

# scientific<sup>®</sup>

## Solar Array Simulator



## Introduction

The Solar Simulator software automatically calculates solar array voltage and current profiles based on user-defined parameters. The software automatically calculates Voc, Isc, Vmp, and Imp parameters from PV panel data & simulates the different I-V characteristic outputs of various solar cell materials with fast response time. The system is capable of saving up to a 4096-point array of user-programmed voltages and currents.

## Features

- Verify MPPT Efficiency of PV Inverters.
- Load and save P-V and I-V data from Excel file.
- Data logging of different Parameters like Voc, Isc, Pmp, Vmp, Imp, MPPT test Efficiency, Irradiance and Temperature etc.
- Verify static MPPT efficiency of PV inverter.
- Verify the MPPT performance of the inverters for dynamic profiles as per EN50530.
- MPPT performance under different conditions like morning to nightfall.
- User definable change in Shadow, Temp & Irradiance.
- User definable Solar Array Size- 1 to 50 in parallel, 1 to 500 in series.
- Simulation of Shadowed I-V Curve with Moving Soft Array Panel, in 8 Directions

## Supported power supply series



**DCX800 Scientific**



**PS1600 Scientific**



**PS3200 Scientific**



**SM15K Delta Elektronika**

## Power Rating Available For Solar Simulator

- Power Rating are available form 1.6kW,3.2KW, 5KW & 15KW & more.  
Power Rating Capacity can be Increased by Connecting Power Supply in series & Parallel Configuration.
- In Delta Elektronika Master-Slave mode operation with up to 60 units and 900 kW output power can be achievable.



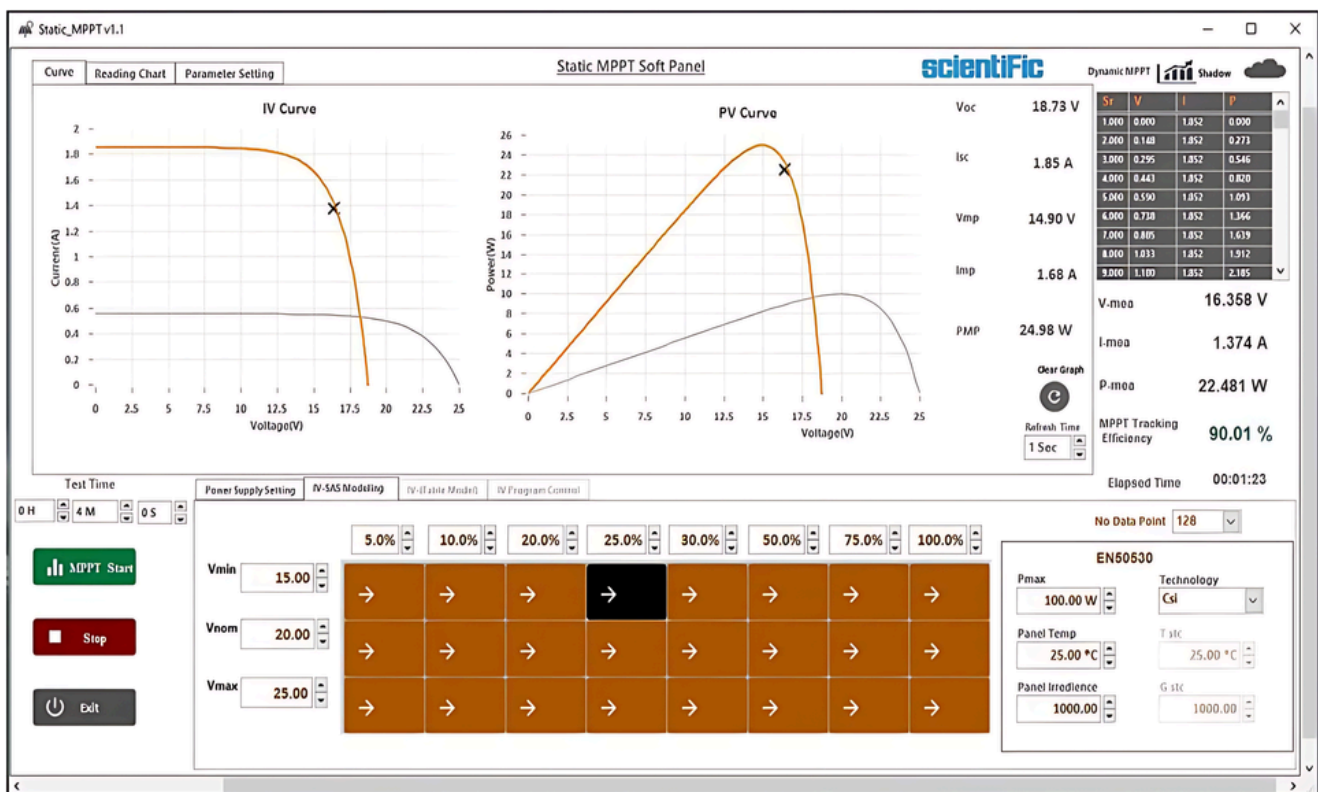
**Figure . The rack uses 10 Delta Elektronika Bi-Directional units**

## Solar Simulator Soft panel:



### Static MPPT Efficiency Testing

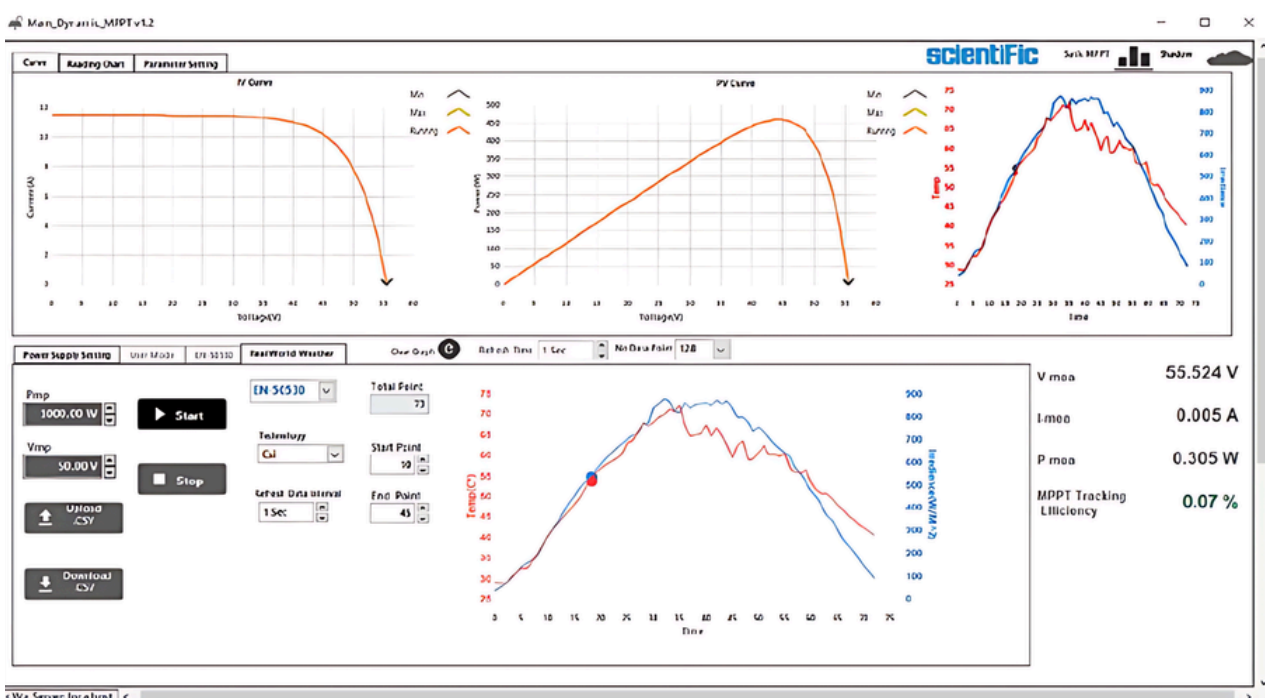
The DC power supply with solar array simulation can program the I-V curve through SAS, Sequencer and table mode via soft panel easily. The user can recall the I-V curve afterwards for testing and monitoring the MPPT performance of the PV inverter with the real-time tracking feature. The soft panel allows the user to set the duration for static MPPT efficiency testing. Each curve test time can be set by user.





## Dynamic MPPT Efficiency Testing

The Dynamic MPPT test function complies with EN50530, test regulations and can be controlled via the graphical soft panel by selecting EN50530 I-V mathematical expressions and test items. This function simulates the irradiation intensity and temperature change of the I-V curve under actual weather variations to test the PV inverter's dynamic MPPT performance. A test data recording function is integrated into the software where users can edit and control the test parameters to be recorded such as voltage, current, power, watt and MPPT performance along with the sampling interval and total time length to facilitate the analysis and validation of PV inverters.



## Shadow IV Curve Simulator

This feature is used to verify the MPPT capability of the PV Inverter based on the IV Curve when the solar cells are shadowed by clouds, trees, etc. The user can set the temperature, moving direction, irradiance and time of the dynamic shadow for the PV module that can simulate the cloud cover change or create the I-V simulation curve of other shades such as under trees or buildings. Using the shadowed mode solar simulation, the user can choose up to 4 different shadow colours. Each shadow colour can have different irradiance and temperature values.

Depending upon the shape of the shadow over the solar panel, a new IV and PV curves will be generated and the user can track MPPT performance in real-time. Similarly, the user can simulate when the cloud is moving at a constant speed. The speed of the cloud and the direction of moving can also be defined.

