

# KIET Group of Institutions , Delhi-NCR , Ghaziabad Electrical and Electronics Engineering



Project Title: Design and Simulation of MPPT with regulated DC output voltage.

Project Number: 49

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# INTRODUCTION

## Problem Statement

Research and development in the field of MPPT, shows that it can provide regulated output DC voltage. So our task to make a MPPT controller which can provide regulated output.

## Objectives

The power output from the PV module is mainly dependent on the PWM duty cycle.

MPPT is used to extract the maximum power from the PV panel in order to maximize the overall efficiency of the system, thereby reducing the overall system cost.

## Project Work

In this work, a controller comprises of buck/boost converter and PV Array having varying radiation and temperature is used to get obtain regulated DC voltage at output. The mathematical model is presented and simulated. Design, implementation and recommendation are in the process.

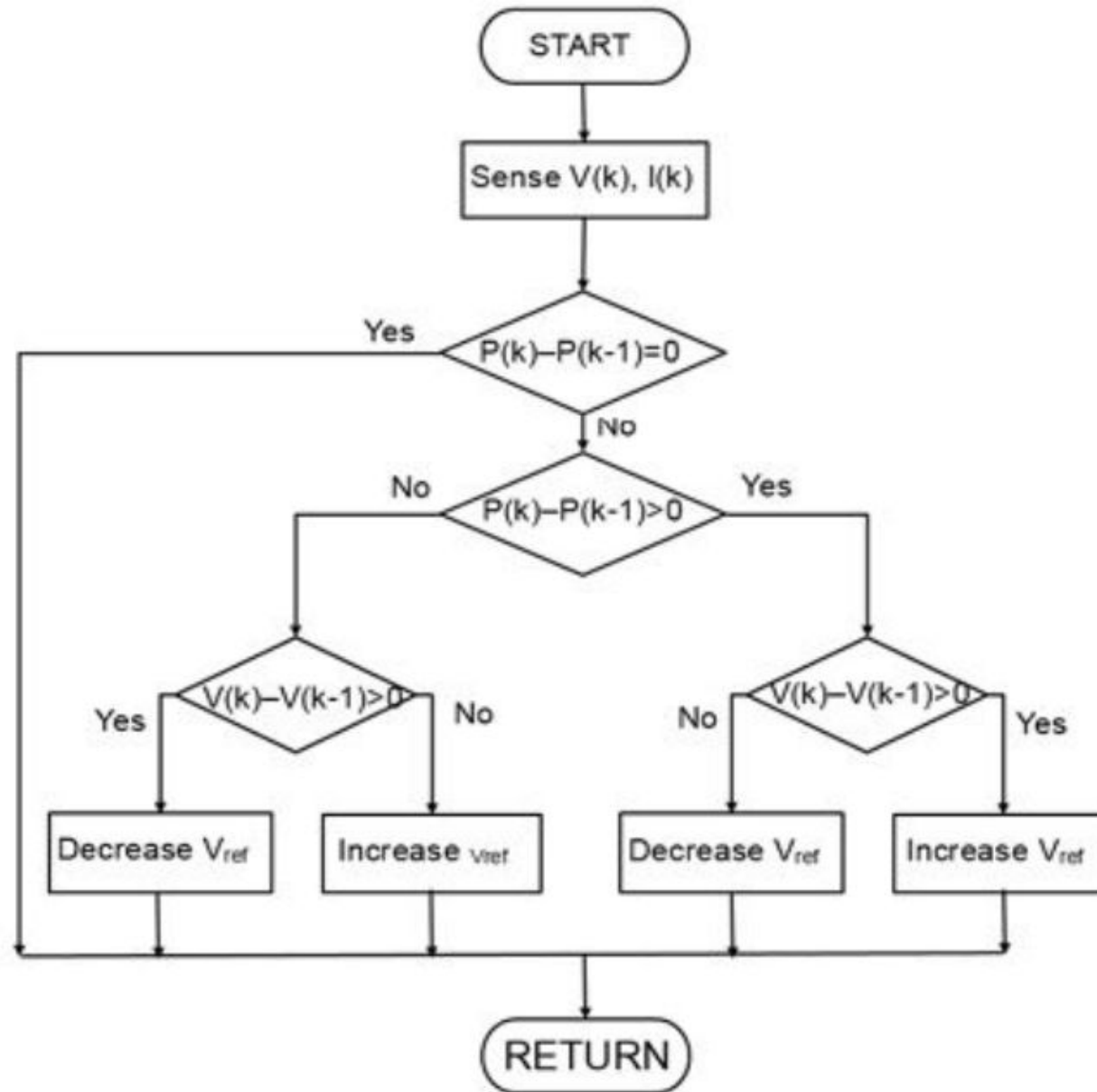
# What is MPPT?

- MPPT stands for Maximum Power Point Tracking. This is a type of charge solar charge controller which manages the charge coming from the solar panels.
- It primarily supervises the charging and discharging of the battery connected with the solar panel so that the solar energy is thoroughly utilized.
- MPPTs are more advanced and complex controllers than the other type of sole charge controller, PWM (Pulse Width Modulation) charge controller.
- It uses many algorithm to generate pwm, the one used in this project is P & O(Perturb and Observation).

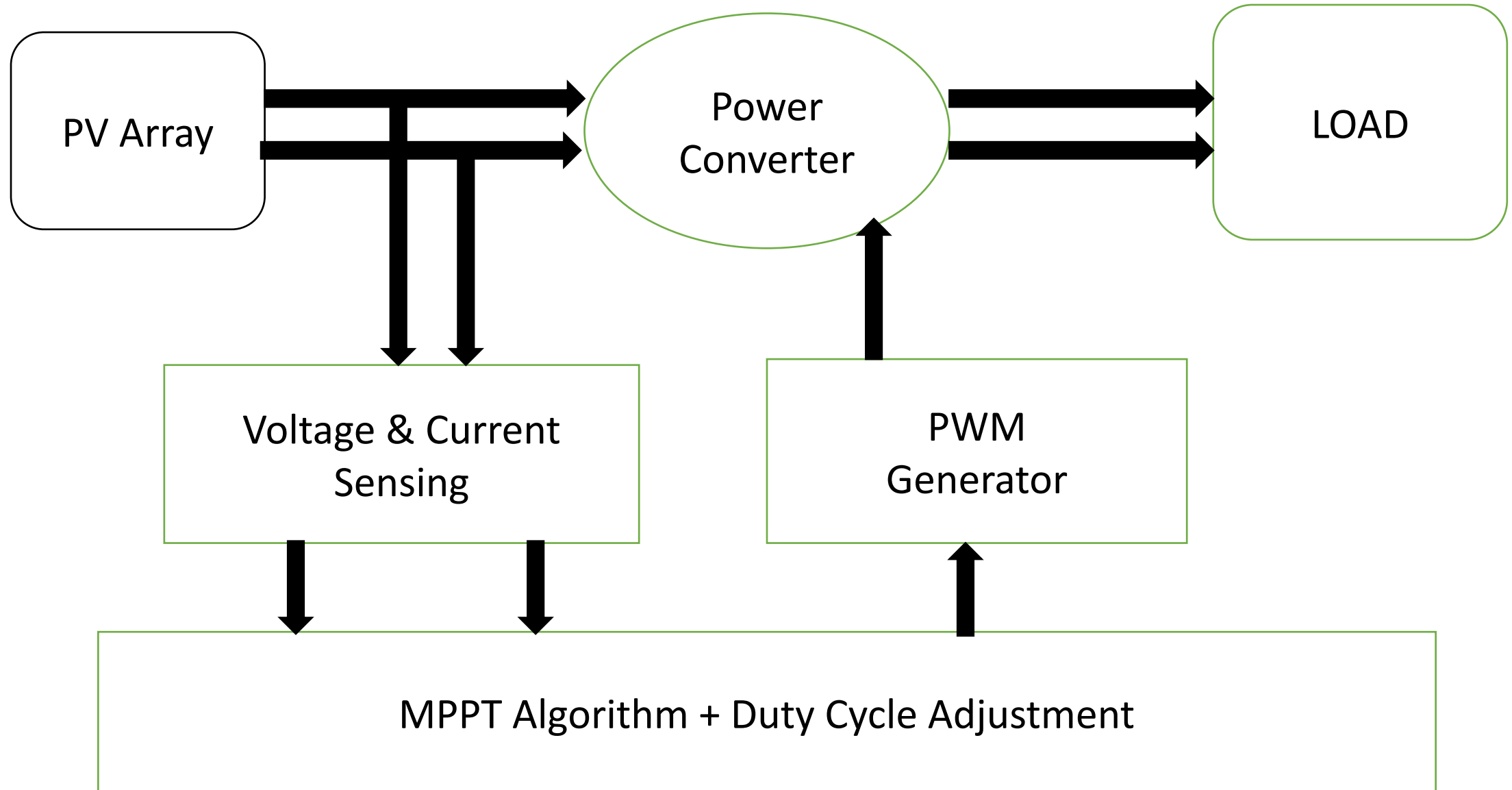
# Perturbation and observation (P&O):

- P&O method is used for tracking the maximum power point.
- The P.V O/P power is periodically measured with previous power.
- When output power increases, the same process is continued otherwise perturbation is reversed.
- So, when power increases, the operating point of the P.V module is on the left of the m.p.p (maximum power point). Hence further perturbation is required towards the right to reach m.p.p.
- Conversely, if power decreases, the operating point of the P.V module is on the right of the m.p.p.Hence further perturbation towards left is required to reach m.p.p.
- The block diagram of the algorithm is given in next slide.

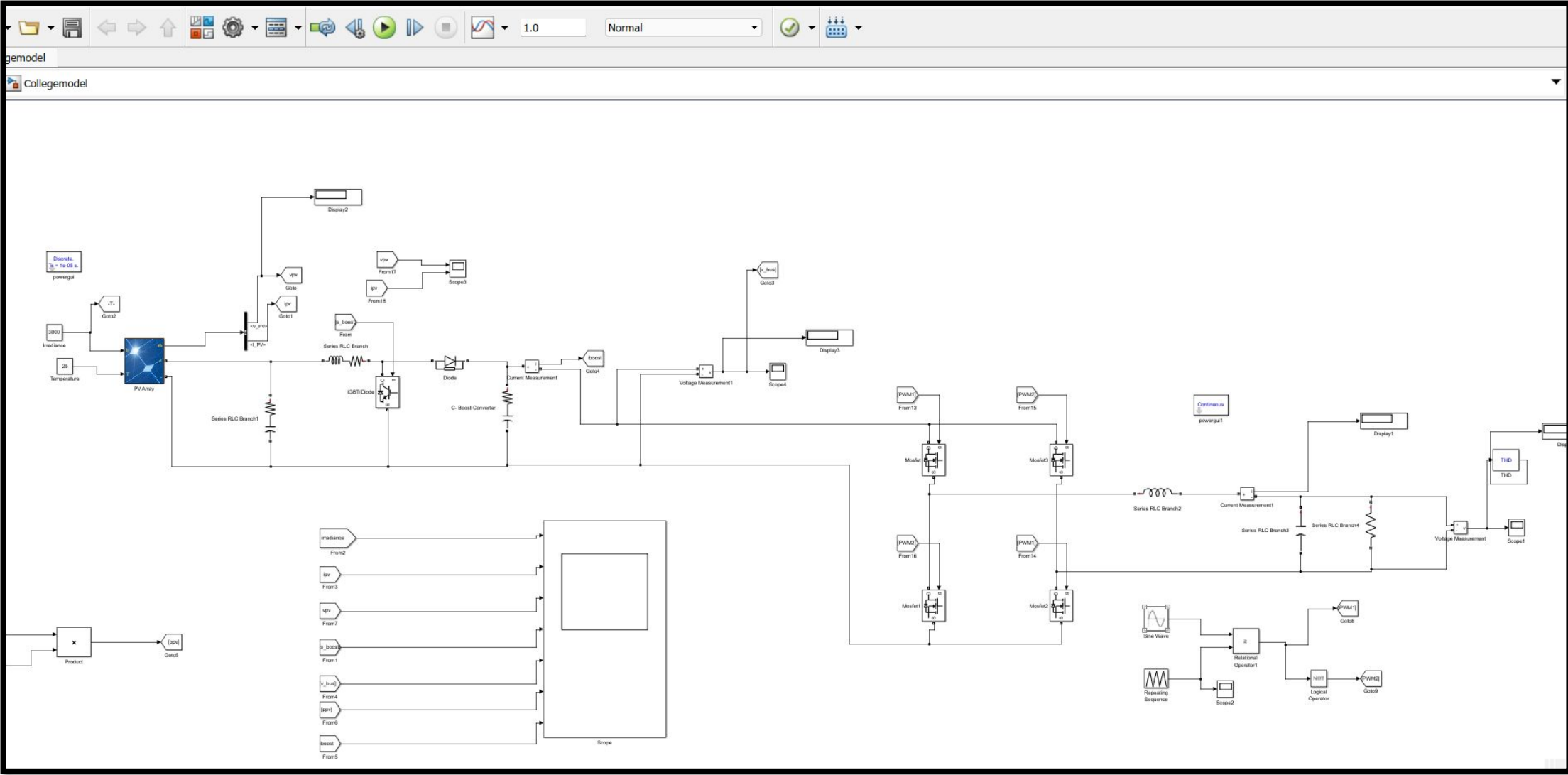
# P&O ALGORITHM BLOCK DIAGRAM



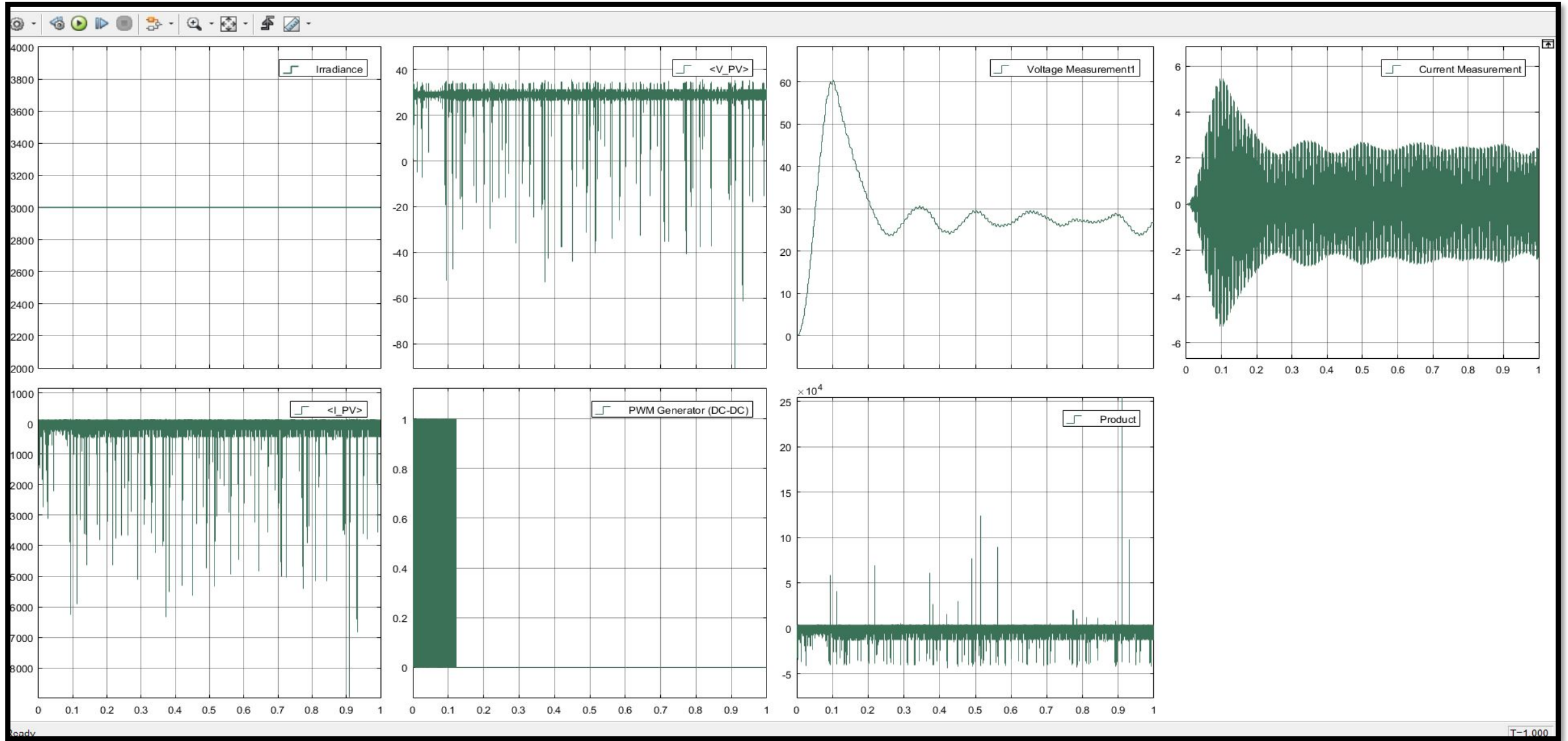
# Block diagram ( M.P.P.T )



# MATLAB MODEL



# MATLAB SIMULATION RESULT



# FUTURE SCOPE

- The future scope of this project is to make M.P.P.T an open source controller, where it's algorithm to generate pwm can be modified to generate desired pulses which can give desired output.
- The designed model can be compatibly used in any line system.
- To get a regulated desired dc output irrespective of the changes in temperature and irradiances.