IN-HOUSE SOLAR SIMULATOR



STANDARD OPERATING PROCEDURES (SOPs) 2018



NCPRE CHARACTERIZATION LAB

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STANDARD OPERATIONAL PRINCIPLE

TURN ON Sequence:

- 1. Check whether the power supply cable is plugged in the switchboard and then turn the Extension switchboard ON.
- 2. Turn ON the power supply switch which is at the back side of the power supply. Confirm Cooling STARTS/RUNS appears, Click OK to confirm.



Fig 9: Power Supply Display

- **3.** Turn on the fan by clicking "Fans On" on the touchscreen of the power supply.
- 4. Make sure the power should be 79% which is on the right side of the touchscreen to get 1000 W/m2.
- 5. Wait for 1 minute after switching on the fan.
- Turn On the lamp by clicking on "LAMP ON" button from the touchscreen. Wait for 20 minutes for lamp to stabilize.
- 7. By the time lamp stabilizes, turn on the "Keithley 2450 Source meter".
- 8. Turn on the PC.
- 9. Start the "KickStart" Software.

Making a New Recipe

1. Click on New tab. Give a file name of IV measurement.

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Fig 10: Making New Recipe

- 2. Wait for 30 seconds.
- **3.** Click on Select Instrument on the bottom left side of the software. Right click on MODEL 2450 and ADD Instrument.

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Fig 11: Selecting Keithley 2450

4. Click on "Select Test type" on bottom middle of the software. Right Click on "IV characterizer" and ADD Test Type.

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- 5. Source Settings
 - I. Select Source Mode : Voltage Sweep
 - II. Select Sweep type Either Linear or Logarithmic.
 - III. Select start voltage and stop voltage and no of steps.
 - IV. Select Voltage Range as Best Fixed.
 - V. Select the current Limit depending upon the solar cell.
 - VI. Delay Seconds as 0.1.

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6. Measure Settings

I. Select Measure Current Enable, Select the of current (should be less than 100mA).

- II. Click on Measure Voltage Enable and Type Measured.
- III. Measure Resistance check box should be unchecked.
- IV. Check the Enable Timestamp check Box.
- V. Advanced Configuration: Input Jacks should be Front.
- VI. Sensing Mode as 4-Wire.
- VII. Output OFF State as Normal.
- 7. Click on Graph tab on the top side. And Select the parameter to be shown in X and Y axis.
- 8. Put the Sample on the chuck and start vacuum to hold the sample.
- 9. Probe the Sample using micromanipulator.
- 10. Press Execute Test to start the dark IV measurement
- 11. Open the Shutter and press Execute Test to start lighted IV Measurement.
- **12.** Save the Data using either "Excel Format" or "CSV Format" from the menu in the software.
- **13.** Turn off the vacuum and take out the sample.

Turn Off Process

- 1. Turn off the lamp by pressing "LAMP OFF" from the touchscreen and wait for 20 minutes.
- 2. Close the Software and shut down the PC.
- 3. Turn off the fan by pressing "Fans Off" from the touchscreen of the power supply.
- 4. Switch off the power supply from the back side of the power supply.
- 5. Switch off the mains power supply.