range	-25 ... +80 °C
Weight	38.6 g
Dimensions in mm (H x W x D)	17 x 31.5 x 58.2
Housing material	ABS, metallized
Pin assignment:	3, 5, 6, 8

* 90° bent version



Fig.: SUBCON-PLUS-PROFIB/SC2, 90° bent version
(item no. 13.10.543)

K-7510: RS485 repeater, isolated

Main features

- One RS485 input and output respectively for the expansion of an RS485 network by a further 32 UMG devices and by a further 1.2 km transfer length
- Twin and four-wire operation RS485
- Galvanic separation up to 3 kV DC
- Automatic direction detection
- Automatic Baud rate detection
- Insulated interface
- Suitable for: UMG 103-CBM, UMG 104, UMG 604-PRO, UMG 605-PRO, UMG 96RM, Prophi®, ProData®
- Separate power supply required



Fig.: Figure similar



Technical data

RS485 repeater, isolated	
Item number	15.06.024
RS485 network expansion	by a max. length of 1.2 km and by 32 modules
Support	up to 256 RS485 devices
Max. number of repeaters per network	8
Insulation	up to 3,000 V DC
Power consumption	1.2 W
Interface connections	with screw-type terminals
Installation	DIN rail or wall mounting
Operating temperature range	-25 ... +75 °C
Weight	157 g
Dimensions in mm (H x W x D)	121 x 72 x 25

Note: Repeater is not suitable for Profibus.

K-7513: RS485 to 3 x RS485 Hub

Main features

- 1 x RS485 input and 3 x RS485 output for a RS485 star type network
- Galvanic separation up to 3 kV DC
- DIN rail or wall mounting
- Suitable for: UMG 103-CBM, UMG 104, UMG 604-PRO, UMG 605-PRO, UMG 96RM, Prophi®, ProData®
- Separate power supply required



Fig.: Figure similar



Technical data

RS485 to 3 x RS485 Hub	
Item number	15.06.035
Input	1 x RS485, twin wire (D+, D-)
Output	3 x RS485, twin wire (D+, D-)
Transmission rate	300 to 115.2 kbps
Insulation	up to 3000 V DC
Supply voltage	10 to 30 V DC
Power consumption	2.2 W
Connections	detachable screw-type terminals
Installation	DIN rail or wall mounting
Operating temperature range	-25 ... +75 °C
Weight	157 g
Dimensions in mm (H x W x D)	121 x 72 x 33
Miscellaneous	each I/O interface is equipped with its own line driver, max. 1.2 km line length per interface

USB/RS485 converter cable

Main features

- Cable length 1.8 m, expandable up to 20 m
- FTDI chip
- -40 °C up to 85 °C operating temperature range



Fig.: USB/RS485 converter cable



Technical data

USB/RS485 converter cable	
Item number	15.06.107
Cable „Yellow“	Terminal A of the RS485 interface of the measurement device
Cable „Orange“	Terminal B of the RS485 interface of the measurement device
Baud rate	9600, 19200, 38400 and 115 kBaud
Stopp bits	1 or 2
Parity	EVEN, NONE, UNEVEN

Switching power supply for DIN rail mounting

Main features

- 100–240 V wide range input
- Adjustable output voltage
- Compact design, width only 22.5 mm
- Simple mounting onto the DIN rail
- Full power between –10°C and +60°C



Technical data

Switching power supply for DIN rail mounting	
Item number	16.05.012
Input	
Input frequency	50 – 60 Hz, ±6%
Input voltage	100 – 240 V AC, –15% / +10%
Input current	0.54 / 0.3 A at 120 / 230 V AC
Output	
Output power	30 W
Output voltage	24 V DC ... 28 V DC adjustable
Output current	1.3 A at 24 V 1.1 A at 28 V
General data	
Connection	Screw-type terminal
Installation	DIN rail
Operating temperature range	–10° C to +70° C
Weight	140 g
Dimensions	75 x 22.5 x 91 mm (H x B x T)

Switching power supply with step shape/DIN rail

Main features

- Universal input 85~264 V AC (277 V AC operational)
- No load power consumption < 0.3 W
- Isolation class II
- DC output voltage adjustable
- Protections: short circuit / overload / over voltage
- Cooling by free air convection (working temperature: -30 °C ... +70 °C)
- DIN rail TS-35/7.5 or 15 mountable
- Over voltage category III
- LED indicator for power on



Technical data

Switching power supply with step shape/DIN rail	
Item number	16.05.014
Input	
Input frequency	47 – 63 Hz
Input voltage	85 – 264 V, universal input 110 – 230 V
Output	
Output power	100 W
Output voltage	24 V
Output current	4,2 A
General data	
Technology	AC/DC
Installation	DIN rail
Operating temperature range	-30° C to +70° C
Weight	270 g
Dimensions	70 x 90 x 54,5 mm (W x H x D)

Touch panels – user-friendly visualisation of measured values without PC, directly at site

Effective, sustainable observation and operation

- Visualisation of process and energy data at site
- Embedded systems in form of touch panels serve the monitoring of electrical data
- JPC35 is equipped with an RS485 or RS232 interface
- Use of compact flash memory cards
- Due to use of special processors and cooling elements cooling fans could be avoided
- Dust, dirt and moisture are not a problem thanks to high front side protection class
- Standard application available for the visualisation of up to 32 measurement points*1 (MultiTouch)

JPC35 "Multi Touch"

- Equipped with a 3.5" touch panel
- Alignment and configuration possible for various applications
- Presentation of measurement values up to 32 measurement devices*1 on one display
- User-friendly, intuitive configuration and menu guidance
- Clear assignment of the measured values through specific naming of each measurement point
- Display mode is variable and can be configured directly on the display
- UMG 604-PRO or UMG 605-PRO can be connected as the master
- RS232 interface serves the communication between master and JPC35
- JPC35 "MultiTouch" requires the free APP (expansion) "MultiTouch" (item no. 15.00.207) on the UMG measurement device



The JPC "MultiTouch" visualises the following measured values for one master and up to 31 slave devices:

Measured values	Display range	Unit
Voltage: L1, L2, L3 / L1-L2, L2-L3, L1-L3	0...999999.9 V	V
Current: L1, L2, L3, current in N	0...999999.9 A	A
Active power: L1, L2, L3, sum	0...999999.9 kW	kW
Apparent power: Sum	0...999999.9 kVA	kVA
Reactive power: Sum	0...999999.9 kvar	kvar
Cosphi: L1, L2, L3, sum	0.00 cap – 0.00 ind	-
THD: UL1, UL2, UL3	0 – 100 %	%
Frequency	45 – 65 Hz	Hz
Rotating field	left / right	-
Current averaging	0...999999.9 A with overline	Active
Active energy sum	0...99999999 kWh	kWh
Reactive energy inductive sum	0...99999999 kvarh	kvarh
Measurement points text input	max. 15 characters	-

*1 slave devices and one master device




JPC35 remote display

- Equipped with a 3.5" touch panel
- Can be used for measured value indication of a measurement point
- The measurement point name is freely configurable
- Switching between measured value list and measured value indication possible within the display mode
- Connection and communication takes place via an RS232 or RS485 interface
- No expansion (APP) is required for the application on the measurement device

Info: The measurement device address of the JPC35 remote display RS485 is always established at 1.



Overview of devices

Types	JPC35 "MultiTouch"	JPC35 remote display RS232	JPC35 remote display RS485
Item number	15.06.313	15.06.314	15.06.315
			
Front panel			
Resolution (Pixel)	240 x 240	240 x 240	240 x 240
Brightness (cd/m²)	110	110	110
Number of colours	16 greyscale	16 greyscale	16 greyscale
Input	resistive touch	resistive touch	resistive touch
Screen diagonal	3.5"	3.5"	3.5"
General technical data			
Supply voltage (external)	24 V DC ± 15 %	24 V DC ± 15 %	24 V DC ± 15 %
Weight	0.21 kg	0.21 kg	0.21 kg
Operating temperature range	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C
Storage temperature range	-10 ... +60 °C	-10 ... +60 °C	-10 ... +60 °C
External dimensions in mm (H x W x D)	96 x 96 x 40.6	96 x 96 x 40.6	96 x 96 x 40.6
Installation dimensions in mm (H x W)	89.3 x 89.3	89.3 x 89.3	89.3 x 89.3
Protection class front	IP65	IP65	IP65
CPU			
Processor (MHz)	32 Bit RISC	32 Bit RISC	32 Bit RISC
Communication			
Interfaces			
RS485	no	no	yes
RS232	yes	yes	no
Protocols			
Modbus RTU	yes	yes	yes
Applications (optional)			
Visualisation of measured values of the slave devices possible	yes	no	no
Expansion required (APP)	yes	no	no

Efficient variant diversity of the JPC35

JPC35 "MultiTouch" Box, item no. 15.06.313

Requisite components

- JPC35 (item no. 15.06.313)
- 1 master (UMG 604 / UMG 605)
- 0 to 31 slave(s) (UMG 103-CBM, UMG 104, MG 604-PRO, UMG 605-PRO and UMG 96RM)
- 1 mains adapter 24 V (e.g. item no. 16.05.002)
- APP "MultiTouch" (item no. 51.00.207)

Information

- Connection via RS232 (max. 15 metre distance to the master)
- APP "MultiTouch" must be installed on the UMG 604 / UMG 605
- The display mode can be configured directly via the display
- Number of measurement points can be configured directly via the display
- Measurement point names (max. 15 characters) are configured directly via the display
- Language selection (German, English, Spanish)
- Communication monitoring of the slave devices
- Configuration assistant

Display of measured value / Modbus

- Real value display of the following values: UL1, UL2, UL3, ULL1, ULL2, ULL3, I1, I2, I3, ISUM, P1, P2, P3, PSUM, SSUM, QSUM, Cosphi1, Cosphi2, Cosphi3, CosphiSum, THDU1, THDU2, THDU3, Hz, rotation field, AVG_I1, AVG_I2, AVG_I3, KWH, kvarh
- Mode setting: Standard, station selection, security measurement, energy list

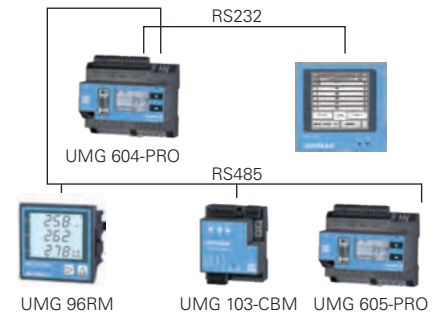


Fig.: Modbus station selection



Fig.: Modbus standard

JPC35 Remote Display Box (RS232), item no. 15.06.314

Requisite components

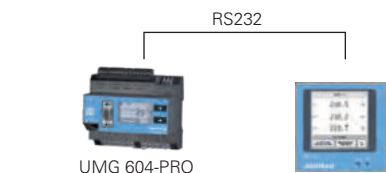
- JPC35 (item no. 15.06.314)
- UMG 604-PRO, UMG 605-PRO, UMG 104
- 1 mains adapter 24 V (e.g. item no. 16.05.002)

Information

- Remote display via RS232 (max. 15 metre distance)
- No device APP installation required
- Measurement point names (max. 15 characters)
- Language selection (German, English, Spanish)
- Configuration assistant

Display (Measured value / Modbus)

- Real value display of the following values: UL1, UL2, UL3, ULL1, ULL2, ULL3, I1, I2, I3, ISUM, P1, P2, P3, PSUM, SSUM, QSUM, Cosphi1, Cosphi2, Cosphi3, CosphiSum, THDU1, THDU2, THDU3, Hz, rotation field, AVG_I1, AVG_I2, AVG_I3, KWH, kvarh
- Modbus selection: Device matrix display, measured value list



Note: Not usable for the UMG 96RM, UMG 508 and UMG 511, because these devices do not possess an RS232 interface.

JPC35 Remote Display Box (RS485), item no. 15.06.315

Requisite components

- JPC35 (item no. 15.06.315)
- UMG 604-PRO, UMG 605-PRO, UMG 104, UMG 509-PRO, UMG 511, UMG 512-PRO, UMG 96RM
- 1 mains adapter 24 V (e.g. item no. 16.05.002)
- Side angled D-SUB-9 connector (item no. 13.10.514)

Information

- Remote display via RS485 (max. 1,200 metre distance)
- No device APP installation required
- Measurement point names (max. 15 characters)
- Language selection (German, English, Spanish)
- Configuration assistant

Display (Measured value / Modbus)

- Real value display of the following values: UL1, UL2, UL3, ULL1, ULL2, ULL3, I1, I2, I3, ISUM, P1, P2, P3, PSUM, SSUM, QSUM, Cosphi1, Cosphi2, Cosphi3, CosphiSum, THDU1, THDU2, THDU3, Hz, rotation field, AVG_I1, AVG_I2, AVG_I3, KWH, kvarh
- Modbus selection: Device matrix display, measured value list



Note: The JPC35 functions in this variant as RS485 master. The RS485 / Ethernet Gateway function of the UMG 604-PRO can no longer be used in this case.

Current channel monitoring – monitoring of up to 200 current channels

Alarm management

Display of warning or fault messages over several levels in the topology view

Rapid localisation of faults

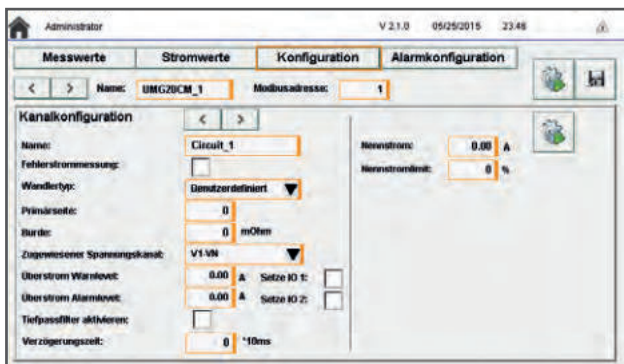
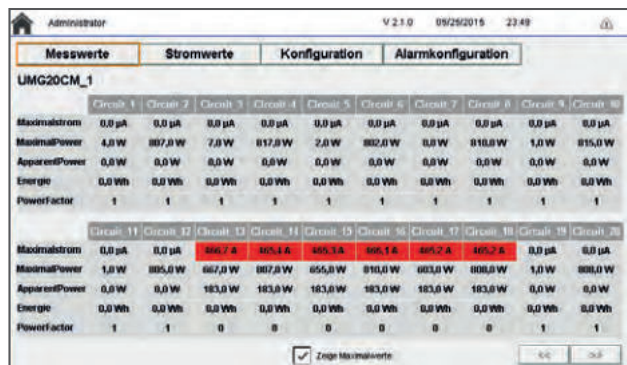
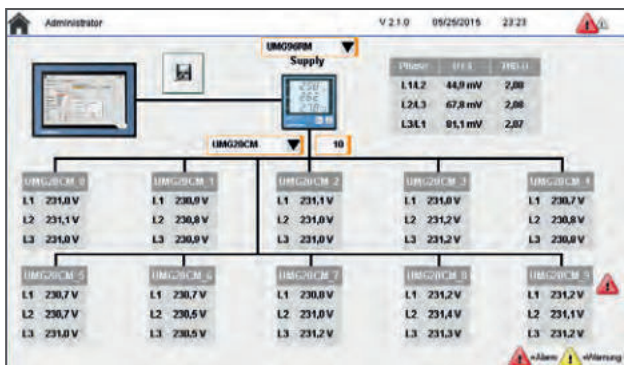
Faults in the power supply for operating and residual currents (RCM) can be quickly detected

1 master & 10 slaves

Assignment of 10 slave devices to one master device

Display of the UMG 20CM current channels

Channel-specific measured values of the UMG 20CM can be displayed locally, directly in the switchgear



Configuration of compatible Janitza Modbus master devices* and slaves (UMG 20CM).



* UMG 96-RM-E, UMG 604-PRO, UMG 605-PRO, UMG 509-PRO, UMG 512-PRO and ProData



Technical data

Item no.	15.06.356
General information	
Net weight	600 g
Dimensions	197 mm x 140 mm x 47.8 mm
Backlight (LED)	Brightness: type 500 cd/m ² Service life in 25 °C ambient temperature ^{*1} : 50.000 h
Cooling	Passive
Power button	No
Reset button	Yes
Status display (7 LEDs)	– Supply voltage OK – Operating status – Module status – Ethernet
Processor	ARM Cortex-A8, 1 GHz
Working memory	256 Mbyte DDRAM

Interfaces	
USB	2 x USB 2.0 type A rating 0.49 A
Ethernet	– 1 x RJ45 shielded – Max. transmission rate 10/100 MBit/s – Cable type: 10BASE-T/100BASE-TX

Display	
Type	Color TFT
Diagonal	7"
Colors	16.7 million (RGB, 8 bits per channel)
Resolution	WVGA, 800 x 480 pixels
Contrast	typically 600:1
Touchscreen	Yes

Electrical properties	
Supply voltage	24 V DC –15% / +20%
Max. power consumption ^{*2}	6.2 W
Pole reversal protection	Yes

Ambient conditions	
Protection rating according to EN 60529	IP65 front side, IP20 rear side
Installation elevation above sea level	0 to 2000 m
Operating temperature	–20 to 60 °C
Storage and transport temperature	–20 to 70°C
Air humidity	5 to 96 %, non-condensing

^{*1} Service life indicates the time after which the lighting still achieves 50% of the initial brightness.
Reduction of brightness by 50% can increase the service life by about 50%.

^{*2} Without USB interfaces

Energy monitoring – visualisation of the energy measured values of up to 33 devices

Display of all energy measured values

Visualisation & monitoring of Modbus-enabled Janitza UMGs

3 master & 30 slaves

Flexibly selectable number of assignments of slave devices to a master device

Direct Modbus connection

Connection of slave devices via RS485

Web-enabled

Direct, worldwide access to the UMG device homepage



Intuitive operation directly at the system switch cabinet

Visualisation

- Display of all current and energy measured values
- Display and storage of the last minimum and maximum values
- Topology view of the connected devices
- Visualisation of the main and ancillary measurements

User management

- Password-protected display
- Creation of a hierarchical user structure
- User rights

Alarm

- Integrated alarm management
- Acknowledgement of pending alarms
- Saving of historical alarms
- E-mail notification

Configuration

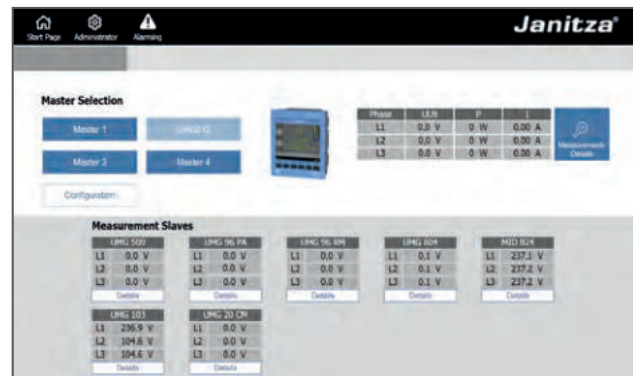
- Dynamic topological configuration of up to 33 devices
- Group transfer of the configuration
- Plug & Play configuration via USB:
import and export of device configurations
- Labelling of the individual measurement channels,
threshold values can be set per channel, etc.
- Factory pre-configured

Data exchange

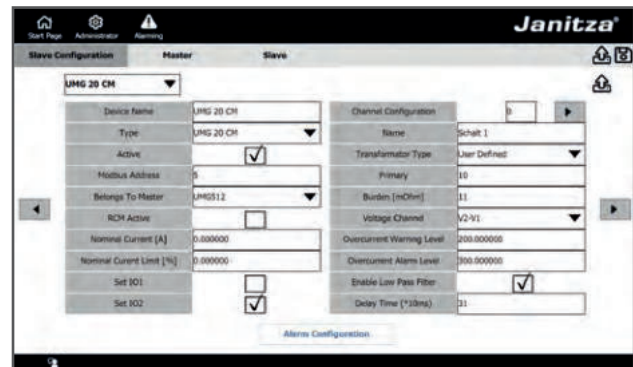
- Display of the device homepage
- Export of measurement data via USB
- Optional remote access

Compatibility

- Access to master and slave devices via GridVis®
- Reporting function



Topological view of the measured values



Configuration of all communication-enabled Janitza Modbus master and slave devices

Timestamp	Message	Status
13.02.2019 17:09:43	Error: Master: UMG512 Value: Voltage L1 (0.010545V) exceeds maximum	Yellow triangle
13.02.2019 17:09:43	Error: Master: UMG512 Value: Voltage L3 (0.009039V) exceeds maximum	Yellow triangle
13.02.2019 17:09:43	Error: Master: UMG512 Value: Current L1 (0.000182A) exceeds maximum	Yellow triangle
13.02.2019 17:09:43	Warning: Master: UMG512 Value: Current L2 (0.000188A) exceeds maximum	Yellow triangle
13.02.2019 17:09:43	Error: Master: UMG513 Value: Current L3 (0.000201A) exceeds maximum	Yellow triangle
13.02.2019 17:09:43	Warning: Master: UMG512 Value: Current L4 (0.000134A) exceeds maximum	Yellow triangle
13.02.2019 17:09:43	Error: Master: UMG512 Value: Effective Power (0.000000W) exceeds maximum	Yellow triangle
13.02.2019 17:09:43	Error: Master: UMG512 Value: Apparent Power (0.000000VA) exceeds maximum	Yellow triangle
13.02.2019 17:09:43	Error: Slave: UMG 509 Value: Voltage L1 (0.023774V) exceeds maximum	Yellow triangle

Alarm list with acknowledgement function



User management with assignment of rights



Technical data

Item no.	15.06.358
General information	
Net weight	approx. 900 g
Dimensions	282 mm x 184 mm x 35 mm
Backlight (LED)	Brightness: approx. 450 cd/m ²
Chip	Rockchip RK3288 Quad-Core CPU 1,6 GHz
Processor	2 GB DDR3 SDRAM
Integrated memory	8 GB eMMC
Cut-out size	± 261 mm x ± 164 mm

Interfaces	
USB	– USB 2.0 Type A – Micro-USB
Ethernet	– RJ45 – 10/100 MBit/s
RS485	Modbus RTU/Master

Display	
Type	TFT Color
Diagonal	10"
Resolution	1024 px x 600 px
Touchscreen	Capacitive multitouch

Electrical properties	
Supply voltage	– 24 V DC (via plug-in connection) – 12 V DC (via jack connection)
Max. power consumption	13 W

Ambient conditions	
Protection type according to EN 60529	IP53 frontside, IP20 backside
Operating temperature	0 to 35 °C
Storage and transport temperature	0 to 70 °C
Relative humidity (non-condensing)	10 to 90%