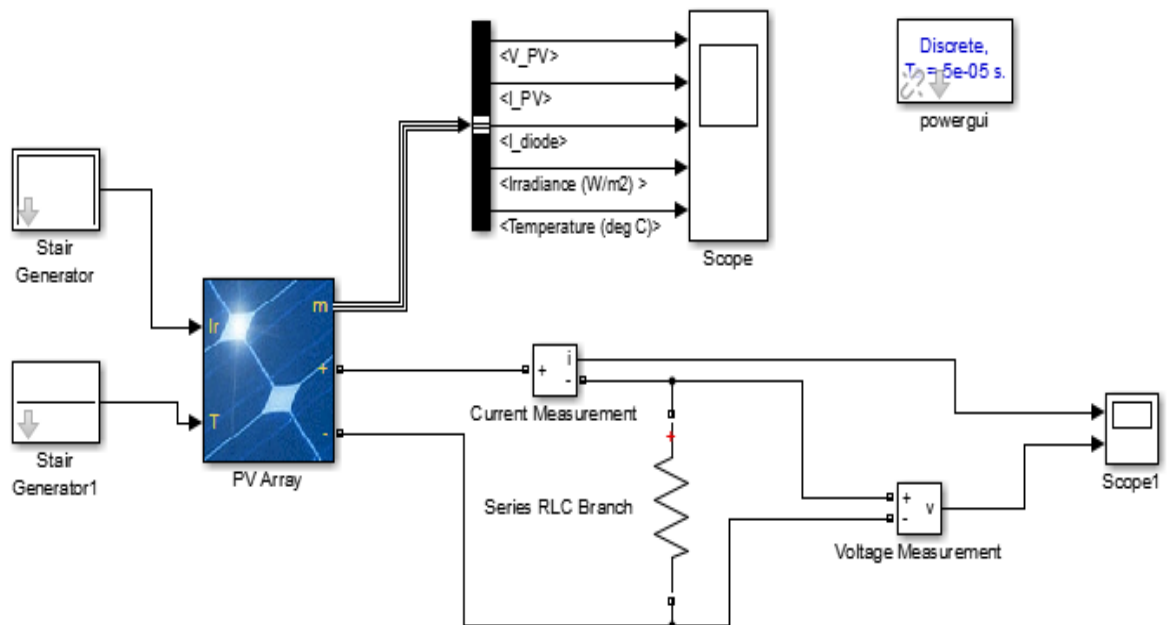


LAB # 03**Analyzing PV Array Set With Load and Vary Irradiance****Objective:**

- To understand the PV array characteristics with resistive load
- To analyze and observe the characteristics of PV array by varying the irradiance
- To observe and calculate the output voltage & current of resistive load

Component required:

- PV array
- Stair generator
- Voltage measurements
- Current measurements
- Series RLC branch
- Scope
- Bus selector
- Powergui

Circuit diagram:

Simulink Block Diagram of PV Array With Resistive Load

Description:

Stair generator:

Stair generator used to provide the value of irradiance & temperature to PV array.

In case of irradiance, we set the value of time is [0, 3, 7,10], amplitude is [500, 1000, 1000, 500] and the sampling time is 0.1.

In case of temperature, we set the value of time is [0, 1, 3], amplitude is [25, 25, 25] & sampling time 0.1.

PV array:

Pin description:

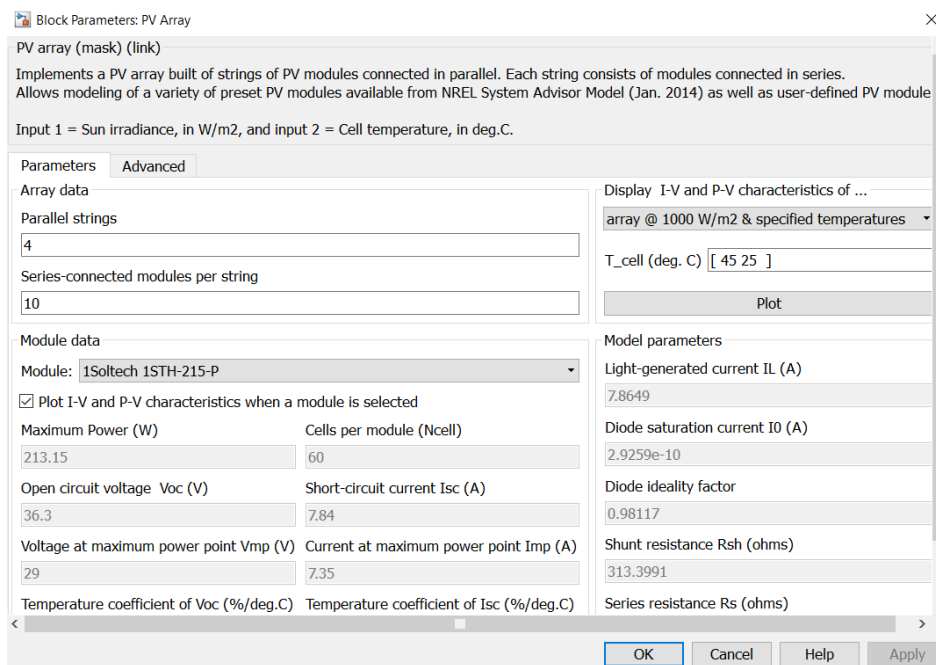
- Input 1 = Sun irradiance, in kW/m^2
- Input 2 = Cell temperature, in deg. C

Outputs:

- +, - (dc supply)
- pin (m) shows the properties/parameters of module.

The input irradiance & temp. is connected to stair generator, whose characteristics are defined above. **m** terminal of PV array connected with bus bar.

Block Parameters of PV Array:



Bus bar & scope:

Bus bar is used to connect the **m** terminal of PV array with scope with the help of scope. We observe the following characteristics of PV array

- V_PV
- I_PV
- I_diode
- Irradiance
- Temperature

Current & voltage measurements:

By using voltage & current measurements blocks, we observe the output voltage & current of Resistive load connected with PV array with the help of scope.

Resistive load:

We use series RLC branch as a load. Set the type of branch is resistive & set the value of resistor.

Powergui:

The powergui block allows you to choose one of these methods to solve your circuit:

- Continuous, which uses a variable-step solver from Simulink.
- Ideal switching continuous.
- Discretization of the electrical system for a solution at fixed time steps.
- Phasor solution.

Set simulation type is discrete.

Output waveforms:**Output Voltage & Current Waveforms of Resistive Load:**

Output Characteristics Waveforms of PV array:

Conclusion and Comments:
