PVTECH TECHTalk Product Series WEBINAR

WEDNESDAY 16 SEPT 2020

Maximizing PV Power Plant ROI with Modular Solar Monitoring Weather Stations

RainWise®
WEATHER BETTER.

PRESENTED BY

Carsten Steenberg
VP of product management
RainWise

Eric Rollins
Sales Director
RainWise

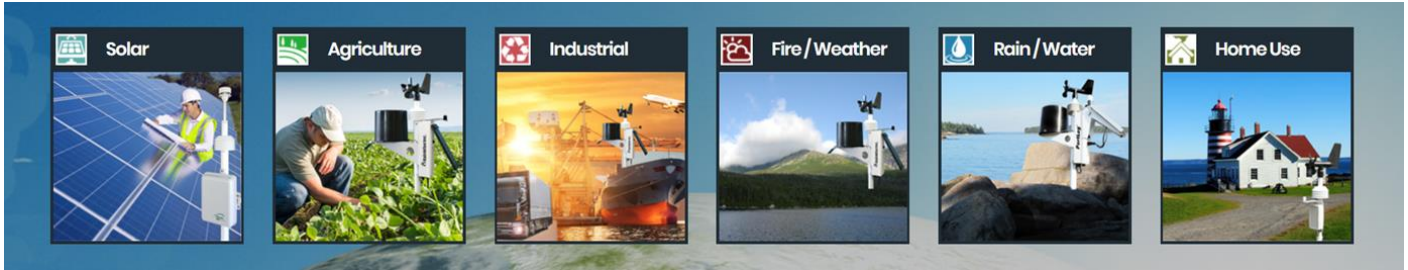
Mark Osborne
Senior News Editor
PV Tech

Content:

- Introduction to RainWise, Inc.
- RainWise and Solar Monitoring
- Why Solar PV monitoring is important
- Why local Weather Stations at PV plants are important
- Todays & the futures PV weather stations demand
- The PVmet 500 Series
- Applications
- Availability

Introduction to RainWise, Inc.

- A Leading manufacture of weather station & Meteorological instruments for more than 45 years.
- The Name RainWise is based on the Patented (1976) rain collecting tipping bucket technology (the system everyone uses today!)
- In 1979 RainWise invented the first digital consumer weather station in the world (Patent granted in 1981)
- In 1996 Invented the first wireless consumer weather station (Patent granted in 1999)
- RainWise, Inc. was acquired by Nielsen Kellerman in January 2021



RainWise and PV Solar Monitoring

- First Weather Station for PV solar monitoring in 2010 –The PVmet200
- RainWise co-wrote the SunSpec standard for Weather Stations
- Leading Inverter companies ABB/FIMER & SMA are selling private label RainWise.

SMA ABB FIMER

- Strong worldwide market share more than 8,000 PV Solar Monitoring weather stations installed. Equivalent to monitoring of approximate 2 GW in more than 30 countries.
- Broadest line of weather stations exclusively for solar monitoring

Why solar PV monitoring is important:

- Guaranteeing maximum power production
- Secondary control of uptime & efficiency
- Fault detecting & Damage prevention
- Often a demand from the financing authority
- Maximize plant efficiency & Minimize revenue losses
- Minimum Key parameters monitored needed are:
  - Solar radiation - Global & Plane of array
  - Temperatures of the PV panels

Why local Weather Stations at PV plants are important:

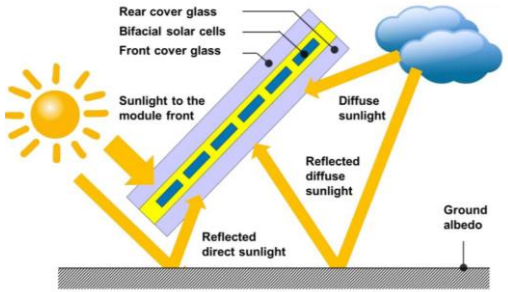
- Microclimate is a reality also for PV plants
- Get real time & precise irradiance & weather data, General forecasted data is simply not accurate enough!

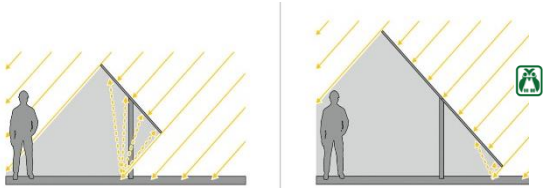
  Example Major European IPP, Encavis generating around 10% extra kilowatt hours of electricity than expected average figures, due to higher irradiance levels at PV power plants

- Prevent potential wind damage

It is a fact that wind is the most common cause of damage for photovoltaics systems in general. *Thorsten Kray, PhD Head of the PV Wind Loading Department*

- Albedo/Bifacial PV monitoring –a new, important but somewhat complex parameter to monitor precisely.





Albedo/Bifacial PV monitoring in further details:

- The Bifacial PV promise =reflected or diffused sunlight is added to power generation without extending the footprint of a module. From a promising vision to a widely applied technology with an estimated world market share of up to 30 to 50% within the next 10 years.
- Suggested height of the Albedo measured irradiance is at roughly 60% height of the complete structure.
- 2 sensible ways to measure solar irradiance on a Bifacial PV system.

1.Using Plane Of Array (POA) sensors on the front and the rear side of the module

2.Using a combination of sensors on the front side, consisting of POA, Global/ Horizontal Irradiance and an albedometer, to calculate the POA on the rear side via a suitable software

- Doing Bifacial PV monitoring is an important and necessary way to learn about maximizing efficiency and optimal system configurations

Problem -Finding an economic solar weather station for your monitoring project – having these demands in mind:

- Modular and upgradable to include all standard weather parameters in addition to solar specific ones.
- Support most irradiance sensor on the market (Thermopile & Silicon diode technologies)
- Meet important standards like SunSpec & IEC 61724-1 Performance monitoring.
- Prepared for monitoring of Bi-facial PV panels (surface albedo)
- Prepared for future communications standards like Modbus TCP (Ethernet)

Solution - The PVMet500 Series of weather stations

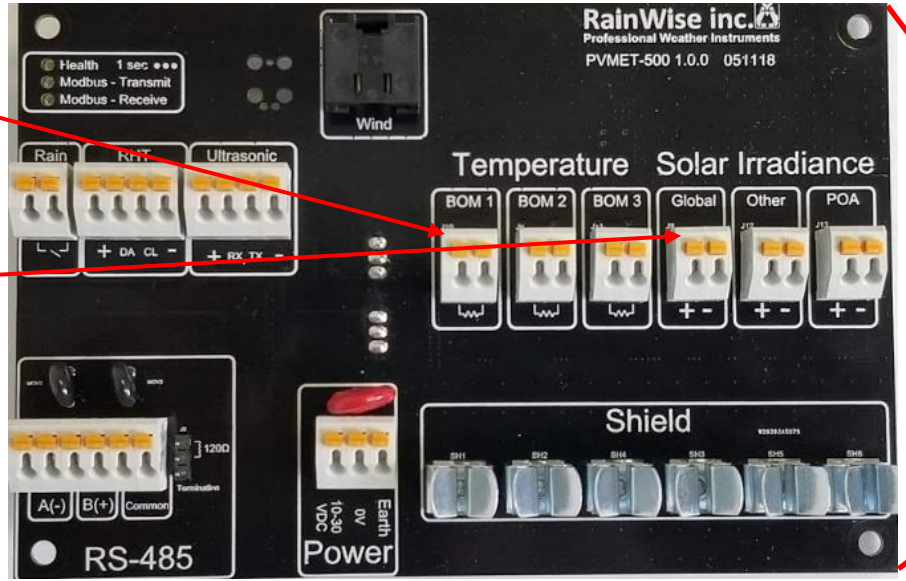
- Easy Monitoring of all irradiance parameters, such as Global, Plane Of Array, Albedo & diffused
- Freedom of choice as all Irradiance sensor standards & technology are supported – First & Second Class, Secondary standard & Silicon diode (Class A, Class B, and Class C)– in addition to reference cell censors
- Meets the IEC-61724-1 standard for PV Monitoring Standards
- For a great PV panel average temperature reference, 3 individual back-of-module temp sensors are supported
- Full modularity now or in the future, all weather station parameter can be supported via individual upgrades
- Fast & simple integration to Inverters and Dataloggers via the SunSpec standard Modbus register map.
- Easy connectivity via Modbus RTU communication & RS485 connection (Modbus TCP Q1 2021)

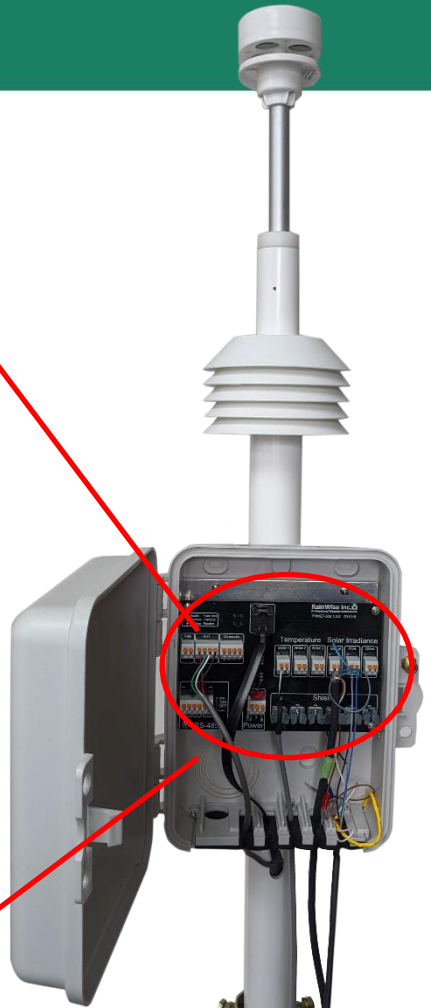
Solution:

The PVMet500 Connectivity seen from the motherboard

Supports up to 3 back of module temp sensors

Supports up to 3 Irradiance sensors in any technology





PVmet a worldwide success because:

SUNSPEC ALLIANCE

- Compact design & easy install (most systems single mast)
- Extreme reliability
- SunSpec compatibility & supported by most inverter and PV monitoring SW solutions
- Many models to choose from
- Competitive pricing
- It has become the “standard” among commercial PV monitoring projects

PVMet 75 PVMet 100 PVmet 150 PVMet 200 PVmet 330 PVmet 500

Applications:

- All Commercial PV Monitoring applications & smaller utility grade projects. The PVmet 500 is Compatible (via its Modbus RTU communication and RS485 connectivity) with most Inverters & Monitoring Solutions worldwide.
- Sample client types are:
  - Common Commercial PV monitoring project – like department /Big box stores rooftops like Ikea, Walgreens, Walmart & Target.
  - PV plants on Institutional Buildings/ Educational campuses, Commercial countrywide state projects, & Smaller Utility grade projects spread over 4 different continents.

NEWS

Just in! – 16 x PVmet 500' being deployed for monitoring of the Sao Mai Solar Power Plant project in Vietnam – a 210MW Utility grade system

SAO MAI GROUP

Availability:

- Available today -PVmet 500 Modbus RTU (RS485) –info listed at RainWise website: https://bit.ly/2RaTp6M
- Available Q1 2021 -PVmet 500 Modbus TCP (Ethernet)
- Note that RainWise is pleased to offer expert guidance for system specification etc.

RainWise WEATHER BETTER.

PVTECH TECHTalk Product Series

Thank You!

For more information please contact

Eric Rollins

Senior Global Sales Manager

erollins@rainwise.com

Direct: +1(207) 266.8465

Office: +1(207) 801.4035

SKYPE: eric.rainwise

WhatsApp: +12072668465