

TECHNICAL SPECIFICATIONS

Parameter	Value, comments
Main parameters	
Supply voltage	230V~, 50Hz
Power consumption – standby mode	<3VA
Power consumption – 1 relay output	0.4W
Power consumption – all outputs switched on and loaded with max. permissible currents	4W (switching losses of power SSRs)
Current measurement range	Mx: 0-20A~ (±5%), 50Hz (±5%) Mx 100A: 0-100 A~ (±5%), 50 Hz (±5%)
Voltage measuring range	230V~ (±5%), 50Hz (±5%)
Current load capacity of the measuring module	Mx: 0-40 A~ (±5%), 50 Hz (±5%) Mx 100A: 0-125 A~ (±5%), 50 Hz (±5%)
Active power measurement accuracy	2% ± 0.05kW (can be further calibrated)
Input and output parameters	
Power terminals L1 and N	230V~, 50Hz. L1 = phase, N = neutral conductor
+12V terminal	+12V relative to GND. Used to control external semiconductor relays (common positive terminal) or to power external PWM/0-10V converters. Max. consumption 60 mA; depending on the load, this voltage may drop to 8V.
+5V terminal	+5V relative to GND. Max. consumption 100 mA. Used to control external semiconductor relays (common positive terminal) or to power digital temperature DS18x20 sensors.
Terminal Y	+1.67V relative to GND. Common center for connecting the measuring module or current measuring transformers to the IL inputs or ANDI inputs in the power measurement function.
Relay outputs	230V~, 50Hz, max. 10A, 2300W (loads with $\cos(\Phi) \neq 1$ must be connected via a separate contactor) Protection: standard type B circuit breaker
SSR outputs – connection of SSR power semiconductor relays (S1-, S2-, S3-, S4-, S5-, S6-)	<+2V or +12V relative to GND, galvanically isolated from the power supply SSR parameters: DC control min. 4VDC, SSR must be zero switch type. Protection: according to the SSR relay manual, we recommend fuses for semiconductor protection.
SSR outputs – connection with PWM function, PWM output (S1-, S2-, S3-)	0V or +12V relative to GND, galvanically isolated from the power supply Output type: open collector PWM parameters: carrier frequency 200Hz to 10kHz, duty cycle 0-100% in 1% steps. Protection: according to the manual for the connected device
SSR outputs – connection with PWM function, direct output	+2V to +12V relative to GND, i.e. -10V to 0V relative to the terminal

0-10V (S4-, S5-,S6-)	+12V, galvanically isolated from the power supply Output type: Sallen-Key circuit. Voltage range: 0-10V in 1% steps. Output ripple: according to the set PWM frequency. Protection: according to the manual for the connected device
Inputs IL1, IL2, IL3:	Current, only accept secondary currents from the measuring module or compatible measuring transformers. The maximum permissible voltage relative to the GND terminal is +5.5V. Model Mx: max. 40 mA~. Model Mx 100A: max. 125 mA~.
LT input	0V or +5V relative to GND, galvanically isolated from the power supply. Can be switched by standard relay outputs and outputs with open collector, always against GND.
ANDI inputs	Analog, max. permissible voltage relative to GND terminal is +5.5V. Galvanically isolated from the power supply. Power measurement function: as inputs IL1 to 3, max. 15 mA~. Pulse counter function: 0V or 5V min. pulse width and gap width is 1ms. NTC function: Supports NTC 10k@25°C resistance temperature sensor, measurement accuracy $\pm 2^\circ\text{C}$. PT1000 function: Supported platinum temperature sensor PT1000, 1k@0°C, measurement accuracy $\pm 5^\circ\text{C}$.
DQ terminal	Data bus for connecting digital sensors DS18B20 or DS18S20 sensors, measurement accuracy $\pm 0.5^\circ\text{C}$.
USB connector	USB 1.1/ USB 2.0, galvanically isolated from the power supply and additionally optically isolated, serial communication 115200 Bd 8N1
LAN connector (RJ45)	10/100 Mbit/s, galvanically isolated from the power supply and additionally galvanically isolated according to IEEE 802.3
RS485 terminals A and B	RS485, galvanically isolated from the power supply, serial communication 115200 Bd 8N1
Dynamic characteristics	
Power measurement period (effective values)	typ. 600 ms (including averaging of switched SSRs)
SSR output control transition time in continuous control	typ. 3s (from 0 to 100% power and vice versa)
Relay output switching delay	Programmable (min. 2s)
Relay output switch-off delay	Programmable (min. 2s)
Other parameters	
Max. diameter of wires connected to terminals	2.5
Max. diameter of wires threaded through the measuring transformers of the measuring module	Model Mx: 9 mm (including insulation) Model Mx 100A: 14 mm (including insulation)
Distance between measuring module and controller	<2 m (longer cables are possible, but reduce accuracy by approximately 0.2% per 2 m)

Distance between controller and solid-state relay	<10 m
Operating position	Any
Mounting	Controller: DIN 35 mm or 2 screws with a round or countersunk head with a diameter of up to 6 mm. Measuring module: DIN 35 mm or 1 screw with a pan head or countersunk head with a diameter of up to 6 mm
Overvoltage category	III
Electrical strength	4 kV / 1 min (between power supply (L1, N) and detachable terminal blocks, between power supply and relay outputs R1 and R2, between power supply and communication interfaces)
Degree of contamination	2
Operating temperature range	-20°C to +40°C
Storage temperature range	-40°C to +80°C
Protection	B6A
Protection	Controller and measuring module: IP 20
Dimensions (WxHxD)	Controller: 106x110x64mm (6M) Measuring module: Model Mx: 70x110x64mm (4M) Model Mx 100A: 91x90x65mm (5-6M)
Weight	Controller: 400g Measuring module: Model Mx: 100g Model Mx 100A: 250g
Noise level (including power SSRs)	0 dB(A). Passive cooling only; for power SSRs, sufficient heat dissipation must be ensured.
Real-time backup battery	CR2032 lithium, typically >6 years
Warranty period	36 months

RECYCLING

The product is not subject to the obligation to take back waste electrical equipment in accordance with Waste Act No. 185/2001 Coll. The device falls under the exemption in accordance with Annex No. 1, Decree No. 352/2005 Coll., group 5923/ENV/720/05.

At the end of its service life, the product can be dismantled, recycled, or disposed of at a secure landfill site. Do not dispose of the product in normal municipal waste!

EU DECLARATION OF CONFORMITY



Company:

SOLAR controls s.r.o. (manufacturer's name), **ID No.: 29109795**
Brojova 25, Plzeň, 32600, Czech Republic (manufacturer's headquarters)

Declares under its sole responsibility that the product:

WATTrouter Mx, WATTrouter Mx 100A (product name)
WRMX 01/08/17 (controller) and WT 02/10, WT 03/11 (measuring modules) (type/model)
For regulating and optimizing the consumption of energy produced by a photovoltaic power plant (function)

It is safe under normal conditions and when used as specified in the instructions for use, and measures have been taken to ensure that all products placed on the market comply with the technical documentation, the essential requirements of the government regulation applicable to it and with the requirements of the technical regulations specified in the following paragraph.

The product complies with the manufacturing documentation and parameters specified therein, as well as with Czech and European directives and technical standards used for conformity assessment:

Directive:

- LVD Directive 2014/35/EU
- EMC Directive 2014/30/EU

Standards:

- EN 61010-1:2010
- EN 61000-3-2:2006+A1:08+A2:09
- EN 61000-3-3:2008
- EN 61000-3-11:2000
- EN 61000-4-2:2009
- EN 61000-4-4:2012
- EN 61000-4-5:2006
- EN 61000-4-11:2004
- EN 61000-6-3:2007

Product conformity assessment was performed in accordance with Act No. 22/1997 Coll. on technical requirements for products, as amended, and in accordance with Government Regulation No. 118/2016 Coll., which lays down technical requirements for low-voltage electrical equipment, and Government Regulation No. 117/2016 Coll., which lays down technical requirements for products in terms of their electromagnetic compatibility.

Year of CE marking: 2017

Place and date of issue of the
declaration:
Pilsen, April 1, 2017



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Ing. Tomas Krystl, company executive

(name, position, and signature of the responsible person
at the manufacturer)