PERFECTION
FOR THE SUN

HT

PHOTOVOLTAIC
TESTERS

New HT solutions for performance optimization and troubleshooting.

Thanks to the decrease in the cost of components and the remarkable increase of performance, installing photovoltaic systems on the roof or on the ground has become increasingly common. In a photovoltaic system, problems connected to safety and to the system's performance must be checked, and maintenance of strings and single panels must be carried out.
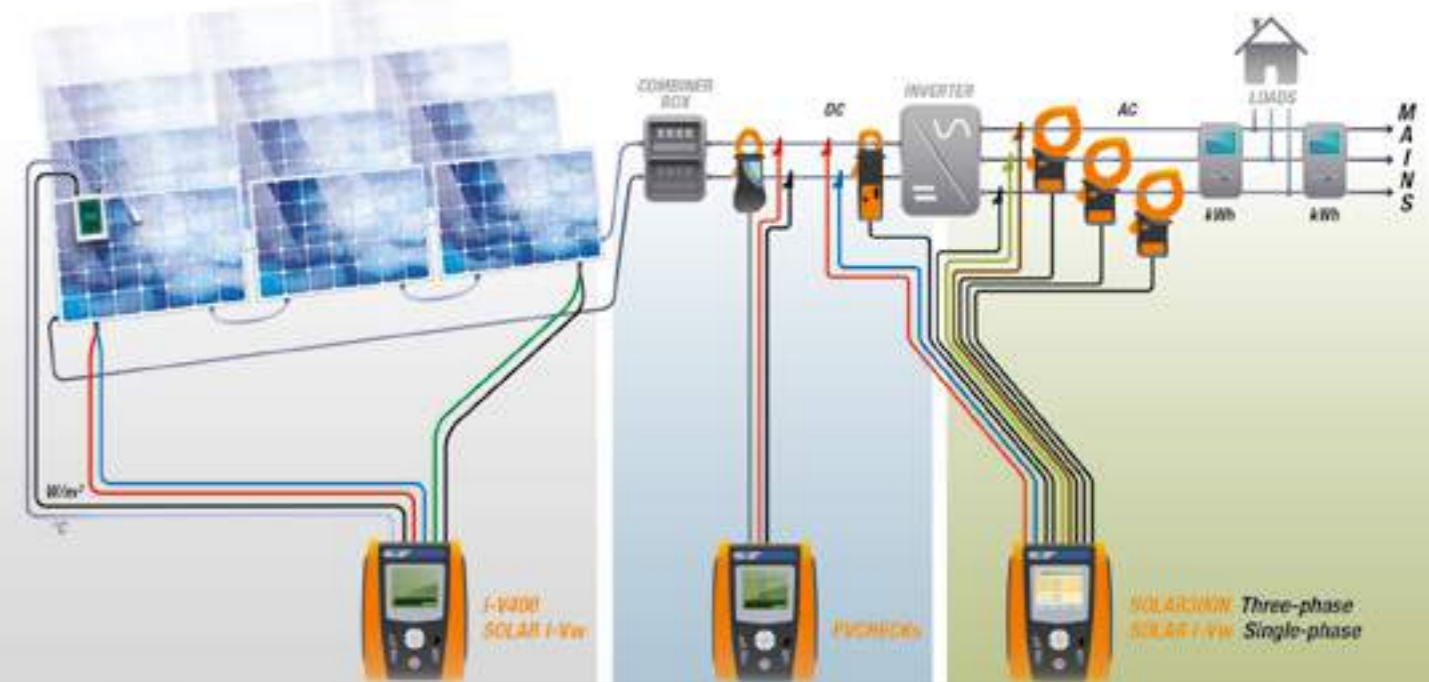
Troubleshooting

› It may happen that, during the operation of a system, **some modules may jeopardize the performance** of the whole system. When system efficiency is lower than expected, it is necessary **to detect the defective modules** so that they can be replaced. This can be achieved **by measuring the I-V curve** with devices **SOLAR I-Vw** and **I-V400w**.

Commissioning Tests

› When **operating** a photovoltaic system, it is necessary to **certify its safety according to IEC62446**. The suitable device to carry out these verifications is **PVCHECKs**.

Performance

› Performance **Recording** is one of the **necessary requirements** to make **maintenance programs efficient**. By monitoring system performance it is possible to **certify** a **production loss** quickly and efficiently. **SOLAR300N**, **SOLAR I-Vw** and **MPP300** are the **ideal solution** for **recording over time the energy production of a system** and the **performance check of an inverter**.

Troubleshooting   **Commissioning Tests**   **Performance**

COMPARISON TABLE
FUNCTIONS

MAINTENANCE AND EFFICIENCY OF THE PHOTOVOLTAIC SYSTEM

	SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
Continuity of protective conductors with 200mA	-	-	-	•	-
Insulation measurement with test voltage 250, 500, 1000VDC with no service interruption	-	-	-	•	-
I-V Curve measurement on single module or string	•	•	-	-	-
VOC and ISC measurement on single module or string	•	•	-	•	-
Single-Phase and Three-Phase efficiency measurement	• 1MPPT (3MPPT with MPP300)	-	• 1MPPT (3MPPT with MPP300)	-	•
DC side efficiency of the photovoltaic field	-	-	•	•	-
Use of remote unit SOLAR-02 with USB \ RF connection	• RF	• RF	• USB	• RF	• RF • USB
Measurement of irradiation with reference cell	•	•	•	•	-
Temperature measurement of cell and environment	•	•	•	•	-

POWER QUALITY ANALYSIS

	SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
AC/DC voltage in single-phase/three-phase systems	-	-	•	• DC	•
AC/DC current in single-phase/three-phase systems	-	-	•	• DC	•
Cosphi, Power Factor	-	-	•	-	-
Voltage unbalance (NEG%, ZERO%)	-	-	•	-	-
Power/Energy: Active P, Reactive Q, Apparent S	• only active P	-	•	• only active P	-
Voltage and current harmonics up to the 49th with THD%	-	-	•	-	-
Voltage anomalies (dips, peaks) with 10ms resolution (@ 50Hz)	-	-	•	-	-
Voltage fast transients (spikes) with 5µs resolution (200kHz)	-	-	•	-	-
Electric motor starting current (INRUSH)	-	-	•	-	-
Voltage flickers (Pst, Plt)	-	-	•	-	-
Full analysis according to EN50160	-	-	•	-	-
Phase sequence	-	-	•	-	-
Neutral-Ground Voltage	-	-	•	-	-
Neutral current	-	-	•	-	-

MEMORY AND RECORDING

	SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
Max number of simultaneously selectable parameters	9	-	251	5	-
Recording with selectable integration period	5s-60m	-	1s-60m	5s-60m	1s-60m
Indicative memory duration (in days @ PI=10min @ max number of parameters)	8	-	90	-	8
Indication of recording duration for power quality analysis	-	-	•	-	-
Internal memory extension with Compact Flash card	-	-	•	-	-

› FOLLOWS	SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
Default and custom recordings	-	-	•	-	-

REAL-TIME DISPLAY

	SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
Summary table of main electric parameters	•	•	•	•	-
Voltage/current waveforms	-	-	•	-	-
Tables or histograms of Harmonics and THD%	-	-	•	-	-
Voltage/current vector diagram	-	-	•	-	-

ADDITIONAL CHARACTERISTICS

	SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
Measuring range of I-V Curve / IVCK	1000V / 15A	1000V / 15A	-	1000V / 15A only VOC and ISC	-
Measuring range for efficiency measurement	1000VDC / 265VAC	-	1000VAC-DC 3000A	-	1000VDC / 600VAC 3000AC / 1000ADC
Measurement category:	CAT III 300V	CAT III 300V	CAT IV 600V	CAT III 300V	CAT IV 300V
Touchscreen colour display	-	-	•	-	-
LCD display with backlight	•	•	-	•	-
Internal memory capacity	200 curves I-V 8 days@ PI=10 min	200 curves I-V	15MB 90 days@ PI 10min	999 Locations	2MB 8 days@ PI=10 min
USB port for data download onto Pen Drive	-	-	•	-	-
PC interface with software for Windows	•	•	•	•	-
Integrated WiFi interface	•	•	-	-	-
Custom management of internal PV module database	•	•	-	•	-
Power supply with rechargeable battery and battery charger	-	-	•	-	•
Auto power off	•	•	•	•	•
Indication of recording duration for efficiency measurement	•		•	-	-
Reference standard for Power Quality Analysis	-	-	EN50160	-	-
Help on line on the display	•	•	•	•	-
Size (LxWxH) (mm)	235x165x75	235x165x75	235x165x75	235x165x75	300x265x214
Weight in kg (batteries included)	1.2	1.2	1	1.2	2.3
Reference standard for safety	IEC/EN61010-1	IEC/EN61010-1	IEC/EN61010-1	IEC/EN61010-1	IEC/EN61010-1
Order Code	HV000IVW	HV00400W	HV00300N	HV00PVCS	HVMPP300

You Tube

CAT II 1000VDC
MAX 1000VDC
BETWEEN INPUTS

CAT III 300VAC
MAX 265VAC
BETWEEN INPUTS

*ORDER CODE **HV00400W***

I-V400w

MULTIFUNCTION DEVICE FOR MAINTENANCE
AND TROUBLESHOOTING
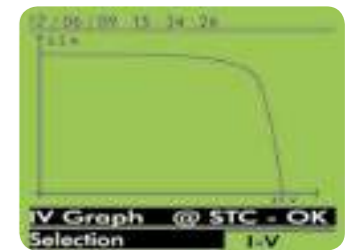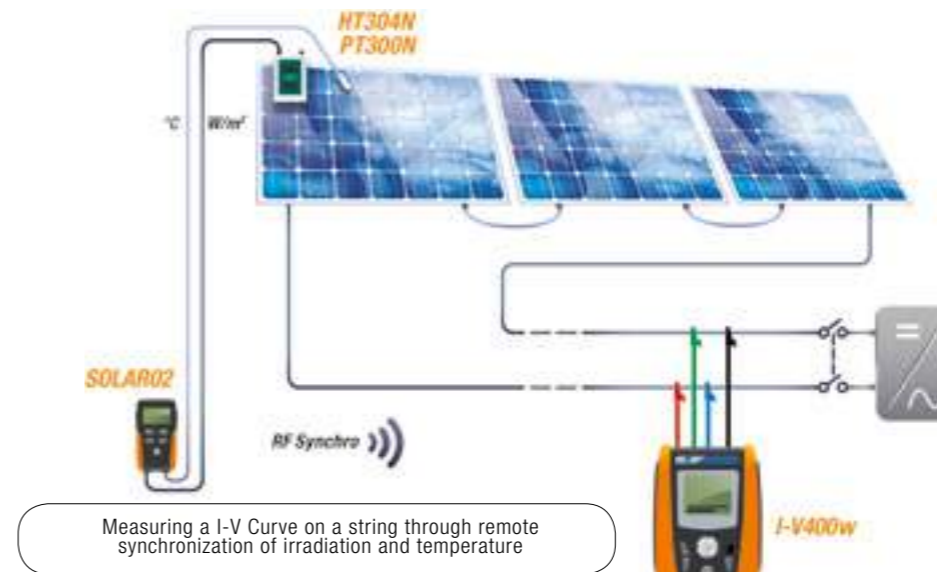OF PHOTOVOLTAIC SYSTEMS

> › Measurement of I-V Curve of a module or of a string
> › Measurement of open-circuit voltage and of
>   short-circuit current Voc/Isc
> › Database of 30.000 selectable photovoltaic modules

I-V400w allows **field detection of I-V Curve** an of the main characteristic parameters both of a single module and of a string for PV installations up to a maximum of **1000V** and **15A**.
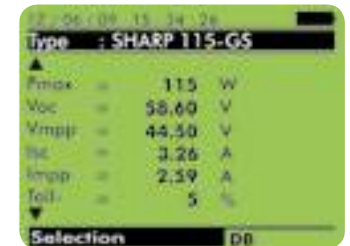
For measuring I-V Curve, I-V400w manages an **internal database modules,** (which can be updated at any time by the user) to compare the measured data with the rated values, thus allowing the immediate evaluation whether the string or the module fulfills the efficiency parameters declared by the manufacturer.

I-V400w carries out irradiance and temperature measurement directly or under remote mode trough the optional unit SOLAR 02, synchronized with main unit I-V400w.

Also for I-V400w, **the display at the end of the test of I-V Curve** is a clear indication about the compliance with the specifications declared by the panel manufacturer.
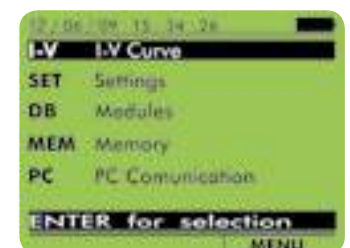

Measuring a I-V Curve on a string through remote synchronization of irradiation and temperature

Measuring Curve IV
with environmental sensors connected to I-V400w

Result of I-V Curve: **OK**

Manual insertion of a module

Detail of the single results of I-V Curve: **OK**

General Menu

⚙ Functions

Maintenance of photovoltaic system
- Measurement of PV module/string output voltage up to 1000V DC
- Measurement of PV module/string output current up to 15A DC
- 128 points per I-V Curve in STD or Capacitive mode
- Measurement of Voc-Isc-Pmax-Vmpp-Impp-Fill Factor
- Measurement of cell temperature through external probe
- Measurement of irradiation [W/m²] through reference cell
- Measurement of DC and rated power at module/string output
- Detection of I-V Curve with direct measurement of Irr/Temp parameters
- Detection of I-V Curve using the remote unit SOLAR02
- Measurement of resistance of series Rs of panels
- Measuring method with 4 terminals
- Direct comparison with reference conditions (STC – 1000W/m², 25°C)
- Test result OK / NO
- Internal database for managing up to 30 PV modules (30.000 modules by software)
- Internal memory for data saving
- Recalling measured data on the display
- Optical/USB interface for transferring data onto the PC
- Help on line on the display

🔌 Main features

Display:	LCD custom, 128x128pxl, with backlight
Power supply:	6x1.5V alkaline batteries type AA LR06
Automatic power off:	after 5 minutes in stand-by
Duration for I-V Curve:	> 200 curves
PC interface:	opto-isolated optical / USB
Safety:	IEC/EN61010-1
Safety and measuring accessories:	IEC/EN61010-031, IEC/EN61010-032
Measurement of I-V Curve:	IEC/EN60891, IEC/EN62446
Insulation:	double insulation
Pollution level:	2
Measurement category:	CAT II 1000V DC, CAT III 300V (to earth) Max 1000V between inputs
Size:	235x165x75 mm
Weight (batteries included):	1.3 kg

🛒 Accessories provided

KITGSC4	Set of 4 cables + 4 alligator clips
KITPVMC3	Set of 2 adapters with connectors MC3
KITPVMC4	Set of 2 adapters with connectors MC4
HT304N	Sensor for irradiation measurement
M304	Mechanical inclinometer
TOPVIEW2006	Windows software + optical/USB C2006 cable
VA500	Rigid carrying case
	User Manual
	ISO9000 calibration certificate

🎁 Optional accessories

PT300N	PT1000 probe for PV modules temperature
SP-0400	Shoulder strap to use the device with free hands
SOLAR02	Remote unit for Irradiation and Temperature
KITPVEXT25M	Set of 2 banana cables 4mm, Green/Black, 25m

จัดจำหน่ายโดย : บริษัท เอฟเวอร์เทค จำกัด
TEL : (02)8702884-5, (02)4289793-5
Email: sales@evertech.co.th
www.evertech.co.th

COMPARISON TABLE
OF ACCESSORIES

	SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
TOPVIEW2006 TOPVIEW2007* PC Windows software + USB/optical cable *ORDER CODE HA000716* ** ORDER CODE HA000714*	S TOPVIEW2006	S TOPVIEW2006	S TOPVIEW2007	S TOPVIEW2006	-
PT300N PT1000 probe for PV module temperature *ORDER CODE HA00300N*	S	0	S	0	-
SOLAR02 Remote unit for Irradiation and Temperature *ORDER CODE HA000120*	S	0	S	0	-
KITGSC4 Set of 4 cables + 4 alligator clips *ORDER CODE HA000021*	S	S	-	S	-
KITPVMC3 - KITPCMC3* Set of 2 adapters with connectors MC3 *ORDER CODE HA000032* ** ORDER CODE HA000757*	S KITPVMC3	S KITPVMC3	-	S KITPCMC3	-
KITPVMC4 - KITPCMC4* Set of 2 adapters with connectors MC4 *ORDER CODE HA000034* ** ORDER CODE HA000758*	S KITPVMC4	S KITPVMC4	-	S KITPCMC4	-
KIT800 Set of 5 cables + 5 alligator clips *ORDER CODE HA008000*	-	-	S	-	-
KITMPPACC Set of 4 alligator clips for AC voltage *ORDER CODE HA000752*	-	-	-	-	S
KITMPPACW Set of 4 cables for AC voltage 2m *ORDER CODE HA000753*	-	-	-	-	S
KITMPPDCC Set of 2 alligator clips for DC voltage *ORDER CODE HA000754*	-	-	-	-	S
KITMPPDCW Set of 2 alligator clips for DC voltage *ORDER CODE HA000755*	-	-	-	-	S
A0055 External power supply AC/DC battery charger 230V 50/60Hz** *ORDER CODE HA005500*	-	-	S	-	S

S = Standard **0** = Optional *Adapter ACON3F4M necessary **Please check accessory line to find the correct power adapter for your country

› FOLLOWS	SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
PT400 Touch-screen pen *ORDER CODE HA0PT400*	-	-	S	-	-
HT304N Sensor for irradiation measurement *ORDER CODE HA0304N0*	S	S	S	0	-
M304 Mechanical inclinometer *ORDER CODE HA000026*	S	S	-	0	-
HT4004N Standard 10-100A DC clamp, diameter 32 mm *ORDER CODE HP04004N*	S	-	S	-	0*
HT4005K Standard 200A AC clamp, diameter 40 mm *ORDER CODE HP04005K*	S	-	S	-	0
C2007 USB cable *ORDER CODE HA002007*	-	-	S	-	S
BORSA2051 Soft carrying bag *ORDER CODE HA002051*	-	-	-	S	S
SP-0400 Shoulder strap to use the device with free hands *ORDER CODE HA000112*	0	0	0	0	-
KITPVEXT25M Green and black cable extension, length 25m *ORDER CODE HA000129*	0	0	-	0	-
VA500 Rigid Carrying case *ORDER CODE HA050000*	S	S	S	-	-
MPP300 Accessory for measuring and recording the efficiency of a single- and three-phase single- and multi-string photovoltaic system (up to three MPPT) *ORDER CODE HVMPP300*	0	-	0	-	-
HT96U Standard clamp 1-100-1000A AC, diameter 54 mm *ORDER CODE HP00096U*	0	-	0	-	0

S = Standard **0** = Optional *Adapter ACON3F4M necessary

COMPARISON TABLE
OF ACCESSORIES
› FOLLOWS

		SOLAR I-Vw	I-V400w	SOLAR300N	PVCHECKs	MPP300
	HT97U Standard clamp 10-100-1000A AC, diameter 54 mm ORDER CODE **HP000972**	O	-	O	-	O
	HT98U Standard 1000A DC clamp, diameter 50 mm ORDER CODE **HP00098U**	O	-	O	-	O*
	HTFLEX33E Flex 3000A AC clamp, diameter 174mm ORDER CODE **HP00033E**	-	-	O	-	O
	HP30D1 Standard 1000A DC clamp, diameter 83 mm ORDER CODE **HP0030D1**	O	-	O	-	O*
	HP30C3 Standard 3000A AC clamp, diameter 70 mm ORDER CODE **HP003003**	-	-	O	-	O
	HP30C2 Standard 200-2000A AC clamp, diameter 70 mm ORDER CODE **HP003002**	-	-	O	-	O
	HT4004P Standard 10-100 ADC clamp, diameter 32 mm ORDER CODE **HP04004P**	-	-	-	-	O
	HT4004 Standard 10-100A DC clamp, diameter 30 mm ORDER CODE **HP004004**	-	-	-	S	-
	HT903 3x1 - 5A/1V box for TA connection ORDER CODE **HA019030**	-	-	O	-	-
	606-IECN Magnetic connectors for voltage measurement ORDER CODE **HA006060**	O	-	O	O	O
	ACON3F4M Adapter for the connection of clamps HT4004N, HP30D1 and HT98U to MPP300 ORDER CODE **HA00ACON**	-	-	-	-	S 3 pieces

S = Standard   **O** = Optional   *Adapter ACON3F4M necessary

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ORDER CODE **HA000406**

HTAnalysis™

ANALYSIS TAB
7.85" IPS Touchscreen, Quad Core, Dual SIM 3G

HT introduces the new tablet with **pre-installed HTanalysis App** to immediately start working, right from the first time.

WITH
ANALYSIS TAB you will:

- Work in a quicker way
- Work in a more collaborative way
- Reduce the amount of paper documents
- Work more safely, protected from any danger of direct contact
- Through HTCLOUD you will be able to share all measurements with your colleagues and/or download them from the PC without physically connecting the device to the PC

COMPATIBLE DEVICES
MacroTestG3, G2, G1
CombiG2
PQA820, PQA819
HT9022

CHARACTERISTICS
TABLET

CPU: MT8382 Cortex A7 Quad Core 1.2Ghz
GPU: Mali-400 MP2 Graphic Processor
RAM: 1GB DDR3
Cell network: Dual SIM 3G
Internal memory: NAND FLASH 8 GB
External memory: MicroSD Slot
Display: 7.85" LCD 1024 x768 (4:3)
OS: Android 4.4 OS
Display: Capacitive touchscreen
Photo camera: 0.3MP (front), 2.0MP (back)

disponibile su **Google play**

disponibile su **App Store**