

In India, several states experience frequent and crippling power cuts. To combat this, solar rooftop systems are springing up everywhere, from small residential homes to large factories. In the case of industrial areas where erratic power outages can cause massive losses, diesel generators coupled with solar grid-tie inverters serve to bridge the gap during power cuts and in some locations are used 24/7.

While a solar setup achieves a saving on electricity costs, given that some states have yet to modify their policies to allow feed in, the installed capacity is required to be less than the average load, exceeding which can incur a fine from the state if the energy is found to be exported to the grid. On sites with diesel generators, a second issue is faced; if the solar generation exceeds a certain amount, and causes the minimum load of the generator from being maintained, the genset can be tripped, causing a power outage.

**The Wattmon Power Control function can be used in two scenarios :**



### Zero Feed-In

Dynamically reduce the output from inverters to limit power for captive consumption, and enforce zero export of energy.



### Diesel Generator Protection

Control the active power of the inverters and optimize the energy generation to protect multiple diesel generator sets.

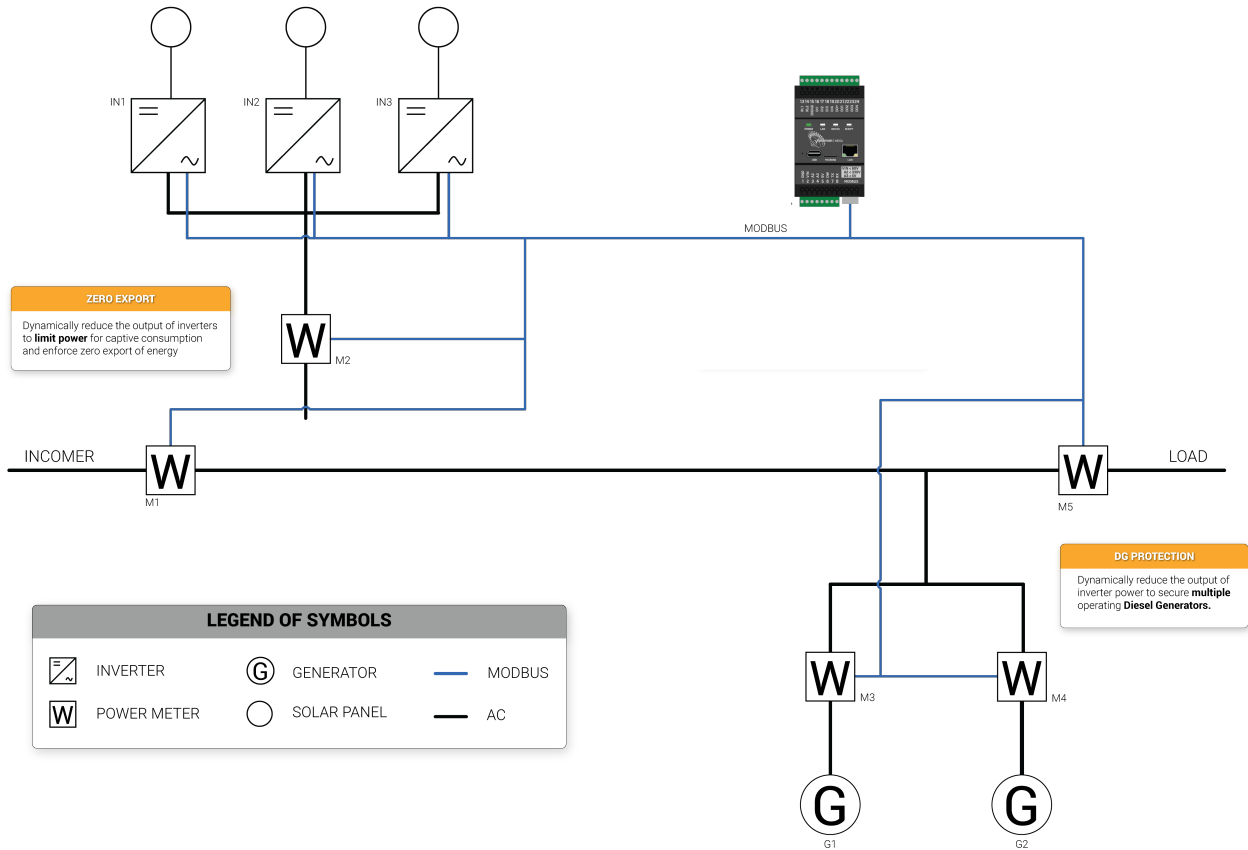
In both of these cases the algorithm works with a max and min set point which can be configured through software. Different set points can be assigned to different energy meters, allowing for multiple generators to work on one setup.

The algorithm works by polling available energy meters to determine the current generation/load and based on that and the number of inverters and inverter capacity it calculates the optimal power level for each inverter in real time. This ensures that reverse feed in to a diesel generator is prevented.

Simply put, the algorithm works as follows:

1. *Read Active Power from meter*
2. *Is Active power > Max Set point? If yes, increase power on inverters*
3. *Is Active power < Min Set point? If yes, decrease power on inverters*
4. *Repeat from step 1*

### Connection Diagram :



### Basic Requirements :

In order to enforce Zero-Export or Diesel Generator Synchronization using a Wattmon Data Logger, several factors play a role in forming the optimum configuration. The Wattmons are compatible with a large number of inverters from leading manufacturers, and are potentially compatible with any inverter which communicates over Modbus RTU/TCP, and supports Active Power Output Control. The energy meters also need to support communication over Modbus RTU/TCP, so the Wattmon can actively monitor the Grid, Solar or Diesel Generator Outputs.

The setup also needs to adhere to the layout as displayed above, and the following information needs to be recorded on the Wattmon during configuration :

1. Inverter(s) and Energy Meter(s) make and model
2. Inverter(s) rating in kW
3. Grid Load in kW
4. Diesel Generator(s) Rating in kVA, and minimum load-output in kW
5. Total Load of Site, which equals Solar + Grid + DG



## Power Control Overview

The Wattmon Data Loggers are compatible with the following inverters and energy meters right out of the box, for the purposes of Zero Export of Energy or Diesel Generator Synchronization.

### Supported Inverters :

- ABB Trio 20.0(27.0)TL, 50.0/60.0TL-TM, PVS-100/120TL
- Delta RPI Series
- Fronius
- Huawei SUN2000 Series
- Ingeteam PLAY3 & PLAY3 100TL Series
- Polycab
- Schneider Conext TL-25, CL-60
- SMA Solid-Q 50, Sunny Boy, Sunny Tripower, Sunny Highpower Peak1 series
- SolarEdge
- Sungrow PV
- Zegersolar

### Supported Energy Meters :

- Archmeter PA330
- Eastron SDM630
- Elmeasure Little Genius & Tiny Master
- Klemsan KLEA 320P
- Legrand EMDX3
- L&T ER300P
- Schneider Conzerv EM6400
- Schneider PowerLogic EM7280
- Secure Elite 440-444, 440-445 & 440-446
- Sumeru Verde Damodar series

### About Cynergy :

Established in 1997 in Auroville, India, Cynergy's extensive knowledge-base and multi-disciplinary team has provided remote maintenance and management solutions across the globe for over 20 years.

Since 2012, Cynergy has focused on an innovative and cost-effective remote monitoring and control platform called Wattmon. Wattmon hardware and software solutions are the most flexible in the industry. They can be used for monitoring Grid-Tie and Off-Grid setups, solar water pumping, building loads, and features a manufacturer agnostic Zero Feed-in and DG Protection compatible with the leading inverter brands of today.

For more information visit our website: <http://www.wattmon.com>