

# TECHNOLOGY CENTER PHOTOVOLTAIC TESTING LAB

Technology Centre-Photovoltaic Testing Laboratory (TC-PTL) has been established in 2019 at U.S.-Pakistan Centre for Advanced Studies in Energy (USPCAS-E) under the head of Technology Center (TC). It plays a pivotal role in assisting Government for the enforcement of national and international codes and standards for PV components, thus serving industry for compliance. It enhances sustainability of USPCAS-E and strengthens academic-industry linkages through short-term certifications and commercial testing to cope with specific needs of PV based solar energy industry in Pakistan.

## LAB MISSION

To be the market leader in provision of PV components certification for the unchartered solar segment in Pakistan.

## RESEARCH PORTFOLIO

PV modules testing based on IEC-61215, PV inverter testing based on UL 1741 and IEEE 1547.



## RESEARCH EQUIPMENT

Equipment	Description	Specification
Temperature and Humidity Test Chamber	It is used to test the heat, cold, dry and humidity resistant performance of all kinds of material such as Electronics, Electrical apparatus, Photovoltaic Modules, Plastic and Metal	Model TH-2600-F-5. Temperature Range -70°~ 150° C Humidity Range 10% R.H. ~ 98% R.H.
Hail Impact Testing Machine	It is used to measure the impact of hail stones on Photovoltaic Modules	Model HTPV-09. Machine Consist of Testing bed, Pneumatic Gun, Compressor, X and Y Axis Stage Rail. Hail is able to trigger hail of sizes from 25mm to 45mm.
DC withstand Voltage Tester	Used to measure the leakage current of Photovoltaic Module	Model 7710. Output Voltage Range 0.00 to 12.00 KV. Resolution 10 Volts/ step.
IV Curve Tracer	Used with Daystar IVPC software to take IV curves of Photovoltaic Modules	Model DS-1000. Maximum open circuit Voltage 1000 Volts. Maximum Input short circuit current 100 Amp.
EL Camera	Is used to detect luminescence from Photovoltaic Module placed in forward bias to detect variety of defects such as micro cracks in PV cells.	The setup includes DS5300 NiKon Digital camera, lens, visible near / IR filter, camera accessories, Laptop and DC Power supply. Specially designed Dark Room used to perform this test
PV 200 Solar Kit	The PV200 is a compact & cost effective I-V curve tracer that uses simple push button operation making it an efficient and versatile tester for PV systems	I-V Curve Tracing On-board storage Easy PV Testing NFC data transfer
Solar Utility Pro Kit	Is used for on site testing a single press of the Test button will give values for Open Circuit Voltage and Short Circuit Current, and when paired with the Seaward Solar Survey 200R irradiance meter, will also record irradiance, module and ambient temperature measurements.	Test multiple strings in parallel up to 1500V 40A. Test at a string level or in the combiner box. Record up to 999 full sets of string data. Test open circuit voltage (Voc), short circuit current (Isc), irradiance (W/m <sup>2</sup> ), ambient temperature & more.
DC Electronic Load	Is used to evaluate power, optimizing power efficiency, maximizing battery life and debug design.	Single channel, DC 150 V/60 A, total power up to 350 W. Dynamic Load Performance and Visualization. Up to 5 A/us slew rate and 30 kHz dynamic loading
Chroma Programmable DC Power supply with Solar Array Simulation	It is high power density DC power supply with solar Array Simulation that can provide stable DC output and accurate measurement for voltage and current.	Power range 15KW. Voltage range: 0 ~ 1000V. Current range: 0 ~ 375A. Easy master / slave parallel & series operation up to 150KW. Precision V&I Measurements. High-speed programming. Voltage & Current slew rate control.