

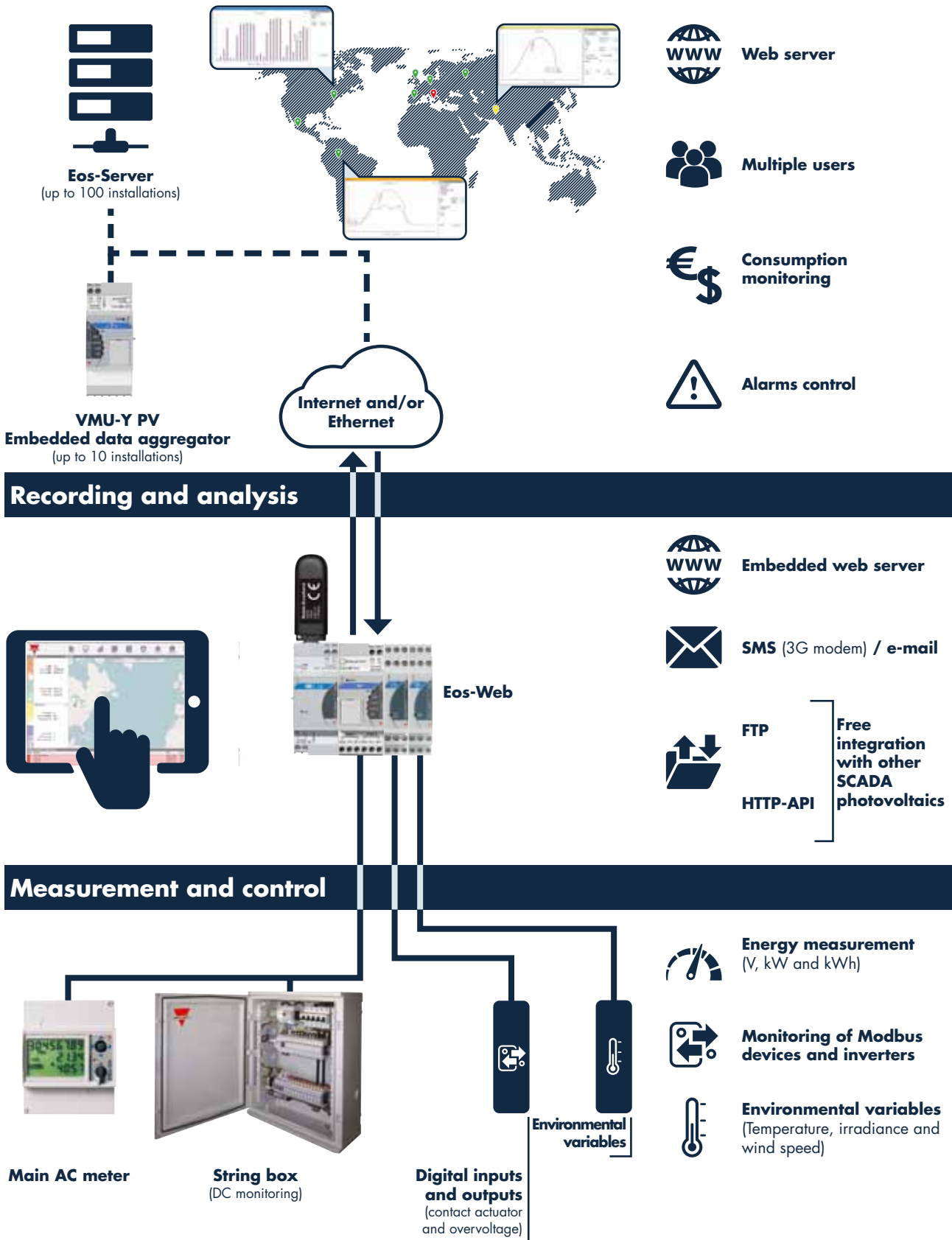


## Overview

# PV monitoring

# PV monitoring diagram

## SOFTWARE Eos-Server - PV multisites management



# Overview

## PV monitoring

### Web server and datalogger



**VMU-C PV (Eos-Web)**

- Dimensions: 2 DIN modules
- Micro PC with web server and web service capability
- Data and event logging capability
- Internal 4GB memory and 16GB SDHC card back-up memory (on request)
- Variables shown as graphs and numbers in formatted tables
- All data exports on HTML format compatible with Excel or other spread sheets
- Management up to 11 Eos-Array, 11 inverters and 11 energy meters

#### MAIN FEATURES

- Efficiency calculation and control on different levels: string, BOS and Performance ratio and Yield indices
- Alarms control with automatic e-mailing and SMS management by means of VMU-D

### Embedded aggregation server



**VMU-Y PV**

- 2-DIN size; DIN-rail mounting
- Multi-site PV monitoring management
- Power supply from 24 VDC (+/- 20%)
- 2 USB ports (for data backup and connection backup)
- 1 SD port (for backup)
- UL approved

#### MAIN FEATURES

- Photovoltaic plant/portfolio management
- Data analysis and benchmark
- Data and event logging
- Data aggregation in plants and virtual plants
- All data exported in format compatible with Excel or other spread sheets
- Alarms management
- Database replication up to 10 VMU-C PV

### Cloud multi-site aggregation server



**Eos-Server**

- Software solution for photovoltaic plant management
- Multi-site PV monitoring management
- Flexible and scalable architecture
- VMware® Technology compatibility - in-house or cloud installation

#### MAIN FEATURES

- Photovoltaic plant/portfolio management
- Data analysis and benchmark
- Data and event logging
- Data aggregation in plants and virtual plants
- All data exported in format compatible with Excel or other spread sheets
- Alarms management
- Database replication up to 100 VMU-C PV

### Solar monitoring solution



**Eos-Array / Eos-Array Lite**

- Modular local monitoring system for PV plant
- Up to 16 DIN module configuration
- Eos-ArraySoft, freeware configuration software
- Eos-Array can manage in addition to VMU-M unit up to: 1 VMU-P, up to 15 VMU-S and up to 7 VMU-O for a total of maximum 15 units

#### MAIN FEATURES

- The Eos-Array solution can be composed of: VMU-M, the master unit and data logger; VMU-S, the string controller; VMU-P, the environment variable unit and VMU-O, the I/O unit
- Eos-Array Lite is the answer to those photovoltaic applications where a less sophisticated monitoring solution is needed

### USB dongle connection modules



**VMU-D**

- Dimensions: 2 DIN modules
- Compatible with Carlo Gavazzi approved 3G/4G USB modems
- Power supply 24 VDC (+/- 20%)
- Suitable for use with VMU-C and VMU-Y

#### MAIN FEATURES

- 3G or 4G Mobile Internet connectivity
- SMS alerting
- SMS commands

# PV monitoring

## Surge arresters



**DSB / DSF**

- Dimensions: 90 x 36 x 72 mm
- Class II
- Available for PV and AC installations
- Models for communication lines
- Optional remote monitoring
- For DIN rail mounting

### MAIN FEATURES

- NO backup fuse required
- Appr. Acc. to IEC61643-11 and UTE C61-740-51
- Complies with prEN50539-11

## Surge arresters



**DSC**

- Dimensions: 90 x 72 x 70 mm
- Class I and II
- Protective element: High Energy MOV
- High surge discharge rating:  $I_{imp} = 12.5$  kA per pole
- Housing: compact design

### MAIN FEATURES

- Specifically designed for PV installations with or without LPS (Lightning Protection System)
- Location of use: photovoltaic system - PV module side

## Surge arresters



**DSB51XXDP**

- Dimensions: 90 x 12 x 71.5 mm DIN-rail housing
- 15 VDC nominal voltage
- 10 kA  $I_{nom}$ , 20 kA  $I_{max}$
- Rated spark overvoltage 184V to 276V
- C1/C2/C3 according to IEC 61643-21

### MAIN FEATURES

- Designed for Dupline® communication lines
- Three stage topology with dual GDT
- Socket with replaceable cartridge

## Switching power supply



**SPM3**

- DIN rail housing
- Universal input 90-264 VAC / 120-370 VDC
- Single phase and battery charger versions available
- Approvals/Marks: UL, cUL listed and TÜV/CE approved

### MAIN FEATURES

- Operating temperature w/o derating -25°C to +60°C
- Short circuit and Overload protection
- High efficiency (up to 89%)

## DIN rail DC/DC converter



**DCC 24151K-D**

- DIN rail mounting
- Ultra wide input: 100 ~ 1000 VDC
- 24VDC output 15W
- High efficiency up to 80%
- Wide temperature range -40 to +70° C
- Output over voltage and short circuit protection
- Reverse input protection

### MAIN FEATURES

- Widely used in Photovoltaic power generation with high voltage inverters
- It provides stable operating voltage to low voltage DC equipment

## 3-phase energy analysers



**EM24 DIN**

- Dimensions: 4 DIN modules
- 3-phase energy analyser with direct connection
- Current input for direct connection up to 65A or external CT connection
- Class 1 (kWh) acc. to EN62053-1
- Pulse open collector output
- Modbus communication port

### MAIN FEATURES

- Direct or external CT measurement in a very compact housing to save space
- Suitable for measuring generated and consumed energy
- MID Annex D certification available

# PV monitoring

## Irradiation sensors

## Pyranometers



**PVS-1**

- Dimensions: 57 x 48 x 15 mm (not including clamp)
- Sensor type: crystalline silicon cell
- No need for external power supply (self-powered)
- Long lasting 3% accuracy, thanks to a special antiageing treatment
- Calibration process according to IEC 60904-2 and 60904-4
- Two available versions: 4-20 mA output / 0-80 mV output

### MAIN FEATURES

- Long life rugged aluminium case
- UV resistant resin encapsulation
- Fast installation, thanks to the clamping system designed to easily fit the photovoltaic module's frame



**PVS-2A**

- Dimensions: 162 x 215 x 40 mm (not including clamp)
- 2nd class thermopile pyranometer
- 4-20 mA output for reliable connections
- Calibration certificate according to ISO 9847

### MAIN FEATURES

- Compact and rugged IP67 aluminium case
- Compliant with WMO (World Meteorological Organization) for environmental monitoring
- Compliant with ISO9060 and IEC17025 for photovoltaic monitoring

## Temperature sensors

## Anemometers



**TEMP SOL / IKE20001K**

- Temperature Pt100 or Pt1000 (TEMP SOL)
- Temperature Pt1000 (IKE20001K)
- $\pm 0.3^{\circ}\text{C}$  connection type
- 2 wire connection type

### MAIN FEATURES

- Specifically design to measure the temperature of PV panels (TEMP SOL)
- For air temperature measurement in PV plants (IKE20001k)



**DWS-V**

- Opto-electronic detection
- Rotor diameter: 145 mm
- Rotor: black painted stainless steel
- PNP & NPN open collector output in one unit
- Measuring range 2 to 30 m/s
- Current source output 10 to 28 VDC supply

### MAIN FEATURES

- All inputs and outputs are protected against reverse polarity and transients
- Dust sealed stainless steel ball bearing

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