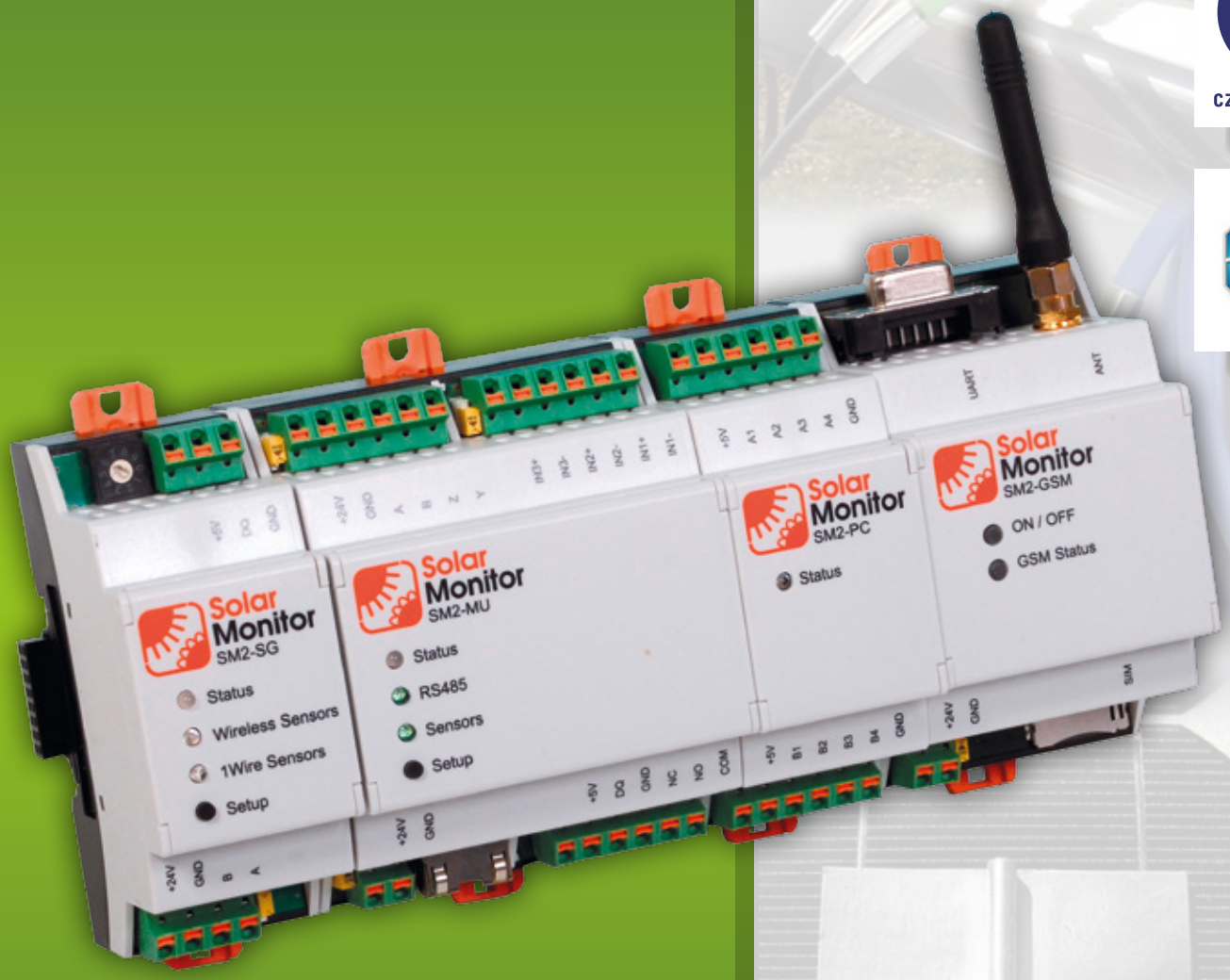
Monitoring 2

CZECH PRODUCT



Solar Monitor s.r.o.
Žižkova 562, 51101 Turnov
www.solarmonitor.cz
tel. : +420 481 313 661
email: info@solarmonitor.cz

Solar Monitor

Supported Devices

ABB · AEG Power Solutions · Carlo Gavazzi · Conext · Danfoss · Delta · Diehl

Fronius · Iridon · Kaco new energy · KMB Systems · Kostal · Mastervolt · Morningstar Corporation

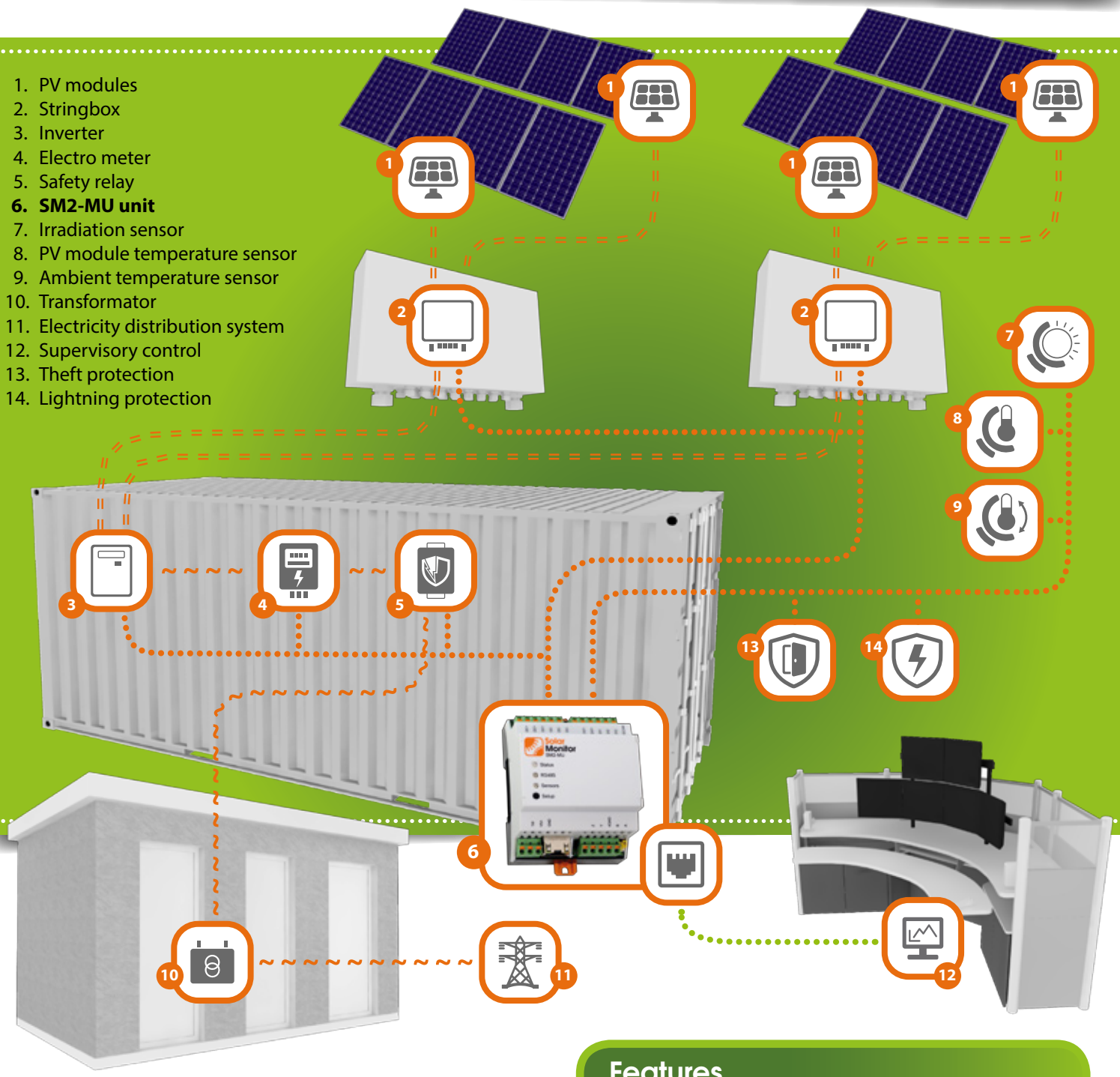
Omnik New Energy · Omron · Pairan · Phoenix Contact · Power Electronics · Power-One · Power-Trap®

Riello UPS · Refu Sol · Elettronica Santerno · Satcon · Schneider Electric · Siemens · Siliken

SMA · SolarEdge · SolarMax · Solutronic Energy · Steca Elektronik · Studer · Sungrow

Sunville · Sunways Photovoltaic Technology · Vagon · WATTrouter · Xantrex · Yorix · ZPA Smart Energy

1. PV modules
2. Stringbox
3. Inverter
4. Electro meter
5. Safety relay
6. **SM2-MU unit**
7. Irradiation sensor
8. PV module temperature sensor
9. Ambient temperature sensor
10. Transformator
11. Electricity distribution system
12. Supervisory control
13. Theft protection
14. Lightning protection



Monitoring for

- Inverters
- String Boxes
- Electricity Meters (AC, DC)
- Sensors (Irradiation, Temperature, Wind)
- Safety Relays
- Door Contact (Theft Protection)
- Overvoltage (Lightning Protection)

Features

- Convenient control of PVP over the Internet
- Support of all major inverter brands
- Monitoring for 1 to 100 inverters (devices)
- Warning outages and failures by email or SMS
- Continuous control of all monitored devices
- Overview of measured values
- Values from sensors, expected performance, audits
- Protection against theft of PVP, lightning
- Extendable by function modules
- Sending data to the web portal
- Active and reactive power control

PV Plant Monitoring

A full-featured system for PVP monitoring can be connected to the inverters, electrometer, sensors and other output devices! Its functionality can also be extended with expansion modules.

Solar Monitoring system is the ideal choice for domestic rooftop installations, medium sized PV plants and solar parks.

One solution for all inverter brands & one web portal for all your plants

1. PV modules
2. Inverter
3. Electro meter
4. **SM2-MU unit**
5. Irradiation sensor
6. PV module temperature sensor
7. Ambient temperature sensor
8. Boiler
9. Storage heater
10. Electricity distribution system

LAN / Internet

Web Portal

Features

- Convenient control of PVP over the Internet
- Support for all major inverter brands
- Monitoring for 1 to 100 inverters (devices)
- Outage and failure warning by email or SMS
- Continuous control of inverters, electrometers, stringboxes, ...
- Overview of measured values
- Values from sensors, expected performance, audits
- Theft protection of PVP, lightning arrester
- Switching outputs according to current power
- Extendable by function modules
- Sending data to the web portal portal.solarmonitor.cz

Extension Modules

AD Extends the number of inputs and outputs.

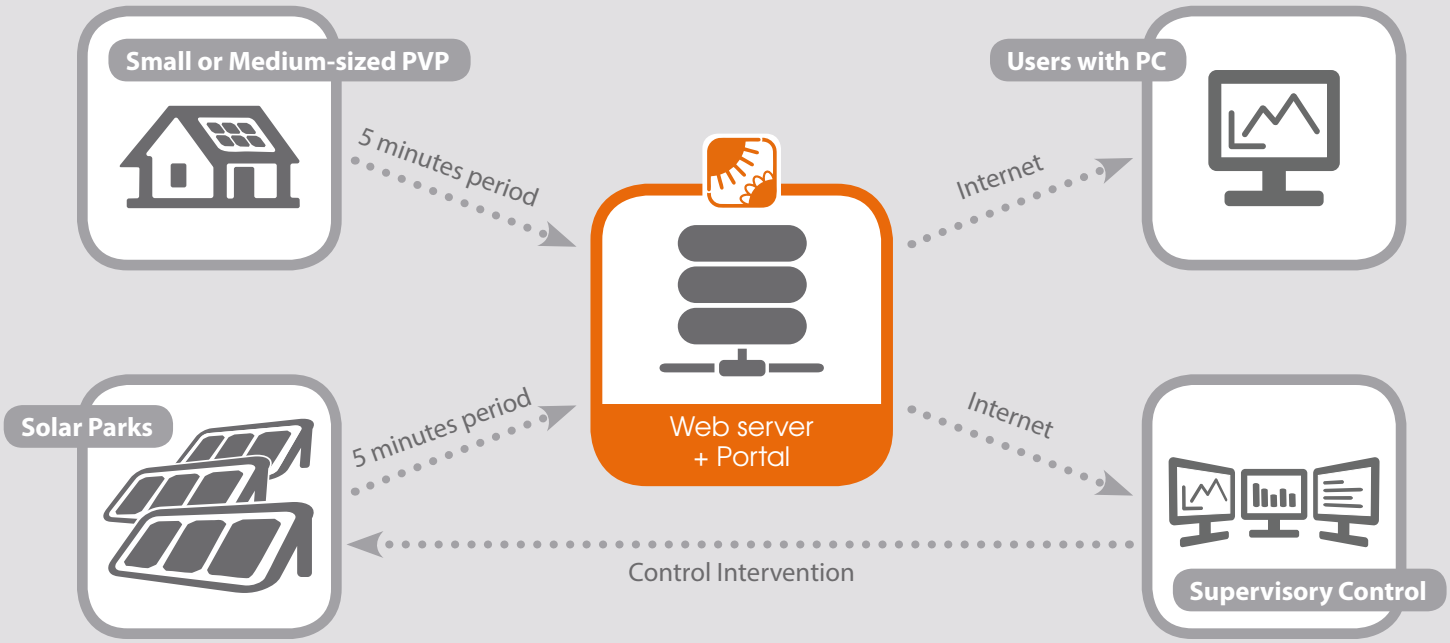
PC Module for Power Management.

DI Increases the number of digital inputs.

GSM Provides sending data and alarms via SMS.

Solar Monitor web portal offers functions for detailed analysis of your PV plant operation. It enables monitoring your PV plant without the IP address, presenting detailed characteristics, long term inverter and stringbox diagnostics, auditing, archiving records and invoicing.

It also represents an ideal tool for monitoring and managing multiple PV plants with different inverter brands.
In that case we offer your own portal version with your PV plants only and custom tailored interface.



Solar Monitor Portal is compatible with:

SMA — Sunny WebBox

SolarMax — Max Web

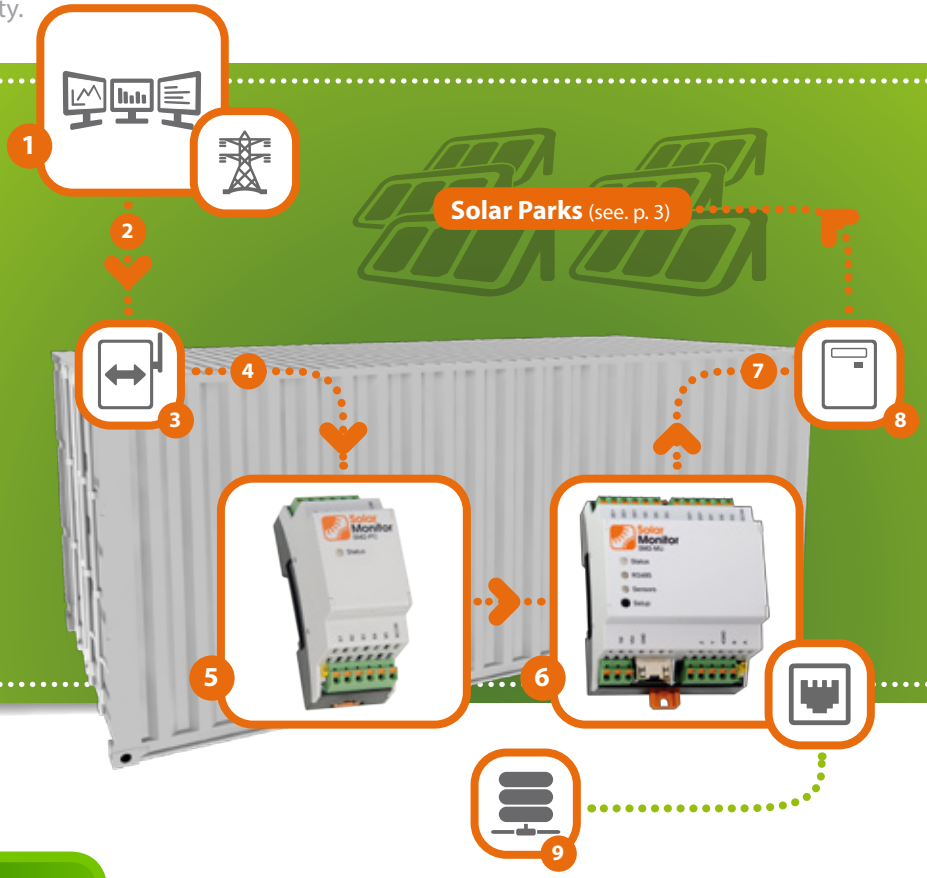
Portal enables following value monitoring:

- power, both production and consumption
- characteristics of a particular inverter (U_{PV}, I_{PV}, U_{AC}, I_{AC}, P_{AC}, f, T_{KK})
- reading values from stringboxes
- sensors of these physical quantities: irradiation, temperature, wind speed and direction
- power audit option comparing with PVGIS or ČHMÚ
- average monthly irradiation calculation that banks require
- option of denying access to PV plant for particular users only
- data can be exported into CSV format (MS Excel, Open Office)

Distribution system operators can use multiple remote control to regulate PV plant production in order to prevent irregularities in distribution system and ensure its stability.

Solution to regulate PV plant production

1. Grid operator
2. Power regulation command
3. RTU unit
4. Command to the SM2-PC module
5. **SM2-PC module**
6. **SM2-MU unit**
7. Command to inverter
8. Inverter
9. Web Portal



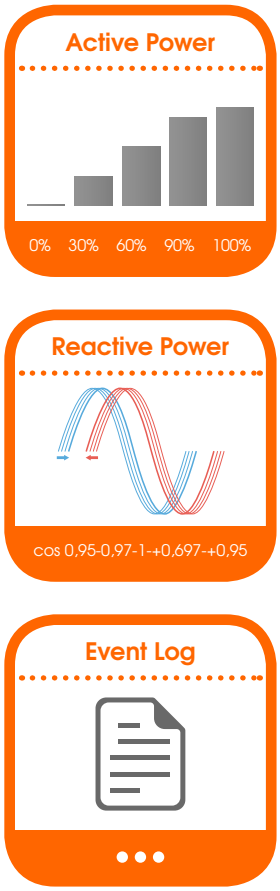
Major Advantages

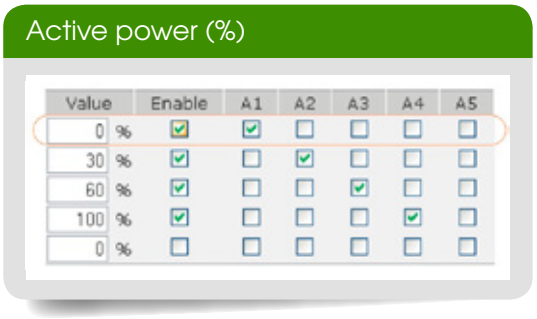
- Cost effective sollution
- Active and reactive power control
- Direct inverter management
- Event log
- Overview on web portal

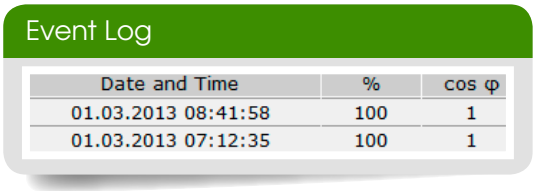
A command to regulate the power production is sent to a PV plant, where it is processed by the remote control receiver (alternatively by a RTU unit).

From this point on a Solar Monitor unit (with a Power Control module) controls everything.

The module is connected to the above mentioned remote control receiver, which provides values relevant for regulation of active and reactive power production. Setting up is possible in Solar Monitor's web.





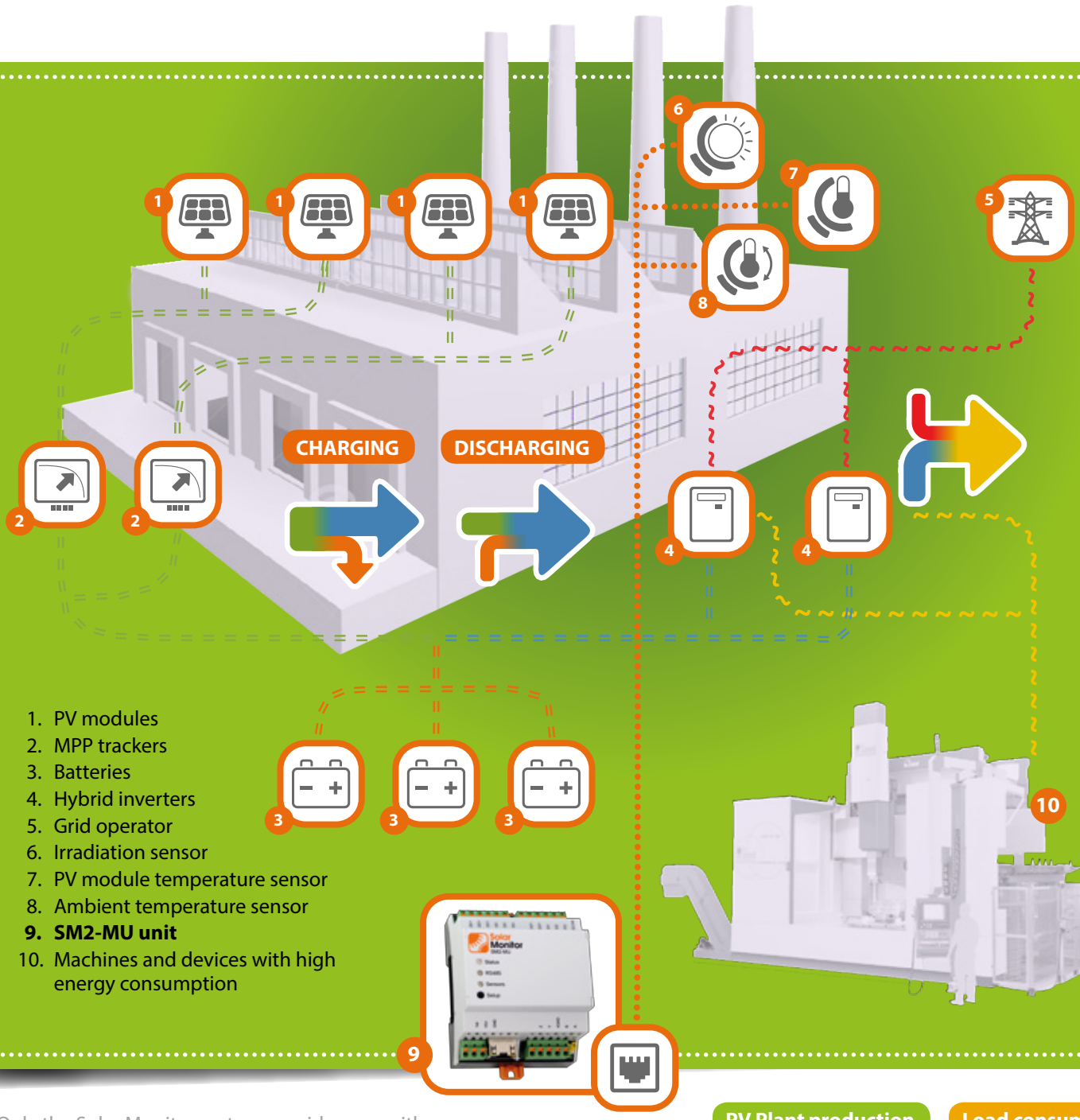


Solar Monitor Mobile Application provides you all the necessary data from your PV plant into the mobile device in your hand. You can find your PVP in the list, log in, and next time the application will provide you data just from your plant. This will give you an overview of production anytime and anywhere. All you need is WiFi or mobile internet connection.

Major Advantages

- comfortable remote PV plant monitoring via smartphone or tablet
- watching current energy production
- monitoring data from sensors and other connected devices
- informing about alarms of the inverter, batteries, trackers, etc.
- diagnosis with all the available values from the device
- production data in numbers and arranged graphs

Hybrid PV Plant (with batteries)



1. PV modules
2. MPP trackers
3. Batteries
4. Hybrid inverters
5. Grid operator
6. Irradiation sensor
7. PV module temperature sensor
8. Ambient temperature sensor
9. **SM2-MU unit**
10. Machines and devices with high energy consumption

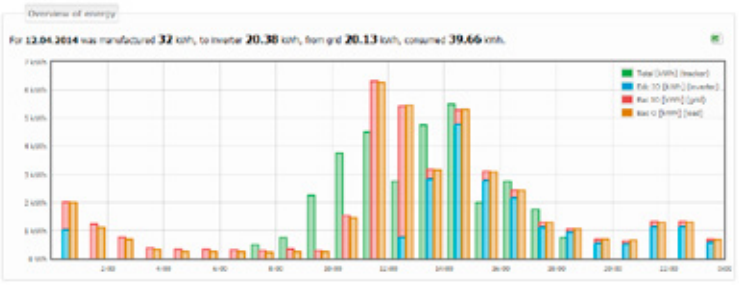
Only the Solar Monitor system provides you with clear overview of how your hybrid PV Plant works and whether it is properly designed.

PV Plant production **Load consumption**

PV Plant production + Batteries **Energy bought from the grid**

Major Advantages

- energy storage for later use
- use of the stored energy at the peak performance without expensive breakers
- use of the stored energy as a backup source of electricity
- preventing the destruction of the battery
- displays all measurements on Android OS devices



Charging Electric Vehicle from the PV Plant

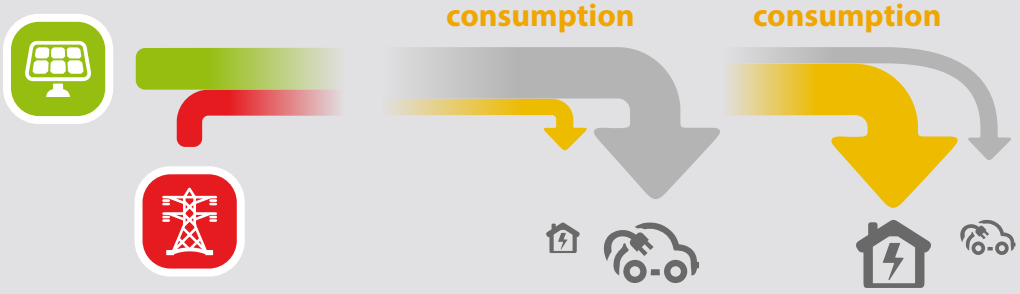
1. Split core transformer
2. Consumption measurement
3. **SM2-MU unit**
4. **SM2-AD module**
5. Charger

Our solution offers

- optimization of the electric vehicle power consumption by surplus electric energy from the PV modules
- balancing when a decrease in generated energy occurs
- reducing power production in case of energy surplus (excess reduction)

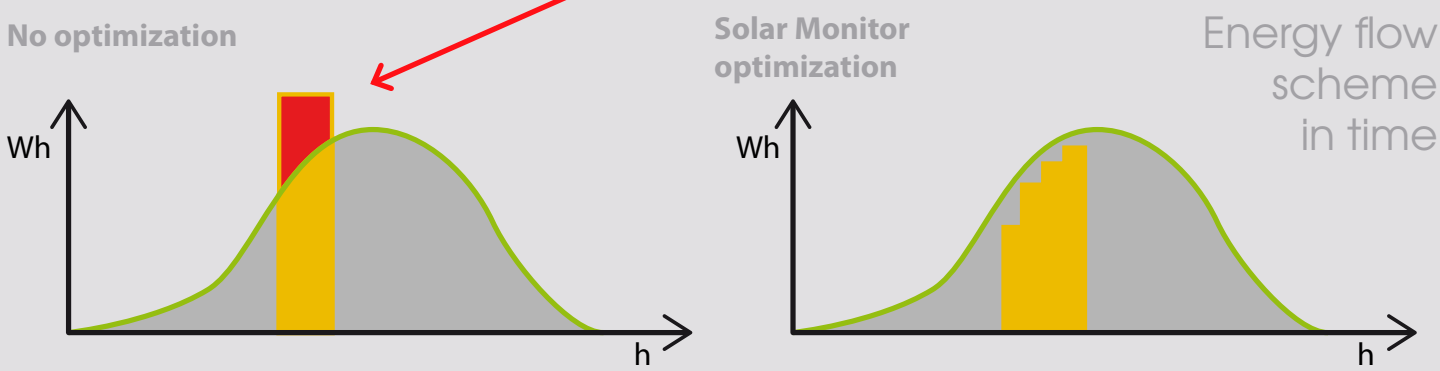
Would you like to charge an electric vehicle without paying for electricity? Do you have a PV Plant and a variable power consumption (e.g. a house where you turn on a kettle, a washing machine and other appliances)? Our solution is suitable for home offices, family houses, but also companies which want to charge electric vehicles during the day.

Energy flow scheme based on usage



PV Plant production | Household consumption | Energy bought from the grid | Energy left for charging

Energy flow scheme in time



Online Meter Reading

1. Electricity meter
2. Water meter
3. Gas meter
4. **SM2-RM-GSM module**
5. Web Portal

Solution suitable for remote reading of electrometers, water meters, gas meters and connecting other devices, where we need to read pulses or binary status. The Solar Monitor modules together with the web portal make remote measurement and monitoring very easy and comprehensible.

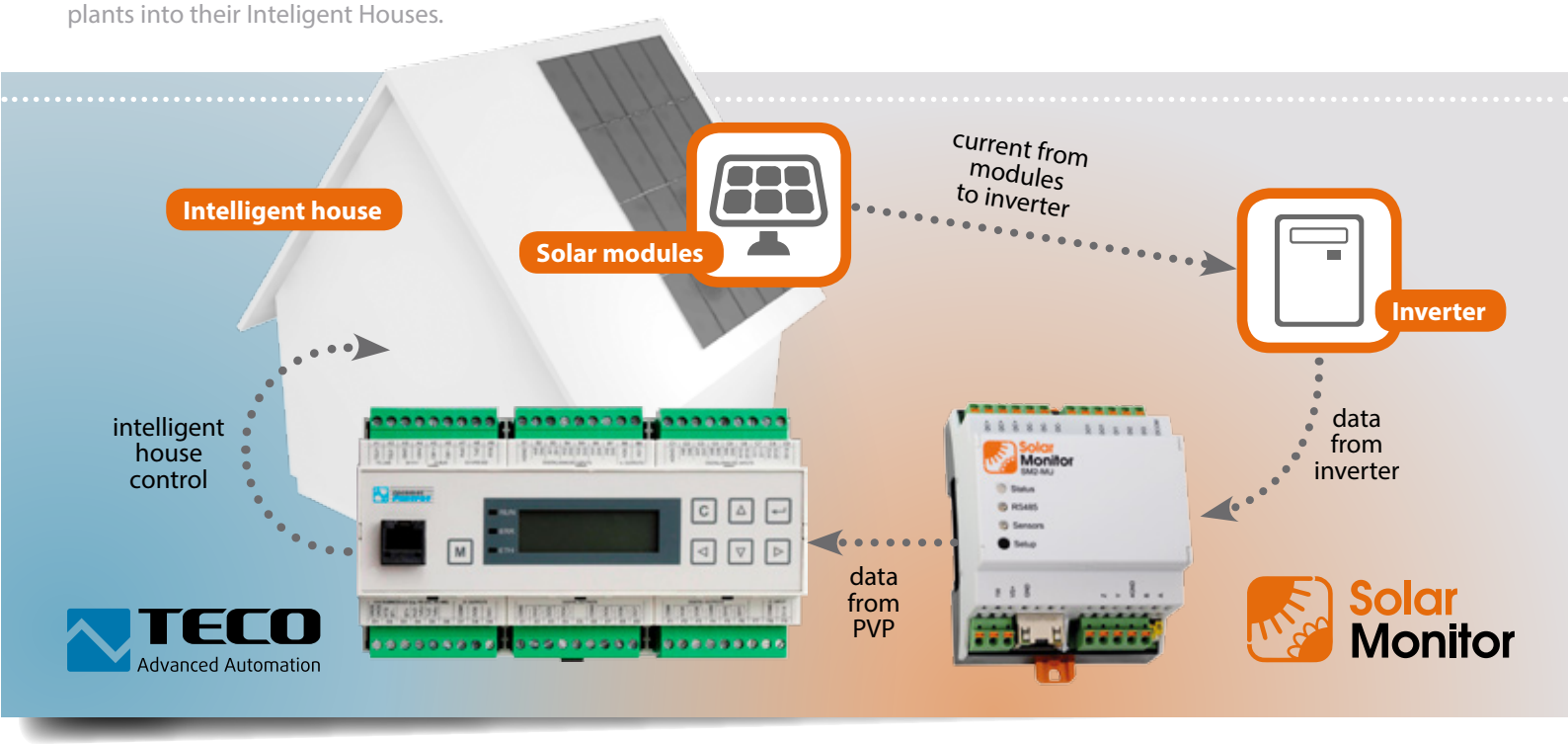
Data from remote measurement of devices with S0 output such as::

- electricity meters
- water meters
- gas meters
- calorimeters
- other devices with S0 output

Intelligent Houses & LCD Visualization

Solar Monitor cooperates with several information systems which allows to process data from PV plants. These are e.g. Dispatcher Control Systems but mainly Home Automation Systems that can thus integrate any photovoltaic inverter from established manufacturers into smart house installation.

In November 2013 TECO company launched library SolarMonitorLib, that significantly increases Foxtrot PLC's ability to integrate PV plants into their Inteligent Houses.



It is Solar Monitor's contribution to the smart house technology and yet another element for building and automation of hybrid, i.e. semi offgrid or autonomous, i.e. offgrid family house energetics.

LCD Visualization

Visualisation of the PV plant on LCD panel is very popular solution of presenting technologies to schools, offices or municipal authorities. Layout is designed according to customers requirements.

We deliver to you

LCD screen of required dimensions

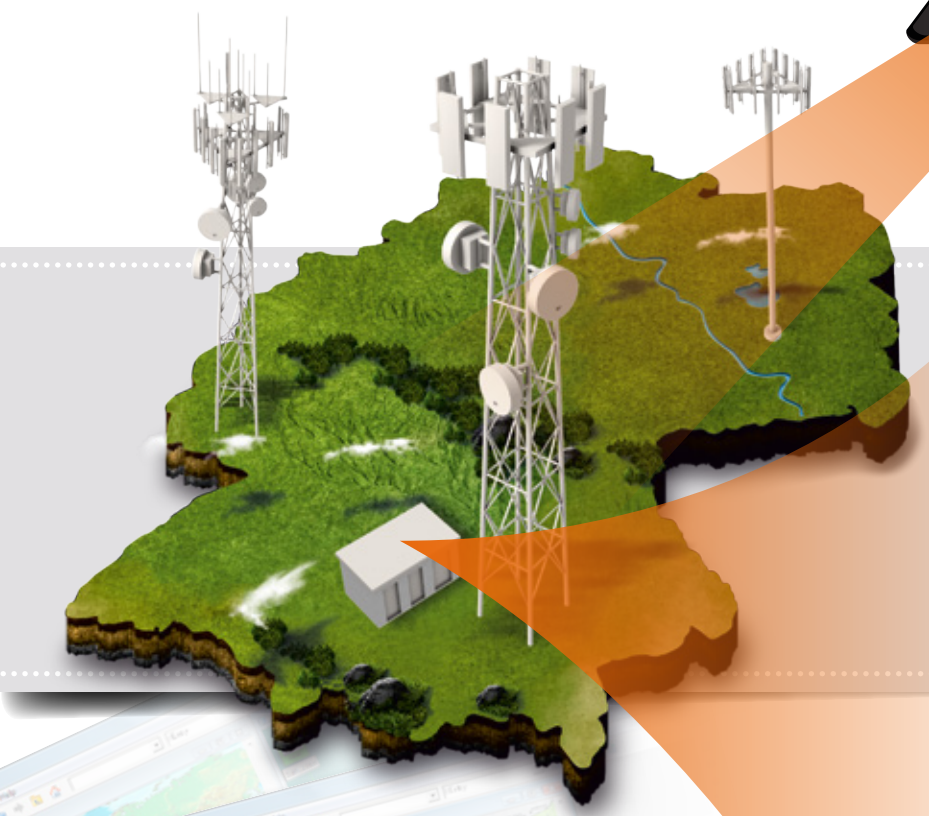
Datalogger

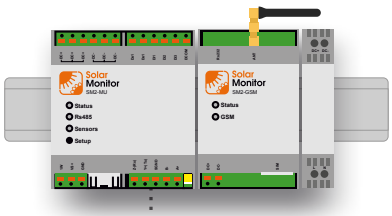
SNMP Gateway

Network Management System Control

- Power Supply under Supervision - Telecomm networks
- Eliminate Downtime
- No Staff Training
- No Additional Costs
- IT Systems Integration (NMS) - Nagios, Tivoli, Openview
- SNMP v1, v2, v2c, v3
- Security with Encryption (DES, AES)
- Downloadable MIB File

CZECH PRODUCT

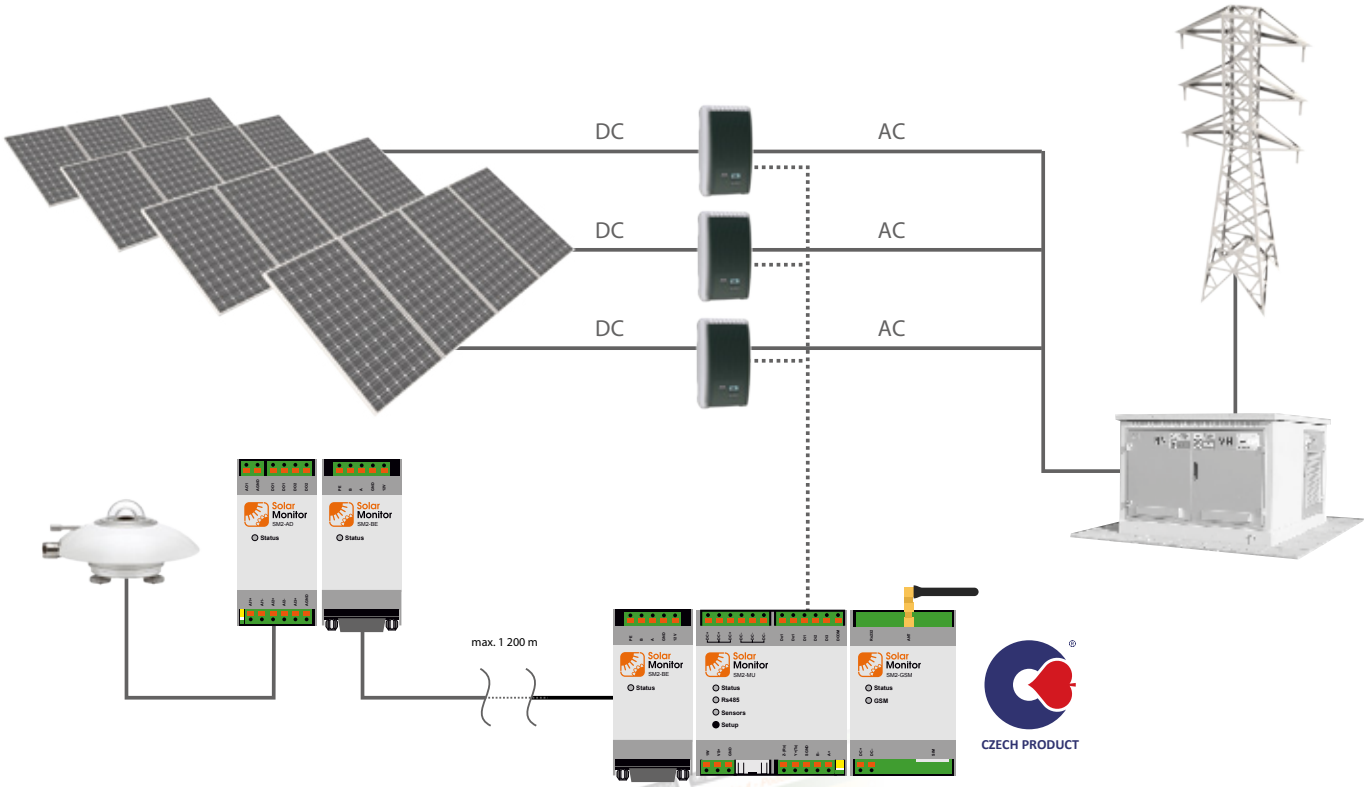




Monitoring and Power Management

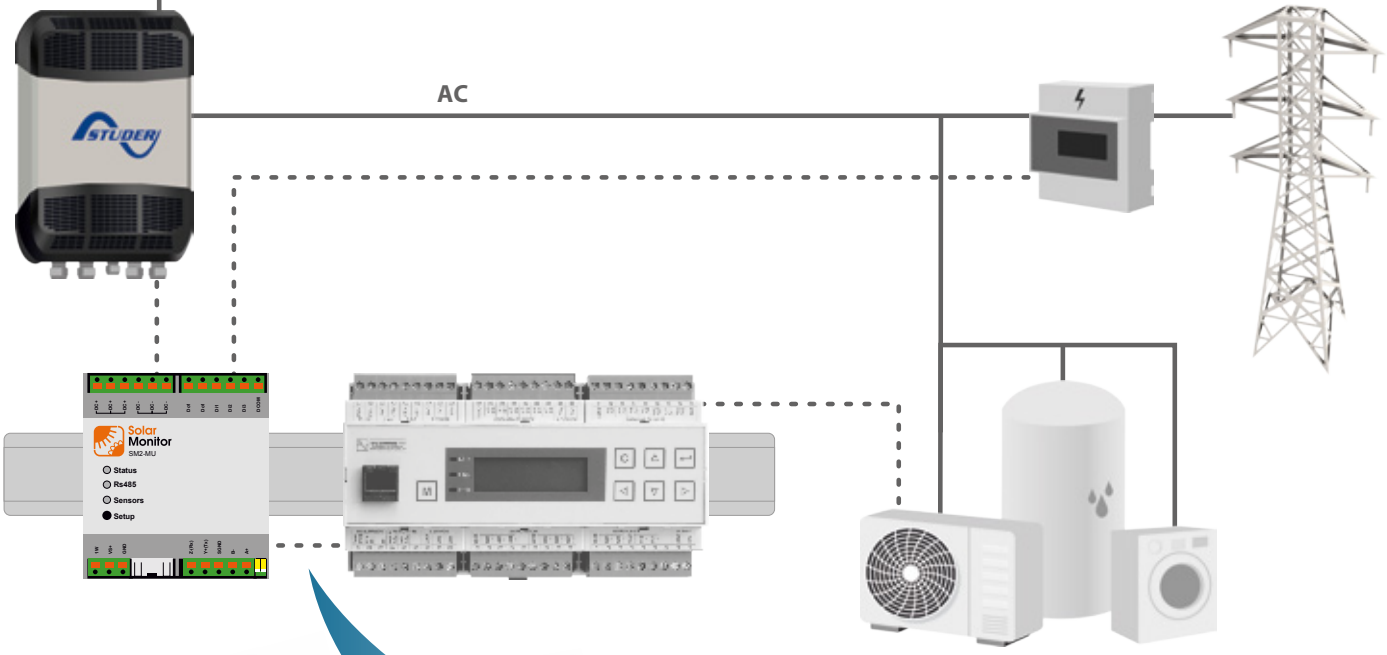
- Modular System - fits into your application
- DIN Rail
- HBUS Backplane System - no wiring
- Extension Modules - analog, digital, power control, RF
- Communication Choice
- Unit Aggregation
- Cloud Solution

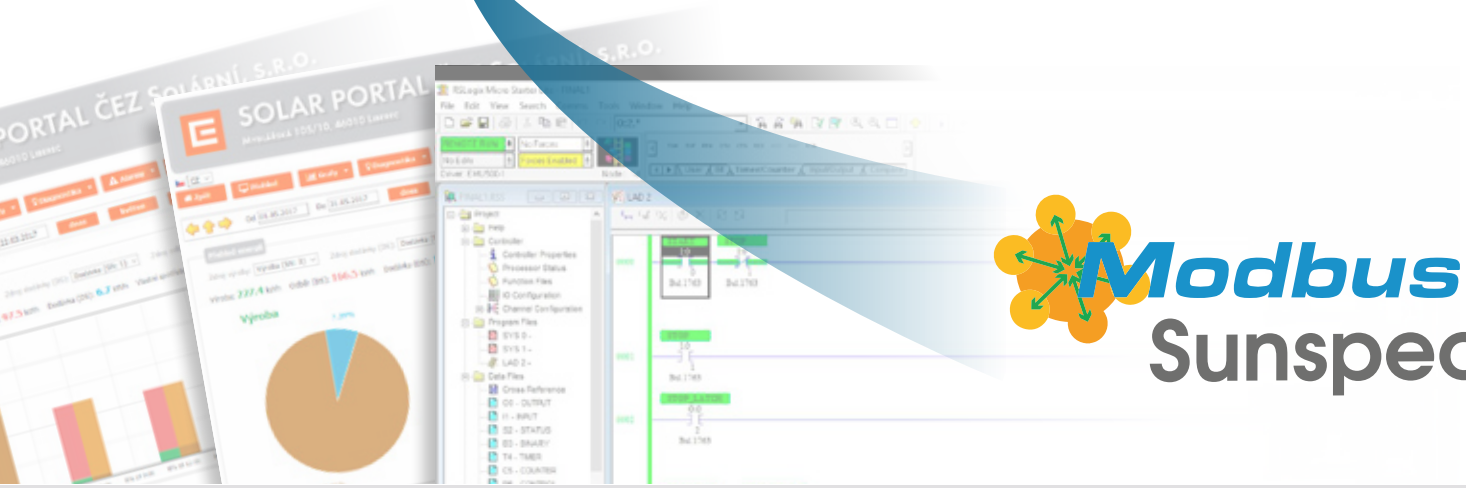
Modular System



Smart House
and Building Automation

- PLC Integration
- Fast Implementation
- Unified Interface
- Zero Effort Inverter Replacement
- Sunspec Modbus Standard
- IEC 61131-3 Library
- Read / Write Access

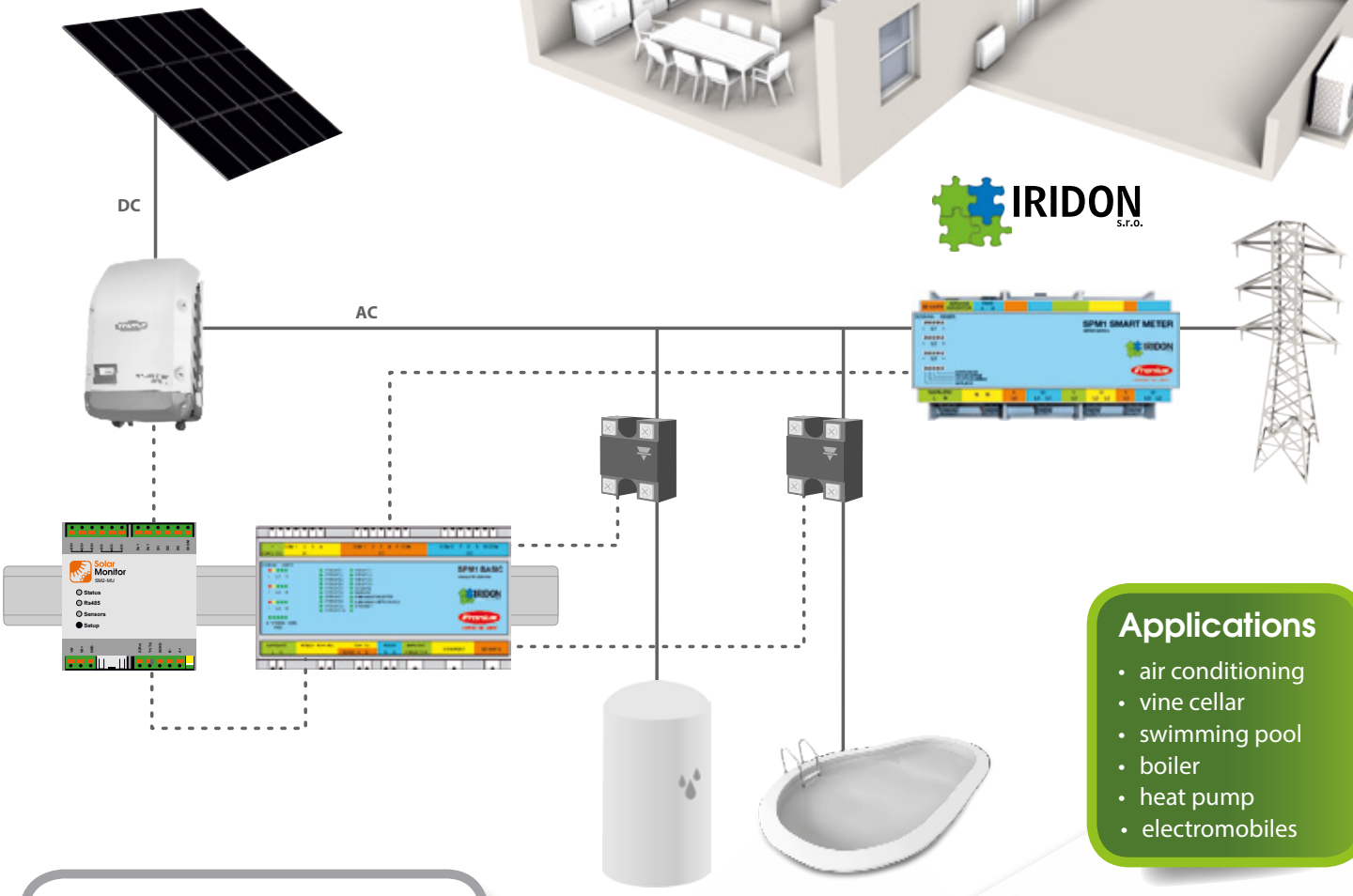




Modbus Sunspec

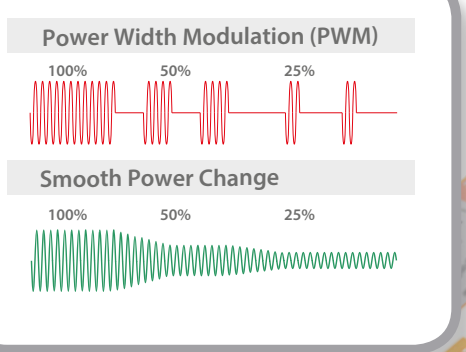
Load Optimisation

- Fast Reaction Time - 40 ms
- No Flickers
- Inverter Power Control
- Intuitive Graphs



Applications

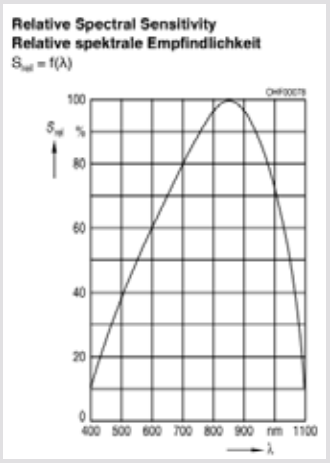
- air conditioning
- vine cellar
- swimming pool
- boiler
- heat pump
- electromobiles



Sensors

By connecting sensors to the Solar Monitor unit you get other important values. You can perform energy audits, calculate the potential power and compare it with the real one. It may also serve to trigger other processes, alarms, etc.

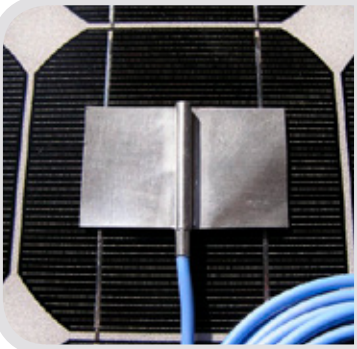
Irradiance Sensor



Irradiation sensor is designed to measure the solar radiation intensity of PV panels by its silicon photodiode. Two connectors provide a secure extension of the bus (1x for the connection to the Solar Monitor unit and 1x for the connection of the PV panel temperature sensor).

Designed to fit on module supporting structure.

Weather resistant.



Module Temperature Sensor

Measures PV panel temperature. Provides data for comparison with ambient temperature and the information about decrease in panel's efficiency.

Designed for mounting on the back of the PV panel.

Weather resistant.

Ambient Temperature Sensor

Suitable for measuring of outdoor temperature on the photovoltaic plant. Provides values for comparison with the temperature of the photovoltaic panel and the information about decrease in panel's efficiency.

Designed for outdoor installation.

Weather resistant.

Wind Speed Sensor (Anemometer)

Device used for measuring wind speed. The anemometer consists of a duraluminium body and stainless-steel shaft. The top end of the shaft contains a brass hexagon connected with a pressed plastic Robinson cross.

Designed for mounting into a tube.

Weather resistant.

SM2-MU Basic PV Plants Monitoring

- monitoring for 1 inverter
- reading pulses from electrometer
- remote PV Plant monitoring via Internet
- sending data to the web portal

P/N 100400

SM2-MU Start PV Plants Monitoring

- monitoring for 1 inverter
- reading pulses from electrometer
- remote PV Plant monitoring via Internet
- load balancing due to generated power
- monitoring sensors data, audit, diagnostics
- monitoring input status
- sending data to the web portal

P/N 100410

SM2-MU 60 PV Plants Monitoring

- monitoring for up to 6 inverters
- reading pulses from electrometer
- remote PV Plant monitoring via Internet
- load balancing due to generated power
- monitoring sensors data, audit, diagnostics
- monitoring input status
- sending data to the web portal

P/N 100420

SM2-MU 300 PV Plants Monitoring

- monitoring for up to 30 inverters
- reading pulses from electrometer
- remote PV Plant monitoring via Internet
- load balancing due to generated power
- monitoring sensors data, audit, diagnostics
- monitoring input status
- sending data to the web portal

P/N 100430

SM2-MU 1000 PV Plants Monitoring

- monitoring for up to 100 inverters
- reading pulses from electrometer
- remote PV Plant monitoring via Internet
- load balancing due to generated power
- monitoring sensors data, audit, diagnostics
- monitoring input status
- sending data to the web portal

P/N 100440

SM2-GSM

GSM Module for the SM2-MU

- sending data and alarms via SMS
- might be used for data transfers (GPRS)
- HBUS connection to the SM2-MU

P/N 100510

SM2-PC

Power Control Module for the SM2-MU

- active and reactive power management
- configurable inputs for cos φ regulation
- inputs for 0 – 30 – 60 – 100% levels
- HBUS connection to the SM2-MU

P/N 100530

SM2-AD

I/O Module for the SM2-MU

- extends the number of industrial sensors
- measures current and voltage of connected devices
- analog output controlled by the PV plant power
- load balancing due to generated power
- 3 analog inputs
- 1 analog and 2 digital outputs (relay)
- HBUS connection to the SM2-MU

P/N 100540

SM2-DI

Digital Inputs Module for the SM2-MU

- extends the number of connectable devices
- monitoring of inputs status (connected / disconnected)
- 2 x 5 digital inputs
- HBUS connection to the SM2-MU

P/N 100550

Sensors Set

Sensors for the SM2-MU

- Solar radiation sensor
- Module temperature sensor
- Ambient temperature sensor
- 1wire connection to the SM2-MU

P/N 101561

SM2-RM

Remote Measurement Module - Ethernet connection

- simple monitoring
- remote measuring via ethernet
- electrometers, gasmeters, hydrometers, etc.
- connecting up to 3 meters together
- reading pulses from devices over S0 output
- monitoring the status of inputs
- sending data to the web portal

M2M

P/N 100560

SM2-RM-GSM

Remote Measurement Module - GPRS connection

- simple monitoring
- remote measuring via GPRS
- electrometers, gasmeters, hydrometers, etc.
- connecting up to 3 meters together
- reading pulses from devices over S0 output
- monitoring the status of inputs
- sending data to the web portal

M2M

P/N 100570

Power Supply 12V/1,25A Meanwell

Power Supply for the SM2-MU

- 1 phase, DIN rail mounting, slim design

P/N 101741

Power Adapter 12V/0,5A

Power Supply for the SM2-MU

- 1 phase, into the socket

P/N 601080

Anemometer

Wind Speed Sensor

- device used for measuring wind speed

P/N 100001

Monitoring of your Home PV Power Plant at a Great Price

Solar Monitor

Solar Monitor s.r.o.
Žižkova 562, 51101 Turnov
www.solarmonitor.cz
tel. : +420 481 313 661
email: info@solarmonitor.cz

website
www.solarmonitor.cz
eshop
shop.solarmonitor.cz
web portal
portal.solarmonitor.cz
wikipedia
wiki.solarmonitor.cz