

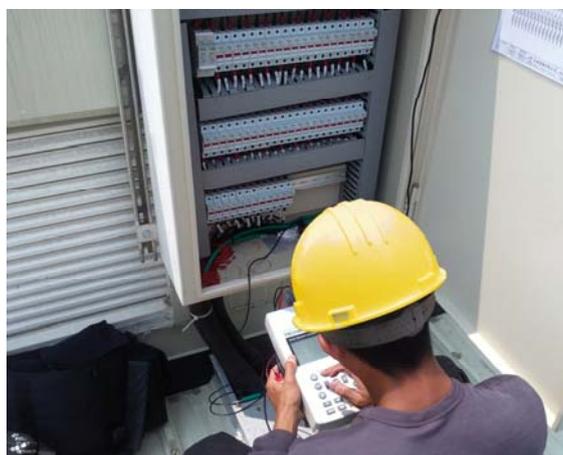
PROVA[®]

PROVA 1011

PV System Analyzer



CE CAT II 1000V
CAT III 300V



Features:

- **I-V curve test** for PV system.
- Max. PV system power (Pmax) search by Auto-scan: **1000V, 12A (12000W capability)**.
- The analyzer and the Remote Solar Detector is connected by **Bluetooth wireless** communication (Bluetooth 2.1 + EDR Class 1).
- The Remote Solar Detector is **moisture-proof**.
- **Intelligent test logic** with no personnel attendance required in the field. PV system analyzer waits and tests the system until appropriate sunlight irradiance is detected.
- Max. voltage (**Vpm**) at Pmax; Max. current (**Ipm**) at Pmax.
- Voltage at open circuit (**Voc**); Current at short circuit (**Isc**).
- **Efficiency (%)** calculation of PV system.
- **Temperature** measurement of solar panels.

- **Irradiance** measurement of sun light.
- **Series resistance** (R_s) calculation of solar panels.
- **I-V curve with cursor** to display each data point.
- With **data logging/open** function, the I-V curves of PV system can be analyzed/recorded for a period of time (e.g. 60 min.).
- **Conversion of I-V curve** under OPC to data under standard test condition (STC) based upon **IEC standard**
- Provide Operating Condition (**OPC**) and Standard Test Condition (**STC**) test reports for verification of solar panel performance (**OK**, or **NO OK**).
- Users can set up the **parameters** of solar panels; users can set up the **series numbers** of solar panels. Parameters of many solar panels can be measured in **one measurement**.
- **Irradiances & temperatures** of solar panels can be continuously measured, monitored and recorded.
- Built-in **calendar clock**.
- **Rechargeable lithium battery**, low battery warning; **AC power adaptor**.
- Optical **USB cable** for PC.
- With **OPTIONAL** power clamps (**SOLAR 15** DC Current Probe and **SOLAR 21** AC Power Clamp), continuously **measure/monitor/record** the **DC power** output of PV system and the **AC power** output of inverter (1 phase or balanced 3 phases); calculate the efficiency of **DC to AC power conversion** and the efficiency of the **max. output power**.

Electrical Specifications:

(23°C±5°C, Irradiance ≥ 800 W/m², 4-wire measurement, Max. power limit is 12000W)

DC Voltage Measurement:

Range	Resolution	Accuracy
1 ~ 1000 V	0.01V / 0.1V / 1V	±1% ± (1% of Voc ± 0.1V)

Voc: open circuit voltage of solar cell or module.

DC Current Measurement:

Range	Resolution	Accuracy
0.1 ~ 12 A	1mA / 10mA	±1% ± (1% of Isc ± 9mA)

Isc: short circuit current of solar cell or module.

DC Current Simulation

Range	Resolution	Accuracy
0.1 ~ 12 A	1mA / 10mA	±1% ± 9mA

Irradiance Measurement

Range	Resolution	Accuracy
0 ~ 2000 W/m ²	1 W/m ²	± 3 % ± 20 dgts

Temperature Measurement

Range	Resolution	Accuracy
-22 ~ 85 °C	0.1 °C	± 1 % ± 1 °C

General Specifications:

Battery Type:	Rechargeable Lithium Battery (3400mAh)
Battery Life:	400 times of linear scan (1000V ~ 1V, 0.1A ~ 12A), 8 hours for standby mode
Memory Size:	512K Bytes (3980 Mod files or 320 REC files or 3980 PWR files or 3980 IRR files)
AC Power Adaptor:	AC 100 ~ 240V input DC 15V / 1~3A output
Dimension:	257(L) x 155(W) x 57(H) mm
Weight:	1525g / 53.7 oz (Batteries included)
Operation Environment:	5°C ~ 50°C, 85% RH
Temperature Coefficient:	0.1% of full scale / °C (<18°C or >28°C)
Storage Environment:	-20°C ~ 60°C, 75% RH
Accessories:	Remote Solar Detector (battery type: rechargeable lithium battery, 1000mAh) with Thermometer USB power cord User manual AC power adaptor Optical USB cable Software CD Software manual Rechargeable lithium battery (3400mAh) Carrying bag Thermal conductive gel Testing clips (1 black & 1 red) 4-wire to 2-wire connecting cable 4-wire testing cable
Option:	Solar 15: DC current probe Solar 21: AC power clamp Testing clips (1 black & 1 red)

Option:

SOLAR 15

DC Current Probe



Electrical Specifications: (23°C±5°C)

DC Current Measurement:

Range	Resolution	Accuracy
DC 12A	1mA / 10mA	±2.0%±30mA

General Specifications:

Conductor Size:	23mm max. (approx.)
Battery Type:	Two 1.5V SUM-3 AA
Range Selection:	Manual
Power Consumption:	10mA (approx.)
Low Battery Indication:	Red LED
Dimension:	183 (L) x 61.3 (W) x 35.6 (H) mm 7.2" (L) x 2.5" (W) x 1.4" (H)
Weight:	190g (Batteries included)
Operation Environment:	-10°C ~ 50°C, < 85% RH
Altitude:	Up to 2000M
Storage Environment:	-20°C ~ 60°C, < 75% RH
Accessories:	User manual Carrying bag 1.5V AA battery x 2

Option:

SOLAR 21

AC Power Clamp



Electrical Specifications: (23°C±5°C)

AC Watt

Range (0 ~ 30A)	Resolution	Accuracy of Readings
0.050 – 9.999 W	0.001W	±2% ± 0.025W
10.00 – 99.99 W	0.01W	±2% ± 0.25W
100.0 – 999.9 W	0.1W	±2% ± 2.5W
1.000 – 9.999 KW	0.001 KW	±2% ± 0.025KW
10.00 – 99.99 KW	0.01 KW	±2% ± 0.25KW
100.0 – 999.9 KW	0.1 KW	±2% ± 2.5KW
1000 – 9999 KW	1 KW	±2% ± 25KW
Range (30 ~ 50A)	Resolution	Accuracy
0.050 – 9.999 W	0.001W	±2% of VA ± 5dgt
10.00 – 99.99 W	0.01W	
100.0 – 999.9 W	0.1W	
1.000 – 9.999 KW	0.001 KW	
10.00 – 99.99 KW	0.01 KW	
100.0 – 999.9 KW	0.1 KW	
1000 – 9999 KW	1 KW	

Range of CT Ratio: 1 to 250

H.P. (Horse Power): 1 H.P. = 746 W

AC Apparent Power (VA, from 0.000VA to 9999 KVA)

$$VA = V \text{ r.m.s.} \times A \text{ r.m.s}$$

AC Reactive Power (VAR, from 0.000 VAR to 9999 KVAR)

$$VAR = \sqrt{(VA^2 - W^2)}$$

AC Active Energy (mWH, WH, or KWH, from 0 mWH to 999,999 KWH)

$$WH = W \times \text{Time (in hours)}$$

Power Factor

Range	Resolution	Accuracy
0.000 – 1.000	0.001	±0.04

General Specifications:

Conductor Size:	30mm max. (approx.)
Battery Type:	Two 1.5V SUM-3 AA
Display:	4+2+2 digits LCD
Range Selection:	Auto
Overload Indication:	OL
Power Consumption:	10mA (approx.)
Low Battery Indication:	<input type="checkbox"/> B
Display Update Time:	2 times / sec.
No. of Samples per period:	512 (V or A) 256 (W)
Temperature Coefficient ($< 18^{\circ}\text{C}$ or $> 28^{\circ}\text{C}$):	0.15 x (Specified Accuracy) / $^{\circ}\text{C}$
Dimension:	210 (L) x 62 (W) x 35.6 (H) mm 8.3" (L) x 2.5" (W) x 1.4" (H)
Weight:	200g (Batteries included)
Operation Environment:	$-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$, $< 85\% \text{ RH}$
Altitude:	Up to 2000M
Storage Environment:	$-20^{\circ}\text{C} \sim 60^{\circ}\text{C}$, $< 75\% \text{ RH}$
Accessories:	Test leads User Manual Carrying bag 1.5V AA battery x 2
Option:	Alligator clips

PROVA INSTRUMENTS INC.

Add: 6F-2, No. 129, Lane 235, Pao-Chiao Road, Shin-Tien District,
New Taipei City 23145, TAIWAN

Tel: 886-2-89191255

Fax: 886-2-89191489

E-mail: prova@ms3.hinet.net

Website: www.prova.com.tw