

Technical data sheet

Solar Module Yield Measuring System SMYMS 2.0

The SMYMS 2.0 is the new version of the solar module measuring device that has been used by the PHOTON laboratory for years.



Forward-backward measurement

Like its predecessor, the SMYMM 2.0 can record a complete I-V curve as often as once per second. If the solar module measuring device were still equipped with a capacitor bank, the SMYMS 2.0 can record the characteristic curve independently of the irradiation intensity at a time programmed by the user. Cycle times from one millisecond to 500 milliseconds can be programmed. The measurement can run from Voc to Isc or vice versa. For control purposes, a combined forward-backward measurement can also be set – this is ideal for high-capacity modules.

Complete autonomy

The previous solar module measuring device required an external capacitor bank with grid feed inverter in order to operate. The SMYMS 2.0, in contrast, can work autonomously. The energy from the MPP can be thermalised or (optionally) fed into the power grid. Each SMYMS has its own inverter in the version used for grid feed-in.

Integrated weather station data logger

The weather and solar radiation sensors already installed can be connected to the SMYMS 2.0 (some connections optional). A complete test bench for yield measurement can be set up with just one SMYMS.

Data storage capacity

The internal memory capacity has been increased considerably. Even at a maximum measuring rate of one I-V characteristic curve per second, the complete measurement data – including the characteristic curve – can therefore now be stored internally for a one-year period (3 years as an option). The MPP values for a period of more than 100 years can also be stored.

External camera

One external camera per SMYMS can capture one image per second of the solar module for testing. This allows external effects (snow layer, bird droppings) to be reliably detected even months later, and be allocated to the measurement deviations.

Calibration

The SMYMS can be calibrated. This allows the measurement accuracy to be increased to +/- 0.5 % if required.



For more information, please scan this QR code with your smartphone, email oliver.ashrafi@photon.info or call us at +49 / 30 / 346 55 46 - 26

Technical data	
Module types suitable for measuring	Monocrystalline – all cell types, 2 terminals Multicrystalline – all cell types, 2 terminals Thin-film – silicon – all cell types, 2 terminals Thin-film – other semiconductors – all cell types, 2 terminals Concentrator cells – on request, 2 terminals 3 and 4 terminal modules on request
Permissible input voltage	0 - 180 volts
Voltage measuring range	0 - 100 volts
Permissible input current	0 - 20 amps
Current measuring range	0 - 12 amps
Maximum module output (P _{tot})	600 watts
Measuring process	Continuous current-voltage measurement
Measuring technology	Variable resistance settings – processor-controlled
MPP maintained between measurements	yes, thermalization as standard Optional grid feed-in
Open circuit-short circuit measurement time	1 - 1000 milliseconds
Short circuit-open circuit measurement time	1 - 1000 milliseconds
Resolution	Current-voltage: 18 bits over the measuring range, 16 bits effective Time: min. 1 microsecond, a standard of 1,024 values per characteristic curve
Measuring precision, uncalibrated	+/- 1.5 % absolute for current and voltage
Measuring precision, calibrated	+/- 0.5 % absolute for current and voltage
Complete I-V characteristic curves per hour	max. 3,600, programmable
Integrated memory capacity	I-V curves 1 year (based on one measurement per second) MPP values > 100 years (based on one measurement per second)
Additional memory capacity	1 TB (I-V curves for three years based on one measurement per second)
Resistance during short-circuit current measurement – standard	10 mOhm
Resistance during short-circuit current measurement – enhanced	1 mOhm
DC connections	According to specifications, all standard DC connectors
Standard test inputs	I2C Module temperature sensors Solar irradiance sensor (2x)
Optional test inputs	Solar irradiance sensor (2x extra, max. 8 inputs in total) Solar spectrum Air temperature Air humidity Air pressure Wind speed Wind direction Precipitation USB camera
Network connection	LAN industrial Ethernet WLAN 2,4 GHz
Power supply	110-240 volts, 50-60 Hz, 100 watts max., 40 watts typ.
Schutzklasse	IP67
Dimensions (W × H × D)	380 × 240 × 130 mm
Weight	10.7 kg
Mounting	4 × M8 tapped holes
Accessories	SI solar irradiance sensor Pyranometer solar irradiance sensor USB camera (outdoor) Temperature sensors for 60-cell module Temperature sensors for 72-cell module Temperature sensors for 96-cell module Spectrometer