English

User Manual

PCE-PVA 100 Solar Measuring Device

User manuals in various languages (français, italiano, español, português, nederlands, türk, polski, русский, 中文) can be found by using our product search on: www.pce-instruments.com

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Contents

1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, …) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Ensure that the fans are not covered and can cool completely.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

2 Specifications

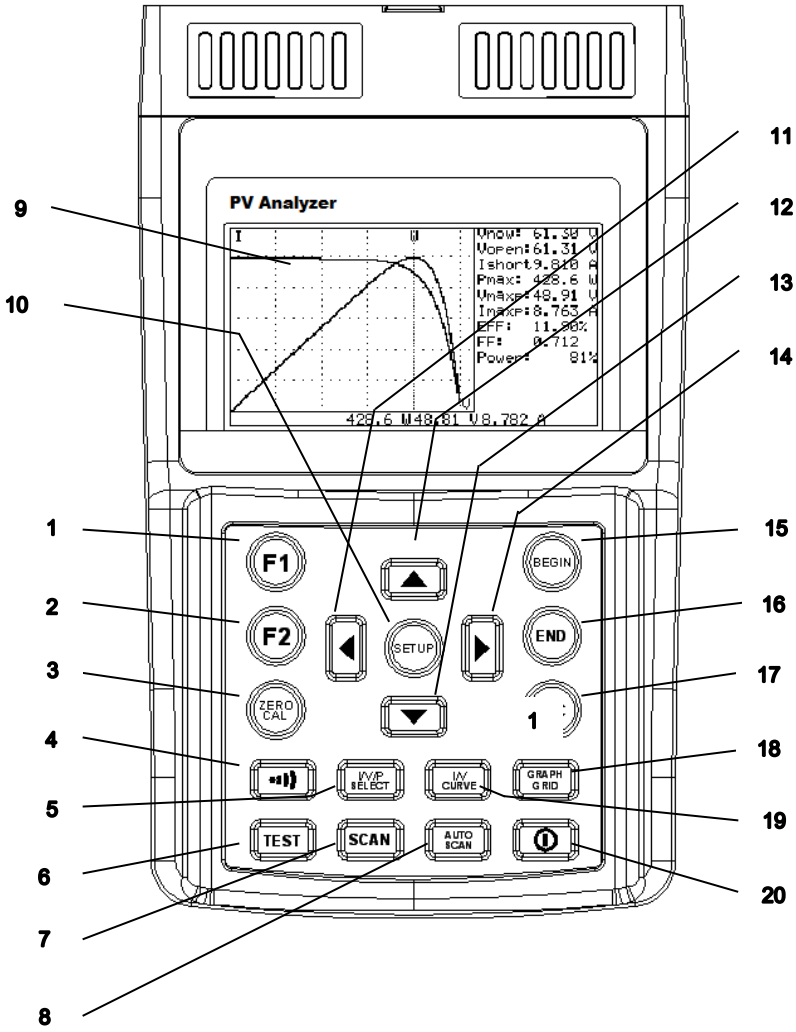
DC voltage		
Measurement range	**Resolution**	**Accuracy**
0 ... 10 V	0.001 V	±1 % ±(1 % of Vopen ±0.1 V)
10 ... 60 V	0.1 V	±1 % ±(1 % of Vopen ±0.1 V)
Vopen: open voltage measurement on a solar module		
Direct current		
Measurement range	**Resolution**	**Accuracy**
0.01 ... 10 A	1 mA	±1 % ±(1 % of Ishort ±9 mA)
10 ... 12 A	10 mA	±1 % ±(1 % of Ishort ±0.09 A)
Ishort: short-circuit current of a solar cell		

Further specifications	
Adjustable photovoltaic surface	0.001 ... 9999 m²
Adjustable light intensity	10 ... 1000 W/m²
Display	4.8" LC display
Fuse	F250 V, 12 A
Data memory	100 measurements
Storage rate	0 ... 99 minutes
Battery life	approx. 400 linear measurements from 60 ... 0 V and 0 ... 12 A
Power supply battery	11.1 V, 3400 mAh lithium battery
Power supply mains adaptor	primary: 100 ... 240 V AC 50/60 Hz secondary: 15 V DC / 3A
Degree of pollution	2
Temperature coefficient	0.1 % of the measurement range / °C at temperatures <18 °C / 64 °F and >28 °C / 82 °F
Operating conditions	5 ... 50 °C, <85 % RH, non-condensing
Storage conditions	-20 ... 60 °C / -4 ... 140 °F, <75 % RH, non-condensing
Dimensions	257 x 155 x 57 mm / 10.1 x 6.1 x 2.2 in
Weight	1160 g / 2.6 lbs

3 Delivery scope

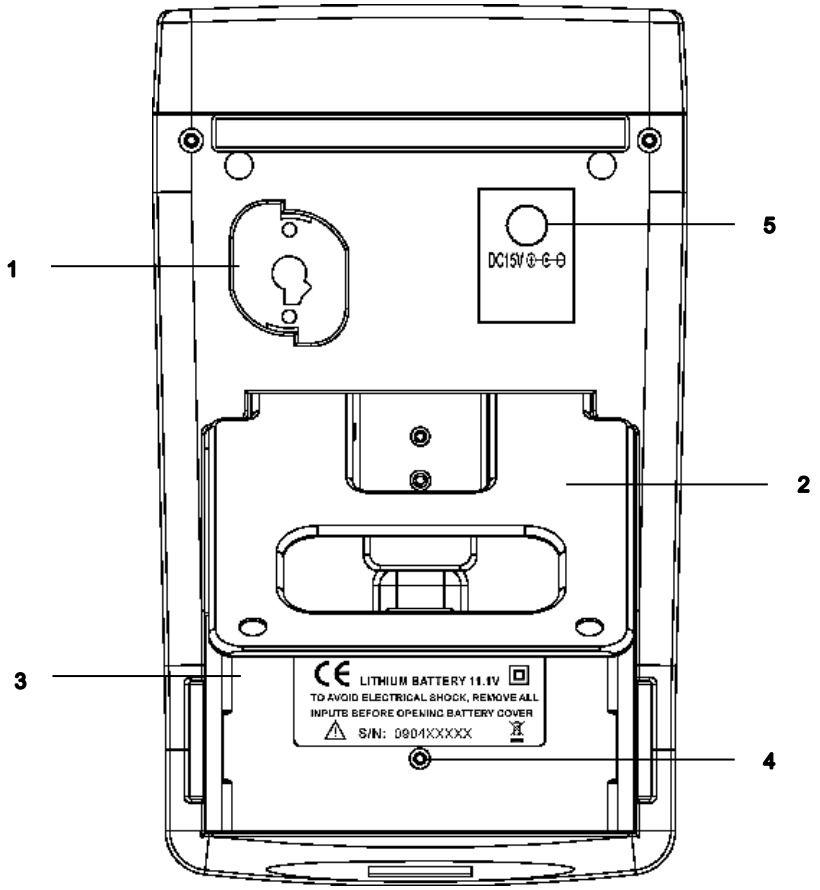
1 x solar measuring device PCE-PVA 100
1 x optical USB cable
1 x battery
1 x software CD
1 x pair of Kelvin clamps
1 x pair of safety test leads (100 mm)
1 x mains adaptor
1 x user manual

4 Device description



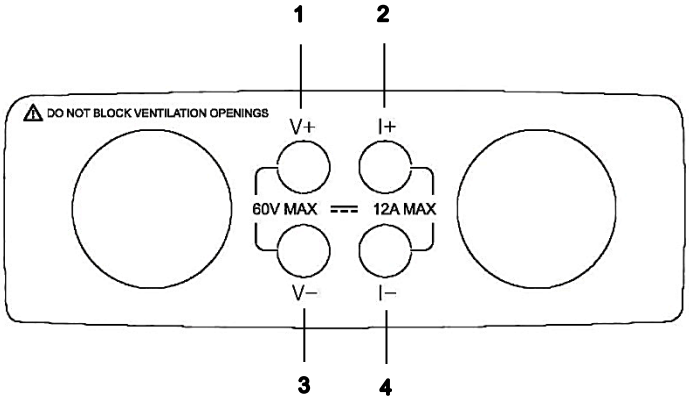
No.	Key	Description
1		No function
2		No function
3		Set zero point for voltage and current
4		Audible alarm for insufficient power
5		Change graphical view P-V P-I P-V-I (both graphics)
6		One-point test based on the settings and voltage measurement
7		Manual scan based on the settings
8		Automatic scan
9		LC display
10		Open and close settings
11		Graphics: Move cursor to the left Menu: Reduce value
12		Menu: Parameter upwards
13		Menu: Parameters downwards
14		Graphics: Move cursor to the right Menu: Increase value
15		No function
16		No function
17		Press briefly: Start and stop data logging Long press: Delete data memory
18		Show and hide grid
19		Change graphical view I-V V-I
20		Switch on and off

4.1 Display description



No.	Description
1	Connection for the optical USB cable
2	Tripod
3	Battery
4	Screw for the battery holder
5	Mains adaptor connection

4.2 Connections



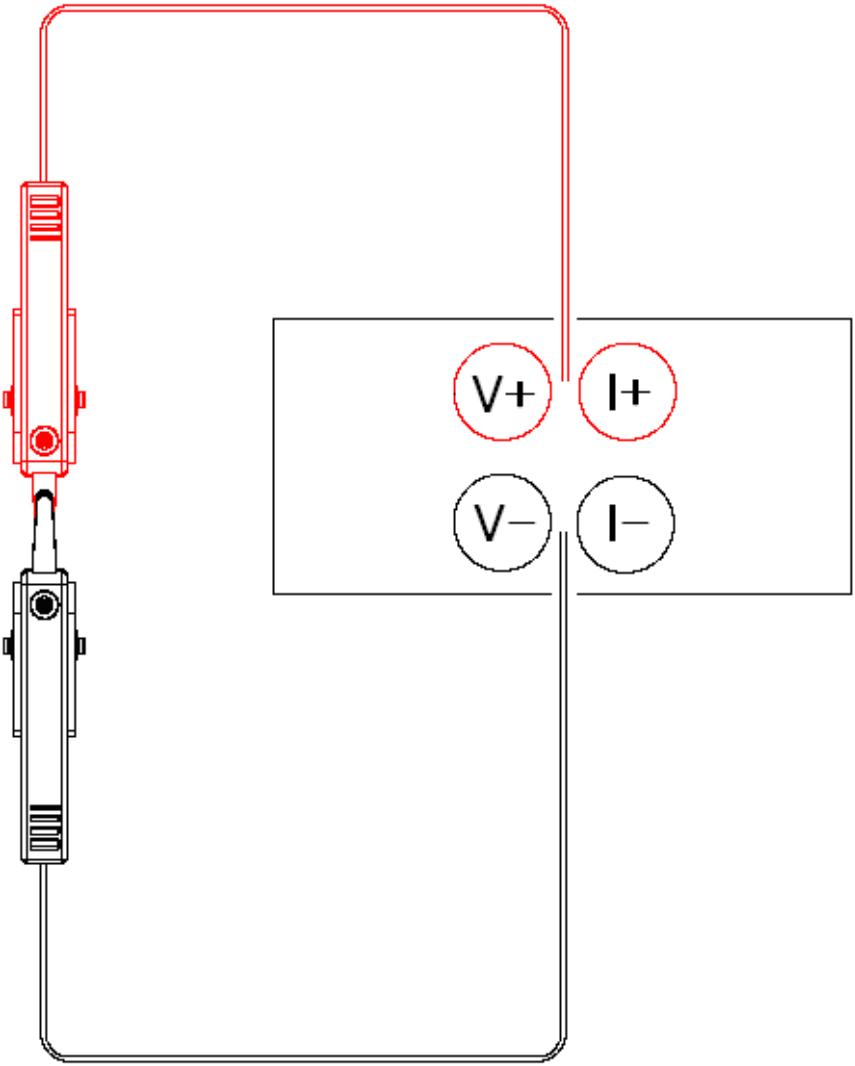
No.	Description
1	Voltage input
2	Power input
3	Voltage output
4	Current output

5 Switch the meter on and off

To switch the meter on or off, briefly press the  key once. If the meter overheats, it should remain active until it has cooled down.

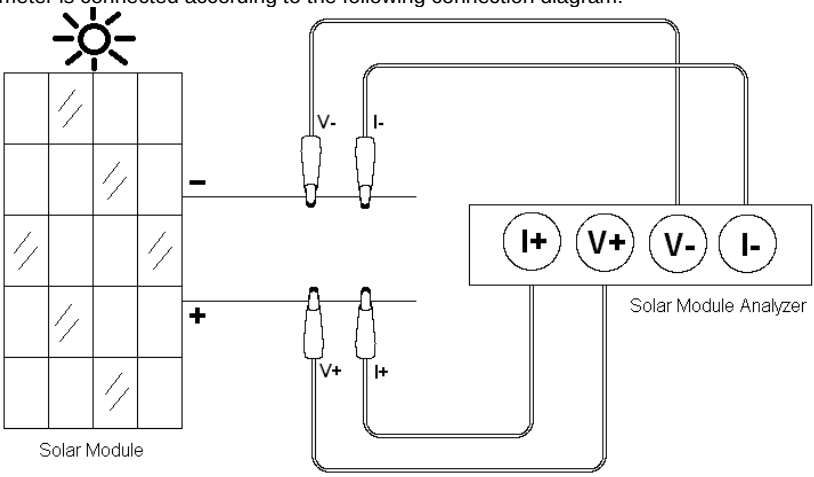
6 Set zero point

The zero point of the test leads should be reset before a measurement. To do this, short-circuit all measuring connections and press the ZERO CAL key. “ZERO CAL ..." appears on the display. As soon as the message disappears, a normal measurement can be started.



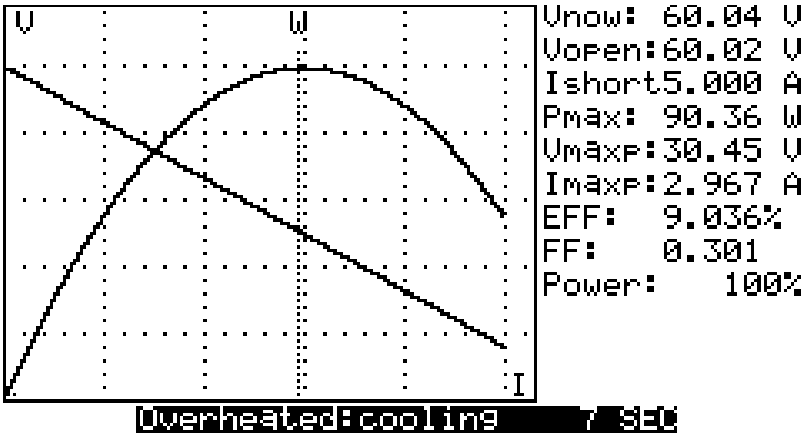
7 Wiring diagram

The meter is connected according to the following connection diagram:



8 Make a measurement

During the measurement, make sure that the fans are not covered to ensure sufficient cooling capacity. If the meter overheats, this is indicated by "Overheated:cooling". As long as this message is displayed, no measurement can be carried out. If the instrument is switched off during the cooling phase, you must wait at least three more minutes until cooling is complete. It is therefore advisable to allow the meter to cool down first before switching it off.



The mains adaptor must not be connected to the meter during a measurement.

8.1 Settings

To make settings, briefly press the 

key once to open the settings. Use the arrow keys to select the desired parameter and you can edit it directly. The value is adopted directly. Press the 

key again to return to measurement mode.

```
Time delay before scan: 3000mS   V6.12
Sampling Time of Datalogging: 1 Minute
Current Range of Scan begin:2.100 A
Current Range of Scan end:11.80 A
Area of Solar Cell or Panel:2.225 m²
Irradiance: 1000W/m²
Single Test Point:9.980 A
Alarm of Low Power:760.0 W
```

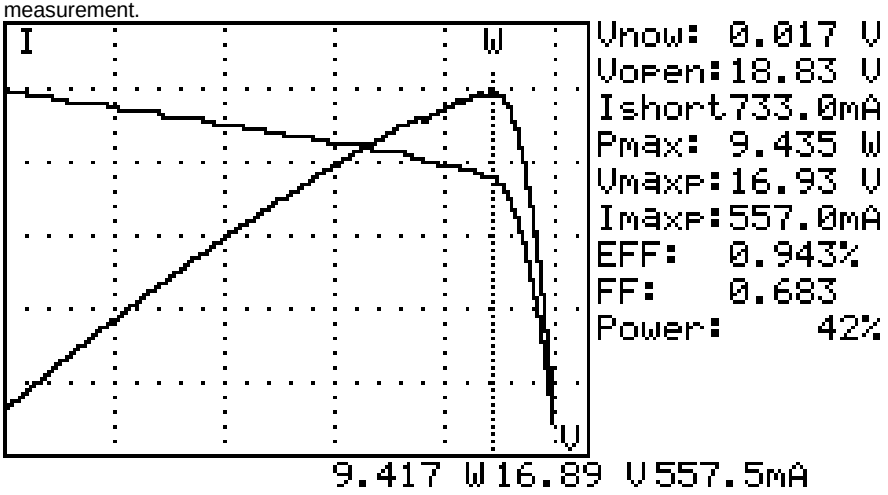
```
Year   Month   Date   Hour   Minute   Second
2009     7      27     11      54        3
```

Menu	Description
Time Delay before scan	Waiting time between individual measurements
Sampling Time of Datalogging	Storage rate in minutes
Current Range of Scan begin	Initial current value for "Scan" mode **Note:** If this value is higher than Ishort, no measurement is possible.
Current Range of Scan end	Final current value for "Scan" mode
Area of Solar Cell of Panel	Surface area of the solar cells
Irradiance	Light intensity in W/m²
Single test point	Setting the measuring point of the single-point measurement
Alarm of Low Power	Setting the alarm limit value when the power falls below the limit. Maximum value: 500 W
Year/Month/Date/Hour/Minute/Second	Setting the date and time. Minutes and seconds cannot be set

8.2 Automatic total measurement

This measurement gives you a rough overview of the solar cell.

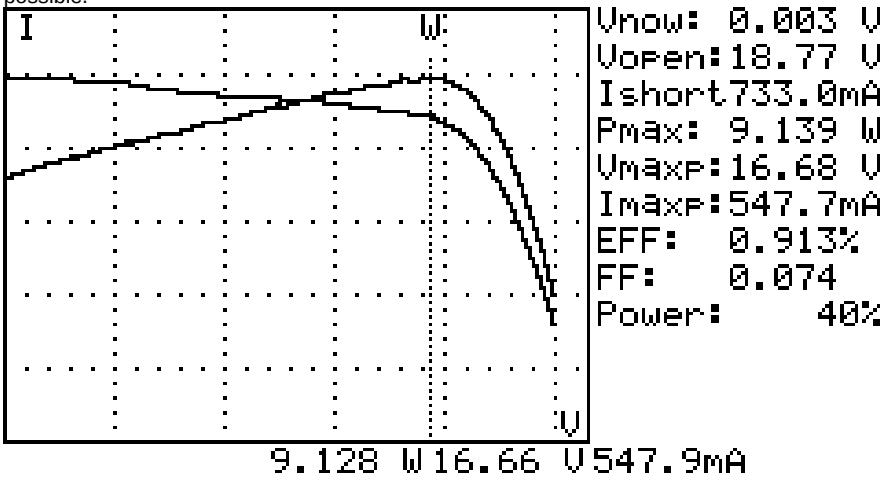
To carry out an automatic measurement, press the AUTO SCAN key. Connect the test lead before the measurement.



8.3 Manual total measurement

After the automatic measurement, you can enter the start and end values of the current measurement in the settings and start a measurement. Once the settings have been made, the measurement can be started using the SCAN key.

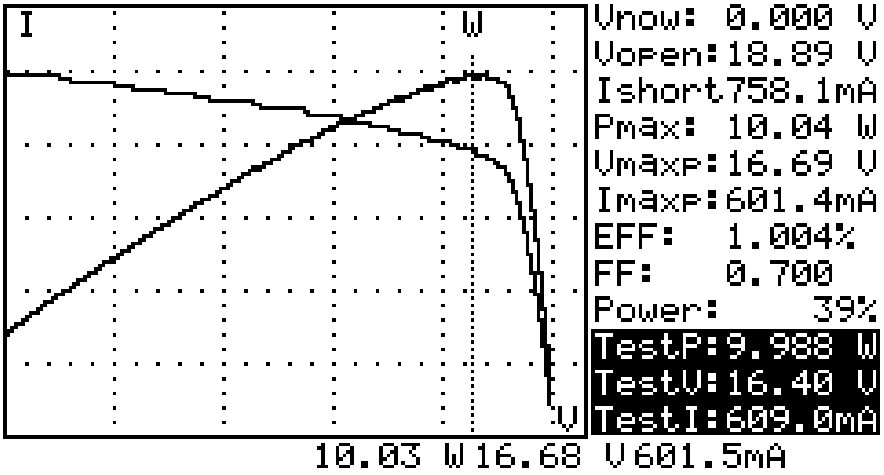
Note: If the short-circuit current exceeds the set measurement range, a measurement is not possible.



8.4 Single-point measurement

The single-point measurement is useful when the values for a specific current value need to be determined. This has the advantage that the measurement can be carried out quickly. The measuring point is selected in the settings. Once the measuring point has been set, the measurement can be carried out using the TEST key. The measurement result is shown at the bottom right of the display.

TestP
TestV
TestA



9 Data recording

To start data recording, briefly press the REC key once. The meter now automatically carries out the automatic measurement at the set measurement interval. To cancel data logging, press the key again.

10 Clear memory

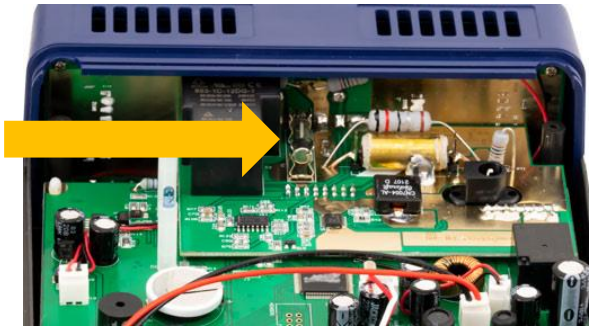
To clear the entire memory, first switch off the meter. Then press and hold the REC key and then press the ⏻ key to switch on the meter. You will hear a long beep. Now release all keys. The memory is deleted and you can resume operation.

11 Replace battery

To replace the battery, disconnect the meter from all test leads and switch it off. You can then loosen the battery using the battery compartment screw. Once you have loosened the screw, you can remove the battery with its housing and replace it by a new one. Pay attention to the connector plug. Once you have replaced the battery and refitted it securely, you can use the meter again.

12 Replace fuse

To replace the fuse, the test leads must first be disconnected from the meter. The meter must then be switched off and the battery removed. The housing must now be opened to access the fuse. There are two screws to loosen at the top on the back and two screws in the battery compartment. The housing can then be lifted. Pay attention to the battery cable when opening. The fuse is located above the sensor system. Replace the fuse with a 15A / 250V fuse. Then re-assembe the meter. It can then be used again.



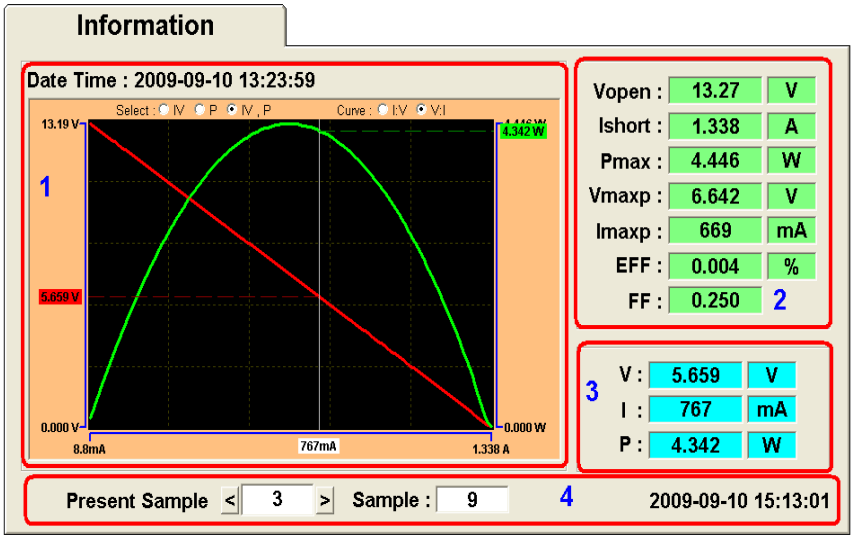
13 Software

To transfer the measured values from the meter to the PC, first install the software and the corresponding driver. You can download these here if necessary:
https://www.pce-instruments.com/deutsch/download-win_4.htm
To ensure proper use of the software, we recommend that you always install and start the software with administrator rights.

After installation, you can connect the USB cable to the PC and the meter and read out the measured values.

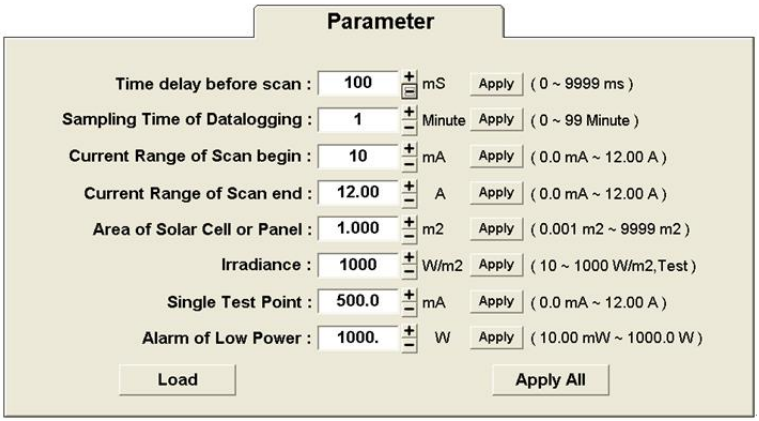
Symbol	Function
	Connect to the meter
	Reset view
	Call up saved measurement
	Save the raw data
	Save measured values as csv or tab file
	Print current view
	Set the date and time in the meter
	Mirror the current image from the meter on the PC (no live view)
	Transfer saved measurement data to the PC
	Delete memory
	Perform automatic measurement
	Perform automatic measurement with quantity
	Perform manual measurement

13.1 Display measured values



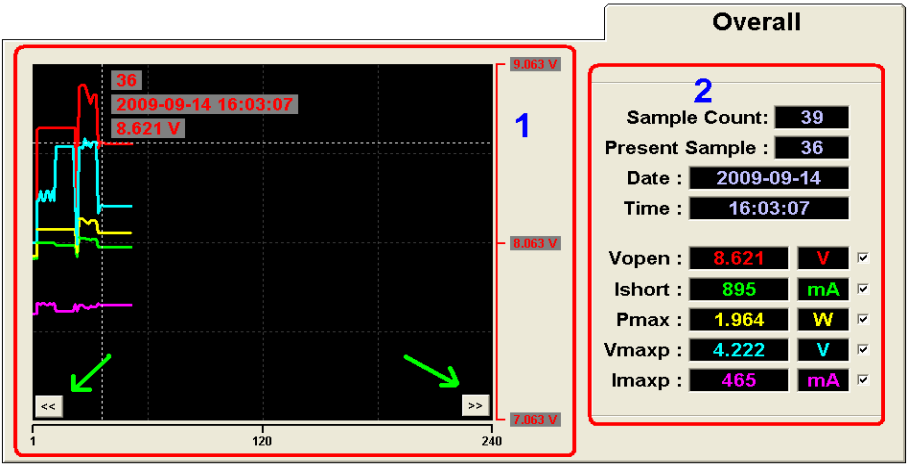
All measurements can be viewed individually in the "Information" window.
The characteristic curve is displayed in the first area. From there, each individual measuring point can be approached using the mouse. The respective measured values are displayed in the third area. The axes can be adjusted if required. The measured values are displayed in the second area. In the fourth area, you can switch between the individual measurements.

13.2 Settings



Measurement settings can be made in the "Parameter" field. “Load" transfers the current settings from the measuring device to the software. A specific value is transferred with "Apply". "Apply All" transfers all settings.

13.3 General view of all measurements



All measurements are summarised in the "Overall" field. All measured values are displayed graphically in the first area. All measured values for the selected measurement are displayed in the second area.

14 Contact

If you have any questions, suggestions or technical problems, please do not hesitate to contact us. You will find the relevant contact information at the end of this user manual.

15 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.

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