Simple and secure monitoring

SMA Solar Monitoring Systems

MONITORING, INFORMING, PRESENTING

Easily securing yield for small, large and very large solar power systems

Sunday afternoon at the garden fence. The sun is shining. Your neighbor nods in the direction of your solar power system: „And, what's it earning now?" One glance at your Sunny Beam is enough. The results leave your neighbor whistling in appreciation. It's a good feeling: Your solar power system is doing what it should – feeding solar power into the public grid and securing you valuable yields. And best of all, you (practically) don't have to take care of anything yourself, thanks to the intelligent monitoring solutions from SMA.

Everything under control

Even for small solar power systems, comprehensive control is important for the yield. The decision to have a solar power system means you are choosing not only an environmentally friendly technology, but also a long-term source of revenue. This means it is essential that the system is running smoothly at all times. If output reductions in your system go unnoticed for a long period, for example, due to shadowing of the solar modules or disturbances in the power distribution grid, this may result in serious losses in yield. Continuous system monitoring therefore not only means seeing your self-produced solar power, but also being able to react quickly should anything go wrong.

Reliable and simple – anywhere in the world

Modern monitoring is much more than just control. Thanks to the Internet, it keeps you clearly informed about the faultless operation of the system – for example via e-mail, anywhere in the world. Furthermore, it presents the system data simply, understandably and professionally; this allows you as system operator to always have an eye on system yield. For larger systems, it allows you to effectively publicize your ecological commitment. System monitoring comes in numerous forms; wireless or cable, compact or complex, brief or detailed. Here, it makes no difference whether you wish to monitor the yield of a home rooftop system, or of an open-field solar power plant of several megawatts.

In this brochure you will find everything you need to know about system monitoring from SMA and which solution is best suited for your individual solar power system. If you have any additional questions, your local solar power professional will be happy to assist you.

SIMPLY SECURE: FROM KILOWATT TO MEGAWATT

Efficient solar inverters and comfortable monitoring solutions from SMA

The worldwide use of photovoltaics is becoming more and more profitable. As the global leader in solar power inverters, SMA plays a large part in this through the development of new technologies, a tremendous speed of innovation and a product spectrum unique in its depth. Our team of more than 600 engineers develops ultra-modern solar inverters – the heart of every PV plant – and user-friendly products for system monitoring.

The right monitoring solution for every solar power system

SMA designs, produces and sells not only highly efficient solar inverters, but also easy to use monitoring systems. Whether a home rooftop system, a larger solar power system on a commercial building or complete solar power plants, SMA has the right monitoring solution for every need because your monitoring needs are as individual as your system. In a flash you can see your private and environmentally friendly solar energy production at all times.

Top quality from a single source

SMA offers a perfectly coordinated system. In doing so, we draw upon years of experience in the development and production of monitoring solutions. Both the solar inverters and system monitoring from SMA are designed for a lifespan of at least 20 years. To meet these strict requirements, we manufacture all devices to an industrial quality and equip them with high-quality components. We also subject our products to extensive quality tests – from a drop test to the simulation of extreme external weather conditions. Our experts on our service line dedicated to monitoring products will gladly assist you if you have urgent questions.

SMA. For the good feeling that your solar power system is always delivering the yield that it should. Without a doubt.


SUNNY SENSORBOX
SUNNY MATRIX
SMA
SUNNY WEBBOX

PRIVATE HOME ROOFTOP SYSTEM

COMMERCIAL SOLAR POWER SYSTEM

SOLAR POWER PLANT

THREEFOLD SIMPLE AND SECURE

The right monitoring solutions for every solar power system

The possible combinations for SMA system monitoring are as different and multifaceted as solar power systems themselves. To make it simple for you, we have summarized our monitoring solutions into three usage scenarios. Here you can see at a glance how your environmentally friendly "profit machine" can be protected from yield losses.

Comfortable monitoring for private home rooftop systems

Do you own a solar power system, for example, on your home? Then relax. With our user-friendly and compact products you always, and easily, have an eye on your yields.

Modular system monitoring for commercial solar power systems

As the operator of larger solar power systems you can individually assemble the right monitoring solution from various components. In combination with solar inverters from SMA, you profit from a perfectly coordinated system.

Reliable monitoring for solar power plants

The larger the solar power system, the faster small reductions in power negatively affect yield – if they remain undiscovered. With our solutions especially developed for solar parks, you can comprehensively and reliably monitor and control systems, even in the megawatt range.

FULL-TIME MINDER

Comfortable monitoring for private home rooftop systems

Our innovative monitoring solutions keep an eye on your solar power system around the clock since those who choose to invest in a solar power system want to know how fast their investment is paying off. Thus, they have that good feeling that everything is working. SMA monitoring is easy to set up and is especially user-friendly. Whether wirelessly with the Sunny Beam via *Bluetooth®*, the Sunny WebBox via *Bluetooth®* or on the PC via Sunny Explorer: you always have an eye on your system and more time for the other important things in life.

SUNNY EXPLORER
The software solution for the PC

Secure, user-friendly, fast: Sunny Explorer is the basic solution for a comfortable overview of your system. All you need is a PC with a *Bluetooth* interface and you can immediately receive the yield overview at a glance, wirelessly. Sunny Explorer is available for download free of charge at www.SMA.de.

SUNNY BEAM with *Bluetooth*®
The all-in-one service package for at home

Simple, fascinating, wireless: The Sunny Beam is the compact solution for small solar power systems: it automatically monitors your system around the clock, it is very easy to operate and informs you at a glance about your yields and events. The fact that it has received prizes for its design makes it even more attractive.

SUNNY WEBBOX with *Bluetooth*®
Remote monitoring and remote maintenance of small solar power systems

Easy, secure, fast: The Sunny WebBox with *Bluetooth*® enables monitoring of the system, wirelessly, from anywhere in the world. In combination with Sunny Portal, it is the most professional solution for consistent yield monitoring. In addition, thanks to the Sunny WebBox Assistant, as well as *Bluetooth*® communication, the Sunny WebBox is set up in a flash.

SUNNY PORTAL
Professional monitoring, management and presentation of solar power systems

Informative, user-friendly, individual: Manage solar systems of any size, simply and centrally, with the comprehensive Internet portal. Wherever you may be, you always have access to the data which is most important to you; whether on your PC or cell phone. In addition, the high-performance reporting regularly informs you via email and thus safeguards your yields.

TEAMPLAYER

Modular system monitoring for commercial solar power systems

An efficient team, a promising strategy and a clearly defined goal; this is how the safeguarding of your solar yields should be designed. After all, even small reductions in power can negatively affect yield. For larger PV systems, monitoring not only depends upon the quality, but also the perfect interaction of the various components. Since every system is different, every monitoring solution must be individually planned.

At SMA, you choose the components that meet your needs from the appropriate building blocks. No wonder that SMA system monitoring has so many fans.

SUNNY WEBBOX
Remote monitoring and remote maintenance of large solar power systems

Comfortable, secure, professional: The Sunny WebBox enables monitoring of the whole system from anywhere in the world. In combination with Sunny Portal, it is the most professional monitoring solution – regardless of where you are at that moment.

SUNNY PORTAL
Professional monitoring, management and presentation of solar power systems

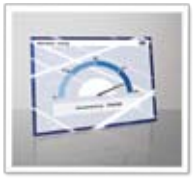
Informative, user-friendly, individual: Manage solar systems of any size simply and centrally with the comprehensive Internet portal. Wherever you are, you always have access to the data which is most important to you. In addition, the high-performance reporting regularly informs you via email and thus safeguards your yields.

SUNNY SENSORBOX
The weather station for your solar power system

Secure, informative, compact: The Sunny SensorBox allows for complete analysis of your solar generator. In combination with Sunny Portal and Sunny WebBox, it provides continuous target-actual comparisons of system performance. Thanks to this, you are able to quickly recognize and avoid possible power losses.

SUNNY MATRIX
Attractive large-scale display

Robust, customized, representative: The info screen presents the data from your solar power system indoors and outdoors. It can also be individualized with, for example your logo or a picture of your system. Thus you can advertise your system and also demonstrate your commitment publicly.



FLASHVIEW
Professional system presentation, free of charge

Informative, attractive, simple: The software, free to download, presents the most important system data live and in easily understandable graphics. All you need is a Sunny WebBox and a PC with monitor.

PARK GUARD

Reliable monitoring for solar power plants

Modern solar parks often stretch over areas the size of multiple football fields. The larger the system, the more important comprehensive monitoring is. Even small disturbances in the grid can have a negative effect on your yields if they remain unnoticed. With monitoring from SMA, even large solar power plants can be optimally monitored, controlled and integrated into power plant control stations. And thanks to the Power Reducer Box you are also fulfilling the legal requirement for grid security management.

For future-proof grids and a faster payback of your system.

SUNNY WEBBOX
Remote monitoring and maintenance of large solar power plants

Comfortable, secure, professional: As a professional data logger, the Sunny WebBox forms the basis for monitoring solar power plants. It collects data from the central inverters and records it over long periods of time. When desired, it automatically feeds the data to the Sunny Portal or a freely configurable Internet server, allowing a system diagnosis from anywhere in the world.

SMA OPC SERVER
Standardized data interface for large-scale systems

Professional, flexible, simple: With the SMA OPC Server [1], you integrate large solar power systems from SMA into OPC compatible control systems. Whether solar, wind power or biogas, thanks to the software, information from different components of a power plant can be exchanged comfortably and collected in a custom-built control system.

POWER REDUCER BOX
The solution for feed-in and grid safety management

Flexible, fast, safe: With the Power Reducer Box your system complies with the requirements of the EEG[2]) and the BDEW guideline[3] "Generating Systems in the Medium Voltage Grid", which is applicable to all solar power systems as of 01.01.2009. Remote-controlled active power derating and reactive power setpoints ensure your solar power plant is fit for the future.

1) OLE for Process Control
2) Renewable Energies Act (EEG)
3) Federal Association for Energy and Water (BDEW)

Typical system design – Wireless transmission

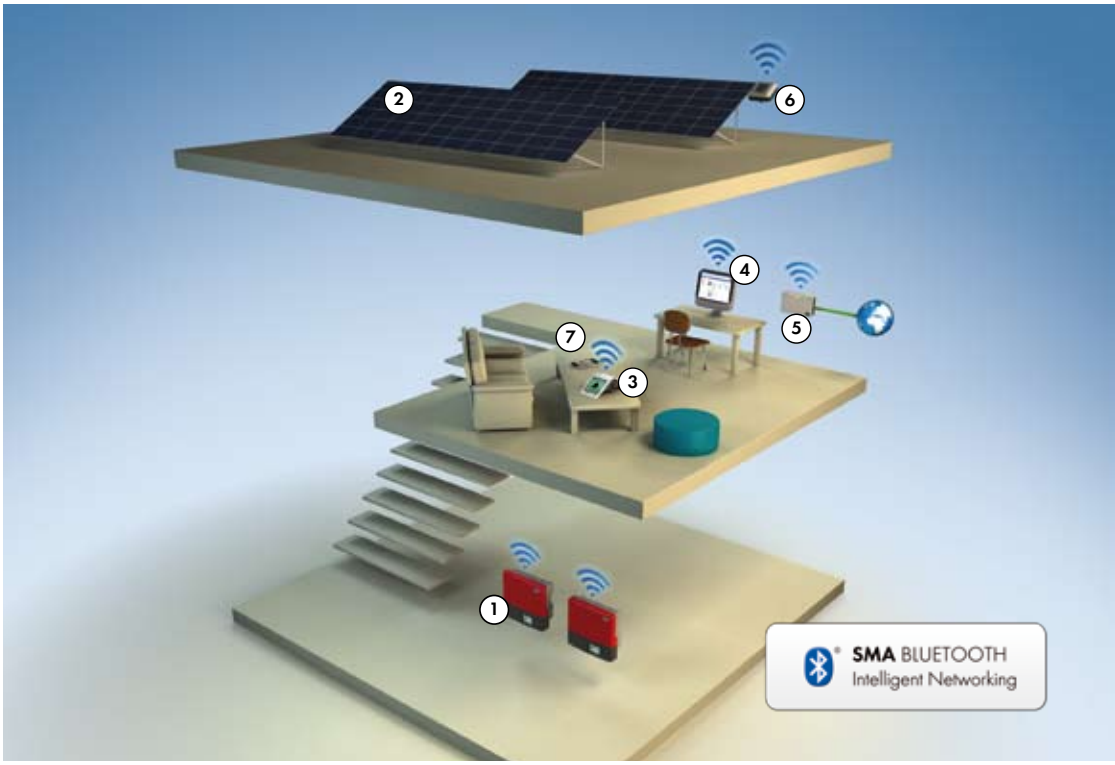
Electricity generation

(1) SUNNY BOY
(2) Solar generator

System monitoring

(3) SUNNY BEAM WITH *Bluetooth*®
(4) SUNNY EXPLORER
SUNNY PORTAL
(5) SUNNY WEBBOX with *Bluetooth*®
(6) SUNNY SENSORBOX with *Bluetooth*®*
(7) Mobile access

*In connection with SMA Power Injector with *Bluetooth*



WIRELESS OR CABLE?

Secure connection with and without wires

In order to monitor solar power systems, data has to be transmitted. This can be, for example, power values or energy yields. For communication between the solar inverter and monitoring devices, SMA provides two basic choices: wireless and wired variants. Both have advantages and are used with different sized systems. Here you can discover which method of communication best suits your solar power system.

A comparison of the two systems

	***Bluetooth*® (wireless connection)**	**RS485 wiring**
Typical application	Especially for small and mid-sized solar power systems	For mid-sized and large solar power systems
Advantages	Reduced costs and effort	High speed and reliability
Number of participants (System monitoring and inverters)	Up to 50 per *Bluetooth*® network	Up to 50 per RS485 bus
Range	Up to 100 m in open air between individual devices	1200 meters per RS485 bus
Data retrieval devices (for example, Sunny Beam or Sunny WebBox)	Up to 4 per network	1 per RS485 bus
Possibility for feed-in and grid safety management	None*	Power Reducer Box from SMA Solar Technology AG

* Information on regulations for feed-in and grid safety management in your country can be obtained from your grid operator.

Typical system design – Cable

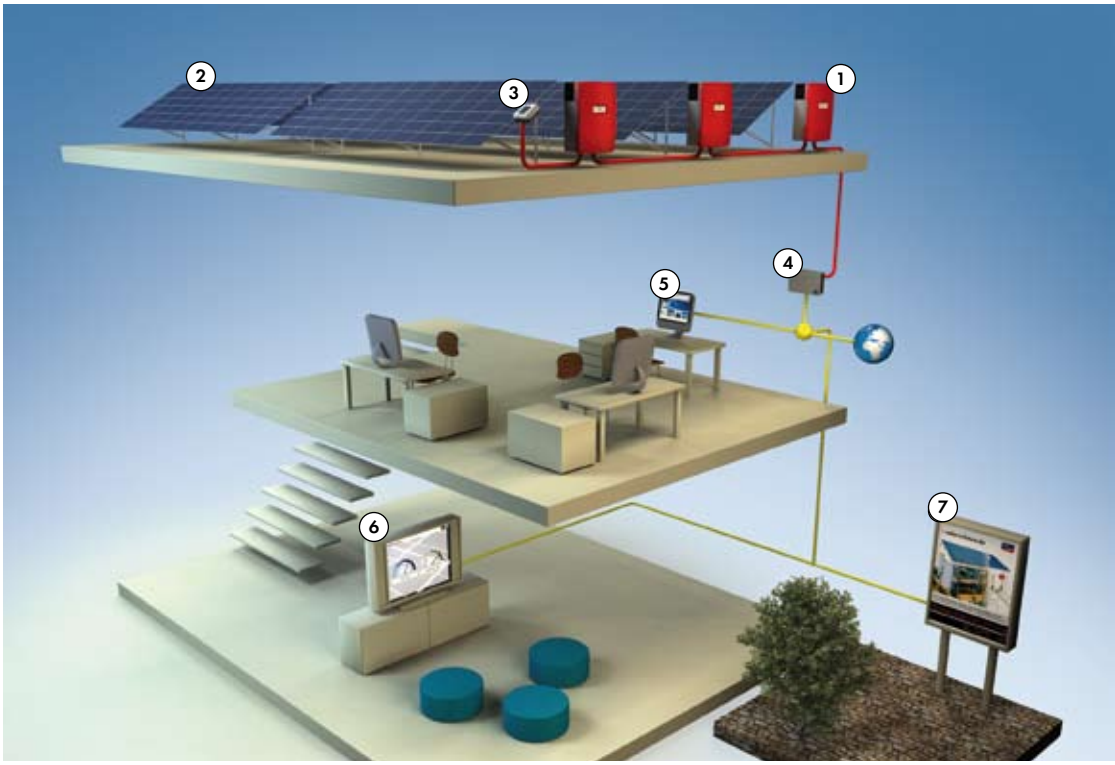
Electricity generation

① SUNNY MINI CENTRAL
② Solar generator

System monitoring

③ SUNNY SENSORBOX
④ SUNNY WEBBOX
⑤ SUNNY PORTAL
⑥ FLASHVIEW
⑦ SUNNY MATRIX

RS485
Local network / Internet



Wireless success – intelligently networked with SMA *Bluetooth*®

With SMA *Bluetooth*, wireless networks can be created simply and quickly – without the additional cost and effort of having to lay cables in walls, re-plaster or paint. It suits your private home rooftop system perfectly.

Bluetooth, the international wireless communication standard, makes your monitoring flexible and extendable. You save time and installation costs. Thanks to *Bluetooth*, all new inverters are recognized in a flash and automatically integrated into the system. Up to 50 devices can be integrated into a communication system due to the intelligent networking concept. As *Bluetooth* Class 1 is used, communication between devices is possible over larger distances. The SMA *Bluetooth* Repeater is available to help systems with too many walls and ceilings in the way.

Bluetooth also stands out in terms of reliability. Thanks to constant frequency changes and the transmission of data packets in small units, the wireless connection is extremely stable. In addition, transmitting power is always adapted to the particular requirement. By the way, the password protection built in to all devices secures your data against unauthorized access.

Robust and secure – powerful over long distances with proven and tested RS485 wiring

The RS485 field bus is a veteran in the area of wired communication technology. It has been used by SMA for many years and has proven itself in a countless number of systems. All devices are connected, one after the other, with a communication cable – just like pearls in a necklace (a so-called data bus). As one of the nodes on the bus, the Sunny WebBox collects all the data and reliably reports on the status of the solar power system.

The advantage of RS485 wiring: Functional lengths of up to 1200 meters and reliable data transmission even in interference-prone areas. For larger solar power systems in particular, you require maximum security and reliability.

Would you like more information on our devices? You will find all technical data sheets available for download at www.SMA.de.

SMA BLUETOOTH
Intelligent Networking

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