



**Logics PowerAMR Automated Weather Monitoring Station (WMS) automatically monitors site meteorological conditions in real-time, transmitting weather sensor's data to our IoT based monitoring platform. It is a fully computerized, digital and self contained power source system, fitted with data logger and battery charging solar panel along with sensors mounted on Tripod stand with sealed water proof enclosure for data logger, solar charger and battery.**

The all-in-one weather station reduces the installation, support and maintenance cost while improving the robustness and manageability of the PV plant monitoring solution/ smart farming.

## Key Components

The expanded sensor set enables plant management across a broad range of plant sizes & requirement.

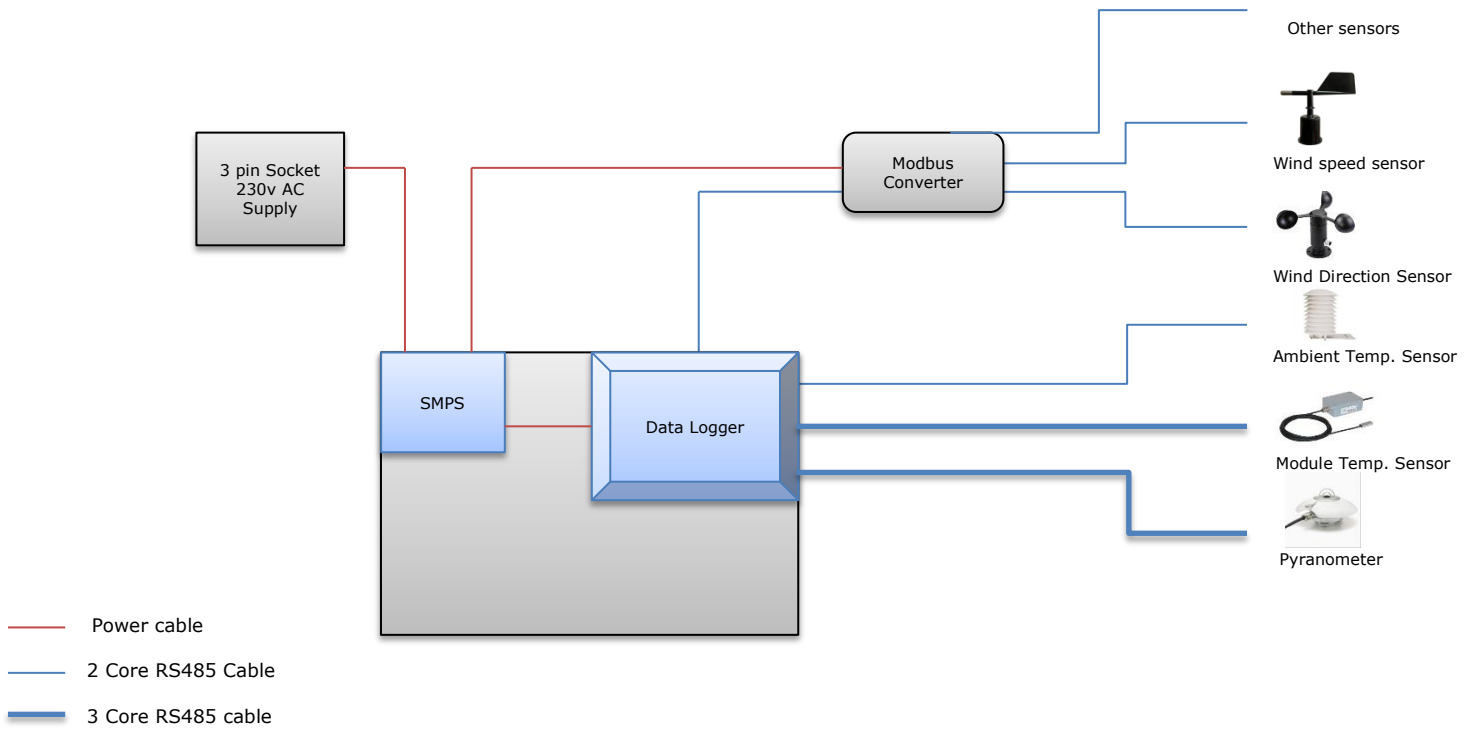
The WMS is delivered ready for installation and requires the installer to mechanically mount the sensors on a Mounting Stand, Insert SIM card in the data logger and connect with power and communication cable. The key components of WMS include-

- Weather sensors & accessories
- Tripod Stand
- Data Logger set
- IoT Platform
- Solar Panel with battery

## Key Features

- WMS supports multiple sensor set: **ambient temperature, solar irradiance (Pyranometer), humidity sensor, module temperature, wind speed, wind direction, rain gauge, Humidity sensor, Air pressure sensor, cloud cover, soil moisture, evaporation, leaf wetness, air quality sensors and many more**
- No on-site configuration, calibration or any software installation is required
- GSM/ LAN/ WiFi supported Data Logger with Inbuilt memory
- Plug and play system

## System Architecture



## Connection Diagram of WMS and Data Logger

### Power Supply

- 1) +12 V from adaptor/ SMPS  
 +12 V from Modbus Module  
 Red wire from solar radiation  
 Red wire from module temp  
 Red Wire form ambient temp

### Inverter/ meter

- 2) Ground from adaptor/ SMPS  
 Ground from Modbus Module  
 Black wire from solar radiation  
 Black wire from module temp
- 3) RS 485 (+) from Modbus Module & inverter/ meter
- 4) RS 485 (-) from Modbus Module & inverter/ meter

### Sensor

- 5) Blue wire from module temp
- 6) Blue wire form solar radiation sensor
- 7) Black wire from Ambient temperature



## Technical Specifications

### Technical data and types

#### Sensors

Ambient temperature	Range: 0°C to 100°C, Accuracy +/- 0.5°C
PV panel temperature	Range: 0°C to 100°C, Accuracy +/- 0.5°C
Solar Radiation sensor	Range 0 to 1800 W/m2 Accuracy +/- 5% Temperature Range -40°C to 65°C
Wind Speed Sensor	Range 0 to 250km/h (0 to 69m/s) Sensor Type: Three Cup Accuracy +/- 3% Start wind Speed 0.5m / s Temperature range -40°C to 65°C
Wind Direction Sensor	Range 0-360 degrees Accuracy +/-3% Temperature range -40°C to 65°C Sensor Type: Wind vane potentiometer Type

### WMS DATA LOGGER SPECIFICATIONS

#### Communication

Serial port	RS-485 2 wire, Modbus RTU, 3 IO Ports
Recommended cable	Cat. 6/ RS485/ orequivalent

#### Power supply

DC power supply input	8-32 VDC
Supply Current	0.08A at 12 VDC

#### Compliance

Humidity	0 to 100% Condensing
Enclosure	IP 65

#### Physical parameters

Dimensions	105mmx95mmx24mm
Weight	160gm
Operating Temperature	-10°C to 55°C

#### Mounting Stand

Material Type	MS, Power coated
Stand Type	Tripod
Height	8 feet

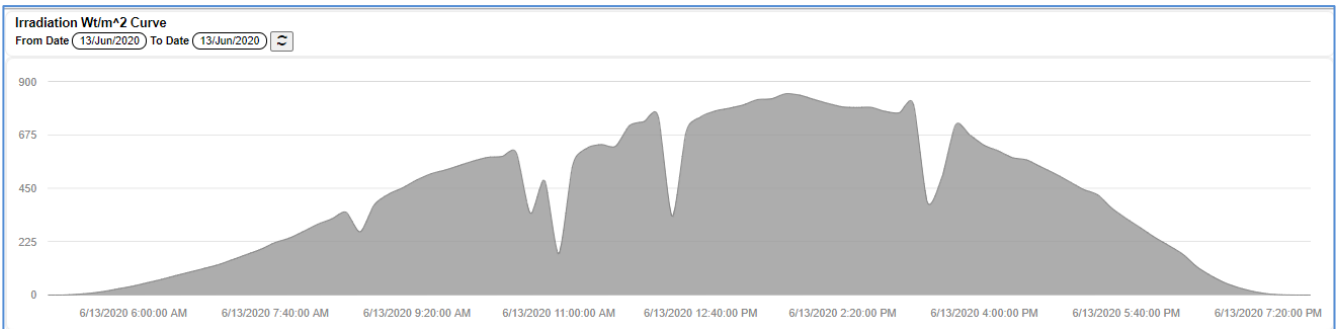
#### Warranty

Standard warranty	1 year
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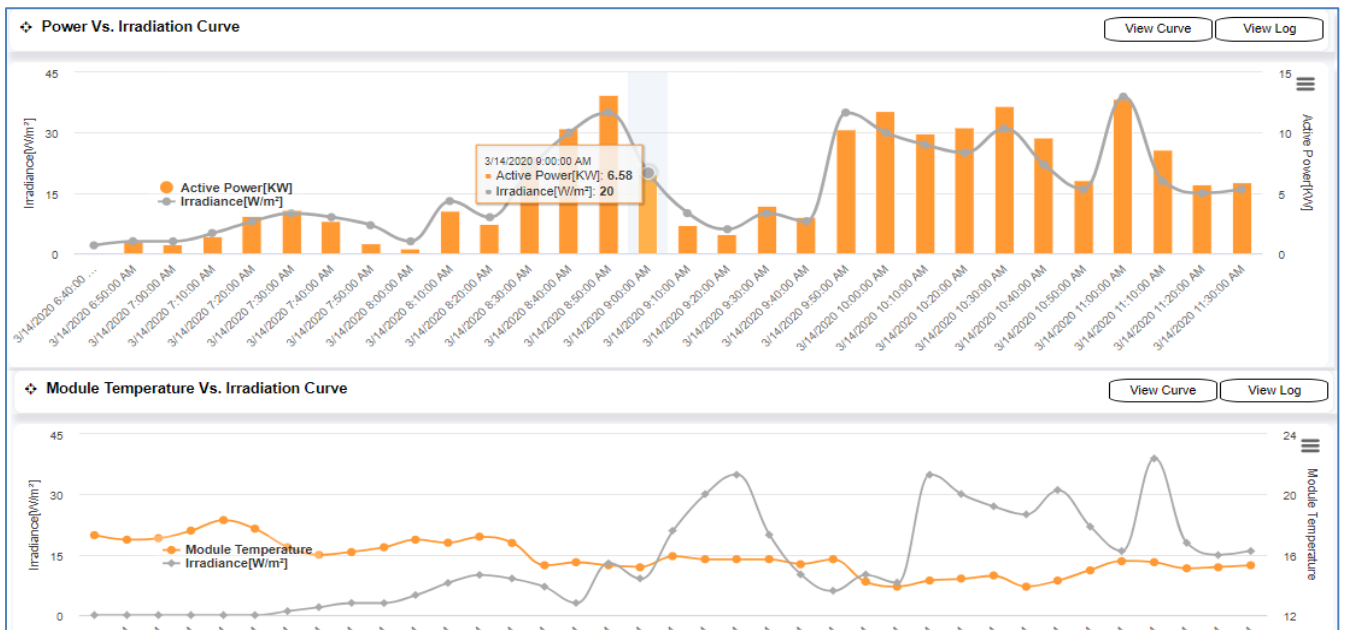
## WMS Dashboard



## Irradiation Curves



## Intelligent Analysis & Multiple graphs comparison



### Solar Radiation Sensor Pyra 300V



Pyranometer is to be mounted in an easy-to-reach location in order to clean the dome regularly and carry out maintenance. At the same time, make sure that no buildings, constructions, trees or obstructions exceed the horizontal plane where the pyranometer lies. If this is not possible, select a site where obstructions in the path of the sun from sunrise to sunset do not exceed 5 degrees of elevation. N.B The presence of obstructions on the horizon line affects significantly the measurement of direct irradiance

Pyranometer is to be located far from any kind of obstruction, which might reflect sunlight (or sun shadow) onto the pyranometer itself.

The sunlight sensor must be installed at the same azimuth and tilt angle than the PV array.

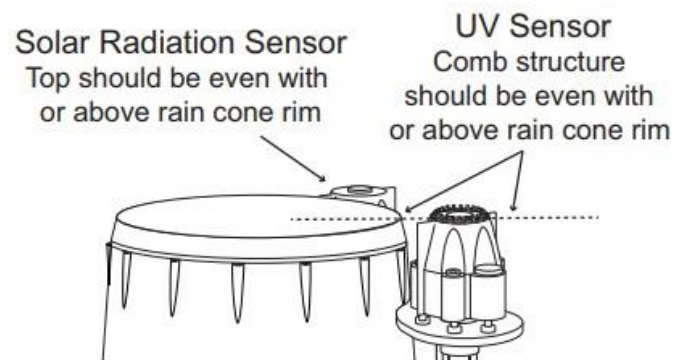
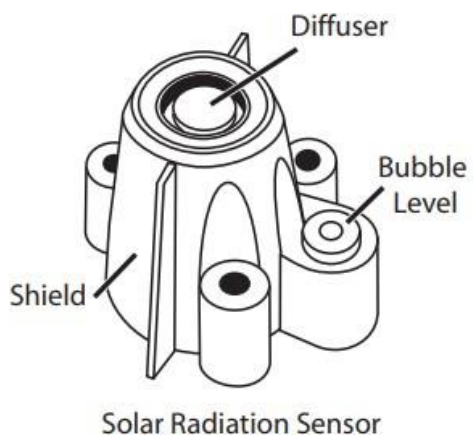
#### Specifications

- Operating Temperature :  $-40^{\circ}$  to  $+65^{\circ}$  C
- Storage Temperature :  $-45^{\circ}$  to  $+70^{\circ}$ C
- Transducer : Silicon photodiode
- Spectral Response : 400 to 1100 nanometers Cosine Response
- Percent of Reading :  $\pm 3\%$  ( $0^{\circ}$  to  $\pm 70^{\circ}$  ),  $\pm 10\%$  ( $\pm 70^{\circ}$  to  $\pm 85^{\circ}$  )
- Percent of Full Scale :  $\pm 2\%$  ( $0^{\circ}$  to  $\pm 90^{\circ}$ )
- Temperature Coefficient : + 0.12% per  $^{\circ}$ C
- Reference temperature :  $25^{\circ}$ C
- Housing Material : UV-resistant PVC plastic
- Weight : 250 g
- Range : 0 to 1800 W/m<sup>2</sup>
- Accuracy :  $\pm 5\%$  of full scale
- Drift : up to  $\pm 2\%$  per year
- Output : 0 to 5 VDC (0- 1800 w/m<sup>2</sup>)
- Power supply : 7- 24 VDC 1mA (typical)

#### Mounting

- Using the bubble level on the sensor as a guide, adjust the sensor until it is level by tightening or loosening the screws. The top of the Solar Radiation sensor should be even with or slightly above the rim of the rain cone. The entire comb structure of the UV Radiation sensor should be above the rim of the rain cone

- Final leveling of the sensor(s) should be done with the ISS mounted in its operating location
- Ensure that the cables are free of crimps. Secure them to the support tubes with the provided cable ties so that they will not fray in the wind.
- Shade the sensor and make sure the reading changes



## Ambient Temperature sensor



The Ambient Temperature Sensor comes factory-assembled inside the radiation shield. The radiation shield bracket can be mounted to a pipe (1.0 - 2.0 in. diameter), using the supplied U-bolt.

The radiation shield can be installed anywhere in the vicinity of the PV array.

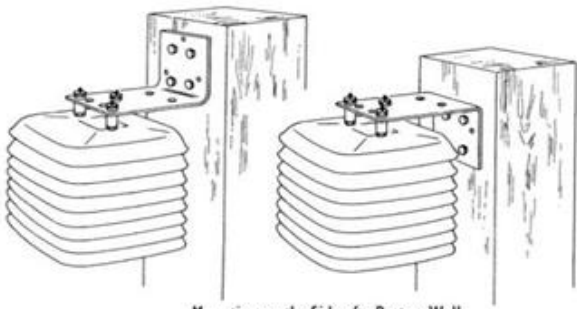
It is recommended to place the Ambient Temperature Sensor on the north side (in the northern hemisphere) of the array, otherwise you must provide array shading setback

### Specifications

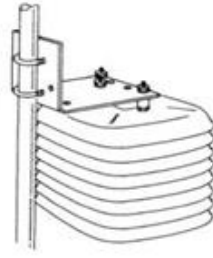
- Construction : UV-stabilized white thermoplastic plates, aluminum mounting
- Bracket, white powder-coated ,stainless-steel U-bolt clamp
- Plate Diameter :196 mm
- Plate Height :110mm
- Measuring Range : 0 to 100 ° C
- Accuracy : ± 0.3 ° C
- Sensors : Temperature : RTD Pt100Ω Class A
- IEC 60751
- Output : 4-20mA ,2 wire Loop Powered ,Max load 600Ω at 24 vdc supply
- Supply Voltage : 12 to 26 VDC
- Housing Electronics :Poly carbonate watertight enclosure
- Protection : IP-67

### Mounting

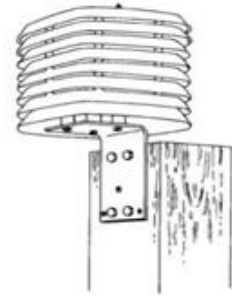
- The Solar Radiation Shield may be mounted in three orientations.
- On the side of a wooden post or a wall.
- On a metal pipe with outside diameter between 1 in. and 1-1/4 in. (25 mm and 31 mm) on top of a wood post.



Mounting on the Side of a Post or Wall



Mounting on a Pipe



Mounting on Top of a Post





## Module Temperature Sensor



This sensor is designed to attach directly to any solar panel. When placed on the center back side of the panel, it accurately measures the temperature of the panel.

Prior to installation of the PV temperature sensor onto the PV panel, the installation area of the panel back should be thoroughly cleaned. This cleaning will ensure a good bond between sensor and panel and allow for accurate panel temperature readings.

After cleaning, peel off the protective adhesive tape on the temperature sensor and stick it onto the back of the panel. Firmly press the sensor into place.

### Specifications

- Measuring Range : 0 to 100 °C
- Accuracy :  $\pm 5^{\circ}\text{C}$
- Sensors : Temperature : RTD Pt100 $\Omega$
- Output : 0- 5v
- Supply Voltage : 12 to 24 VDC
- Housing : Poly carbonate watertight enclosure
- Protection : IP-65 Weight :
- Approx 150gms

### Mounting

- Select a PV module that remains non-shaded throughout the day.
- Peel the backing from the adhesive tape and press the sensor firmly against the surface.
- Do not attempt to extend or shorten the pre-assembled 2.5 m cable.
- The module temperature sensor is affixed to the back of the PV module.
- Tie the sensor cable off in a way that does not pull on the sensor
- It is recommended to fix the sensor and the cable with an additional adhesive tape.



## Wind Speed Sensor



The wind speed sensor comes in three different parts. We have the sensor body, the anemometer cup wheel and an Allen key to mount the cup wheel on the sensor body. There are different ways to mount the sensor.

When selecting your mounting system, take into consideration that you will occasionally need to access the anemometer for preventive maintenance and possible component replacement.

The goal of installing a wind speed meter (anemometer) is to position it in a location where the wind flows freely and is not influenced by nearby objects.

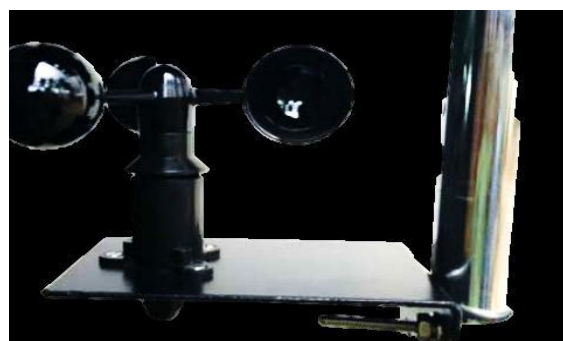
For the most accurate wind speed readings, mount the sensor as the highest object for 50 feet in all directions.

### Specifications

- Sensor Type : Three cups
- Material : Control Head UV-resistant ABS
- Wind Cups : Polycarbonate
- Range : 0 to 250 km/hr
- Startup wind speed : 0.5m / s
- Accuracy :  $\pm 3\%$
- Output :Pulse , 62 Hz = 250 km/hr
- Dimensions : 3 cup Dia 15 cms
- Cable length : 2 mts
- Temperature : - 40 ~ 75 ° C
- Potential lead : Two wire

### Mounting

- Cups should be on the top of the sensor.
- Mount vertically.



## Wind Direction Sensor



The goal of installing a wind direction meter is to position it in a location where the wind flows freely and is not influenced by nearby objects.

For the most accurate readings, mount the sensor as the highest object for 50 feet in all directions.

### Specifications

- Sensor Type : Wind vane potentiometer Type
- Material : Control Head UV-resistant ABS
- Wind Vane : Polycarbonate
- Range : 0- 360 Deg
- Accuracy :  $\pm 3$
- Output : 0 – 5v
- Supply : 12 to 24 vdc
- Cable length : 2 mts
- Temperature : - 40 ~ 75 ° C
- Colour Code :Brown :Supply ,Black : Gnd, Blue : output

### Mounting

- Allow sufficient clearance for the wind sensor. Install the wind sensor away from buildings or any other objects that might affect the airflow
- Try to make the sensors the highest object around. 7 feet or more above the surrounding obstructions is best
- The sensor must be mounted in an upright position; otherwise, water can enter the sensor and destroy it

### Tools and Materials Needed

- Wrench or pliers
- Wire cutters and stripper
- Multimeter
- Drill with 3/16 in drill bit (4.7 mm) to drill pilot holes
- Adjustable wrench or 11/32 in. wrench and 7/16 in
- Electrical Tapes to cover the wire

We pursue a policy of continuous research and product development, Specifications and features are subject to change without notice