Solar System Analyzer (Photovoltaic I-V Curve Tester)
with DC Current Clamp, AC Power Clamp, Thermo & Irradiance Meter

MECO SINCE 1962

SOFTWARE

CE

USB

BLUETOOTH

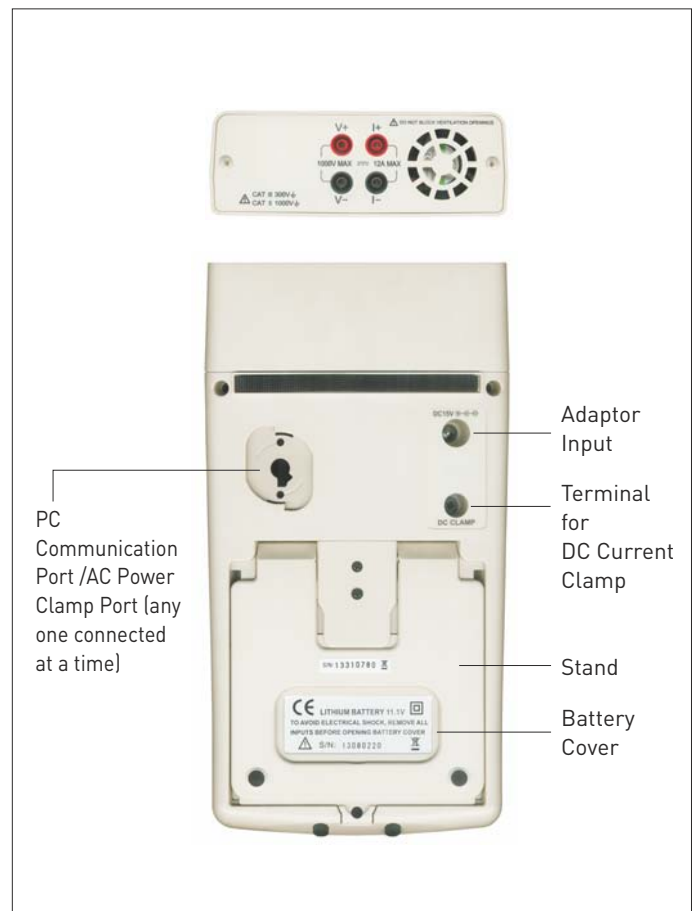Solar 21 (AC Clamp) — 9018BT — Solar 15 (DC Clamp) — Irradiance Meter — Thermo Meter

MECO Solar System Analyzer Model 9018BT is Portable Analyzer used for Testing, Monitoring, Measuring, Analyzing and Troubleshooting various parameters of Solar System. This System has Intelligent Test Logic with no personal attendance required. The System continuously monitor DC Output of Solar System and AC Power Output of Inverter, Calculate Efficiency of DC to AC Power Conversion and Maximum Output Power.

Features

- I-V Curve Test for Solar System
- Max. Solar 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.
- Max. Voltage (Vpm) at Pmax, Max. Current (Ipm) at Pmax
- Voltage at Open Circuit (Voc), Current at Short Circuit (Isc)
- Efficiency (%) Calculation of Solar System
- Temperature Measurement of Solar Panels
- Irradiance Measurement of Sun Light
- Series Resistance (Rs) Calculation of Solar Panels
- I-V Curve with Cursor to Display each Data Point
- With Data Logging / Open Function, the I-V Curves of Solar System can be analysed / 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
- Built-in Calendar Clock
- Users can set up the Parameters of Solar Panels
- Users can set up the Series number of Solar Panels. Parameters of many Solar Panels can be Measured in One Measurement.
- The Irradiances and Temperatures of Solar Panels can be continuously Measured, Monitored and Recorded.
- Rechargeable Lithium Battery, Low Battery Warning, AC Power Adaptor
- Optical USB Cable for PC Communication
- Solar Connector (optional)
- Provide Operating Condition (OPC) and Standard Test Condition (STC) test reports for Verification of Solar Panel Performance (OK, or NO OK)
- With Power Clamps (SOLAR 15 DC Current Probe and SOLAR 21 AC Power Clamp), continuously measure / monitor / record the DC Power output of Solar 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.

Top & Rear Panel Connections

PC Communication Port /AC Power Clamp Port (any one connected at a time)

Adaptor Input

Terminal for DC Current Clamp

Stand

Battery Cover

General Specifications for Solar System Analyzer

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 Adaptor	AC 100 ~ 240V input, DC 15V / 1 ~ 3A output
Standards	EN 61323-1:2006 Class B, EN 61010-1:2010, IEC 6100-4-2:2008, CAT II 1000V, CAT III 300V & Pollution Degree 2
Operation Environment	5^0C ~ 50^0C, <85% RH
Temperature Coefficient	0.1% of full scale / ^{0}C (<18^0C or >28^0C)
Storage Environment	-20^0C ~ 60^0C, <75% RH
Dimension	260 x 158 x 64mm (approx.)
Weight	1580gms Batteries included (approx.)
Accessories	Solar Irradiance Meter (Remote Solar Detector) x 1, Thermometer x 1, USB power cord x 1, User manual x 1, AC adaptor x 1, Optical USB cable x 1, Rechargeable lithium battery (3400mAh) x 1 (installed), Software CD x 1, Software manual x 1, Carrying bag x 1, Thermal conductive gel x 1, Testing clips (1 black & 1 red), 4-wire to 2-wire connecting cable x 1, 4-wire testing (Extension) cable x 1, Solar 15 : DC current probe x 1, Solar 21: AC power clamp x 1, **Optional :** Solar Connector (1 black & 1 red)

Electrical Specifications (23^0C ± 5^0C, Irradiance ≥ 800W/m^2, Four-Wire Measurement, Maximum Power Limit is 12000W)

DC Voltage Measurement

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

Voc : open circuit voltage of solar system

DC Current Measurement

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

Isc : short circuit current of solar system

DC Current Simulation

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

Irradiance Measurement

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

Temperature Measurement

Range	Resolution	Accuracy
-22 ~ 85^0C	0.1^0C	± 1% ± 1^0C

Conversion of OPC Data into STC Data

Operating Condition   Module Data   Standard Test Condition
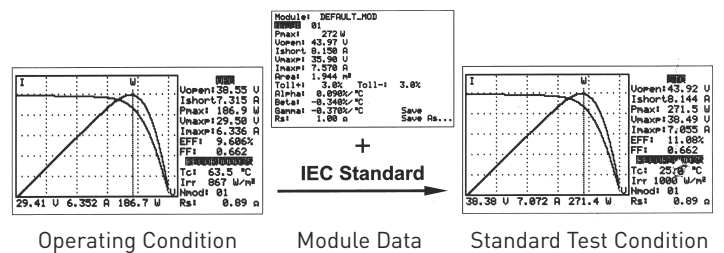
AC Power Clamp (Solar 21)
Features

- Active (W, KW, HP), Reactive (VAR, KVAR) & Apparent (VA, KVA) Power
- Power factor (PF), Phase angle (Φ), & Energy (mWH, WH, KWH)
- Measurement of standby power consumption for IT products
- Non-interrupted AC current harmonic analysis
- 1 to 99th order of harmonics at 1.0% basic accuracy
- Total harmonic distortion (%THD-F) & crest factor (CF)
- True RMS measurement of V & A at 0.5% basic accuracy
- Fast peak function (39μs for 50Hz, 33μs for 60Hz)
- Measurement of balanced 3Φ power
- Measurement of balanced 3Φ sequence
- Programmable CT ratio from 1 to 250
- Max, Min & Data hold functions
- Leakage current measurement at 10μA resolution
- Active power in H.P.
- Shielded jaw immune to external interference

Efficiency of Power Mode

Normal I-V Curve

Abnormal I-V Curve (Cells at the corner of solar panel are defected)

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Solar System Analyzer (Photovoltaic I-V Curve Tester) with DC Current Clamp, AC Power Clamp, Thermo & Irradiance Meter
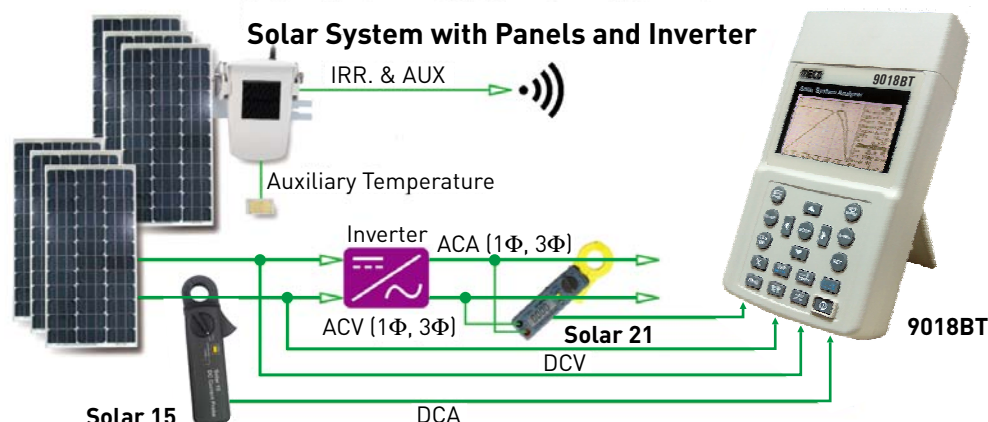
DC Current Probe (Solar 15)

Features
- Accurate DC Current Probe for Current Measurement
- One Touch Zero for DCA adjustment
- 23mm Diameter Jaw

Electrical Specifications for DC Current Probe (Solar 15)

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

Applications

Solar System with Panels and Inverter

IRR. & AUX

Auxiliary Temperature

Inverter ACA (1Φ, 3Φ)

ACV (1Φ, 3Φ) **Solar 21**

DCV

Solar 15 DCA

9018BT

A. Quality Control at Production Line, Warehouse or Site of Installation
- Manufacturers of solar panels can test the characteristics for quality control purpose at the production line.
- Installation engineers can randomly test samples of solar panels at site to verify the quality of solar panels used at site of installation.

B. Identify Requirements of Solar Power System
- The unit can measure actual max. power (Pmax), voltage (Vpm) and current (Ipm) at max. power.
- Instead of the rated max. power, system designers need to be aware of the actual solar power from solar panels under actual operating conditions.

C. Maintenance of Solar Panels
- Maintenance engineers can store the characteristics data of solar panels in the beginning and compare the characteristics data in weekly, monthly or yearly maintenances.

D. Verify the Best Installation Angles of Solar Panels
- Engineers can collect data of the installation angles at different dates and time by using the unit at site of installation.
- The data can be used as a reference to design the automated angle adjustment system or the data can be used to select an optimal angle for a fixed angle installation.

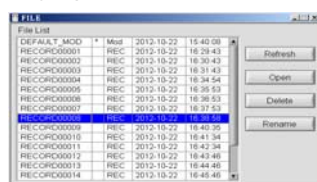**E. Measure / Monitor / Record the DC Power Output & Efficiency**
- Continuously Measure / Monitor / Record the DC power output of solar system and the AC power output of inverter (1 phase or balanced 3 phases)
- Calculate the efficiency of DC to AC power conversion and the efficiency of the max. output power
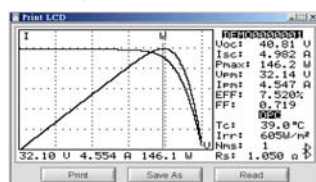
Product Kit

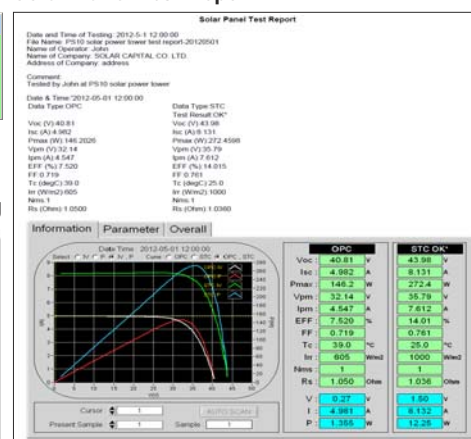### User Interface and Data Acquisition Software
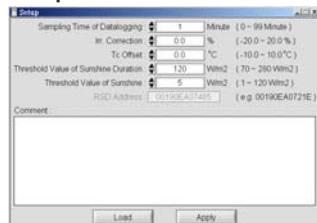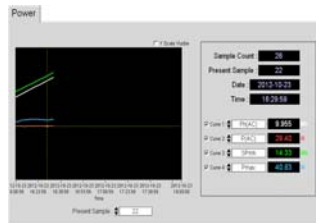
File List	Print LCD	Cycle Scan	Solar Panel Test Report

Setup	Power Curves	Irradiance / Temperature Recording	