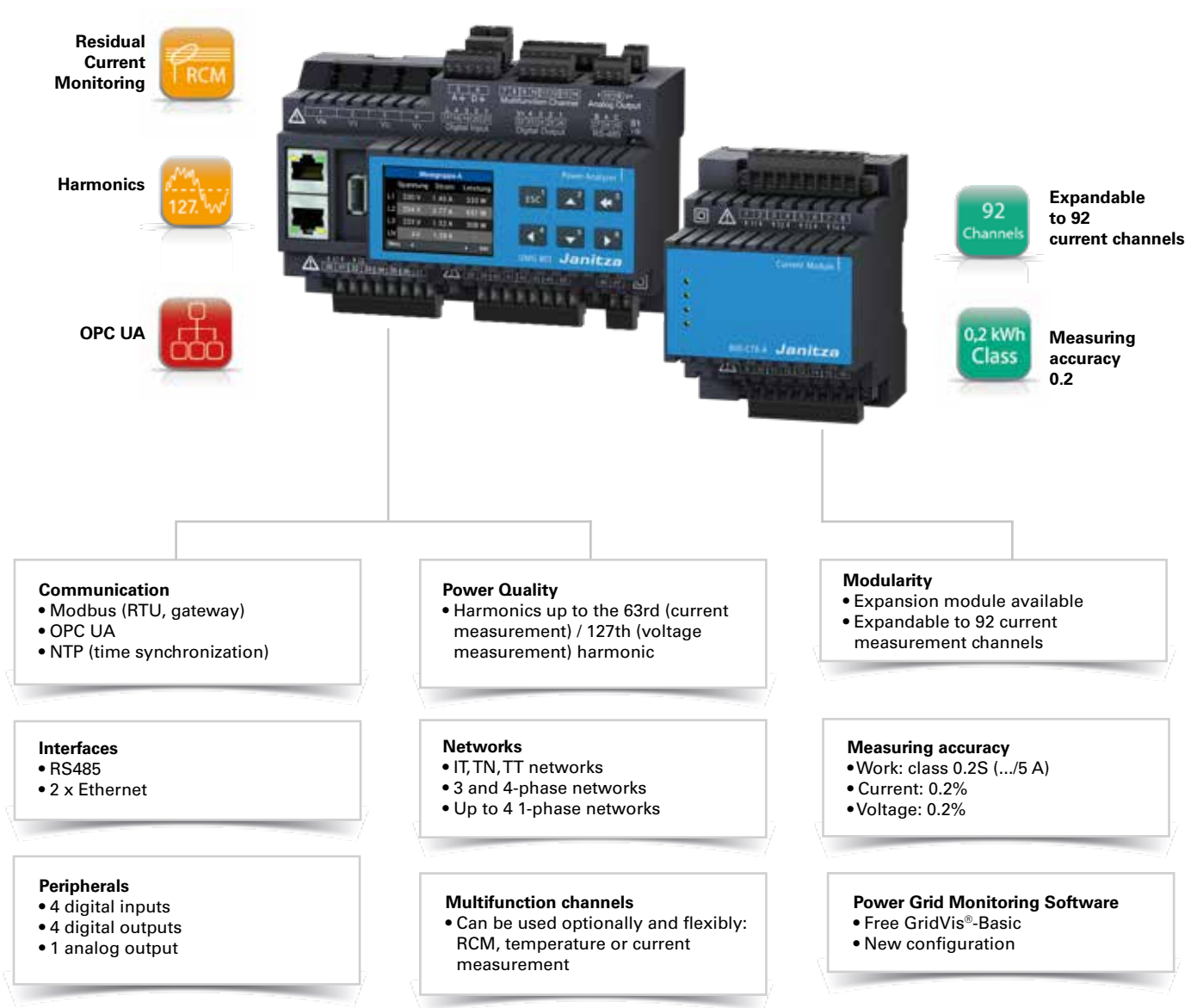


# UMG 801

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



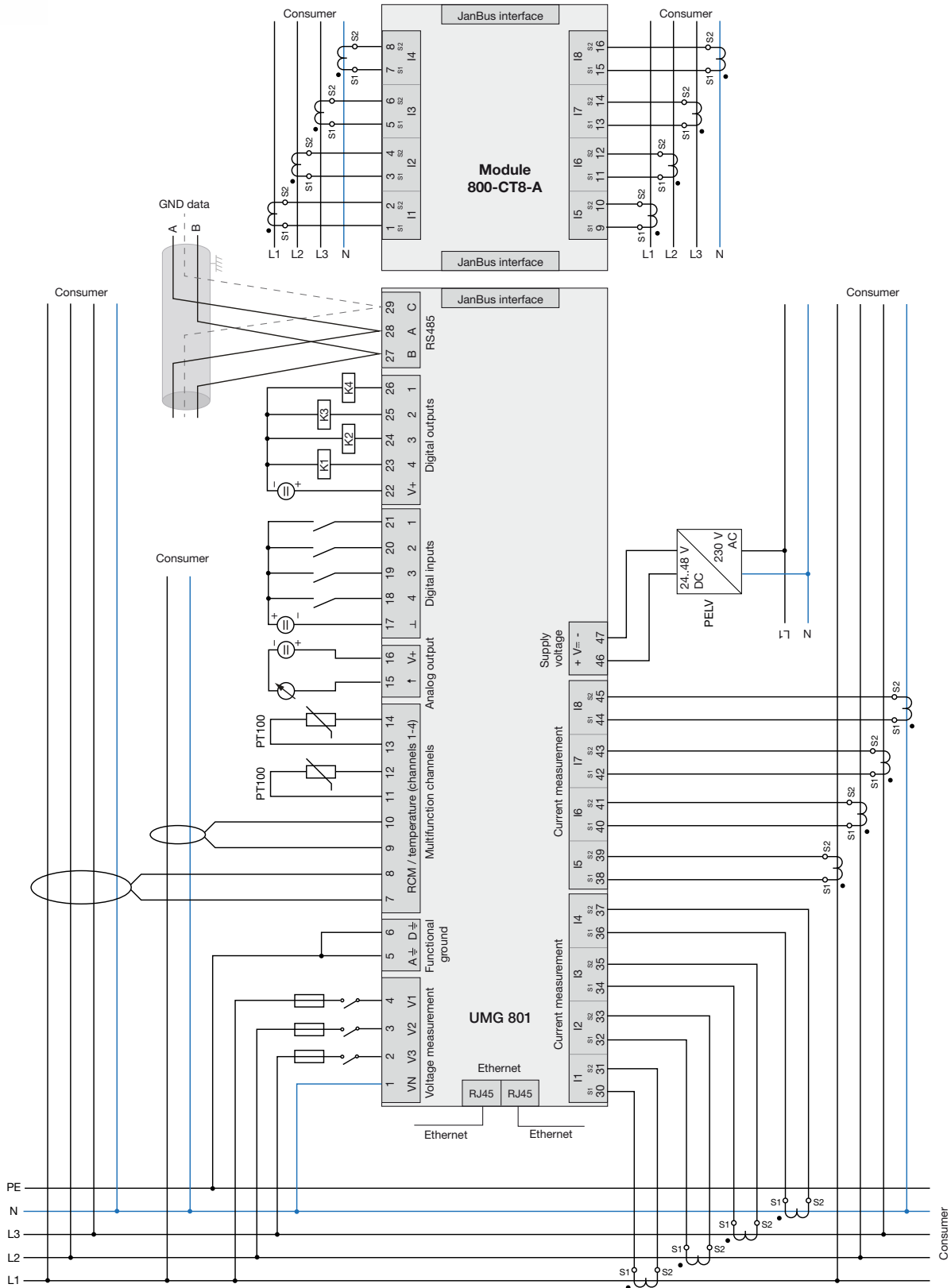
### Modular system expansion

- 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®-Basic Power Grid Monitoring Software provides comprehensive options for data preparation, visualization and documentation





# Typical connection variant

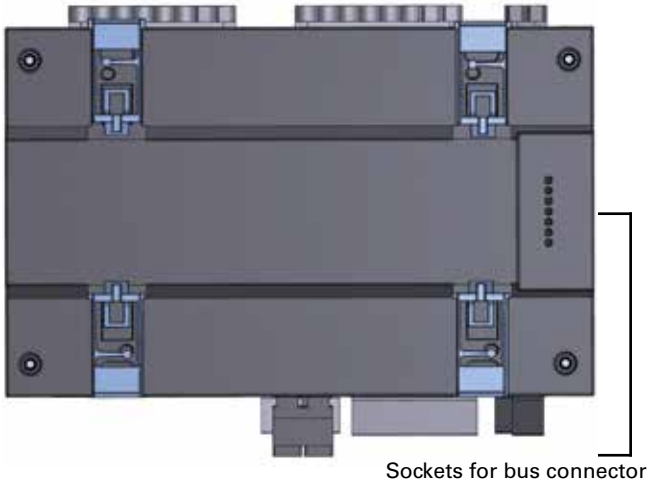




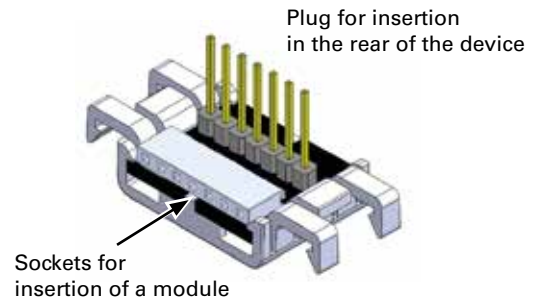
## Dimensional drawings

All specifications in mm

Rear view



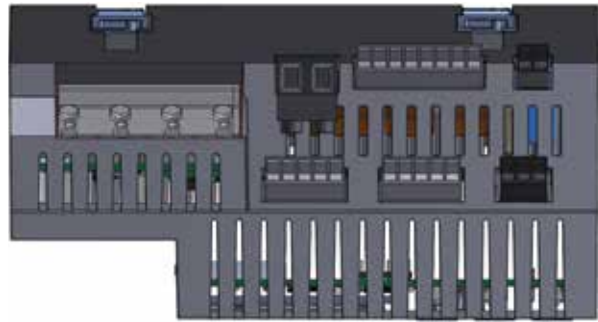
Bus connector



View from below



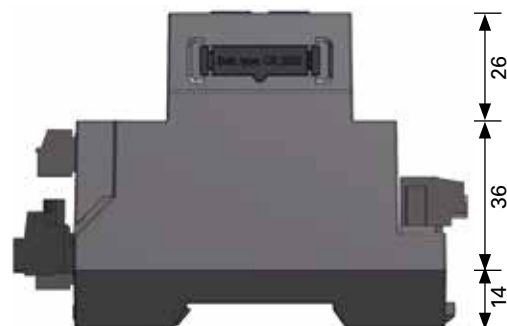
View from above



Front view



View from the left





## Device overview and technical data

UMG 801 <sup>1)</sup>	
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 starting 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 applies 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"> <li>• For weather-protected and stationary use.</li> <li>• Fulfills operating conditions according to DIN IEC 60721-3-3.</li> <li>• Has protection class II according to IEC 60536 (VDE 0106, part 1), a ground wire connection is not required!</li> </ul>	
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 CATIII; 600 V CATIV Current measurement: 300 V CATII
	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	
Three-phase 4-conductor systems with rated voltages up to	480 V <sub>LN</sub> / 830 V <sub>LL</sub> (± 10%) according to IEC 347 V <sub>LN</sub> / 600 V <sub>LL</sub> (± 10%) according to UL
Three-phase 3-conductor systems (grounded) with rated voltages up to	830 V <sub>L-L</sub> (± 10%) according to IEC 600 V <sub>L-L</sub> (± 10%) according to UL
Three-phase 3-conductor systems (non-grounded) with rated voltages up to	690 V <sub>L-L</sub> (± 10%) according to IEC 600 V <sub>L-L</sub> (± 10%) according to UL
Overvoltage category	· 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 <sup>1)</sup> ... 720 V <sub>eff</sub> (max. overvoltage 1000 V <sub>eff</sub> )
Measuring range L-L	0 <sup>1)</sup> ... 1000 V <sub>eff</sub> (max. overvoltage 1000 V <sub>eff</sub> )
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<sub>eff</sub> or an L-L voltage of >18 V<sub>eff</sub> present.

Current measurement (../1 A) (../5 A)	
Nominal current	5 A
Channels	8 · 2 systems – L1, L2, L3, N (optional) · Single channels
Measuring range	0.005 ... 6 A <sub>eff</sub>
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 CATII
Rated surge voltage	2 kV
Power consumption	approx. 0.2 VA (R <sub>i</sub> = 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)

<b>Residual current monitoring (RCM)</b>	
Nominal current	30 mA <sub>eff</sub>
Measurement range	0 ... 40 mA <sub>eff</sub>
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)

<b>Temperature measurement</b>	
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

<b>Digital inputs</b> 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

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

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

<b>Analog output</b> 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

<b>RS485 interface</b> 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 switch

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



<b>Connecting capacity of the terminals (supply voltage)</b>	
Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 – 4 mm <sup>2</sup> , AWG 24-12
Wire ferrules (non-insulated)	0.2 – 4 mm <sup>2</sup> , AWG 24-12
Wire ferrules (insulated)	0.2 – 2.5 mm <sup>2</sup> , AWG 26-14
Tightening torque	0.4 – 0.5 Nm (3.54 - 4.43 lbf in)
Stripping length	7 mm (0.2756 in)

<b>Connecting capacity of the terminals (current measurement)</b>	
Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 – 4 mm <sup>2</sup> , AWG 24-12
Wire ferrules (non-insulated)	0.2 – 4 mm <sup>2</sup> , AWG 24-12
Wire ferrules (insulated)	0.2 – 2.5 mm <sup>2</sup> , AWG 26-14
Tightening torque	0.4 – 0.5 Nm (3.54 - 4.43 lbf in)
Strip length	7 mm (0.2756 in)

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

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

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

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

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

<b>Firmware</b>	
Firmware update	Update via GridVis® Power Grid Monitoring Software. Firmware download (free) from website: <a href="http://www.janitza.com">www.janitza.com</a>

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



## Module 800-CT8-A technical data



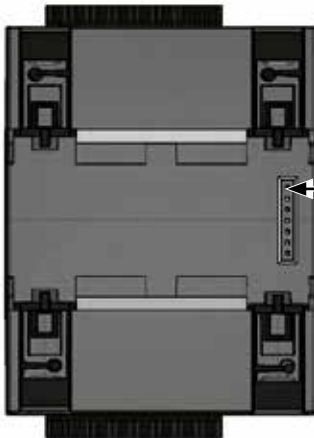
Module 800-CT8-A	
Item number	52.31.201
<b>General</b>	
Net weight	approx. 220 g (0.49 lbs)
Device dimensions (W x H x D)	approx. 73 x 90 x 76 mm (2.87 x 3.54 x 2.99 in)
Mounting orientation	As desired
Fastening/mounting – Suitable DIN rails (35 mm / 1.38 in)	<ul style="list-style-type: none"> <li>· TS 35/75 according to EN 60715</li> <li>· TS 35/10</li> <li>· TS 35/15 x 1.5</li> </ul>
Impact resistance	IK07 according to IEC 62262
<b>Transport and storage</b>	
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
<b>Environmental conditions during operation</b>	
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
<b>Interface and energy supply</b>	
JanBus (proprietary)	<ul style="list-style-type: none"> <li>· Via bus connector</li> <li>· The maximum bus length of the JanBus is 100 m.</li> </ul>
<b>Current measurement module 800-CT8-A</b>	
Nominal current	5 A
Channels	<ul style="list-style-type: none"> <li>· 2 systems (L1, L2, L3, N)</li> <li>· Single channels</li> </ul>
Measurement range	0.005 .. 6 A
Crest factor	2 (relative to 6 A <sub>eff</sub> )
Overload for 1 s	120 A (sinusoidal)
Resolution	0.1 mA (color graphic display 0.01A)
Overvoltage category	300 V CATII
Rated surge voltage	2.5 kV
Power consumption	approx. 0.2 VA (R <sub>i</sub> = 5 mΩ)
Sampling frequency	8.3 kHz
Frequency of the fundamental oscillation	40 Hz ... 70 Hz
Harmonics	1 ... 9. (only odd)
<b>Connecting capacity of the terminals – 800-CT8-A module</b>	
Connectible conductors only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 – 4 mm <sup>2</sup> , AWG 24-12
Wire ferrules (non-insulated)	0.2 – 4 mm <sup>2</sup> , AWG 24-12
Wire ferrules (insulated)	0.2 – 2.5 mm <sup>2</sup> , AWG 26-14
Tightening torque	0.4 – 0.5 Nm (3.54 - 4.43 lbf in)
Strip length	7 mm (0.2756 in)



## Dimensional drawings

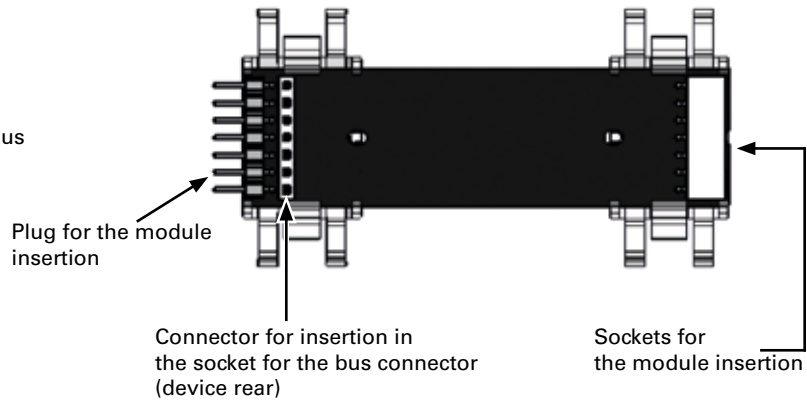
All specifications in mm

Rear view

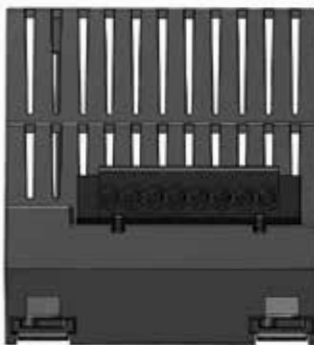


Socket for bus connector

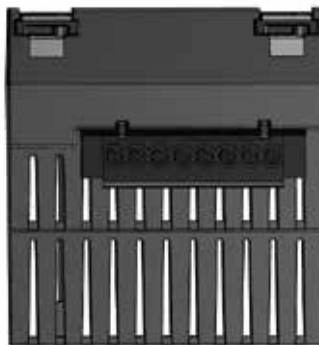
Bus connector for current measurement module



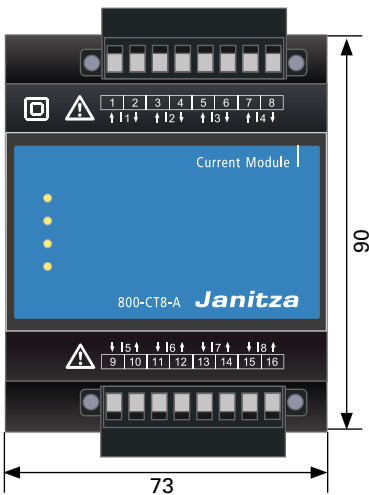
View from below



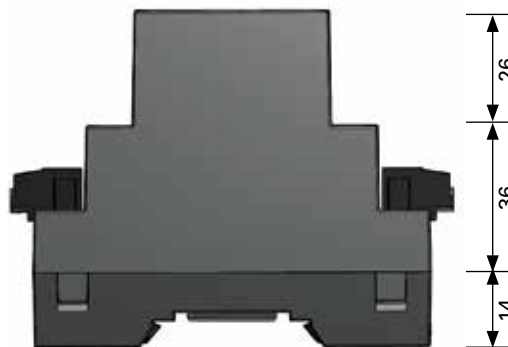
View from above



Front view



View from the left





## Module 800-CON technical data



Module 800-CON <sup>1</sup>	
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"> <li>· TS 35/75 according to EN 60715</li> <li>· TS 35/10</li> <li>· TS 35/15 x 1.5</li> </ul>
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 and energy supply	
JanBus (proprietary)	– Via bus connector to device and module series
<b>NOTE!</b> 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 <sup>2</sup> , AWG 24-16
Wire ferrules (non-insulated)	0.2–1.5 mm <sup>2</sup> , AWG 26-16
Wire ferrules (insulated)	0.2–1 mm <sup>2</sup> , AWG 26-18
Tightening torque	0.2–0.25 Nm (1.77 - 2.21 lbf in)
Strip length	7 mm (0.2756 in)

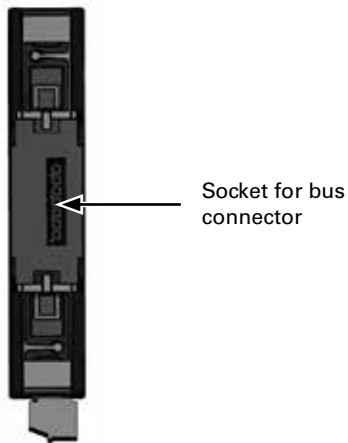
<sup>1</sup> Connection cable not included in the content of a set, optionally available as an accessory.  
Cable length 22.5 cm, item no. 08.02.452  
Cable length 100 cm, item no. 08.02.451



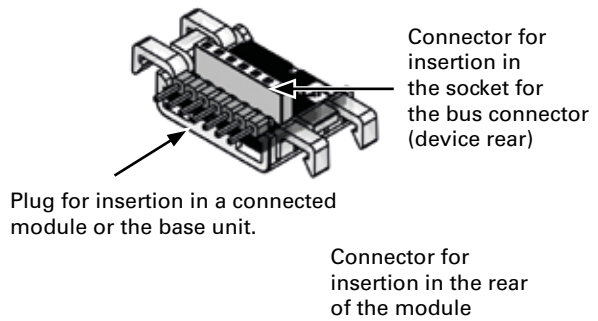
## Dimensional drawings

All specifications in mm

Rear view



Bus connector for transfer module - **output**



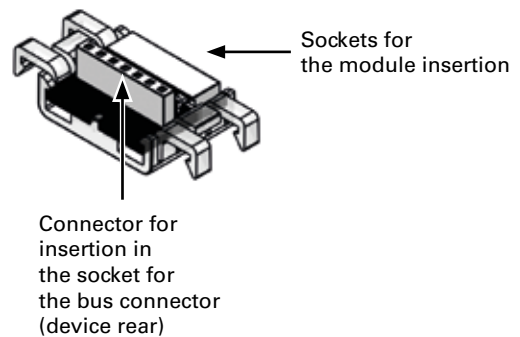
View from below



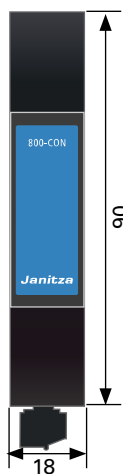
View from above



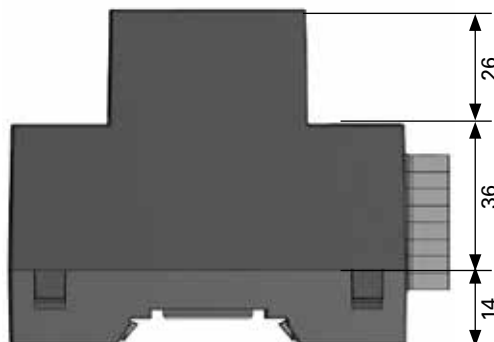
Bus connector for transfer module - **input**



Front view



View from the left



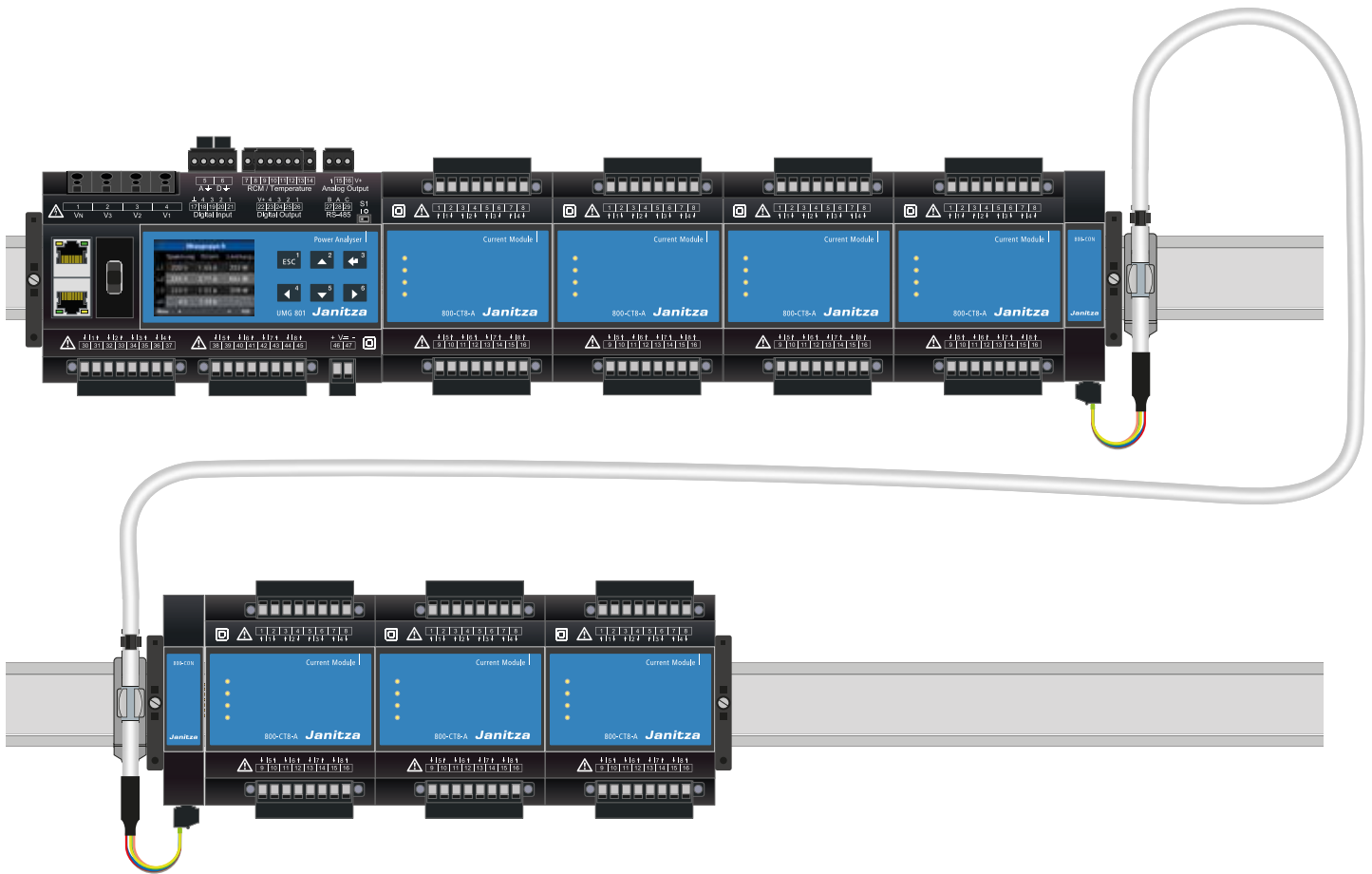


Fig.: Example structure of UMG 801 and modules