

## **Performance Evaluation of Photovoltaic Models Based on a Solar Model Tester**

The performances of 130 W (Solara PV) and 100 W (Sunworth PV) solar modules are evaluated using a single diode equivalent circuit. The equivalent circuit is able to simulate both the I–V and P–V characteristic curves, and is used to study the effect of the operating temperature, diode ideality factor, series resistance, and solar irradiance level on the model performance. The results of the PV characteristics curves are compared with the parameters from the manufacturing companies for each model. Afterwards, the Solara PV model is tested under different irradiance levels. The relationship between the model power versus its current under different irradiance levels is plotted, such that if the solar power meter (pyrheliometer) does not exist, the irradiance-current (G–I) curve can be used to measure solar radiation power without using the solar power meter. The measurement is achieved by moving the solar panel by a certain angle toward the solar radiation, and then measuring the corresponding current.