Photovoltaic meter

PVM-1530

PVM-1530 Max | index: WMGBPVM1530MAX
PVM-1530 Pro | index: WMGBPVM1530PRO
PVM-1530 | index: WMGBPVM1530

MeasureEffect™

PVM-1530 IP65 closed cover | CAT III 1500 V DC | TOUCH SCREEN | LI-ION BATTERY | WiFi | BLUETOOTH

IRM-1 IP65 | LoRa | LI-ION BATTERY

CMP-1015-PV IP40 | BLUETOOTH | CAT IV 600 V



PVM-1530

reSYNC

automatic synchronization of STC parameters

Professional meter for photovoltaic installations up to 1500 V

Features

PVM-1530

- **It can be used for category 1 measurements according to EN 62446-1.**
- **It allows the measurement of the I-U curve for category 2 according to EN 62446-1 and EN 61829.**
- **It allows the measurement of photovoltaic panels, including bifacial and high-efficiency panels.**
- **Ability to define measurement procedures.**
- **It converts measured parameters into STC conditions according to EN IEC 60891 by cooperation with the IRM-1 solar radiation and temperature meter.**
- **reSYNC** function – automatic completion of results with environmental parameters and their conversion to STC conditions after restoring connection with IRM-1.
- The attachable radio interface ensures cooperation with the IRM-1 meter over long distances.
- Built-in Bluetooth and Wi-Fi for communication with external devices.
- Large structured memory of measurements.
- Large touchscreen for good visibility in bright sunlight.

IRM-1

- Measurement of solar radiation and temperature.
- The LoRa interface for communication with a master meter – offers a larger range than the Bluetooth technology!
- Automatic data synchronization with a master meter with reSYNC function.
- Built-in compass and inclination sensor.
- Built-in recorder that can be used to record solar radiation before constructing PV systems, as well as to measure the shading of existing systems.
- Large measurement memory: 999 cache memory cells and 5000 recorder records available (one-time recording) with the option of overwriting them (continuous recording).

Choose the best set for your needs

PVM-1530	IRM-1	CMP-1015-PV

PVM-1530 Max

Photovoltaic meter, two solar radiation and temperature meters and clamp meter



PVM-1530 Pro

Photovoltaic meter, solar radiation and temperature meter and clamp meter



PVM-1530

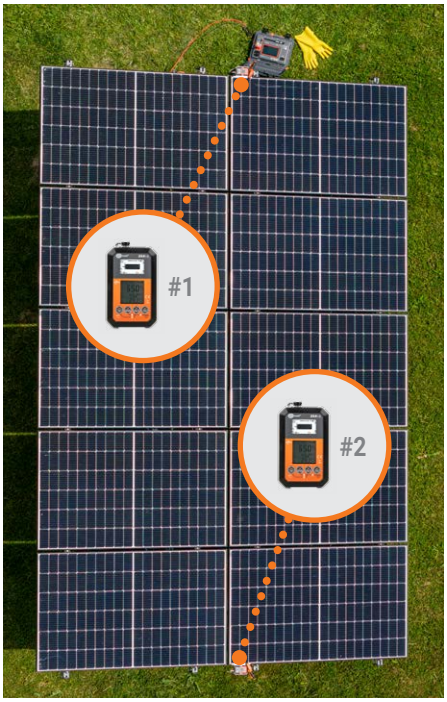
Photovoltaic meter



MeasureEffect™

Sonel MeasureEffect™

The meter is a part of the **Sonel MeasureEffect™** platform. It is a comprehensive system that enables you to take measurements, store and manage data, and provides multi-level control of your instruments.



Measured parameters

PVM-1530

- Measurement of I-U and P-U characteristics. Conversion to STC conditions.
- The open circuit voltage of the PV panel or a chain of panels, up to 1500 V DC.
- RMS voltage of the AC network up to 1000 V with frequency measurement.
- Short circuit current of a PV panel or chain of panels - up to 40 A DC.
- Insulation resistance of PV panels - measuring voltage of 250, 500, 1000, 1500 V DC, simultaneous measurement of two values: R_{ISO+} and R_{ISO-}.
- Insulation resistance of AC circuits - measuring voltage 250, 500, 1000 V DC.
- Resistance of protective conductors and equipotential bonding with ± 200 mA current.
- Measurement of PV panels operating current and AC current - all with CMP-1015-PV meter.
- AC/DC power measurement.
- Test of bypass diodes, automatic polarity detection.
- Test of blocking diodes with 1000, 1500 V DC voltage.

IRM-1

- Solar radiation intensity (irradiance) in W/m^2 or BTU/ft^{2}h.
- PV panel temperature in °C or °F.
- Ambient temperature in °C or °F.
- Inclination angle of panels
- Orientation of the panels with the built-in compass.



PVM-1530: cat. 1 measurements and I-U characteristics

The PVM-1530 is a pioneering meter for photovoltaic installations up to 1500 V with such a substantial number of measurement functions. Their selection is done via a touch screen. The screen is large, colorful and with strong backlight so that operation in full sunlight is not a problem. Extensive structural memory significantly reduces the time for preparing post-measurement documentation.

IRM-1: simple and compact

IRM-1, small, but indispensable for testing PV systems. By measuring solar radiation values, as well as panel and ambient temperatures, it provides the necessary data to convert the results into STC conditions. A built-in recorder with a memory of 5000 records enables the instrument to be used as a tool in the PV plant design process, as well as to diagnose panel shading problems.

Tightness and durability

The meters perform well in harsh environmental conditions. The PVM-1530's housing is rugged and tight when closed to easily ensure that the meter is protected during measurement.



Communication and software

Measurement data from the IRM-1 can be transferred to a computer via the USB port. In addition, the device has a built-in wireless **LoRa interface** (Long Range) for automatic data exchange with the master meter – even over long distances.

Measurement data from the PVM-1530 can be transferred to a computer via cable or wireless communication. Saving the downloaded data to popular formats and printing is ensured by **Sonel Reader**. In order to generate a report on electric shock protection use the optional software: **Sonel Reports Plus**.

Trouble? reSYNC!

It may happen that in the course of measurements the PVM-1530 moves away from the IRM-1 so far, that communication between them is lost. If the measurements are continued, then after the connection is restored, the results will be automatically **supplemented with environmental parameters**, which in the meantime were recorded by the IRM-1 in its **temporary memory**, and converted into STC conditions.



Specifications

Parameter	Measurement range	Display range	Resolution	Accuracy ±(% m.v. + digits)
Voltage				
AC voltage	0.0 V...1000.0 V	0.0 V...1000.0 V	0.1 V	±(2% m.v. + 6 digits)
DC voltage	0.0 V...1500.0 V	0.0 V...1500.0 V	0.1 V	±(0.5% m.v. + 2 digits)
Frequency	10.0 Hz...100.0 Hz	0 Hz...100.0 Hz	0.1 Hz	±(0.5% m.v. + 2 digits)
Short circuit current I_{sc}				
Voltage 1500 V DC	0.00...30.00 A	0.00...30.00 A	0.01 A	±(1% m.v. + 2 digits)
Voltage 1000 V DC	0.00...40.00 A	0.00...40.00 A	0.01 A	±(1% m.v. + 2 digits)
Insulation resistance				
Insulation resistance at AC side				
Measuring voltage 250 V	250 kΩ...200 MΩ acc. to EN IEC 61557-2	0.0 kΩ...200.0 MΩ	from 0.1 kΩ	±(3% m.v. + 8 digits)
Measuring voltage 500 V	500 kΩ...500 MΩ acc. to EN IEC 61557-2	0.0 kΩ...500.0 MΩ	from 0.1 kΩ	±(3% m.v. + 8 digits)
Measuring voltage 1000 V	1000 kΩ...1.000 GΩ acc. to EN IEC 61557-2	0.0 kΩ...1.000 GΩ	from 0.1 kΩ	±(3% m.v. + 8 digits)
Insulation resistance at DC side				
Measuring voltage 250 V / 500 V / 1000 V / 1500 V	250 kΩ...500 MΩ acc. to EN IEC 61557-2	0.0 kΩ...500.0 MΩ	from 0.1 kΩ	±(8% m.v. + 8 digits)
Resistance of protective conductors and equipotential bondings				
Measurement of resistance of protective conductors and equipotential bondings with ±200 mA current	0.10 Ω...1999 Ω acc. to EN IEC 61557-4	0.00 Ω...1999 Ω	from 0.01 Ω	from ±(2% m.v. + 3 digits)
Operating current	as for CMP-1015-PV	as for CMP-1015-PV	as for CMP-1015-PV	as for CMP-1015-PV
Active power	0.0 kW...999.0 kW	0.0 kW...999.0 kW	0.1 kW	±(6% m.v. + 5 digits)

Other technical data

Safety and work conditions	
Measuring category according to EN IEC 61010-2-030	
Terminal group: „–", „+", ⏚	CAT III 1500 V DC
Terminal group: R_{CONT}–, R_{CONT}+	CAT III 600 V
Ingress protection	
Closed cover	IP65
Open cover	IP40
Type of insulation according to EN 61010-1 and EN IEC 61557	double
Power supply	mains, Li-Ion 7.2 V, 9.8 Ah rechargeable battery
Dimensions	390 x 308 x 172 mm
Weight	ca. 8.8 kg
Operating temperature	-10...+45°C
Storage temperature	-20...+60°C
Humidity	20...90%
Nominal temperature	23 ± 2°C
Reference humidity	40%...60%
Memory and communication	
Memory of measurement results	9999 records
Data transmission	USB, RJ-45, Bluetooth, Wi-Fi
Communication with IRM-1	wireless
Other information	
The product meets the EMC (emission for industrial environment) requirements according to standards	EN IEC 61326-1 EN IEC 61326-2-2

"m.v." – measured value

Standard accessories

		PVM-1530 Max WMGBPVM1530MAX	PVM-1530 Pro WMGBPVM1530PRO	PVM-1530 WMGBPVM1530
	**IRM-1 solar radiation and temperature meter** WMGBIRM1	2	1	
	**CMP-1015-PV digital clamp meter for photovoltaic installations + standard accessories** WMGBCMP1015PV	1	1	
	**LORA-S1 USB adapter for data transmission** WAADAUSBLORA	1	1	
	**MC4-banana sockets adapter 1.5 kV (set)** WAADA5KVMC4KPL	1	1	1
	**Cable 2 m with MC4 plugs (set of 2 pcs)** WAPRZ002MC4KPL	1	1	1
	**Test lead 3 m blue 5 kV (banana plugs)** WAPRZ003BUBB5K	1	1	1
	**Test lead 3 m yellow CAT III 1500 V (banana plugs)** WAPRZ003YEBB1K5V	1	1	1
	**Test lead 1.8 m red 5 kV (banana plugs)** WAPRZ1X8BLBB5K	1	1	1
	**Test lead 1.8 m black 5 kV (banana plugs)** WAPRZ1X8BLBB5K	1	1	1
	**Crocodile clip 1 kV 20 A black** WAKROBL20K01	2	2	2
	**Pin probe 5 kV (banana socket) black** WASONBLOGB2	2	2	2
	**Solar radiation meter mounting kit for PV panels + probe for measuring the temperature of PV panels and the ambient temperature** WASONTPVCKPL	2	1	
	**5 V power supply with USB 2.0 output and a detachable micro-USB cable** WAZASZ24	2	1	
	**L-4 carrying case** WAFUTL4	1	1	1
	**USB cable** WAPRZUSB	1	1	1
	**Mains cable with IEC C13 plug** WAPRZ1X8BLIEC	1	1	1

Standard accessories

	PVM-1530 Max	PVM-1530 Pro	PVM-1530
	WMGBPVM1530MAX	WMGBPVM1530PRO	WMGBPVM1530
Key for MC4 connectors WAPOZKEYMC4	1	1	1
Fuse 0.5 A, 1000 V AC/DC, 6.3x32 mm WAPOZB05A1000V	1	1	1
Factory calibration certificate - PVM-1530	1	1	1
Factory calibration certificate - IRM-1	2	1	
Factory calibration certificate - CMP-1015-PV	1	1	



Optional accessories

		PVM-1530 Max WMGBPVM1530MAX	PVM-1530 Pro WMGBPVM1530PRO	PVM-1530 WMGBPVM1530
	**IRM-1 solar radiation and temperature meter** WMGBIRM1		√	√
	**CMP-1015-PV digital clamp meter for photovoltaic installations + standard accessories** WMGBCMP1015PV			√
	**Optional accessories for CMP-1015-PV**	√	√	
	**MC4 splitter for power measurement in PV installations 1500 V (set of 2 pcs.)** WAADAMC4SV2KPL	√	√	√
	**AC-16 line splitter (facilitates current measurements)** WAADAAC16	√	√	√
	**Industrial socket adapter 16 A / 32 A** WAADAAGT16T / WAADAAGT32T	√	√	√
	**Three-phase socket adapter 16 A / 32 A** WAADAAGT16P / WAADAAGT32P	√	√	√
	**Three-phase socket adapter 63 A** WAADAAGT63P	√	√	√
	**Crocodile 1 kV 20 A clip red / blue / yellow** WAKRORE20K02 / WAKROBU20K02 / WAKROYE20K02	√	√	√
	**Pin probe 1 kV (banana socket) red / blue / yellow / black** WASONREOGB1 / WASONBUOGB1 / WASONYEOGB1 / WASONBLOGB1	√	√	√
	**Barcode scanner (USB)** WAADACK2D	√	√	√
	**Report / barcode printer D2 SATO (USB, portable)** WAADAD2	√	√	√
	**Tape / paper (glued) for D2 printer** WANAKD2	√	√	√
	**Ink tape for D2 printer** WANAKD2BAR	√	√	√

		PVM-1530 Max WMGBPVM1530MAX	PVM-1530 Pro WMGBPVM1530PRO	PVM-1530 WMGBPVM1530
	**Report / barcode printer D3 Brother (Wi-Fi / USB, portable)** WAADAD3	√	√	√
	**Ink tape for D3 printer** WANAKD3	√	√	√
	**Rechargeable battery for D3 printer** WAAKU19	√	√	√
	**Sonel Reader software** WAPROREADER	√	√	√
	**Sonel Reports Plus software** WAPROREPORTSPLUS	√	√	√
	Calibration certificate with accreditation - PVM-1530	√	√	√
	Calibration certificate without accreditation - IRM-1	√	√	
	Calibration certificate with accreditation - CMP-1015-PV	√	√	



