

UMG 801

Modular energy measurement device for the DIN rail





Areas of application

- Industrial sector
- Data centers
- Commercial buildings
- Building installations on distribution units, circuit breakers and busbar trunking systems
- Energy supplier

Main features



Power Quality

- Harmonics analysis up to the 127th harmonic
- Unbalance
- Distortion factor THD-U, THD-I
- Measurement of co-system, counter and zero sequence component



Communication

- Fast, cost-optimized and reliable communication through connection to an existing Ethernet system
- Integration in PLC systems and GLT
- High flexibility through the use of open standards
- Simultaneous query of the interfaces possible
- Configuration of the entire measuring system via OPC UA
- Easy integration of measurement data from the base unit and measurement modules into higher-level systems (e.g. building management systems, SCADA systems)
- Cyber security: Integrated security mechanisms to protect against unauthorized access and misuse
- Future-proof software architecture as the OPC UA standard evolves with new applications



Ethernet Modbus gateway

- Easy integration of the Modbus RTU devices in the Ethernet system through the Modbus gateway function
- Integration of devices with identical file formats and consistent function codes possible via the Modbus RTU interface



Measurement device with accuracy of 0.2% (V), kWh class = 0.5S

- High sampling rate at 25.6 kHz / 51.2 kHz (current/voltage)
- Reliable measuring accuracy of 0.2% (V)
- Energy class (kWh): 0.2S



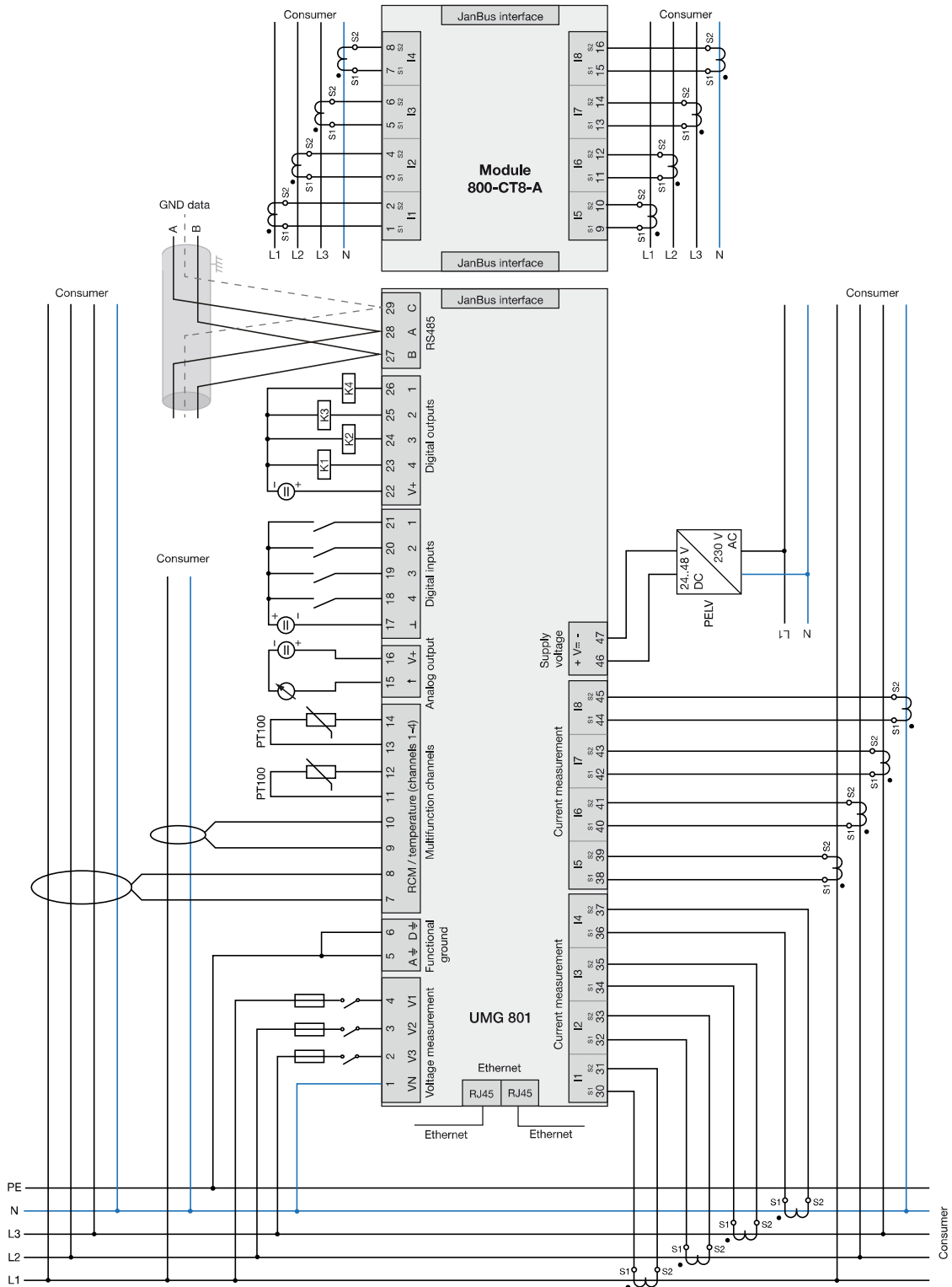
Modular system expansion

- Easy system expansion due to flexible scaling to 92 current measurement channels
- Up to 10 current measurement modules can be integrated via click system, without external cabling between the basic device and the current measurement modules
- Space optimization through compact design, even with measurement point extension
- No additional power supply required for the measuring modules
- Costs savings through shortened assembly times
- Reduced error sources thanks to Plug & Play solution
- Low costs per additional measurement channel
- No additional voltage measurement necessary
- Measurement distance can be bridged up to a total length of 100 m
- The GridVis® Essentials Power Grid Monitoring Software provides comprehensive options for data preparation, visualization and documentation





Typical connection variant

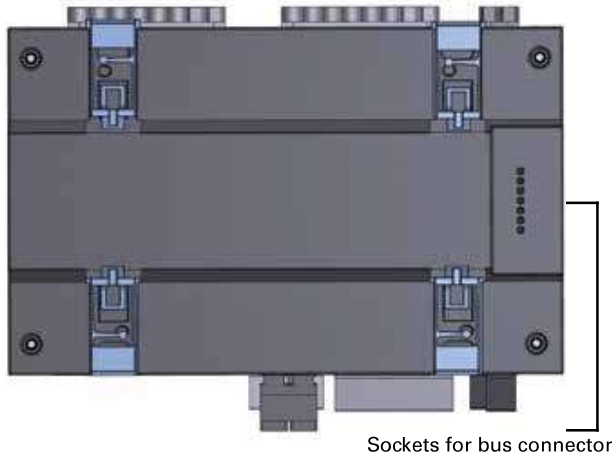




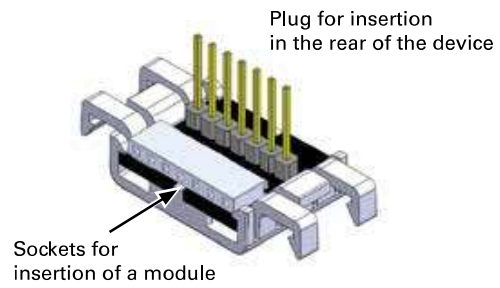
Dimensional drawings

All specifications in mm

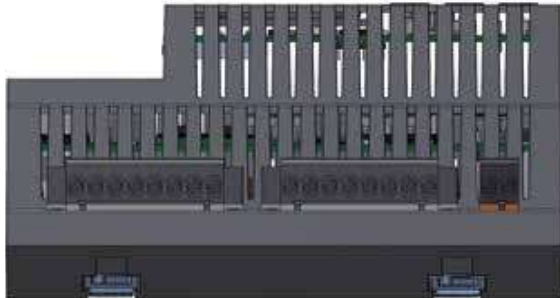
Rear view



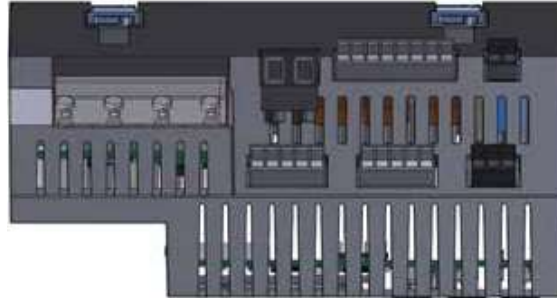
Bus connector



View from below



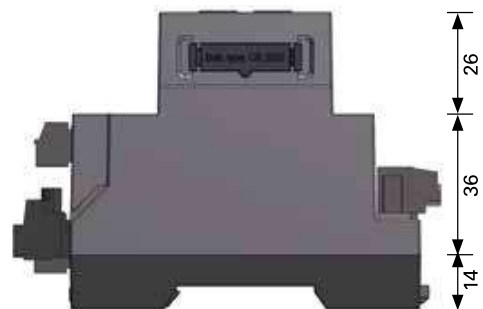
View from above



Front view



View from the left





Device overview and technical data

	UMG 801 ¹⁾
Item number	52.31.001
Supply voltage	External 24 ... 48 VDC, PELV

General	
Net weight	420 g (0,93 lb)
Device dimensions (W x H x D)	approx. 144 x 90 x 76 mm (5,67 x 3,54 x 2,99 in)
Battery	Type: Lithium CR2032, 3 V (UL1642 approval)
Integrated memory	4 GB
Backlight service life	40000 h (50% of the start brightness)
Mounting orientation	As desired
Fastening/mounting – suitable DIN rails – 35 mm (1,38 in)	TS 35/7,5 according to EN 60715 TS 35/10 TS 35/15 x 1,5

Transport and storage	
The following information apply to devices which are transported and stored in the original packaging.	
Free fall	1 m (39,37 in)
Temperature	-25 °C bis +70 °C (-13 °F ..to 158 °F)
Relative humidity	5 to 95% RH at 25 °C (77 °F) no condensation

Environmental conditions during operation	
The device <ul style="list-style-type: none"> • For weather-protected and stationary use. • Fulfills operating conditions according to DIN IEC 60721-3-3. • Has protection class II according to IEC 60536 (VDE 0106, part 1), a ground wire connection is not required! 	
Rated temperature range	-10 °C bis +55 °C (14 °F to 131 °F)
Relative humidity	5 to 95% at 25 °C (77 °F) no condensation
Operating height/overvoltage category	2000 m (6562 ft) above sea level Voltage measurement: 1000 V CAT III; 600 V CAT IV Current measurement: 300 V CAT II
	4000 m (13123 ft) above sea level Voltage measurement: 600 V CATIII; Current measurement: 300 V CATII
Pollution degree	2
Ventilation	No forced ventilation required
Protection against foreign matter and water	IP20 according to EN60529

Supply voltage	
Nominal range	DC: 24 V – 48 V, PELV
Operating range	± 10% of nominal range
Power consumption	max. 4 W
Maximum power consumption with 10 modules	12 W (UMG 801 with 4 W plus 10 modules with 0,8 W each)
Recommended overcurrent protection device for the line protection	2–6 A (char. B), IEC-/UL approval

1) Separate switching power supply is required, optionally available:
switching power supply ultraslim, item no. 16.05.012 or
switching power supply with step shape/DIN rail, item no. 16.05.014

Voltage measurement	
3-phase 4-conductor systems with rated voltages up to	480 V _{LN} / 830 V _{LL} (± 10%) according to IEC 347 V _{LN} / 600 V _{LL} (± 10%) according to UL
3-phase 3-conductor systems (grounded) with rated voltages up to	830 V _{L-L} (± 10%) according to IEC 600 V _{L-L} (± 10%) according to UL
3-phase 3-conductor systems (non-grounded) with rated voltages up to	690 V _{L-L} (± 10%) according to IEC 600 V _{L-L} (± 10%) according to UL
Overvoltage category	<ul style="list-style-type: none"> 1000 V CAT III according to IEC 600 V CAT III according to UL
Rated surge voltage	8 kV
Protection of the voltage measurement	1–10 A tripping characteristic B (with IEC/UL approval)
Measuring range L-N	0 ¹⁾ ... 720 V _{eff} (max. overvoltage 1000 V _{eff})
Measuring range L-L	0 ¹⁾ ... 1000 V _{eff} (max. overvoltage 1000 V _{eff})
Measuring range N-PE	up to 100 V
Resolution	16 bit
Crest factor	1.6 (referred to measuring range 600 V L-N)
Impedance	4 MΩ/phase
Power consumption	approx. 0.1 VA
Sampling frequency	51.2 kHz
Frequency of fundamental oscillation - Resolution	40 Hz ... 70 Hz 0.01 Hz
Harmonics	1 ... 127.

1) ... The device only measures if at least one voltage measurement input has an L-N voltage of >10 V_{eff} or an L-L voltage of >18 V_{eff} present.

Current measurement (./1 A) (./5 A)	
Nominal current	5 A
Channels	8 <ul style="list-style-type: none"> 2 systems – L1, L2, L3, N (optional) Single channels
Measuring range	0,005 ... 6 A _{eff}
Crest factor (based on the rated current)	1,98
Overload for 1 sec.	120 A (sinusoidal)
Resolution	0.1 mA (color graphic display 0.01A)
Overvoltage category	300 V CAT II
Rated surge voltage	2 kV
Power consumption	approx. 0.2 VA (R _i = 5 mΩ)
Sampling frequency	25.6 kHz
Harmonics	1 ... 63.

The device optionally has 4 multifunction channels for use as

- Residual current measuring inputs and/or temperature measuring inputs (mixed),
- Additional system inputs (L1, L2, L3; N)

Residual current monitoring (RCM)	
Nominal current	30 mA _{eff}
Measurement range	0 ... 40 mA _{eff}
Operating current	50 µA
Resolution	1 µA (color graphic display 0.01 A)
Crest factor	1,414 (relative to 80 mA)
Load	4 Ω
Overload for 20 ms	50 A
Overload for 1 s	5 A
Permanent overload	1 A
Standard	IEC/TR 60755 (2008-01), type A + type B and B+ (via corresponding current transformer)

Temperature measurement	
Update time	1 s
Total burden (sensor and lead)	max. 4 kΩ
Cable	Up to 30 m (32.81 yd) not shielded Greater than 30 m (32.81 yd) shielded
Suitable sensor types	KTY83, KTY84, PT100, PT1000

Digital inputs 4 digital inputs, solid state relays, not short-circuit proof.	
Maximum counter frequency	20 Hz
Input signal applied	18 ... 28 V DC (typically 4 mA)
Input signal not applied	0 ... 5 V DC, current less than 0.5 mA

Digital outputs 4 digital outputs, semiconductor relays, not short-circuit proof.	
Switching voltage	max. 60 V DC
Switching current	max. 50 mA _{eff} DC
Response time	approx. 500 ms
Digital output (energy pulses)	max. 20 Hz

Cable length (digital inputs/outputs)	
Up to 30 m (32.81 yd)	Unshielded
Greater than 30 m (32.81 yd)	Shielded

Analog output 1 channel	
External supply	max. 33 V DC
Current	0/4...20 mA DC
Update time	0,2 s
Load	max. 300 Ω
Resolution	10 Bit

RS485 interface 3-conductor connection with A, B, GND	
Protocol	Modbus RTU/Slave Modbus RTU/Gateway
Transmission rate	9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps, 115.2 kbps
Termination	DIP switches

Ethernet interfaces	
Connection	2 x RJ45
Function	Modbus gateway
Protocols, services and time synchronization	OPC UA, DHCP, Modbus/TCP, NTP

Connecting capacity of the terminals (supply voltage)	
Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 – 2,5 mm ² , AWG 26-12
Wire ferrules (non-insulated) – Recommended stripping length	0.2 – 2,5 mm ² , AWG 26-12 – 10 mm (0.3937 in)
Wire ferrules (insulated) – Recommended stripping length	0.2 – 2,5 mm ² , AWG 26-12 – 13 mm (0.5118 in)
Wire ferrules: Length of the contact sleeve	10 mm (0.3937 in)

Connecting capacity of the terminals (current measurement)	
Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 – 2,5 mm ² , AWG 26-12
Wire ferrules (non-insulated) – Recommended stripping length	0.2 – 2,5 mm ² , AWG 26-12 – 10 mm (0.3937 in)
Wire ferrules (insulated) – Recommended stripping length	0.2 – 2,5 mm ² , AWG 26-12 – 13 mm (0.5118 in)
Screw flange tightening torque	0.4 – 0.5 Nm (3.54 - 4.43 lbf in)
Wire ferrules: Length of the contact sleeve	10 mm (0.3937 in)

Connecting capacity of the terminals (voltage measurement)	
Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.08 – 4.0 mm ² , AWG 28-12
Wire ferrules (insulated/non-insulated)	0.25 – 2.5 mm ² , AWG 24-14
Strip length	8 – 9 mm (0.3150 - 0.3543 in)

Connecting capacity of the terminals (functional earth A/D)	
Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 – 4.0 mm ² , AWG 24-12
Wire ferrules (non-insulated)	0.2 – 4.0 mm ² , AWG 24-12
Wire ferrules (insulated)	0.2 – 2.5 mm ² , AWG 26-14
Tightening torque	0.4 – 0.5 Nm (3.54 - 4.43 lbf in)
Strip length	7 mm (0.2756 in)

Connecting capacity of the terminals - Multifunction channels (RCM, Temp.)	
Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 – 1.5 mm ² , AWG 24-16
Wire ferrules (non-insulated)	0.2 – 1.5 mm ² , AWG 26-16
Wire ferrules (insulated)	0.2 – 1 mm ² , AWG 26-18
Tightening torque	0.2 – 0.25 Nm (1.77 - 2.21 lbf in)
Strip length	7 mm (0.2756 in)

Connecting capacity of the terminals (digital inputs/outputs, analog output)	
Single core, multi-core, fine-stranded	0.2 – 1.5 mm ² , AWG 24-16
Wire ferrules (non-insulated)	0.2 – 1.5 mm ² , AWG 26-16
Wire ferrules (insulated)	0.2 – 1 mm ² , AWG 26-18
Tightening torque	0.2 – 0.25 Nm (1.77 - 2.21 lbf in)
Strip length	7 mm (0.2756 in)

Connecting capacity of the terminals (RS485)	
Single core, multi-core, fine-stranded	0.2 – 1.5 mm ² , AWG 24-16
Wire ferrules (non-insulated)	0.2 – 1.5 mm ² , AWG 26-16
Wire ferrules (insulated)	0.2 – 1 mm ² , AWG 26-18
Tightening torque	0.2 – 0.25 Nm (1.77 - 2.21 lbf in)
Strip length	7 mm (0.2756 in)

Firmware	
Firmware update	Please observe the operating instructions

Remark: For detailed technical information, please refer to the operation manual and Modbus address list.



Module 800-CT8-A technical data



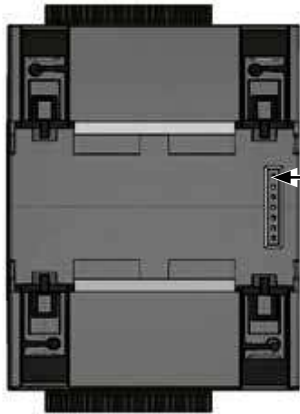
Module 800-CT8-A	
Item number	52.31.201
General	
Net weight	Approx. 220 g (0.49 lbs)
Device dimensions (W x H x D)	Approx. 72 x 90 x 76 mm (2.83 x 3.54 x 2.99 in)
Mounting orientation	As desired
Fastening/mounting – Suitable DIN rails (35 mm / 1.38 in)	<ul style="list-style-type: none"> • TS 35/7.5 according to EN 60715 • TS 35/10 • TS 35/15 x 1.5
Impact resistance	IK07 according to IEC 62262
Transport and storage	
The following specifications apply for devices transported and stored in the original packaging.	
Free fall	1 m (39.37 in)
Temperature	K55: -25 °C up to +70 °C (-13 °F up to 158 °F)
Relative humidity	5 to 95% at 25 °C (77 °F), no condensation
Environmental conditions during operation	
The device:	
– Is for weather-protected and stationary use.	
– Fulfills operating conditions according to DIN IEC 60721-3-3.	
– Has protection class II according to IEC 60536 (VDE 0106, part 1), a ground wire connection is not required!	
Rated temperature range	-10 °C up to +55 °C (14 °F up to 131 °F)
Relative humidity	5 to 95% at 25 °C (77 °F), no condensation
Pollution degree	2
Ventilation	No forced ventilation required
Protection against foreign matter and water	IP20 according to EN60529
Interface and energy supply	
JanBus (proprietary)	<ul style="list-style-type: none"> • Via bus connector • The maximum bus length of the JanBus is 100 m.
Current measurement module 800-CT8-A	
Nominal current	5 A
Channels	<ul style="list-style-type: none"> • 2 systems (L1, L2, L3, N) • Single channels
Measurement range	0.005 .. 6 A
Crest factor	2 (relative to 6 A _{eff})
Overload for 1 s	120 A (sinusoidal)
Resolution	0.1 mA (color graphic display 0.01A)
Overvoltage category	300 V CAT II
Rated surge voltage	2.5 kV
Power consumption	approx. 0.2 VA (R _i = 5 mΩ)
Sampling frequency	8.3 kHz
Frequency of the fundamental oscillation	40 Hz ... 70 Hz
Harmonics	1 ... 9. (only odd)
Connecting capacity of the terminals – 800-CT8-A module	
Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 – 2.5 mm ² , AWG 26-12
Wire ferrules (non-insulated) – recommended stripping length	0.2 – 2.5 mm ² , AWG 26-12 – 10 mm (0.3937 in)
Wire ferrules (insulated) – recommended stripping length	0.2 – 2.5 mm ² , AWG 26-12 – 13 mm (0.5118 in)
Screw flange tightening torque	0.2 Nm (1.77 lbf in)
Wire ferrules: length of the contact sleeve	10 mm (0.3937 in)



Dimensional drawings

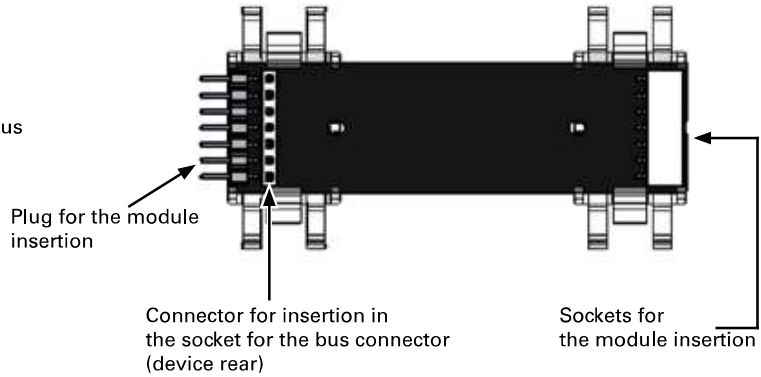
All specifications in mm

Rear view

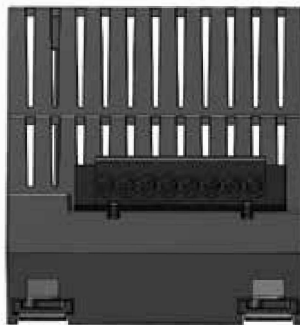


Socket for bus connector

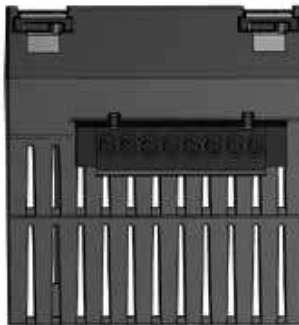
Bus connector for current measurement module



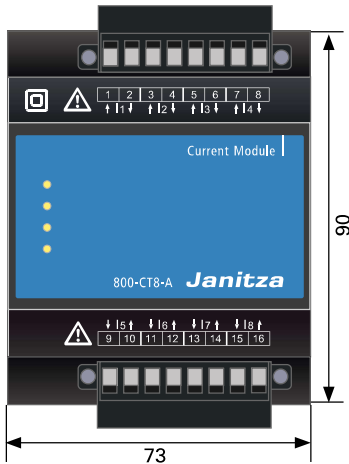
View from below



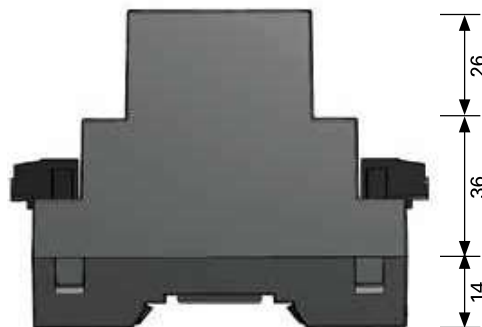
View from above



Front view



View from the left





Module 800-CON technical data



Module 800-CON ¹	
Item number	52.31.210
General	
Net weight (with plug-in terminals)	Approx. 55 g (0,12 lb) – 1 device
Device dimensions (W x H x D)	Approx. 18 x 90 x 76 mm (0,71 x 3,54 x 2,99 in)
Mounting orientation	As desired
Fastening/mounting – Suitable DIN rails – (35 mm / 1.38 in)	<ul style="list-style-type: none"> • TS 35/7.5 according to EN 60715 • TS 35/10 • TS 35/15 x 1,5
Impact resistance	IK07 according to IEC 62262
Transport and storage	
The following specifications apply for devices transported and stored in the original packaging.	
Free fall	1 m (39,37 in)
Temperature	K55: -25 °C up to +70 °C (-13 °F to 158 °F)
Relative humidity	5 to 95% at 25 °C (77 °F), no condensation
Environmental conditions during operation	
The device:	
– Is for weather-protected and stationary use.	
– Fulfills operating conditions according to DIN IEC 60721-3-3.	
– Has protection class II according to IEC 60536 (VDE 0106, part 1), a ground wire connection is not required!	
Rated temperature range	-10 °C up to +55 °C (14 °F up to 131 °F)
Relative humidity	5 to 95% at 25 °C (77 °F), no condensation
Pollution degree	2
Ventilation	No forced ventilation required
Protection against foreign matter and water	IP20 according to EN60529
Interface	
JanBus (proprietary)	– Via bus connector to device and module series
NOTE! To connect the transfer modules, use a twisted pair, stranded, shielded data cable (cable connection 1:1)!	– Via shield clamps between the transfer modules with twisted pair, shielded data cable (cable connection 1:1) – The maximum bus length of the JanBus is 100 m.
Terminal connection capacity	
Connectible conductors Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0,2–1,5 mm ² , AWG 24-16
Wire ferrules (non-insulated)	0,2–1,5 mm ² , AWG 26-16
Wire ferrules (insulated)	0,2–1 mm ² , AWG 26-18
Tightening torque	0,2–0,25 Nm (1,77 - 2,21 lbf in)
Strip length	7 mm (0,2756 in)

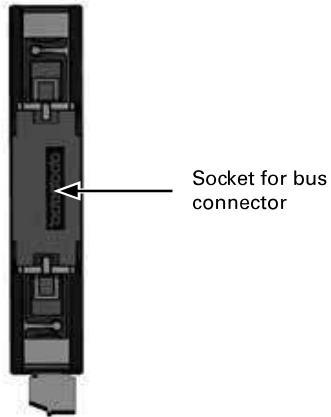
¹ Connection cable not included in the content of a set, optionally available as an accessory.
Cable length 22.5 cm, item no. 08.02.452
Cable length 100 cm, item no. 08.02.451



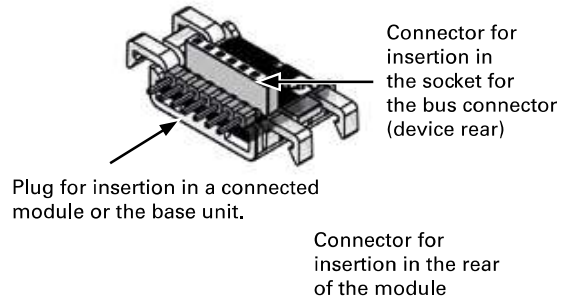
Dimensional drawings

All specifications in mm

Rear view



Bus connector for transfer module - **output**



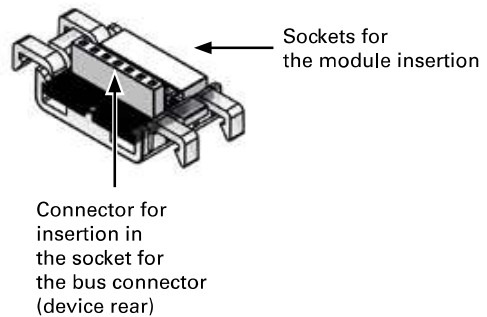
View from below



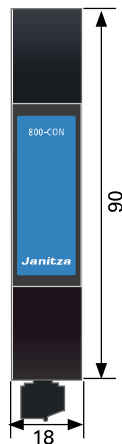
View from above



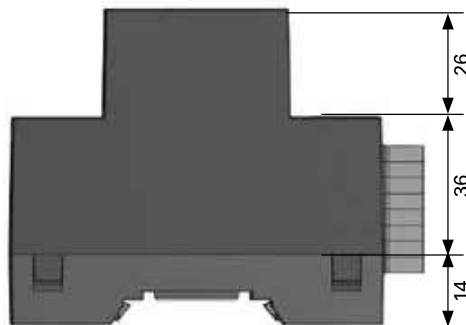
Bus connector for transfer module - **input**



Front view



View from the left



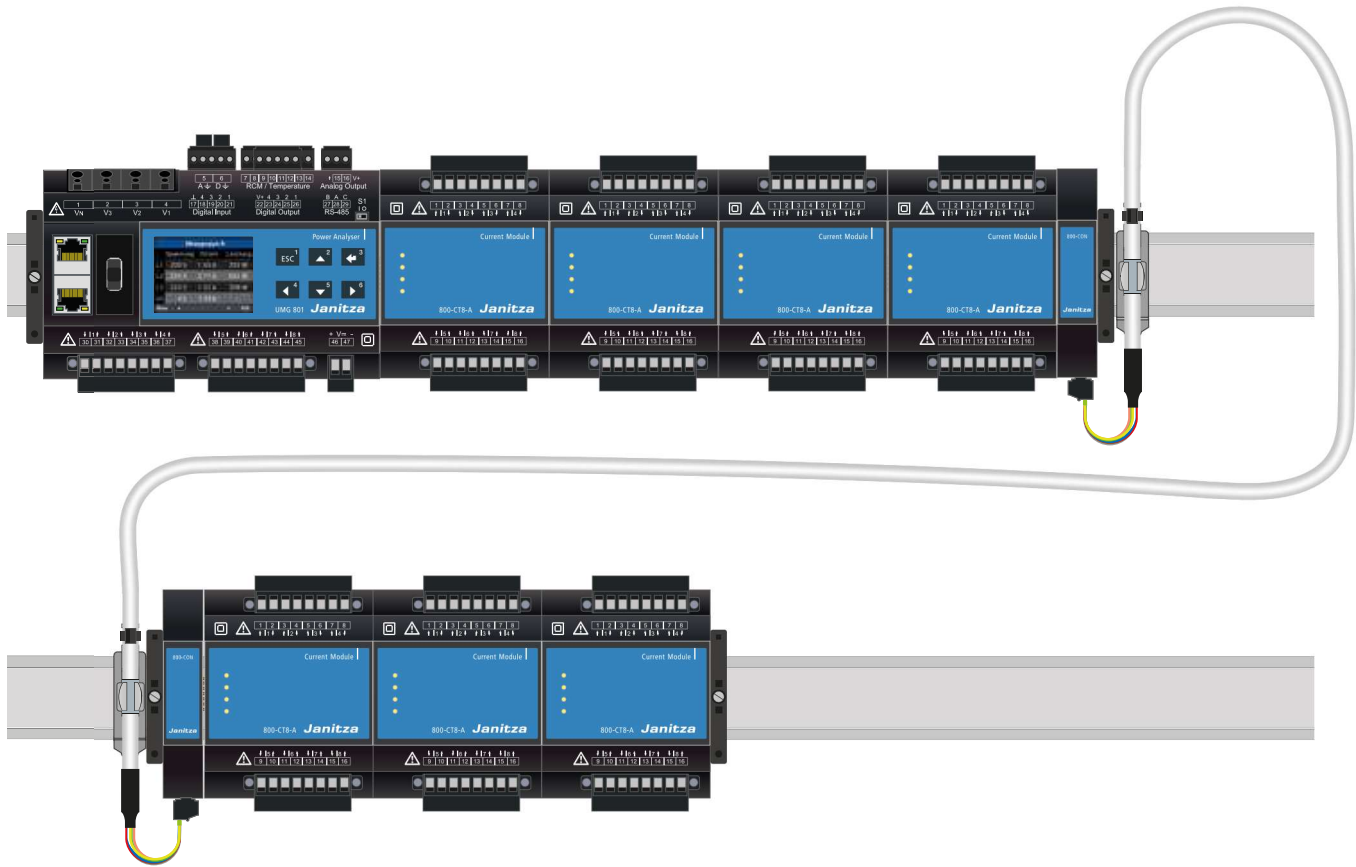


Fig.: Example structure of UMG 801 and modules



Technical Data Remote Display

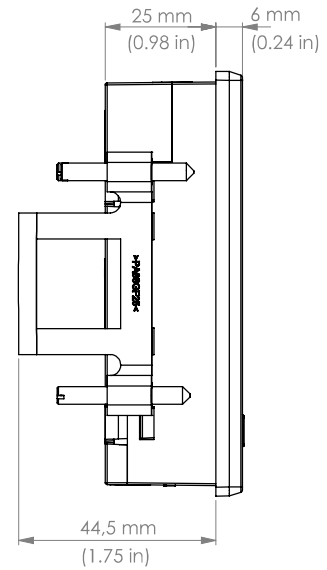


		RD 96
Item number		52.31.212
Allgemein		
Net weight	approx. 140 g (0,31 lbs)	
Package weight (incl. accessories)	approx. 440 g (0,97 lbs)	
Dimensions W x H x D without mounting clamps	96 mm x 96 mm x 30 mm (3.78 in x 3.78 in x 1.18 in)	
Backlight service life	40000 h (after 40000 h the backlight goes down to approx. 50%)	
Impact resistance	IK07 according to IEC 62262	
Serial interface (USB)		
USB 2.0 (type A)	1x	
USB 2.0 (type B)	1x	
Supply voltage	DC 5 V	
Nominal current	200 mA	
Operating range	+-5% of nominal range	
Power consumption	1 W	
Transport and storage		
The following specifications apply for devices transported and stored in the original packaging.		
Free fall	1 m (39,37 in)	
Temperature	-25 °C (-13 °F) bis +70° C (158 °F)	
Relative air humidity (non-condensing)	0 to 90% RH	
Environmental conditions during operation		
Install the device in a weather-protected and stationary location. Protection class II according to IEC 60536 (VDE 0106, Part 1).		
Rated temperature range	-10 °C (14 °F) to +55 °C (131 °F)	
Relative air humidity (non-condensing)	0 to 75% RH	
Operating elevation	0 – 2000 m (6562 ft) above sea level	
Pollution degree	2	
Mounting orientation	As desired	
Ventilation	No forced ventilation required	
Protection against foreign matter and water		
- Front	IP40 according to EN60529	
- Rear	IP20 according to EN60529	
- Front with seal	IP54 according to EN60529	
USB cable (included in delivery)		
USB 2.0 (type A to type B connector)	1,8 m (1,97 yd)	

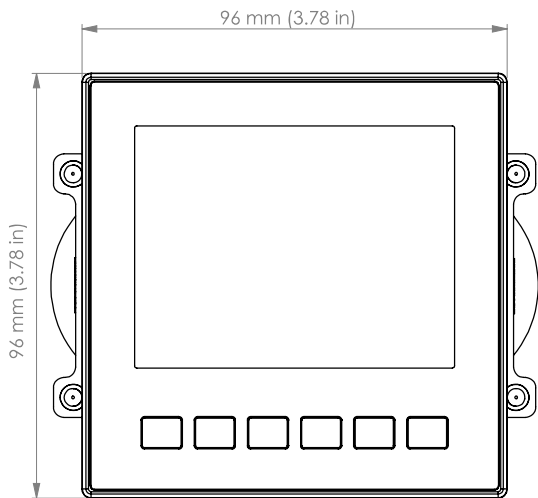


Dimensional drawings

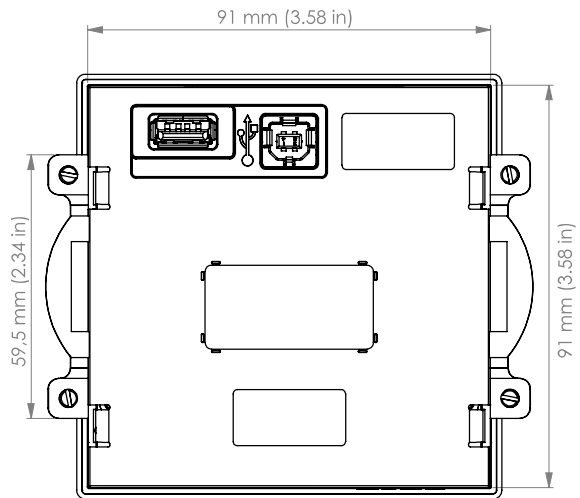
All specifications in mm



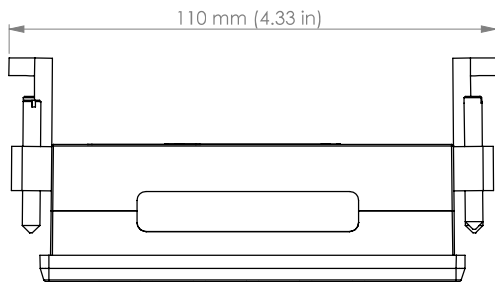
Side view



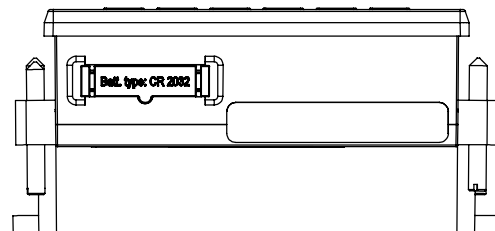
Front view



Rear view



View from above



View from below