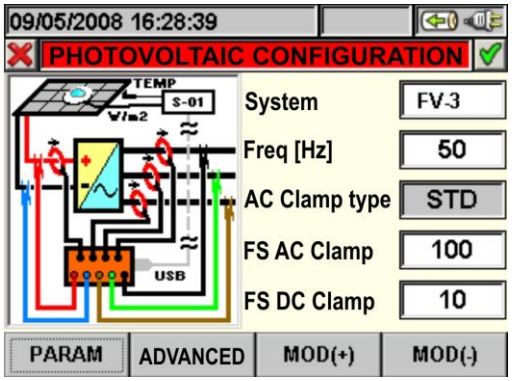
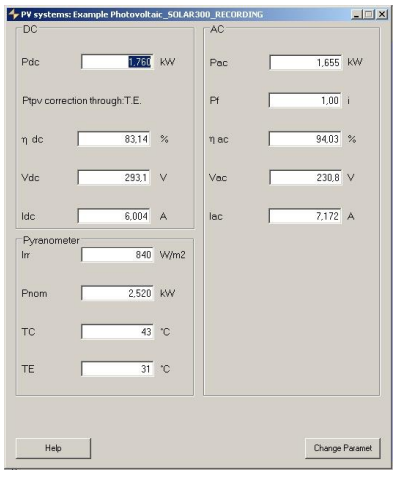
1. SOLAR300N MAIN FEATURES

SOLAR300N performs all tests on PV plants by using of SOLAR-02 remote unit which, after a preliminary synchronisation, save in independent way the values of irradiance and temperature. Only at the end of test the remote unit should be connected again with the master unit to download the recorded data

With SOLAR-02 remote unit the irradiance and temperature measured values are shown at display also in independent mode (ideal solution during a pre-test on installation) besides test/recording with SOLAR300N



A synoptic connection scheme on the display helps the user while connecting the instrument to the installation (Single or Three phase) under test



Final result of a PV test performed with SOLAR300N and downloaded by TopView software. Possible export in XLS and PDF format files

2. ELECTRICAL SPECIFICATIONS

Accuracy is indicated as ± [% readings + (no. of digits) * resolution] at 23°C ± 5°C, con relative humidity <80%HR

DC Voltage – PV systems

Range (V)	Resolution (V)	Accuracy	Input impedance
0.0 ÷ 1000.0	0.1	± (0.5%rdg + 2dgt)	10MΩ

Voltage values <20.0V are zeroed

AC TRMS Voltage – P-N / P-PE / P-P – PV systems Single/Three phase plants

Range (V)	Resolution (V)	Accuracy	Input impedance
0.0 ÷ 600.0	0.1	± (0.5%rdg + 2dgt)	10MΩ
0.0 ÷ 1000.0 (P-P)			

Voltage values < 20.0V are zeroed ; The meter could be connected to external VTs with selectable ratio from 1 to 3000
Max. crest factor: 2

DC/AC TRMS Voltage – P-N / P-PE / P-P – NPV systems Single/Three phase plants

Range (V)	Resolution (V)	Accuracy	Input impedance
0.0 ÷ 600.0	0.1	± (0.5%rdg + 2dgt)	10MΩ
0.0 ÷ 1000.0 (P-P)			

Voltage values <2.0V are zeroed; The meter could be connected to external VTs with selectable ratio from 1 to 3000
Max. crest factor: 2

AC Voltage Anomalies – Phase-Neutral Single Phase plants

Range (V)	Resolution Voltage (V)	Accuracy Voltage	Resolution Time (ms)	Accuracy Time
0.0 ÷ 600.0	0.2	± (1.0%rdg+2dgt)	10	± 10ms

Max. crest factor: 2
Voltage values <2.0V are zeroed
The meter could be connected to external VTs with selectable ratio from 1 to 3000
Voltage threshold adjustable from ±1 to ±30%

AC Voltage Anomalies – Phase-Phase Three Phase plants

Range (V)	Resolution Voltage (V)	Accuracy Voltage	Resolution Time (ms)	Accuracy Time
0.0 ÷ 1000.0	0.2	±(1.0%rdg+2dgt)	10	± 10ms

Max. crest factor: 2
Voltage values <2.0V are zeroed
Voltage threshold adjustable from ±1 to ±30%

AC Voltage spikes – Phase-Earth voltage – Single/Three phase plants

Range (V)	Resolution Voltage (V)	Accuracy Voltage	Response interval (50Hz)	Accuracy Time (50Hz)
-1000 ÷ -100	1	±(2.0%rdg+60V)	78µs – 2.5ms (SLOW)	± 10ms
100 ÷ 1000				
-6000 ÷ -100	15	±(10%rdg+100V)	5µs - 160µs (FAST)	
100 ÷ 6000				

Adjustable threshold from 100V to 5000V
Max number of recorded spikes: 20000

DC and AC TRMS Current with external transducers (STD)

Range (mV)	Resolution (mV)	Accuracy	Input impedance	Overload protection
0.0 ÷ 1000.0	0.1	± (0.5%rdg + 0.06%FS)	510kΩ	5V

FS = full scale of the clamp
Max. crest factor: 3 (AC current)
Measurements performed through clamps 1V output voltage at nominal current
Current values < 0.1%FS are zeroed

AC Current with FLEX transducer – NPV systems – Range 300A

Range (A)	Resolution (A)	Accuracy	Input impedante	Overload protection
0.0 ÷ 49.9	0.1	±(0.5%rdg+0.24%FS)	510kΩ	5V
50.0 ÷ 300.0		±(0.5%rdg+0.06%FS)		

Measure performed by HTFLEX33D clamp, crest factor max = 3
Current values < 1A are zeroed

AC Current with FLEX transducer – NPV systems – Range 3000A

Range (A)	Resolution (A)	Accuracy	Input impedante	Overload protection
0.0 ÷ 3000.0	0.1	±(0.5%rdg+0.06%FS)	510kΩ	5V

Measure performed by HTFLEX33D clamp, crest factor max = 3
Current values < 5A are zeroed

AC Inrush current

Range (A)	Resolution (A)	Accuracy	Resolution time (ms) at 50Hz	Accuracy time (ms) at 50Hz
Dep.on clamp	Dep.on clamp	±(1.0%rdg+0.4%FS)	10	±10

Max crest factor = 3
Max number of recording anomalies: 1000

Voltage and Current Harmonics

Order	Resolution	Accuracy (*)
DC ÷ 49th (**)	0.1V / 0.1A	± (5%rdg + 5dgt)

(*) To be added to the accuracy of the related RMS parameter ; (**) 64° order in real time visualisation

DC Power (Vmeas > 150V, Imeas > 10% FS clamp)

Parameter	FS clamp	Range [W]	Resolution [W]	Accurcay
POWER	10A	0.000 ÷ 9.999k	0.001k	± (0.7%rdg+3dgt)
	100A	0.00 ÷ 99.99k	0. 01k	
	1000A	0.1 ÷ 999.9k	0.1k	

Vmeas = voltage which the power measurement is performed

AC Power Single and Three phase (@ PF = 1, Vmeas > 200V, Imeas > 10% FS clamp)

Parameter [W, VAR, VA]	FS clamp	Range [W, VAR, VA]	Resolution [W, VAR, VA]	Accuracy
Active power Reactive power Apparent power	FS ≤ 1A	0 ÷ 9.999k	0.1 ÷ 0.001k	± (0.7%rdg+3dgt)
	1A ≤ FS ≤10A	0.000 ÷ 99.99k	0.001k ÷ 0.01k	
	10A ≤ FS ≤100A	0.00 ÷ 999.9k	0.01k ÷ 0.1k	
	100A ≤ FS ≤ 3kA	0.0 ÷ 9.999M	0.1k ÷ 0.01M	

Vmeas = voltage which the power measurement is performed

AC Energy Single and Three phase (@ PF = 1, Vmeas > 200V, Imeas > 10% FS clamp)

Parameter [Wh, VARh, VAh]	FS clamp	Range [Wh, VARh, VAh]	Resolution [Wh, VARh, VAh]	Accuracy
Active energy Reactive energy Apparent energy	FS ≤ 1A	0 ÷ 9.999k	0.1 ÷ 0.001k	± (0.7%rdg+3dgt)
	1A ≤ FS ≤10A	0.000 ÷ 99.99k	0.001k ÷ 0.01k	
	10A ≤ FS ≤100A	0.00 ÷ 999.9k	0.01k ÷ 0.1k	
	100A ≤ FS ≤ 3kA	0.0 ÷ 9.999M	0.1k ÷ 0.01M	

Vmeas = voltage which the power measurement is performed

Frequency

Range (Hz)	Resolution (Hz)	Accuracy
42.5 ÷ 69.0Hz	0.1	±(0.2%rdg+1dgt)

Power factor (cosφ) – Single Phase / Three Phase plants

Range	Resolution [°]	Accuracy [°]
0.20 ÷ 0.50	0.01	1.0
0.50 ÷ 0.80		0.7
0.80 ÷ 1.00		0.6

Flicker – Single/Three phase plants

Parameters	Ange	Resolution	Accuracy
Pst1', Pst	0.0 ÷ 10.0	0.1	Compliance to EN50160
Plt			

Irradiance (by SOLAR-01 unit and PYRA input)

Range (mV)	Resolution (mV)	Accurcay	Overload protection
0.00 ÷ 12.0	0.01	± (1.0%rdg + 5dgt)	5V
0.0 ÷ 120.0	0.1		

Irradiance (by SOLAR-02 unit and PYRA/CELL input)

Range (W/m^2)	Resolution (W/m^2)	Accurcay
0 ÷ 1400	1 + INT (100 * 0.1/K)	±(1.0%rdg + INT(1000 * 0.1/K)

K = sensitivity of irradiance sensor used (expressed in mV/kW/m^2 or in uV/W/m^2)

Probe sensitività	Range (mV)	Resolution (mV)	Accuracy
K<10	0.00 ÷ 15.00	0.01	±(1.0%rdg+0.1mV)
K≥10	0.00 ÷ 65.00	0.02	

Temperature (by SOLAR-01 unit and TEMP input)

Range (°C)	Resolution (°C)	Accuracy	Overload protection
0 ÷ 100	1	± (1.0%rdg +2dgt)	5V

Temperature (by SOLAR-02 unit and TEMP input)

Range (°C)	Resolution (°C)	Accuracy
-20 ÷ 100	0.1	± (1.0%rdg +1°C)

3. GENERAL SPECIFICATIONS

DISPLAY:	
Features:	graphic TFT with backlight, ¼ VGA (320 x 240pxl)
Touch screen:	present
Colours:	64k
Contrast:	adjustable
POWER SUPPLY:	
SOLAR300N internal power supply:	Li-ION, 3.7V rechargeable battery
Battery life:	> 6 hours
External power supplier:	AC/DC 100-240V 50/60Hz / 5VDC adapter
Auto power off:	after 5 minutes without using the instrument (no external power)
SOLAR-01 power supply:	2x1.5V alkaline batteries type AA LR06
SOLAR-02 power supply:	4x1.5V alkaline batteries type AAA LR03
SOLAR-0x max recording time (@ IP=5s):	approx 1.5h
MEMORY AND PC INTERFACE	
Internal memory:	15Mbyte
External memory:	USB memory stick
External memory:	compact flash card
Operative system:	Windows CE
PC communication port:	USB
MECHANICAL FEATURES	
Dimensions (L x W x H):	235 x 165 x 75mm
Weight (batteries included):	1.0 kg
IP degree:	IP50
ENVIRONMENTAL CONDITIONS:	
Reference temperature:	23°C ± 5°C
Working temperature:	0°C ÷ 40°C
Working humidity:	<80%RH
Storage temperature (batt. not included):	-10°C ÷ 60°C
Storage humidity:	<80%RH
GENERAL REFERENCE STANDARDS:	
Safety:	IEC/EN61010-1
Safety of measurement accessories:	IEC/EN61010-031, IEC/EN61010-2-032
EMC:	IEC/EN61326-1
Insulation:	double insulation
Pollution degree:	2
Measurement category:	CAT IV 600V to ground, max 1000V between inputs
Max altitude of use:	2000m
Quality networks:	IEC/EN50160
Quality of power measurements:	IEC/EN61000-4-30 class B
Flicker:	IEC/EN61000-4-15, IEC/EN50160
Unbalance:	IEC/EN61000-4-7, IEC/EN50160

This instrument complies with the requirements of the European Low Voltage Directives 2014/35/EU (LVD) and EMC 2014/30/EU
This instrument satisfies the requirements of 2011/65/EU (RoHS) directive and 2012/19/EU (WEEE) directive