

# Solar Guarantee

**Advanced Performance Analysis of Solar Systems**

**Professional. Comprehensive. Reliable.**

**Inbar Solar Energy** - One of Israel's leading solar energy companies.

The Experts in developing, designing, installing and maintaining solar systems.

24/7 operation and maintenance via advanced software solutions and experienced teams.

**Our Customers Enjoy** Top testing and analysis services for installed solar systems.

The most cutting-edge test equipment available in the market.

Comprehensive testing reports, to ensure optimal performance.

# Test Yourself

## Are you getting the most out of your solar system?

- Considering purchase of an operating solar system? Test it for quality, compliance and expected performance
- Already owning a system? Ensure optimal system performance and validate preventative maintenance procedures. Make the test!

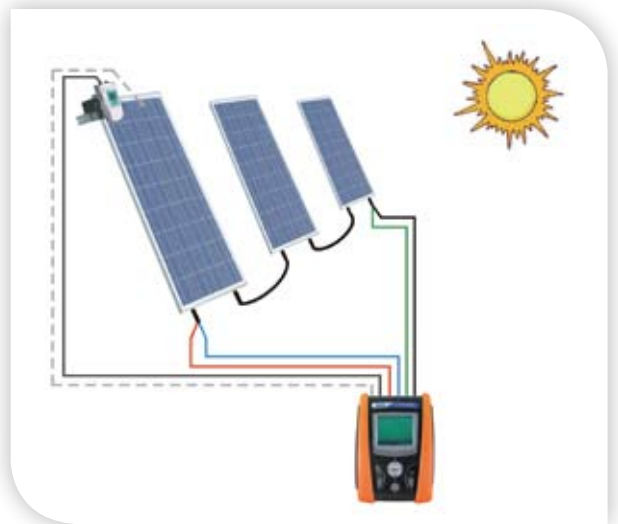


Figure 1. Testing the panels array against a reference cell connected directly to the test system

## Going the Extra Mile for You

- **Know what's best for you** - optimize your system's performance, increase effectiveness, productivity and income
- **Know your system** - as-made vs. planned and promised
- **Know your enemies** - identify causes for possible malfunctions or hazards and make the essential steps to prevent them
- **Know your standards** - ensure that the system complies with relevant codes and standards

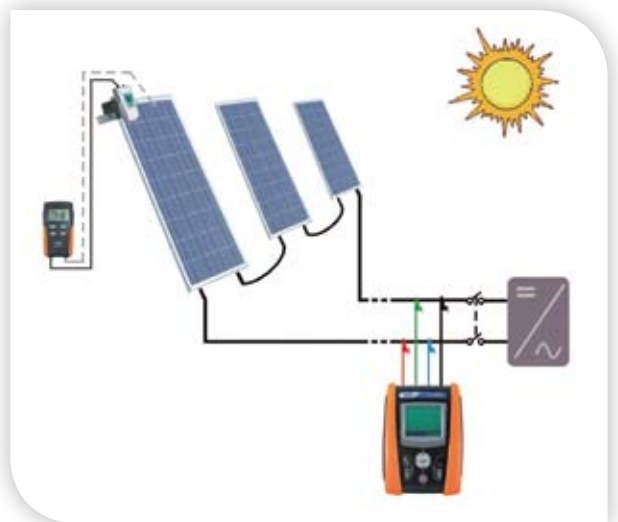


Figure 2. Testing the panels array at the inverter input using a reference cell connected wirelessly to the test system

## Creating a Better Solar System

- **Check List** – acceptance tests for new system, or due-diligence prior to purchasing an operational system, to ensure it was designed and built according to plan
- **Efficiency check** – testing system's power output against solar irradiance.
- **Functionality test** – searching for possible causes of less than optimal performance

\*Testing is done by a certified electrical engineer experienced in power systems

\*\*Testing uses advanced instruments by HT Italia



Our engineering team produces a detailed report from the thermo graphic test. It includes photographs, infra-red imaging, details of deficiencies and corrective options





















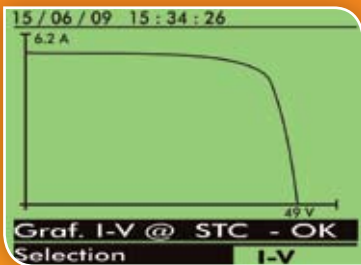
Test type	Check list	Functionality test	Efficiency test	Test goals and method
Visual test				Visual test of mechanical structures, electrical system, electrical equipment and connections, including quality of components.
Grounding test				Measurement of earth resistance and fault loop impedance using MACROTEST 5035
Conductor insulation test				Measurement of conductor insulation resistance, and earth leakage current using a Megger tester.
Thermographic test				Thermo graphic imaging of all system components to locate electrical faults. This test identifies sources of power-loss which directly affects revenues. The test reveals faulty components and faulty electrical connections, preventing burnouts and possible fire.
System performance analysis based on historical data				Runs a historic data analysis to check and compare the system performance against other systems. The test involves actual and theoretical analyses of system performance including faults and failures, taking into consideration geographical characteristics such as solar irradiation, shading, and other environmental data.
Systemic efficiency test using a reference cell				Simultaneous holistic efficiency check of all system components. The test includes panel outputs, inverter efficiency and grid quality, relative to a reference cell. The test identifies power losses in each of the system's components (figure 4).
I/V Curve test for panels and strings				Testing panels array efficiency against a reference cell which measures irradiation and temperature. If a fault is found, each panel in the array can be individually tested. (see figures 1, 2).
Panel fault detection				Identifying damaged panels using the thermographic camera.
Electrical boards inspection				Electrical boards are scanned using the thermographic camera, to identify points of failure, power losses and to prevent fires.
Inverter efficiency test				Identifying inverter power losses and overheating.
Grid quality test				Connecting a grid analyzer to test and troubleshoot the electrical grid.

Figure 3



Inverter efficiency and grid quality test

Testing single panel or array of panels



I/V curve – example of properly functioning panel

15 / 06 / 09 15 : 34 : 26

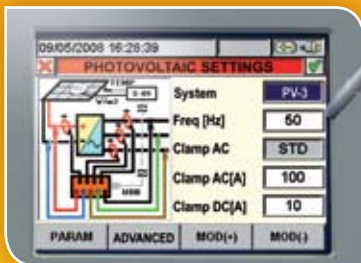
Voc	48.0 V
Vmpp	39.7 V
Imp	5.24 A
Isc	5.60 A
Pmax	208 W
FF	0.77 %
Dpmax	0.7 %

Results @ STC - OK

% deviation from panel's nominal power



Figure 4. Simultaneous holistic testing of all system components



Inverter efficiency and grid quality test results



Inverter efficiency analysis data as shown on the computer after data is transmitted from the device



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