

Next Innovations 2013





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Our catalog on new product releases contains all innovations from the area of residential and commercial PV plants, PV power plants, off-grid system solutions as well as monitoring and control. Furthermore, we present the latest developments in the area of PV diesel hybrid systems, Service and intelligent energy and battery management solutions.

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Roland Grebe,
Chief Technology Officer



Lydia Sommer,
Chief Financial, Legal & Compliance Officer



Pierre-Pascal Urbon,
Chief Executive Officer



Marko Werner,
Chief Sales Officer

Dear Business Partners, Dear Readers,

The energy sector is going through a fast and sustainable transition worldwide. Decentralized energy generators based on renewable energy are becoming more and more important and continue to replace centralized large-scale power plants. Both technical developments and system intelligence are key to furthering the evolution happening in the energy sector.

SMA has focused on meeting the requirements of the future energy supply from the very start. As a result of our development of innovative system technology and energy management solutions and our company-wide efforts to reduce costs and consistent internationalization, we believe that we are well-positioned to contribute in advancing the energy supply of the future.

More and more households and commercial businesses in Europe, Japan and the U.S. rely on self-consumption of solar power due to rising electricity prices. The SMA Smart Home was designed specifically for this area of application. The integrated system concept from SMA – based on the Sunny Home Manager, optional battery bank and other system components – automatically coordinates power consumption in the household with solar power generation and, as such, significantly raises the rate of self-consumption.

When it comes to large-scale PV power plants, our turnkey system solutions with the efficient Sunny Central CP XT inverters, ranging from PV modules to medium-voltage grids, ensure a high rate of plant availability even in harsh climatic conditions. Moreover, with their wide-ranging technical functions, SMA's central inverters already comply with many countries' specific grid requirements.

In sunny regions of the globe, photovoltaics have already become economical in comparison to diesel gensets. SMA recognized the enormous potential in this growth segment early on and consequently developed the Fuel Save Solution. This intelligent control solution synchronizes photovoltaic and diesel power generation in photovoltaic diesel hybrid applications and can thus optimally cover the load profile of industrial loads.

Our global service infrastructure provides for maximum availability and yield stability across all segments. With the help of state-of-the-art communication technology for remote system monitoring and intelligent analysis tools in the Sunny Portal, we can identify potential power losses and system failures at an early stage. In this way, we not only increase technical availability but also the energy yield of PV systems.

On the following pages we present our latest system solutions and product innovations for all photovoltaic applications. In 2013, SMA will invest over 120 million euros in development to further establish our advantage as global market and technology leader. We are looking forward to joining you in making the worldwide energy transition a success.



Pierre-Pascal Urbon
Chief Executive Officer

AVAILABLE



ECONOMIC EXCELLENCE

Economical

- Maximum efficiency of 98.5 %
- SMA OptiTrac for prime MPP tracking efficiency
- Active temperature management with OptiCool
- Bluetooth communication

Easy-to-Use

- Three-phase feed-in
- No tools required for cable connection
- SUNCLIX DC plug-in system

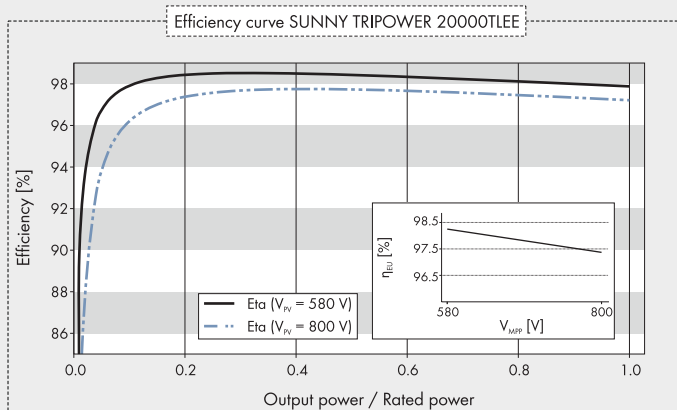
Flexible and Future-Proof

- DC input voltage of up to 1000 V
- Integrated grid management functions
- Reactive power capability

SUNNY TRIPOWER 15000TL / 20000TL ECONOMIC EXCELLENCE

The expert cost saver for high-yield, commercial systems

Peak performance and technological perfection at a significantly reduced specific price: The new Sunny Tripower TL Economic Excellence is the next logical step in the evolution of the Sunny Tripower series in terms of achieving an optimum price-performance ratio. It brings with it a considerable reduction in investment costs while at the same time guarantees exceptionally high yields with an efficiency of 98.5 percent. Therefore, the Sunny Tripower TL Economic Excellence is the ideal solution for uniformly structured medium-sized to large-scale PV systems. The focus is on the essentials meeting all requirements, including reactive power provision, grid support and grid management integration.



Accessories



RS485 interface
DM-485CB-10



Speedwire/Webconnect
interface SWDM-10



Multifunction relay
MFR01-10



Power Control Module
PWCBRD-10

¹ Does not apply to all national appendices of EN 50438

Preliminary information - last updated: May 2013

● Standard features ○ Optional features – Not available

Data at nominal conditions

Technical Data

Input (DC)

Max. DC power (@ $\cos \varphi = 1$)
Max. input voltage
MPP voltage range at 230 V line voltage
Min. input voltage / initial input voltage
Max. input current
Max. input current per string
Number of independent MPP inputs / strings per MPP input

Output (AC)

Rated power (@ 230 V, 50 Hz)
Max. apparent AC power
Nominal AC voltage
Nominal AC voltage range
AC power frequency / range
Rated power frequency / rated grid voltage
Max. output current
Power factor at rated power
Adjustable displacement power factor
Feed-in phases / connection phases

Efficiency

Max. efficiency / European efficiency

Protective Devices

DC disconnection device
Ground-fault monitoring / grid monitoring
DC surge arrester type II
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated
All-pole sensitive residual-current monitoring unit
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)

General Data

Dimensions (W / H / D)
Weight
Operating temperature range
Noise emission (typical)
Self-consumption (night)
Topology / cooling concept
Degree of protection: electronics / connection area (according to IEC 60529)
Climatic category (according to IEC 60721-3-4)
Max. permissible value for relative humidity (non-condensing)

Features

DC connection
AC connection
Display
Interfaces: RS485, Bluetooth®, Speedwire/Webconnect
Interfaces: multifunction relay / Power Control Module
Warranty: 5 / 10 / 15 / 20 / 25 years
Certificates and approvals (more available on request)

Sunny Tripower 15000TL

15260 W
1000 V
580 V – 800 V
570 V / 620 V
36 A
36 A
1 / 6

15000 W
15000 VA
3 / N / PE; 230 V / 400 V
160 V – 280 V
50 Hz, 60 Hz / -6 Hz ... +5 Hz
50 Hz / 230 V
24 A
1
0.8 overexcited ... 0.8 underexcited
3 / 3

98.5 % / 98.3 %

○
● / ●
–
● / ● / –
●
I / III

Sunny Tripower 20000TL

20450 W
1000 V
580 V – 800 V
570 V / 620 V
36 A
36 A
1 / 6

20000 W
20000 VA
3 / N / PE; 230 V / 400 V
160 V – 280 V
50 Hz, 60 Hz / -6 Hz ... +5 Hz
50 Hz / 230 V
29 A
1
0.8 overexcited ... 0.8 underexcited
3 / 3

98.5 % / 98.2 %

○
● / ●
–
● / ● / –
●
I / III

665 / 680 / 265 mm (26.2 / 26.8 / 10.4 inch)
45 kg (99.2 lb)
-25 °C ... +60 °C (-13 °F ... +140 °F)
51 dB(A)
1 W
Transformerless / OptiCool
IP65
4K4H
100 %

665 / 680 / 265 mm (26.2 / 26.8 / 10.4 inch)
45 kg (99.2 lb)
-25 °C ... +60 °C (-13 °F ... +140 °F)
51 dB(A)
1 W
Transformerless / OptiCool
IP65
4K4H
100 %

Sunclix
Spring-cage terminal
Graphic
○ / ● / ○
○ / ○
● / ○ / ○ / ○ / ○
AS 4777, BDEW 2008, C10/11, CE, CEI 0-21, EN 50438 ¹ , G59/2, IEC 61727, IEC 62109-1/-2, PPC, PPDS, RD 1699, RD 661/2007, SI4777, UTE C15-712-1, VDE0126-1-1, VDE-AR-N 4105
STP 15000TLEE-10

Sunclix
Spring-cage terminal
Graphic
○ / ● / ○
○ / ○
● / ○ / ○ / ○ / ○
STP 20000TLEE-10



Flexible

- Two independent MPP trackers
- Various power classes

Efficient

- Up to 1000 V DC input voltage range
- 98 % efficiency
- Shade management with OptiTrac™ Global Peak

Secure Operation

- All-pole sensitive residual-current monitoring unit
- Arc fault detection (according to UL 1699B)

Future-Proof

- Comprehensive grid management functions
- Ethernet-based communication

SUNNY TRIPOWER 12000TL-US / 15000TL-US / 20000TL-US / 24000TL-US

The economical solution for decentralized PV systems

The new UL-certified Sunny Tripower TL-US is designed specifically to meet American requirements for mid to large-scale decentralized PV systems. With a peak efficiency of above 98 percent, OptiTrac Global Peak shade management, a DC input voltage range of up to 1000 volts – this three-phase, transformerless PV inverter has everything needed to ensure high efficiency. A security the Sunny Tripower can offer, thanks, in part, to integrated arc fault detection. Equipped with two independent MPP trackers, the Sunny Tripower TL-US can be used in applications with input voltages of up to 600 and up to 1000 volts, offering enormous flexibility in the design of a PV system. Grid management functions are of course included as standard as well as the most cutting-edge communication and monitoring technology.

Flexible system design, power and reliability were most important during development of the Sunny Tripower TL-US. The goal: reduced energy generation costs and increased yields and economic viability.

Unmatched flexibility

The Sunny Tripower TL-US is available in four power classes. The inverter supports both 1000 V of system voltage as well as systems with 600 V of system voltage. With its broad operating range and two MPP trackers, it is ideal for decentralized projects of any kind. System planning has been made significantly easier, shortening the development process.

Time is money. This is also true during the installation of a PV system. The Sunny Tripower is not only easy to transport and install, but also offers endless possible positions for installation. Concrete pads usually required by central inverters are unnecessary, saving space at the mounting location.

Enhanced power

Due to the leading efficiency and SMA's proprietary OptiTrac Global Peak MPP tracking, operators benefit from optimal power and, thus, superior yields.

Furthermore, the Sunny Tripower TL-US boasts cutting-edge diagnostic functions such as a reverse polarity indicator (via the CU 1000-US connection unit).

Ready for the future

The Sunny Tripower TL-US is equipped with technologies that already meet future requirements. These include, for example, comprehensive grid management functions and cutting-edge communication options such as SMA's Cluster Controller and Speedwire. SMA Service offers comprehensive packages for easy, long-term planning covering system-wide inverter operation and maintenance.

Optimized cost

The Sunny Tripower TL-US allows system integrators to optimally use real estate, shorten design and installation time, and increase yields. Thanks to string technology, little operational management and maintenance is required for the inverters. Long-term support is made simple through SMA's service structure, making the Sunny Tripower TL-US the perfect inverter for decentralized PV systems.





RS485 interface
DM-485CB-IIS-10



SMA Cluster Controller
CICON-10

- Standard features ○ Optional features – Not available

* Suitable for systems with 600 V DC max.

Preliminary information – last updated: March 2013

Type designation

CONNECTION UNIT 1000-US



Technical Data	Connection Unit 1000 V	
Input (DC)		
Max. DC voltage	1000 V	
Number of input source circuits (strings)	8 (4 + 4)	
Input wire size	AWG 12 to AWG 6	
Max. fuse size	20 A	
Output (DC)		
Output circuits	2	
Output wire size	AWG 12 to AWG 2	
Max. rated continuous current / per output circuit	66 A / 33 A	
Protective Devices		
Fuse holder with protection against contact	●	
Reverse polarity indicator	●	
Output load-break switch	●	
General Data		
Dimensions (W / H / D)	500 / 380 / 140 mm (19.7 / 15.0 / 5.5 inch)	
Packing dimensions (W / H / D)	520 / 420 / 200 mm (20.5 / 16.5 / 7.9 inch)	
Weight	5.5 kg (12 lb)	
Weight including packaging	6.0 kg (13 lb)	
Degree of protection	NEMA 3R	
Features		
Certificates and approvals	IEEE 1547, UL 1741	
● Standard features ○ Optional features — Not available		
Preliminary information – last updated: March 2013		
Type designation	CU 1000-US-10	



Efficient

- Efficiency of 96.5 % (as per JIS C8961)
- Peak efficiency of 97.8 %
- Excellent price-performance ratio

Innovative

- Highest robustness and best level of protection thanks to degree of protection IP65 (outdoor)
- Integrated display showing yield values and daily trends

- Operating temperature range from -25 °C to +60 °C through active OptiCool temperature management
- Easy plant monitoring thanks to Webconnect and Sunny Portal

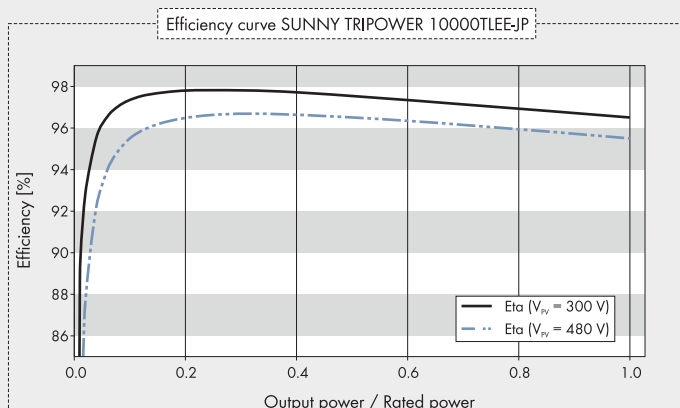
Flexible

- Versatile use in all common grid topologies of commercial applications

SUNNY TRIPOWER 10000TLEE-JP

The innovative expert for low costs and high efficiency

Developed for the requirements of the Japanese market, built with more than thirty years of experience and with the know-how of the technological leader, the Sunny Tripower Economic Excellence offers more benefit for each Yen invested. Its robust outdoor enclosure meets the strict specifications of the IP65 device classification and offers very solid protection from dirt, water, and salt-containing atmospheres. Unmatched in its class, the three-phase inverter operates at 97.8 % peak efficiency and offers numerous features, such as an Emergency Power Supply for energy supply even during grid failure. The Sunny Tripower can also be equipped with an optional Webconnect data module. It allows for monitoring individual or several Ethernet-based SMA devices via Sunny Portal, as well as remotely via smartphone or tablet.



Accessories



RS485 interface
DM-485CB-10



Webconnect interface
SWDM-10



Sunny View
View-10

● Standard features ○ Optional features — Not available

Provisional data, as of May 2013

Data at nominal conditions

Technical data

Input (DC)

Max. DC power (@ $\cos \varphi = 1$)
Max. input voltage
MPP voltage range / rated input voltage
Min. input voltage / initial input voltage
Max. input current input A
Max. input current per string input A
Number of independent MPP inputs / strings per MPP input

Output (AC)

Rated power (@ 202 V, 50 Hz)
Max. apparent AC power
Nominal AC voltage / range
AC power frequency / range
Rated power frequency / rated grid voltage
Max. output current
Power factor at rated power
Feed-in phases / connection phases

Efficiency

Max. efficiency / efficiency (according to JIS C8961)

Output (Stand-Alone)

Rated power
Max. output current
Rated voltage, frequency

Protective Devices

DC disconnect device
Ground fault monitoring / grid monitoring
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated
All-pole-sensitive residual-current monitoring unit
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)

General Data

Dimensions (W / H / D)
Weight
Operating temperature range
Noise emission (typical)
Self-consumption (night)
Topology
Cooling concept
Degree of protection (according to IEC 60529)
Climatic category (according to IEC 60721-3-4)
Maximum permissible value for relative humidity (non-condensing)

Features

DC connection / AC connection
Display
Interfaces: Bluetooth, RS485, Speedwire/Webconnect
Warranty: 5 / 10 / 15 / 20 years
JET certification number

Type designation

Sunny Tripower 10000TLEE-JP

10500 W
600 V
300 V ... 590 V / 300 V
300 V / 310 V
36 A
36 A
1 / 6

10000 W
10000 VA
202 V / 160 V - 240 V
50 Hz, 60 Hz / -2 Hz ... +2 Hz
50 Hz / 202 V
29.5 A
> 0.95
3 / 3

97.8 % / 96.5 %

1500 W
15 A
101 V, 50/60 Hz

●
● / ●
● / ● / —
●
I / III

665 / 680 / 265 mm (26.2 / 26.8 / 10.4 inch)
45 kg (99.2 lb)
-25 °C ... +60 °C (-13 °F ... +140 °F)
< 51 dB(A)
1 W
Transformerless
OptiCool
IP65
4K4H
100 %

Clamp bar / Spring-cage terminal
Graphic
● / ○ / ○
● / ○ / ○ / ○
Is expected

STP 10000TLEE-JP-11

AVAILABLE



Economical

- Maximum efficiency of 98 %
- Shade management with OptiTrac Global Peak
- Active temperature management with OptiCool

Flexible

- DC input voltage of up to 1000 V
- Integrated grid management functions
- Reactive power supply
- Module-tailored system design with Optiflex

Communicative

- Integrated Webconnect function to Sunny Portal via Ethernet
- *Bluetooth* communication
- Simple country configuration
- Multifunction relay comes standard

Easy-to-Use

- Three-phase feed-in
- No tools required for cable connection
- SUNCLIX DC plug-in system
- Integrated ESS DC switch-disconnector
- Easy wall mounting

SUNNY TRIPOWER 5000TL / 6000TL / 7000TL / 8000TL / 9000TL

The three-phase inverter for your home

At home with cutting-edge technology and top yields: The Sunny Tripower in the 5 to 9 kW power classes is also setting new standards for residential PV systems. It features asymmetric multistring and Optiflex technology to ensure maximum flexibility while combining peak efficiency with OptiTrac Global Peak to generate the highest possible yields. In addition to communication via the external *Bluetooth* antenna, the PV system also includes a direct Sunny Portal connection via SMA Webconnect as standard – and now for the first time without data loggers. Furthermore, the „small“ Sunny Tripower comes with integrated grid management functions, is capable of reactive power supply and is suitable for operation with a 30 mA RCD.

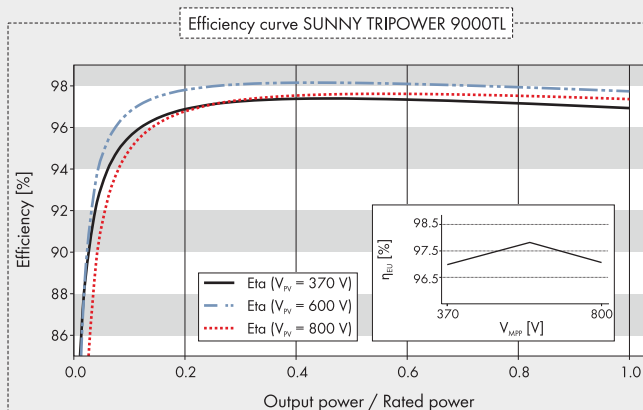


Lyon, France

SUNNY TRIPOWER

5000TL / 6000TL / 7000TL / 8000TL / 9000TL

Technical Data	Sunny Tripower 5000TL	Sunny Tripower 6000TL
Input (DC)		
Max. DC power (@ cos φ = 1)	5100 W	6125 W
Max. input voltage	1000 V	1000 V
MPP voltage range / rated input voltage	245 V – 800 V / 600 V	295 V – 800 V / 600 V
Min. input voltage / initial input voltage	150 V / 188 V	150 V / 188 V
Max. input current input A / input B	11 A / 10 A	11 A / 10 A
Max. input current per string input A / input B	11 A / 10 A	11 A / 10 A
Number of independent MPP inputs / strings per MPP input	2 / A:2, B:2	2 / A:2, B:2
Output (AC)		
Rated power (@ 230 V, 50 Hz)	5000 W	6000 W
Max. apparent AC power	5000 VA	6000 VA
Nominal AC voltage	3 / N / PE; 220 / 380 V, 3 / N / PE; 230 / 400 V, 3 / N / PE; 240 / 415 V	3 / N / PE; 220 / 380 V, 3 / N / PE; 230 / 400 V, 3 / N / P E; 240 / 415 V
Nominal AC voltage range	160 V – 280 V	160 V – 280 V
AC power frequency / range	50 Hz, 60 Hz / -5 Hz ... +5 Hz	50 Hz, 60 Hz / -5 Hz ... +5 Hz
Rated power frequency / rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	7.3 A	8.7 A
Power factor at rated power	1	1
Adjustable displacement power factor	0.8 overexcited ... 0.8 underexcited	0.8 overexcited ... 0.8 underexcited
Feed-in phases / connection phases	3 / 3	3 / 3
Efficiency		
Max. efficiency / European efficiency	98 % / 97.1 %	98 % / 97.4 %
Protective Devices		
DC-side disconnection device	●	●
Ground-fault monitoring / grid monitoring	● / ●	● / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / –	● / ● / –
All-pole sensitive residual-current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
General Data		
Dimensions (W / H / D)	470 / 730 / 240 mm (18.5 / 28.7 / 9.4 inch)	470 / 730 / 240 mm (18.5 / 28.7 / 9.4 inch)
Weight	37 kg (81.4 lb)	37 kg (81.4 lb)
Operating temperature range	-25 °C ... +60 °C (-13 °F ... +140 °F)	-25 °C ... +60 °C (-13 °F ... +140 °F)
Noise emission (typical)	40 dB(A)	40 dB(A)
Self-consumption (night)	1 W	1 W
Topology / cooling concept	Transformerless / OptiCool	Transformerless / OptiCool
Degree of protection (according to IEC 60529)	IP65	IP65
Climatic category (according to IEC 60721-3-4)	4K4H	4K4H
Max. permissible value for relative humidity (non-condensing)	100 %	100 %
Features		
DC connection	Sunclix	Sunclix
AC connection	Spring-cage terminal	Spring-cage terminal
Display	Graphic	Graphic
Interface: RS485, Bluetooth, Speedwire / Webconnect	○ / ● / ●	○ / ● / ●
Multifunction relay / Power Control Module	● / ○	● / ○
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○ / ○
Certificates and approvals (more available on request)	AS 4777, C10/11, CE, CEI 0-21 (>6 kWp), EN 50438 ¹ , G83/1-1, G59/2 ² , IEC 61727, IEC 62109-1/-2, NRS 097, PPC, PPDS, RD1699, RD 661/2007, SI 4777, UTE C15-712-1, VDE-AR-N 4105, VDE0126-1-1	
Type designation	STP 5000TL-20	STP 6000TL-20



Accessories



Power Control Module
PWCBRD-10



RS485 interface
485BRD-10

¹ Does not apply to all national appendices of EN 50438

² Certificates and approvals (planned)

● Standard features ○ Optional features – Not available

Data at nominal conditions

Sunny Tripower 7000TL	Sunny Tripower 8000TL	Sunny Tripower 9000TL	
7175 W	8200 W	9225 W	
1000 V	1000 V	1000 V	
290 V – 800 V / 600 V	330 V – 800 V / 600 V	370 V – 800 V / 600 V	
150 V / 188 V	150 V / 188 V	150 V / 188 V	
15 A / 10 A	15 A / 10 A	15 A / 10 A	
15 A / 10 A	15 A / 10 A	15 A / 10 A	
2 / A:2, B:2	2 / A:2, B:2	2 / A:2, B:2	
7000 W	8000 W	9000 W	
7000 VA	8000 VA	9000 VA	
3 / N / PE; 220 / 380 V, 3 / N / PE; 230 / 400 V, 3 / N / PE; 240 / 415 V	3 / N / PE; 220 / 380 V, 3 / N / PE; 230 / 400 V, 3 / N / PE; 240 / 415 V	3 / N / PE; 220 / 380 V, 3 / N / PE; 230 / 400 V, 3 / N / PE; 240 / 415 V	
160 V – 280 V	160 V – 280 V	160 V – 280 V	
50 Hz, 60 Hz / -5 Hz ... +5 Hz	50 Hz, 60 Hz / -5 Hz ... +5 Hz	50 Hz, 60 Hz / -5 Hz ... +5 Hz	
50 Hz / 230 V	50 Hz / 230 V	50 Hz / 230 V	
10.2 A	11.6 A	13.1 A	
1	1	1	
0.8 overexcited ... 0.8 underexcited	0.8 overexcited ... 0.8 underexcited	0.8 overexcited ... 0.8 underexcited	
3 / 3	3 / 3	3 / 3	
98 % / 97.5 %	98 % / 97.6 %	98 % / 97.6 %	
●	●	●	
● / ●	● / ●	● / ●	
● / ● / –	● / ● / –	● / ● / –	
●	●	●	
I / III	I / III	I / III	
470 / 730 / 240 mm (18.5 / 28.7 / 9.4 inch)	470 / 730 / 240 mm (18.5 / 28.7 / 9.4 inch)	470 / 730 / 240 mm (18.5 / 28.7 / 9.4 inch)	
37 kg (81.4 lb)	37 kg (81.4 lb)	37 kg (81.4 lb)	
-25 °C ... +60 °C (-13 °F ... +140 °F)	-25 °C ... +60 °C (-13 °F ... +140 °F)	-25 °C ... +60 °C (-13 °F ... +140 °F)	
40 dB(A)	40 dB(A)	40 dB(A)	
1 W	1 W	1 W	
Transformerless / OptiCool	Transformerless / OptiCool	Transformerless / OptiCool	
IP65	IP65	IP65	
4K4H	4K4H	4K4H	
100 %	100 %	100 %	
Sunclix	Sunclix	Sunclix	
Spring-cage terminal	Spring-cage terminal	Spring-cage terminal	
Graphic	Graphic	Graphic	
○ / ● / ●	○ / ● / ●	○ / ● / ●	
● / ○	● / ○	● / ○	
● / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○	
AS 4777, C10/11, CE, CEI 0-21 (>6 kWp), EN 50438 ¹ , G83/1-1, G59/2 ² , IEC 61727, IEC 62109-1/-2, NRS 097, PPC, PPDS, RD1699, RD 661/2007, SI 4777, UTE C15-712-1, VDE-AR-N 4105, VDE0126-1-1			
STP 7000TL-20	STP 8000TL-20	STP 9000TL-20	

AVAILABLE



Leading-edge Technology

- Maximum efficiency of 96.7 % and wide input voltage range
- ESS
- Transformerless with H5 topology
- OptiTrac MPP control
- Multi-String

Easy Installation

- Easily accessible connection compartment
- Cabling without tools
- Ergonomic design

For Global Use

- Comprehensive SMA warranty program
- JET certification

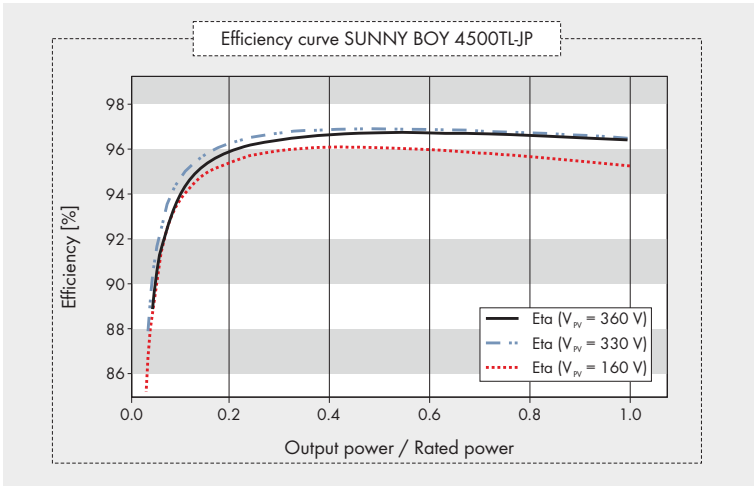
Communicative

- Bluetooth® Technology
- Graphic display


SUNNY BOY 3500TL-JP / 4500TL-JP

Perfection Plus. Usability.

The Sunny Boy 3500TL-JP and 4500TL-JP offer more communication options, are easier to use and more efficient than ever – setting new standards in inverter technology. A modern graphic display, indication of the daily values even after sunset, simplified installation concept, stand-alone function and wireless communication via *Bluetooth*: The new Sunny Boys fulfill every wish. The Sunny Boy 3500TL-JP and 4500TL-JP have a peak efficiency of 96.7 percent with a wide input voltage range. They are multistring inverters providing an optimal yield, maximum flexibility for system design and an outstanding module compatibility – this makes them the first choice for nearly any PV system.



Accessories



Sunny View for monitoring the PV-System
View-10



CT Meter for collecting of consumption data
ZBJP-BT-10



Lid color may be selected from red or white

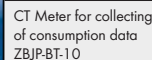
● Standard features ○ Optional features — Not available

As of May 2013

Data at nominal conditions



Lid color may be selected
from red or white



● Standard features ○ Optional features – Not available

As of May 2013

Data at nominal conditions

Technical data	Sunny Boy 3500TL-JP	Sunny Boy 4500TL-JP
Input (DC)		
Max. DC power	3700 W	4500 W
Max. input voltage	450 V	450 V
MPP voltage range / rated input voltage	160 V ... 360 V / 330 V	160 V ... 360 V / 330 V
Min. input voltage / initial input voltage	70 V / 110 V	70 V / 110 V
Max. input current input A / input B	15 A / 15 A	15 A / 15 A
Max. input current per string input A / input B	15 A / 15 A	15 A / 15 A
Number of independent MPP inputs / strings per MPP input	2 / A:2; B:2	2 / A:2; B:2
Output (AC)		
Rated power (@ 202 V, 50/60 Hz)	3500 W	4500 W
Max. apparent AC power	3500 VA	4500 VA
Nominal AC voltage / range	202 V (2 x 101 V) / 160 V – 230 V	202 V (2 x 101 V) / 160 V – 230 V
AC power frequency / range	50 Hz, 60 Hz / -2 Hz ... +2 Hz	50 Hz, 60 Hz / -2 Hz ... +2 Hz
Rated power frequency / rated grid voltage	50 Hz / 202 V	50 Hz / 202 V
Max. output current	17.5 A	22.3 A
Power factor at rated power	1	1
Feed-in phases / connection phases	1 / 1	1 / 1
Efficiency		
Max. efficiency / max. efficiency conforming to JIS C8961	96.7 % / 96.5 %	96.7 % / 96 %
Output (stand-alone)		
Rated power	1500 W	1500 W
Max. output current	15 A	15 A
Rated voltage, frequency	101 V, 50/60 Hz	101 V, 50/60 Hz
Protective devices		
DC disconnect device	●	●
Ground fault monitoring / grid monitoring	● / ●	● / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / –	● / ● / –
All-pole-sensitive residual-current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
General data		
Dimensions (W / H / D)	490 / 519 / 185 mm (19.3 / 20.4 / 7.3 inch)	
Weight	26 kg (57.3 lb)	26 kg (57.3 lb)
Operating temperature range	-25 °C ... +60 °C (-13 °F ... +140 °F)	-25 °C ... +60 °C (-13 °F ... +140 °F)
Noise emission (typical)	25 dB(A)	25 dB(A)
Self-consumption (night)	1 W	1 W
Topology	Transformerless	Transformerless
Cooling concept	Convection	Convection
Degree of protection (according to IEC 60529)	IP65	IP65
Climatic category (according to IEC 60721-3-4)	4K4H	4K4H
Maximum permissible value for relative humidity (non-condensing)	100 %	100 %
Features		
DC connection / AC connection	Sunclix / Spring clamp terminal	Sunclix / Spring clamp terminal
Display	Graphic	Graphic
Interface: <i>Bluetooth</i>	●	●
Warranty: 5 / 10 / 15 / 20 years	○ / ● / ○ / ○	○ / ● / ○ / ○
JET certification number	P-0191	P-0190
Type designation	SB 3500TL-JP-22	SB 4500TL-JP-22

AVAILABLE



Certified

- UL 1741 and UL 1699B compliant
- Integrated arc-fault circuit interrupter (AFCI) meets the requirements of NEC 2011 690.11

Innovative

- Secure power supply provides daytime power in case of grid failure

Powerful

- Maximum efficiency of 97.2 %
- Broad input voltage range
- Shade management with OptiTrac Global Peak MPP tracking

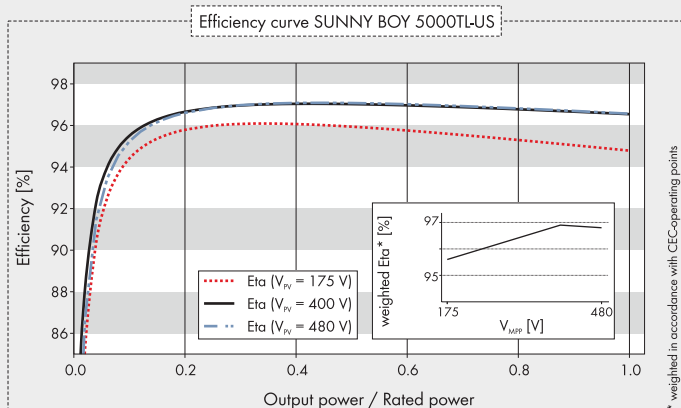
Flexible

- Two MPP trackers provide numerous design options
- Extended operating temperature range

SUNNY BOY 3000TL-US / 4000TL-US / 5000TL-US

Sets the bar

The Sunny Boy 3000TL-US / 4000TL-US / 5000TL-US PV inverters with UL listing offer that little something extra when it comes to performance. What makes them unique is their ability to supply smaller household appliances with power during the day in the event of a grid outage via an extra outlet. Simultaneously, a high degree of efficiency and a very broad operating temperature range ensure that power is used to its maximum advantage. Thanks to OptiTrac™ Global Peak and its multistring technology with a broad input voltage range, the Sunny Boy TL-US is especially flexible when it comes to system planning, even in combination with demanding PV arrays and partially shaded systems. It is no wonder that the PV inverters in the Sunny Boy TL-US series are setting performance standards and leading the way in technology for private residential PV systems.



Accessories

Speedwire / Webconnect
SWDM-US-10 interfaceRS485 interface
DM-485CB-US-10Additional fan kit
FANKIT02-10

● Standard features ○ Optional features – Not available
Data at nominal conditions

Technical Data	Sunny Boy 3000TL-US		Sunny Boy 4000TL-US		Sunny Boy 5000TL-US	
	208 V AC	240 V AC	208 V AC	240 V AC	208 V AC	240 V AC
Input (DC)						
Max. DC power (@ cos ϕ = 1)	3200 W		4200 W		5300 W	
Max. DC voltage	600 V		600 V		600 V	
MPP voltage range	175 – 480 V		175 – 480 V		175 – 480 V	
Min. DC voltage / start voltage	125 / 150 V		125 / 150 V		125 / 150 V	
Max. input current / per string	18 A / 15 A		24 A / 15 A		30 A / 15 A	
Number of MPP trackers / strings per MPP tracker			2 / 2			
Output (AC)						
Nominal AC power	3000 W		4000 W		4550 W	5000 W
Max. apparent AC power	3000 VA		4000 VA		4550 VA	5000 VA
Nominal AC voltage / adjustable	208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●
AC voltage range	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V
AC grid frequency; range	60 Hz / 59.3 ... 60.5 Hz		60 Hz / 59.3 ... 60.5 Hz		60 Hz / 59.3 ... 60.5 Hz	
Max. output current	15 A		20 A		22 A	
Power factor (cos ϕ)	1		1		1	
Feed-in phases / line connections	1 / 2		1 / 2		1 / 2	
Harmonics	<4 %		<4 %		<4 %	
Efficiency						
Max. efficiency	96.8 %	97.1 %	96.8 %	97.2 %	96.8 %	97.1 %
CEC efficiency	96 %	97 %	96 %	97 %	96 %	97 %
Protective Devices						
DC disconnection device			●			
DC reverse polarity protection			●			
Ground-fault monitoring / grid monitoring			● / ●			
AC short-circuit current capability			●			
All-pole sensitive residual-current monitoring unit			●			
Arc-fault circuit interrupter (AFCI) according to UL 1699B			●			
Protection class / overvoltage category			I / IV			
General Data						
Dimensions (W / H / D)			490 / 519 / 185 mm (19.3 / 20.5 / 7.3 inch)			
Dimensions of DC Disconnect (W / H / D)			187 / 297 / 190 mm (7.4 / 11.7 / 7.5 inch)			
Packing dimensions (W / H / D)			617 / 597 / 266 mm (24.3 / 23.5 / 10.5 inch)			
DC Disconnect packing dimensions (W / H / D)			370 / 240 / 280 mm (14.6 / 9.4 / 11.0 inch)			
Weight / DC Disconnect weight			24 kg (53 lb) / 3.5 kg (8 lb)			
Packing weight / DC Disconnect packing weight			27 kg (60 lb) / 3.5 kg (8 lb)			
Operating temperature range			-40 °C ... +60 °C (-40 °F ... +140 °F)			
Noise emission (typical)	≤25 dB(A)		<25 dB(A)		<29 dB(A)	
Self-consumption (night)	<1 W		<1 W		<1 W	
Topology	Transformerless		Transformerless		Transformerless	
Cooling concept	Convection		Convection		Convection	
Electronics degree of protection	NEMA 3R		NEMA 3R		NEMA 3R	
Features						
Secure power supply	●		●		●	
Graphic display	●		●		●	
Interfaces: RS485, ZigBee, Speedwire / Webconnect	○/○/○		○/○/○		○/○/○	
Warranty: 10 / 15 / 20 years	●/○/○		●/○/○		●/○/○	
Certificates and approvals (more available on request)			CAN/CSA C22.2 107.1-1, FCC Part 15 (Class A & B), IEC 62109-1/-2, IEEE 1547, UL 1699B, UL 1741, UL 1998			
NOTE: US inverters ship with gray lids						
Type designation	SB 3000TL-US-22		SB 4000TL-US-22		SB 5000TL-US-22	

AVAILABLE



Economical

- Maximum DC input voltage of 750 V
- Cost savings resulting from fewer parallel strings
- Shade management with OptiTrac Global Peak

Flexible

- Compatible with all PV modules available on the market
- Variable applications due to use as a main or complementary device

Easy-to-Use

- Fanless
- Simplified wall mounting
- SUNCLIX DC plug-in system
- Fast connection, no tools required

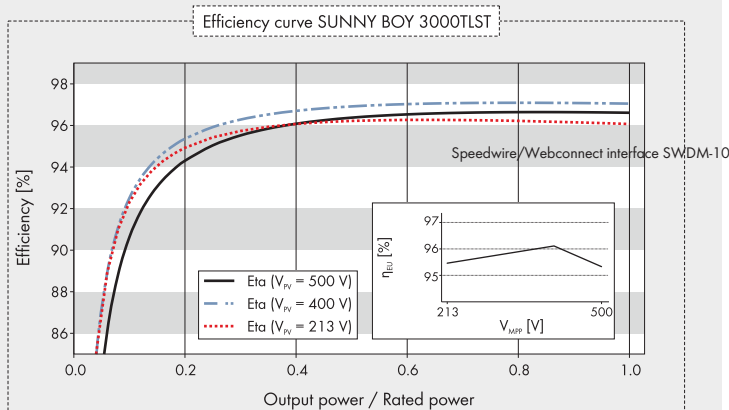
Communicative

- Simple country configuration
- Bluetooth technology

SUNNY BOY 2500TL / 3000TL SINGLE TRACKER

Now also available as an economical specialist for small, simple systems

The same. Only new. The Sunny Boy TL is now available with only one MPP tracker and in principle offers all the benefits of its multistring brothers 3000TL, 3600TL, 4000TL and 5000TL. With economical operation, advanced technology and convenient operation, the unique strengths of the Sunny Boy Single Tracker make it a standout. Not only is it a cost-efficient specialist for small, simple rooftop installations, but thanks to its reactive power capability, it is also the perfect addition to existing systems.



Accessories



RS485 interface
DM-485CB-10



Speedwire/Webconnect
interface SWDM-10



Multifunction relay
MFR01-10



Additional fan kit
FANKIT01-10



Power Control Module
PWCMOD-10

¹ Does not apply to all national appendices of EN 50438

Technical Data

Input (DC)

Max. DC power (@ $\cos \varphi = 1$)
Max. input voltage
MPP voltage range / rated input voltage
Min. input voltage / initial input voltage
Max. input current
Max. input current per string
Number of independent MPP inputs / strings per MPP input

Output (AC)

Rated power (@ 230 V, 50 Hz)
Max. apparent AC power
Nominal AC voltage
Nominal AC voltage range
AC power frequency / range
Rated power frequency / rated grid voltage
Max. output current
Power factor at rated power
Adjustable displacement power factor
Feed-in phases / connection phases

Efficiency

Max. efficiency / European weighted efficiency
--

Protective Devices

DC disconnection device
Ground-fault monitoring / grid monitoring
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated
All-pole sensitive residual-current monitoring unit
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)

General Data

Dimensions (W / H / D)
Weight
Operating temperature range
Noise emission (typical)
Self-consumption (night)
Topology / cooling concept
Degree of protection (according to IEC 60529)
Climatic category (according to IEC 60721-3-4)
Max. permissible value for relative humidity (non-condensing)

Features

DC connection
AC connection
Display
Interfaces: RS485, Bluetooth®, Speedwire / Webconnect
Warranty: 5 / 10 / 15 / 20 / 25 years
Multifunction relay / Power Control Module
Certificates and approvals (more available on request)

Certificates and approvals (planned)

● Standard features ○ Optional features — Not available, data at nominal conditions

Type designation

Sunny Boy 2500TL Single Tracker

2650 W
750 V
180 V – 500 V / 400 V
125 V / 150 V
15 A
15 A
1 / 2

2500 W
2500 VA
220 V / 230 V / 240 V
180 V – 280 V
50 Hz, 60 Hz / -5 Hz ... +5 Hz
50 Hz / 230 V
10.9 A
1
0.8 overexcited ... 0.8 underexcited
1 / 1

97 % / 96 %

○
● / ●
● / ● / —
●
I / III

Sunny Boy 3000TL Single Tracker

3200 W
750 V
213 V – 500 V / 400 V
125 V / 150 V
15 A
15 A
1 / 2

3000 W
3000 VA
220 V / 230 V / 240 V
180 V – 280 V
50 Hz, 60 Hz / -5 Hz ... +5 Hz
50 Hz / 230 V
13.1 A
1
0.8 overexcited ... 0.8 underexcited
1 / 1

97 % / 96.1 %

○
● / ●
● / ● / —
●
I / III

CE, VDE0126-1-1, G83/1-1, RD 661/2007, PPC, AS 4777, EN 50438¹, C10/11, PPDS, IEC 61727, UTE C15-712-1, G59/2, VDEAR-N 4105, CEI 0-21, RD1699, NRS 097-2-1, IEC 62109-1/-2

SI4777

SB 2500TLST-21

SB 3000TLST-21

AVAILABLE



Efficient

- Efficiency of up to 96 %
- Transformerless

Safe

- Integrated ESS DC switch-disconnector (optional)

Reliable

- Tried and tested technology
- Maintenance-free, thanks to convection cooling

Easy-to-Use

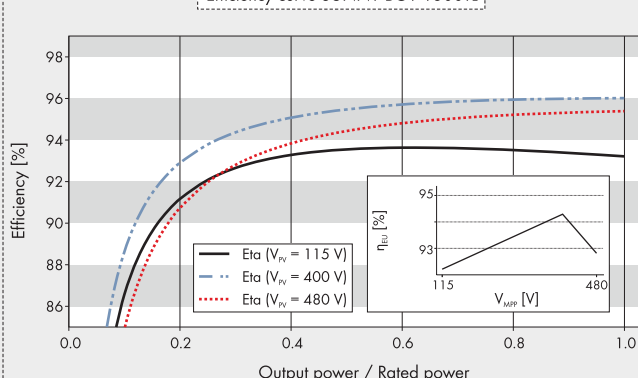
- SUNCLIX DC plug-in system

SUNNY BOY 1300TL

Small inverter with big returns

Combining a broad input voltage range and a broad input current range, the Sunny Boy 1300TL can be connected to nearly all standard crystalline PV modules. As a proven starter model, its efficiency is first-class. Its low weight and robust enclosure allow for easy installation, both indoors and outdoors. Due to its power class, it is the ideal inverter for smaller PV systems.

Efficiency curve SUNNY BOY 1300TL



Accessories

RS485 interface
485PB-NRBluetooth interface
BTPBINV-NRSpeedwire/Webconnect
interface SWPB-10¹ Valid from firmware version 4.50² Does not apply to all national appendices of EN 50438

● Standard features ○ Optional features — Not available
Data at nominal conditions

Technical Data

Input (DC)

Max. DC power (@ $\cos \varphi = 1$)

Max. input voltage

MPP voltage range / rated input voltage

Min. input voltage / initial input voltage

Max. input current

Max. input current per string

Number of independent MPP inputs / strings per MPP input

Output (AC)

Rated power (@ 230 V, 50 Hz)

Max. apparent AC power

Nominal AC voltage

Nominal AC voltage range

AC power frequency / range

Rated power frequency / rated grid voltage

Max. output current

Power factor at rated power

Feed-in phases / connection phases

Efficiency

Max. efficiency / European weighted efficiency

Protective Devices

DC disconnection device

Ground-fault monitoring / grid monitoring

DC reverse polarity protection / AC short-circuit current capability / galvanically isolated

All-pole sensitive residual-current monitoring unit

Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)

General Data

Dimensions (W / H / D)

Weight

Operating temperature range

Noise emission (typical)

Self-consumption (night)

Topology / cooling concept

Degree of protection (according to IEC 60529)

Climatic category (according to IEC 60721-3-4)

Max. permissible value for relative humidity (non-condensing)

Features

DC connection

AC connection

Display

Interfaces: RS485, Bluetooth®, Speedwire/Webconnect

Warranty: 5 / 10 / 15 / 20 / 25 years

Certificates and approvals (more available on request)

Sunny Boy 1300TL

1400 W

600 V

115 V¹ - 480 V / 400 V

100 V¹ / 120 V¹

12 A¹

12 A¹

1 / 1

1300 W

1300 VA

220 V / 230 V / 240 V

180 V - 260 V

50 Hz, 60 Hz¹ / -6 Hz ... +5 Hz

50 Hz / 230 V

7.2 A

1

1 / 1

96 % / 94.3 %

○

● / ●

● / ● / -

●

I / III

440 / 339 / 214 mm

(17.3 / 13.3 / 8.4 inch)

16 kg (35.3 lb)

-25 °C ... +60 °C (-13 °F ... +140 °F)

33 dB(A)

0.1 W

Transformerless / convection

IP65

4K4H

100 %

Sunclix

Connector

Text line

○ / ○ / ○

● / ○ / ○ / ○ / ○

AS 4777, C10/11, CE, CEI 0-21, EN 50438², G83/1-1, IEC 62109-1/-2,
NRS 097-2-1, PPC, PPDS, RD 1699, RD 661/2007, UTE C15-712-1,
VDE-ARN 4105, VDE0126-1-1

Type designation

SB 1300TL-10



Easy, Different, Flexible – The New Micro Inverter System From SMA

SMA's new feed-in system with micro inverters is the perfect solution for all residential PV systems, particularly in the low power classes. Knowledge of large-scale PV plant design is not required to install the new Sunny Boy 240 micro inverter combined with Sunny Multigate. Other advantages of the feed-in system include separate MPP tracking for each module and a modular approach to system expansion.

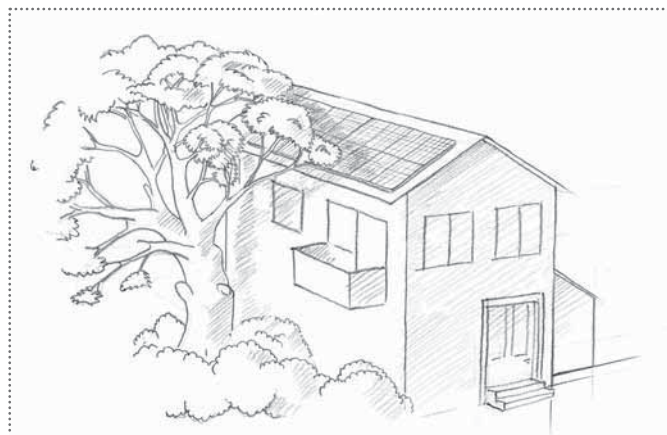
The perfect complement to the string concept

In addition to these advantages, installers and system operators profit from a double bonus: SMA's micro inverter and the well-known string concept can be perfectly combined. This way, existing PV systems can be expanded through the addition of a module or several PV arrays. This is applicable in many system types including modules in "inconvenient" places around dormers or partially shaded areas, additional roof surfaces (east/west roofs) and later installation on balconies.

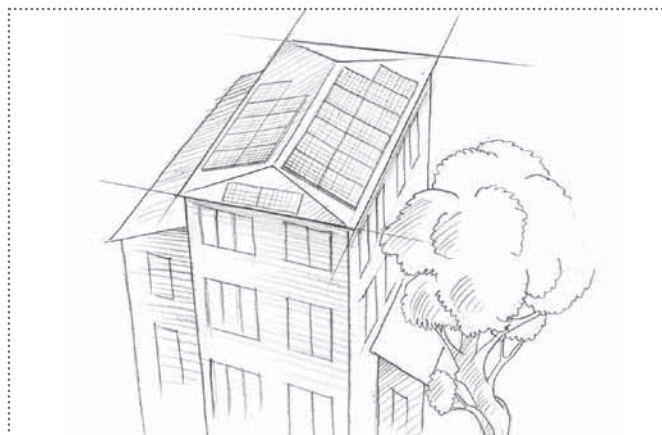
In this combination of an existing PV system and a micro inverter system, power and flexibility are of top priority: Starting with the Sunny Boy 240, up to 12 units can be connected to the Sunny Multigate, the intelligent link between the micro inverters and the utility grid.

In short, the concept for the micro inverter is extremely well thought out and offers a modular design, both as an individual solution and especially in combination with the common string concept.

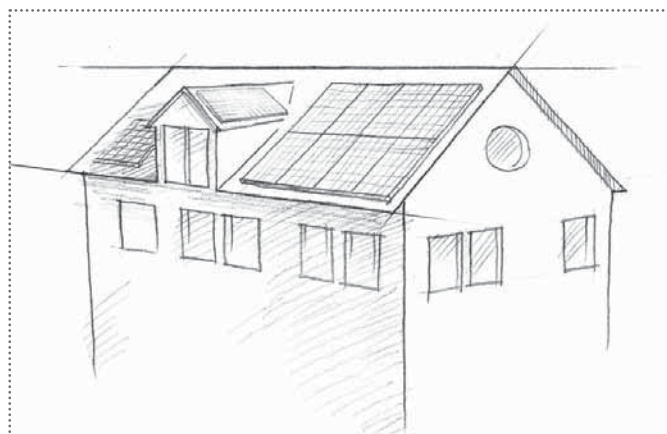
Common applications with real advantages



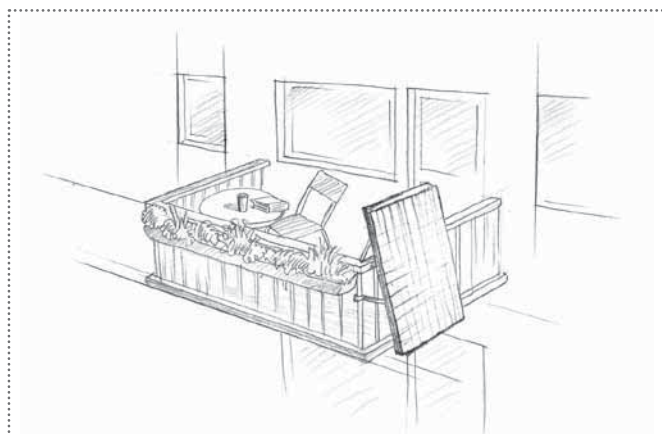
Partial shading: One MPP tracker per module ensures optimal yields, even with moving shade.



Different alignment: Even modules installed on an east-west roof under uneven irradiation conditions can be operated.



Optimal use of roof surfaces: The micro inverter now makes it possible to use "inefficient" roof areas to generate electric current.



Small systems: Whether on the balcony or in the garden, even the smallest PV system for private power generation can use the Sunny Boy 240.



reddot design award



Economical

- CEC efficiency of 96 %
- Optimal module use with individual MPP tracking
- Maximum service life thanks to patented electronics design and minimum number of components

Safe

- Galvanic isolation
- Integrated grid disconnection point with monitoring in the Sunny Multigate
- Sunny Multigate XT for outdoor use
- Complies with all relevant protection classes and standards

Communicative

- Integrated Webconnect function to Sunny Portal via Ethernet
- Real-time monitoring on module level
- Remote monitoring via smartphone or tablet
- Free and convenient plant monitoring via Sunny Portal

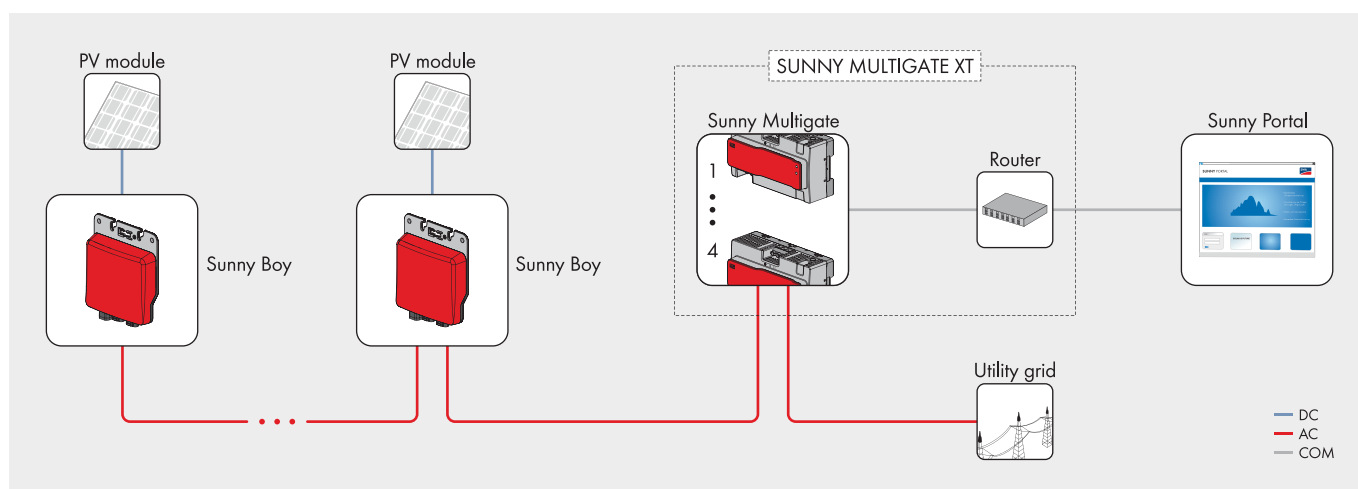
User-Friendly

- Pre-assembled AC cables
- Selection of DC adapters for the SB 240
- Turnkey Sunny Multigate XT, pre-installed component for various system sizes
- Easy installation

SUNNY BOY 240-US

Great things come in small packages

The ideal inverter for a flexible, modular PV system: The Sunny Boy 240, in combination with the Sunny Multigate, is the perfect, easy-to-install solution for various applications such as differently arranged substrings and systems with regularly shaded modules. As a result of their modular design, systems equipped with the Sunny Boy 240-US, the Sunny Multigate-US and the Sunny Multigate XT can be realigned and upgraded at any time – for instance for structural modifications, capacity expansion or depending on financial circumstances. The Sunny Multigate XT is specifically designed for outdoor use and is a robust, turnkey component with up to four pre-installed Multigate devices.



Technical Data	Sunny Boy 240-US	Sunny Multigate-US
Input (DC)		
Max. DC power (@ $\cos \varphi = 1$) / max. input voltage	250 W / 45 V	— / —
MPP voltage range / rated input voltage	23 V – 32 V / 29.5 V	—
Min. input voltage / max. initial input voltage	23 V / 23 V	—
Max. input current / max. input current per string	8.5 A / 8.5 A	—
Number of independent MPP inputs / strings per MPP input	1 / 1	—
Max. number of micro inverters	—	12 x SB 240-US-10
Output (AC)		
Rated power (@ 240 V, 60 Hz) / max. apparent AC power	240 W / 240 VA	2880 W / 2880 VA
Nominal AC voltage / range	2 x 120 V / 211 V – 264 V	2 x 120 V / 211 V – 264 V
AC power frequency / range	60 Hz / 59.3 Hz ... 60.5 Hz	60 Hz / 59.3 Hz ... 60.5 Hz
Rated power frequency / rated grid voltage	60 Hz / 240 V	60 Hz / 240 V
Max. output current	1 A	12 A
Power factor at rated power	1	1
Feed-in phases / connection phases	1 / 2	2 / 2 x 120 V split phase
Efficiency		
Max. efficiency / CEC efficiency	95.9 % / 96 %	—
Protective Devices		
Ground-fault monitoring / grid monitoring	● / ●	— / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / ●	— / ● / —
Max. permissible fuse protection	—	15 A circuit breaker
General Data		
Dimensions (W / H / D)	188 / 218 / 43 mm (7.4 / 8.6 / 1.7 inch)	162 / 90 / 63 mm (6.4 / 3.5 / 2.5 inch)
Weight	1.3 kg (2.9 lb)	0.7 kg (1.5 lb)
Operating temperature range	-40 °C ... +65 °C (-40 °F ... +149 °F)	-40 °C ... +45 °C (-40 °F ... +113 °F)
Noise emission	38 dB(A)	
Self-consumption (night)	0.3 W	
Topology / cooling concept	HF transformer / convection	— / convection
Degree of protection (according to IEC 60529)	NEMA 3R	TYPE 1
Max. permissible value for relative humidity (non-condensing)	100 %	100 %
Communication		
Sunny Portal	—	SMA Webconnect via Ethernet
Features		
DC terminal / AC terminal	Connector / connector	— / screw terminal
Interface: Speedwire/Webconnect	—	●
Certificates and approvals (more available on request)	CAN/CSA C22.2 107.1-1, FCC Part 15 (Class A & B), IEC 62109-1/-2, IEEE 1547, UL 1741, UL 1998	
Warranty: 10 years	●	●
Note: Technical data is preliminary and subject to change, ● Standard features ○ Optional features — Not available		
Type designation	SB 240-US-10	MULTIGATE-US-10

	Multigate XT1	Multigate XT2	Multigate XT3	Multigate XT4
Input (AC) / Output (AC)				
Number of AC inputs / number of AC outputs	1 / 1	2 / 1	3 / 1	4 / 1
Connection terminals	AWG 6 – AWG 14			
General Data				
Dimensions (W / H / D)	305 / 305 / 152 mm (12 / 12 / 6 inch)	406 / 508 / 203 mm (20 / 24 / 8 inch)	610 / 508 / 203 mm (20 / 24 / 8 inch)	610 / 508 / 203 mm (20 / 24 / 8 inch)
Weight	4 kg (8.8 lb)	7 kg (15.4 lb)	12 kg (26.5 lb)	13 kg (28.7 lb)
Operating temperature range	-40 °C ... +45 °C			
Cooling principle / degree of protection (according to IEC 60529)	Convection / NEMA 3R			



reddot design award



Economical

- CEC efficiency of 96 %
- Optimal module use with individual MPP tracking
- Maximum service life thanks to patented electronics design and minimum number of components

Safe

- Galvanic isolation
- Integrated grid disconnection point with monitoring in the Sunny Multigate
- Sunny Multigate XT for outdoor use
- Complies with all relevant protection classes and standards

Communicative

- Integrated Webconnect function to Sunny Portal via Ethernet
- Real-time monitoring on module level
- Remote monitoring via smartphone or tablet
- Free and convenient plant monitoring via Sunny Portal

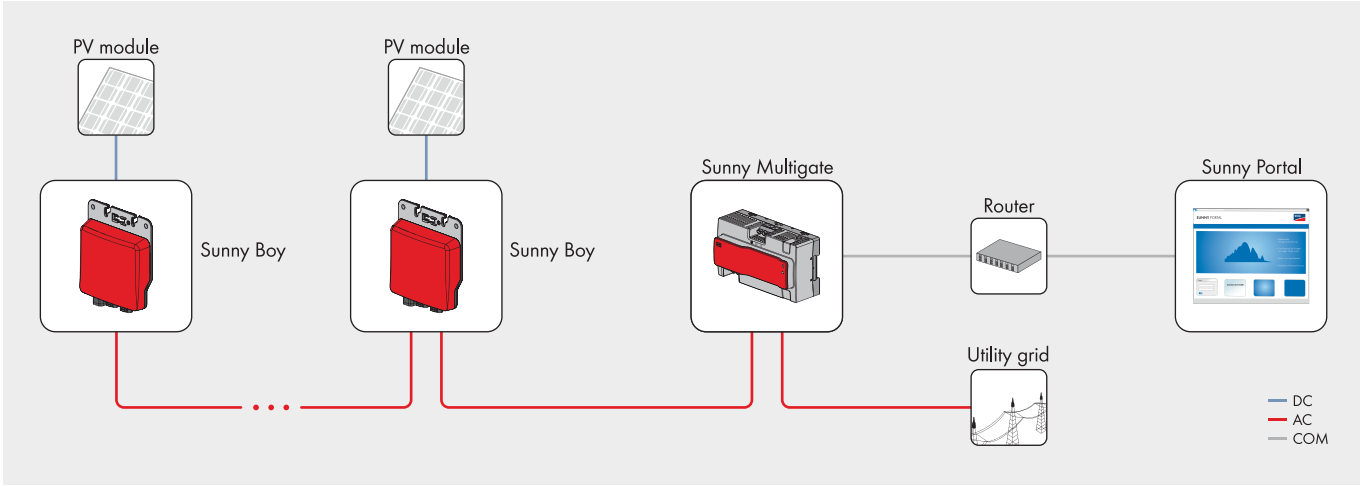
User-Friendly

- Pre-assembled AC cables
- Selection of DC adapters for the SB 240
- Easy installation

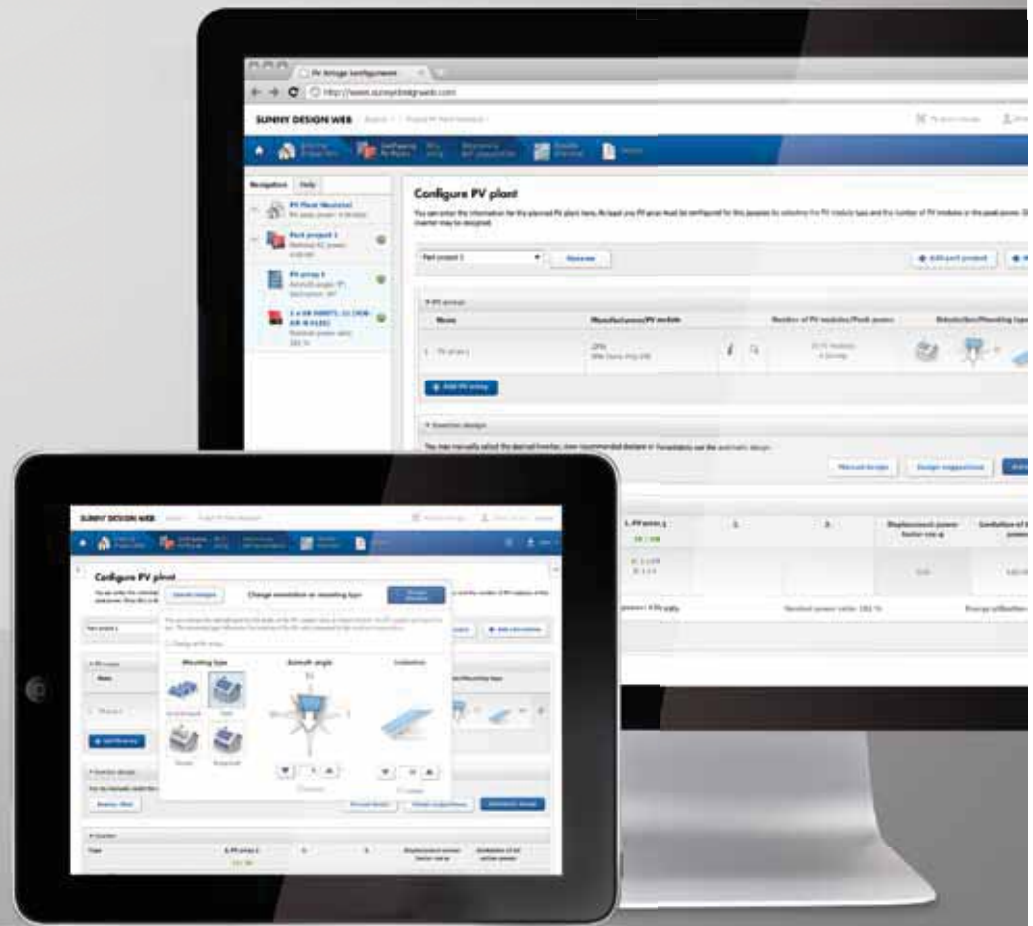
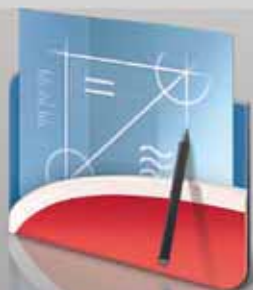
SUNNY BOY 240

Great things come in small packages

The ideal inverter for a flexible, modular PV system: The Sunny Boy 240, in combination with the Sunny Multigate, is the perfect, easy-to-install solution for various applications such as differently arranged substrings and systems with regularly shaded modules. Due to their modular design, all systems equipped with the Sunny Boy 240 and the Sunny Multigate can be realigned and upgraded at any time – be it due to structural modifications, capacity expansion or depending on financial circumstances. In addition, at SMA the micro inverter concept and the well-known string concept can be perfectly combined.



Technical Data	Sunny Boy 240	Sunny Multigate
Input (DC)		
Max. DC power (@ cos φ = 1)	245 W	—
Max. input voltage	45 V	—
MPP voltage range / rated input voltage	23 V – 32 V / 29 V	—
Min. input voltage / max. initial input voltage	23 V / 23 V	—
Max. input current	8.5 A	—
Max. input current per string	8.5 A	—
Number of independent MPP inputs / strings per MPP input	1 / 1	—
Max. number of micro inverters	—	12 x SB 240-10
Output (AC)		
Rated power (@ 230 V, 50 Hz)	230 W	2760 W
Max. apparent AC power	230 VA	2760 VA
Nominal AC voltage / range	230 V / 180 V – 270 V	230 V / 180 V – 270 V
AC power frequency / range	50 Hz / 45.5 Hz ... 63 Hz	50 Hz / 55.5 Hz ... 63 Hz
Rated power frequency / rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	1 A	12 A
Power factor at rated power	1	1
Feed-in phases / connection phases	1 / 1	1 / 1
Efficiency		
Max. efficiency / CEC efficiency	95.9 % / 96 %	—
Protective Devices		
Ground-fault monitoring / grid monitoring	● / ●	— / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / ●	— / ● / —
General Data		
Dimensions (W / H / D)	188.4 / 218.4 / 43.7 mm (7.4 / 8.6 / 1.7 inch)	162 / 90 / 63 mm (6.4 / 3.5 / 2.5 inch)
Weight	1.3 kg (2.9 lb)	0.7 kg (1.5 lb)
Operating temperature range	-40 °C ... +65 °C (-40 °F ... +149 °F)	-40 °C ... +45 °C (-40 °F ... +113 °F)
Noise emission	38 db(A)	—
Self-consumption (night)	0.3 W	—
Topology	HF transformer	—
Cooling concept	Convection	Convection
Degree of protection (according to IEC 60529)	IP65	IP20
Max. permissible value for relative humidity (non-condensing)	100 %	—
Communication		
Sunny Portal	—	SMA Webconnect via Ethernet
Features		
DC terminal	Connector	—
AC terminal	Connector	Screw terminal
Interface: Speedwire / Webconnect	—	●
Certificates and approvals (planned)	AS 4777, C10/11, EN 50438, G83/1-1, IEC 62109-1/-2, PPC, RD1699, VDE0126-1-1, VDE-AR-N 4105	
● Standard features ○ Optional features — Not available		
Note: Technical data is preliminary and subject to change		
Type designation	SB 240-10	MULTIGATE-10



Easy-to-Use

- Optimal design for grid-connected PV plants
- Tips for plant optimization
- Free registration

Comprehensive

- Database of current PV modules
- Use of high-resolution meteorological data
- Creation of design proposals
- Energy analysis over a period of one operating year
- Forecast of projected self-consumption
- Custom calculation of optimum dimensioning for inverters

Flexible

- Worldwide location selection
- Import of individual load profiles and meteorological data
- Access via Web browser or desktop client

SUNNY DESIGN

Plant design made easy

With the latest release of the Sunny Design application, designing PV systems is even easier. Simply install Sunny Design on a Windows-operated PC or open the online version using a browser, iPad or Android tablet, enter all required data and receive the ideal plant configuration within minutes. The application provides solar power professionals and plant planners with a user-friendly interface. The software provides data for an evaluation of the system's economic viability along with technical testing of the various components. In this way, end customers receive a tailored PV system and solar power professionals save valuable time.

Sunny Design encompasses the most important data on all SMA inverters and communication products as well as standard PV modules. The intuitive program guides the planner through the entire design process. A set of design recommendations for the optimum configuration can be viewed easily and quickly, making it possible to configure even complex PV systems with several different types of substrings and inverters. This saves time and allows different configurations to be simulated without the need for complicated calculations.

Potentially critical operating states are detected and identified. This ensures that the planner can react to any deviations from standard designs. The software also helps to estimate the effect of the most important parameters on the yield, the potential rate of self-consumption and the investment costs, thus offering a customized system.

Realistic operation is evaluated over a calendar year on the basis of the integrated meteorological database. Although a precise yield forecast cannot be expected from Sunny Design (further simulation programs are necessary for this), it can determine the yield differences between various designs,

including a technical performance verification. Finally, a technical assessment of the system design is clearly illustrated in an individually customized results report. As a printed document or an electronic PDF file, this summary is the ideal supplement to any offer.

In addition to these features, Sunny Island storage systems can also be considered while calculating possible self-consumption. Also, if the inverters are configured for polystring operation, several module strings in different alignments can be operated with one single MPP tracker.

The desktop option

As an installer for Windows-operated PCs, Sunny Design 3 now offers all features included in the Web version for the ideal planning and design of a PV system. This allows the application to also be used off-line. The Internet connection makes the synchronization of projects and personal data with the online account easy. Sunny Design supports Windows 7 and 8 operating systems as well as Windows XP SP3.

Sunny Design Web

Sunny Design Web makes system design on a Mac, iPad, Android tablet or smartphone also possible. It can be accessed using a standard Web browser. Registered users have access to additional, useful functions such as online project management and an area for personal settings.
www.SunnyDesignWeb.com

Sunny Design for photovoltaic diesel hybrid systems

Since January, SMA has offered system technology for photovoltaic diesel hybrid applications. Here, PV systems supplement genset-based systems in order to reduce a genset's fuel consumption and, subsequently, costs. Sunny Design now also assists in the planning and design of such photovoltaic diesel hybrid systems. Apart from the PV system, the design software also takes the integrated gensets into account and provides forecasts for diesel or CO₂ savings based on the data entered as well as complete analyses of economic viability. More information on photovoltaic diesel hybrid applications can be found starting on page 82.



Use of real, high-resolution meteorological data



Database of current PV modules



Database of all SMA inverters



Tips for system optimization



Worldwide location selection



Creation of design proposals



Results report with individual layout for integration into system quotes



Planning of system monitoring system



Special design for photovoltaic diesel hybrid systems



User-Friendly

- Monitoring, administration and presentation of the PV plant
- Basic version includes mobile access via iPhone and Android
- Basic version free of charge

Easy-to-Read

- Live overview of entire plant portfolio
- Detailed analysis of plant data displayed in high resolution

Powerful

- Module group analysis
- Guaranteed performance

SUNNY PORTAL PROFESSIONAL PACKAGE

An investment that pays off

The new Sunny Portal Professional Package offers additional functions for professional PV plant monitoring to operators and installers of large-scale plants. Furthermore, the package enhances the entire portfolio with significant multi-plant management functions.

SUNNY PORTAL*

- Comprehensive monitoring, administration and presentation of the PV system
- Mobile access via iPhone and Android



PROFESSIONAL PACKAGE

- + **MORE UP-TO-DATE:** Overview of the entire system portfolio
- + **MORE DETAILED:** Analysis of high-resolution system data
- + **MORE MODULAR:** Analysis of module groups
- + **FASTER:** High performance

* Remains free of charge

SMA Sunny Portal has more than half a million visitors each month, and the number is increasing. There is a high demand for comprehensive management and monitoring tools for professional PV plant monitoring. And for a good reason. The fact is that uninterrupted monitoring is required in order to reap the maximum power and economic benefits of every plant – and this becomes even more important, the larger and more complex the PV plant is designed.

To this end, working with operators of commercial PV plants and taking SMA Service's years of experience into account, a high-quality package has been put together to support professional PV plant monitoring. The Professional Package serves as fee-based expansion of SMA's complementary Sunny Portal for commercial users of the web application.

Resembling a central control room, the Professional Package provides plant operators and monitors with a quick overview of the entire plant portfolio as well as key information on each individual plant. The fee-based Professional Package ensures enhanced process data processing, allowing deviations to be addressed more quickly.

Plus, the Professional Package does even more than boast significant benefits in speed. Through the development of an autodidactic algorithm, we can analyze deviations in power and react to unusual situations in a targeted manner. This ensures

substantial improvement in the quality of system notifications. With only a few clicks, deeper analyses of plant data can also be made.

Furthermore, the Sunny Portal Professional Package is also designed to configure module groups. This means PV plants can be grouped into various partitions, such as east-west orientations, in various building-mounted systems or based on shading. Inverter yields within the selected module groups can also be compared.

A Sunny Portal system can be easily upgraded with the Professional Package online. At the moment the Professional Package is only available to customers in Germany, but will gradually be introduced in other countries.



Building Upon the Future

With energy management from SMA

The energy transition challenge

We are currently standing in the face of the energy transition challenge. Not only in Germany and in Europe, but all across the globe, people have the desire to create sustainable energy supply. It means no more coal, no more oil and no more nuclear energy. This requires not only strong will-power but also great effort.

Here at SMA, we make it our duty to provide the technology needed for a successful energy transition. Technology that generates clean electric current through photovoltaics within a large, centralized framework. In particular, technology that ensures "small-scale" decentralized power generation. Even though the developments over

the past years have positively trended towards renewable energy sources such as photovoltaics, the need for more comprehensive thinking and systems has become increasingly clear.

New opportunities for return

Considering globally increasing energy costs, money can only be saved through the comfortable security of fixed energy prices. It is exactly this type of security that we work to guarantee. There is already an enormous discrepancy between the price of one (purchased) kilowatt hour of electric current and the corresponding average cost of generating electricity. For example, in Germany, Australia and Spain one kilowatt hour of electric current costs up to 15 cents in areas

where residential PV systems can be operated. Similar is true for commercial businesses. This means that system operators receive attractive returns through the highest possible rate of self-consumption. So, instead of purchasing expensive "external" electric current, it is better to consume clean, self-generated electric current. This principle and its accompanying technology will contribute to many international markets supporting themselves in the future. Governmental financial support program for solar power storage, such as the program in Germany, provide additional attractive support.



Images: Leon Schmidt

From generation to supply to independence

Since its advent, intelligent energy management has taken center stage stealing the spotlight away from the simple “evening out” of solar power feed-in – which relies completely on the sun’s behavior – moving energy generation away from pure generation and instead toward a solar energy based supply. This trend stipulates the largest possible and most sensible consumption of self-generated solar power. Or, to put it in other words: System operators should ideally be able to meet their entire energy demand with their own solar energy. It is all about independence. It is all about the freedom to choose how much clean energy is generated decentralized at home and how

it is consumed. This type of energy management serves greater independence and has several additional benefits. Apart from the financial advantages, greater efficiency and more independence, system operators enjoy more comfort and have a completely transparent energy budget. This transparency also facilitates more conscientious use of energy and helps to reduce total energy consumption. To ensure the success of the energy transition, even utility grids will soon intelligently combine loads, renewable power sources and storage systems. The ideal basis for this, however, lies in generating electricity locally and using energy intelligently in the SMA Smart Home. The essential and exciting factor: Anyone can begin their own, personal energy transition today.



SMA SMART HOME

The system solution for more independence

Where intelligent energy takes shape

The SMA Smart Home ensures, with its modular design, that each and every plant operator can individually determine how to carry out energy management. This is true for new and existing systems, small and large power classes and for flexible and integrated storage solutions.

Intelligent – analyze, plan, inform

The base function of the SMA Smart Home ensures comprehensive monitoring and analysis of all relevant energy flows. The key feature of this basic function is continuous data exchange among the individual components and the Sunny Home Manager, the central energy manager. Based on this data and

depending on regional PV generation forecasts, the SMA Smart Home calculates the best consumption of solar energy. This is of course done according to the system operator's individual settings which are entered via the user-friendly Sunny Portal interface.

Automatic load management – plan and activate

Doing the laundry while the sun is shining? That is right. The purpose of this function is to perfectly time power consumption with power generation – and fully automatically at that. Ideally, this means that a lot of electric current should be consumed when the PV system is also harvesting an abundance of energy. Based on diverse input variables, the Sunny Home Manager puts together a

schedule for the flexible loads. Automatic activation at the optimal time is carried out via connected SMA radio-controlled sockets or direct communication with the end device.

Temporary storage of solar energy – stockpile and make available

Maximum flexibility: An electric storage system allows you to accumulate solar energy for later use, boosting self-consumption rates and independence. While the cost of fossil energy carriers continues to rise, there is a clear downward trend in the price of batteries. Even small storage systems can reduce grid load by limiting the maximum feed-in capacity and avoiding power loss due to throttling. Large storage systems pro-

THE BENEFITS OF THE SMA SMART HOME AT A GLANCE:

- » Planning security and cost saving through the self-consumption of solar energy in the home at fixed, cheap rates
- » Maximum environmentally friendly energy supply through use of self-generated solar energy
- » Greater independence from rising electricity prices
- » All optimizations are automatically carried out taking consumer needs into account
- » Visible savings potential through complete transparency of electrical energy consumption
- » Prepared for the future by incorporating variable electricity prices and upcoming Smart Grid business models

OUR PRODUCT SOLUTIONS:

1. Sunny Home Manager. The basic solution for intelligent energy management.
2. SMA Integrated Storage System. The turn-key solution for new PV systems.
3. SMA Flexible Storage System. The versatile solution for new and retrofit PV systems.

vide homes with greater protection from grid failures and make them less dependent on external power sources. With the integration of electric vehicles into the household energy concept, yet another additional storage option becomes available.

Thermal use of solar energy – convert, warm up, cool down

Apart from its direct electrical use and storage, the SMA Smart Home also facilitates the thermal use of self-generated solar energy. For example, “excess” solar energy can be used to heat water and can thus be temporarily, thermally stored. A heat pump that converts electrical energy into thermal energy can also be used as needed. In other words, it heats or cools.

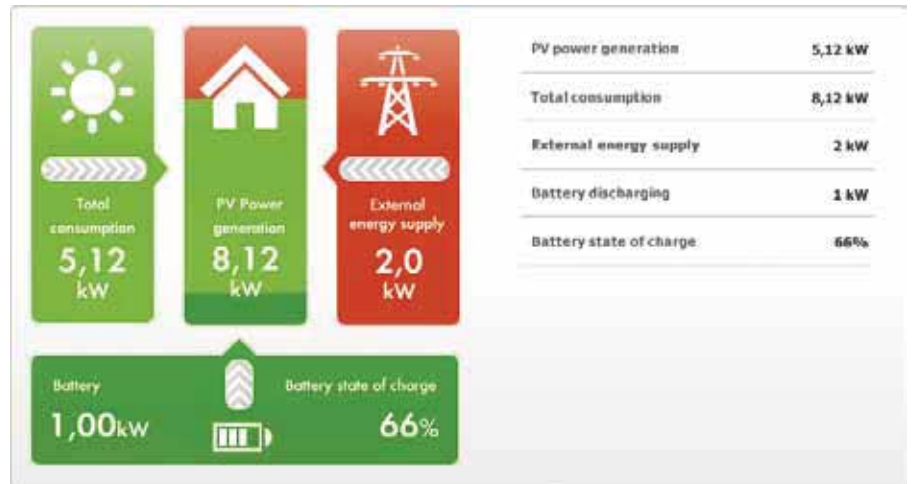
Collaboration with Miele, Stiebel Eltron and Vaillant

With the future of communication standards in mind, SMA is collaborating with worldwide leaders in household appliances such as Miele and with highly innovative companies such as Vaillant and Stiebel Eltron. This paves the way for endless discovery of intelligent ways to use clean solar energy efficiently. Simply put – our system solutions provide maximum benefits to our customers.

SUNNY HOME MANAGER

The basic solution for intelligent energy management

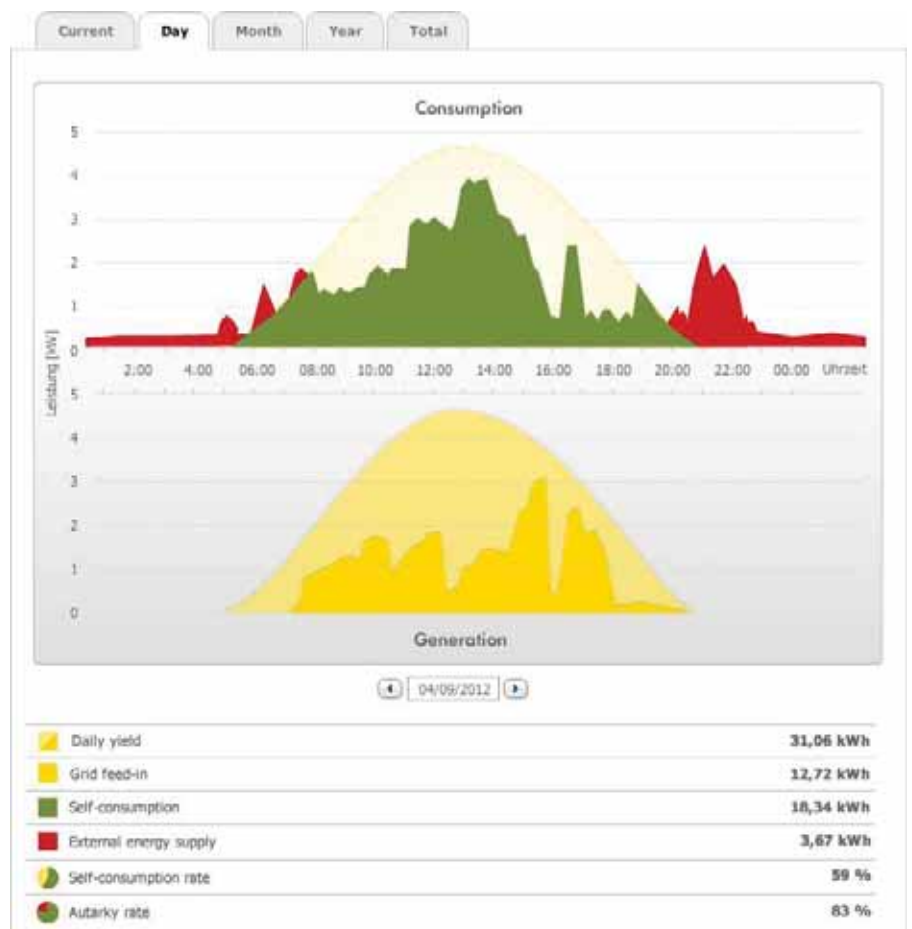
The Sunny Home Manager acts as the switchboard for intelligent energy management in the SMA Smart Home. It guarantees not only comprehensive monitoring but also the analysis and visualization of all relevant energy flows in the home. In addition, it also carries out PV generation and consumption forecasting and planning functions.



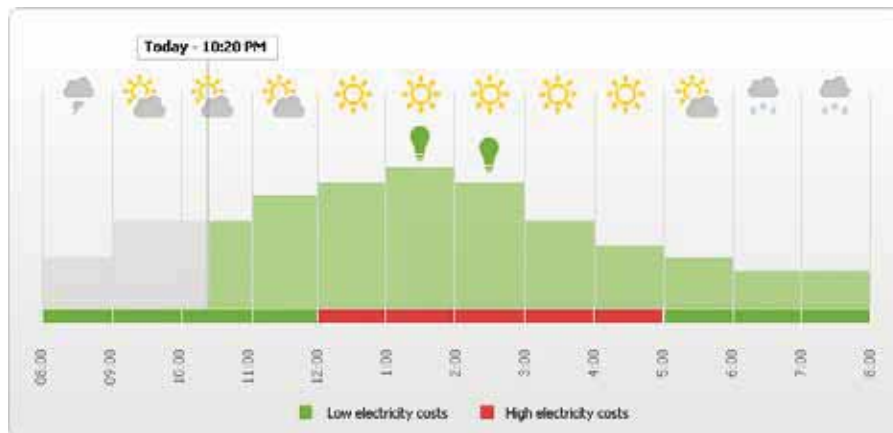
The status report displays current power generation, feed-in and purchased electricity data.

System monitoring and energy monitoring

Every PV plant in a residential PV system can be conveniently and seamlessly monitored with the Sunny Home Manager. After a simple commissioning procedure with the System Setup Assistant, the Sunny Portal clearly displays all basic functions. The system operator can use the live display to get quickly updated on energy home management.



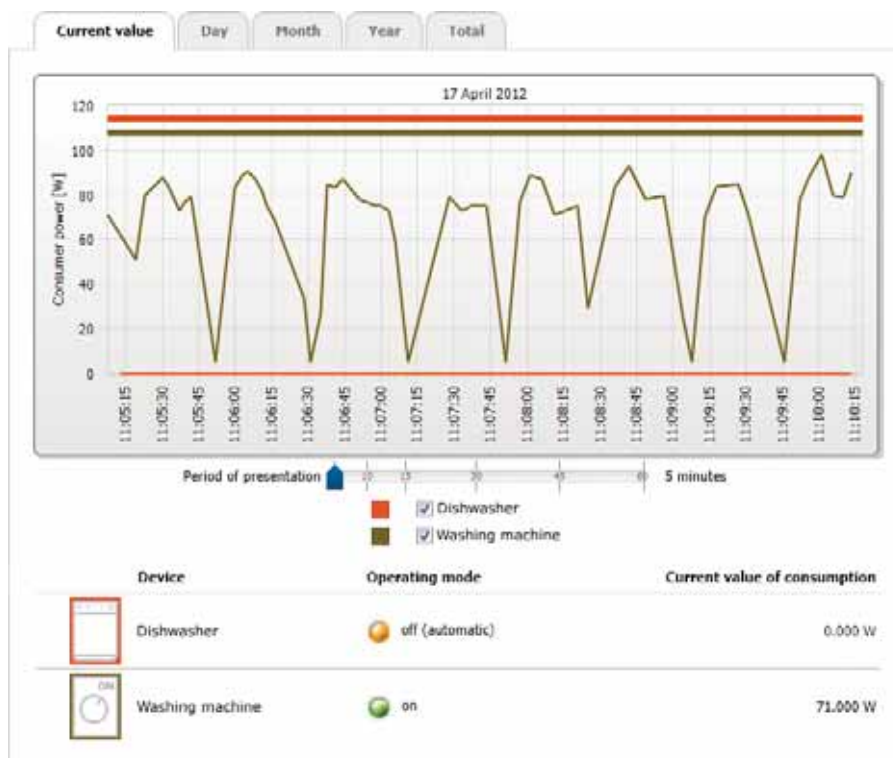
The analysis page displays the energy balance for the desired time period and facilitates a variety of generation, feed-in, consumption and self-consumption analyses.



Display of the generation forecast over the next hours as well as recommended actions

Energy management

The Sunny Home Manager's energy management functions are based on more than statistics, in fact they are dynamic through their assessment of various influential factors. The resulting recommended actions the device generates are the main component of this solution. The Sunny Home Manager calculates these actions based on the home's typical load profile and local weather forecast as well as the subsequent PV generation forecast. The results are unrivaled and predictive. Your customers are informed in specific terms about when they can best make use of their solar energy, with what, and for how long – for example when is the perfect time to use the washing machine. This increases the share of self-consumption and level of independence.



The energy balance indicates the duration of operation and load level of the various remotely controlled appliances.

Load control via SMA radio-controlled sockets

Operating the Sunny Home Manager with SMA radio-controlled sockets expands the possibilities to include automatic activation of individual electrical devices in the home. Based on individual user criteria, the Sunny Home Manager can remotely turn household appliances, such as washing machines, dishwashers, or heat pumps, on and off. Through the process, you can increase self-consumption and monitor load profiles of various appliances, which helps to single out any electricity guzzlers.

How are loads intelligently integrated and controlled?

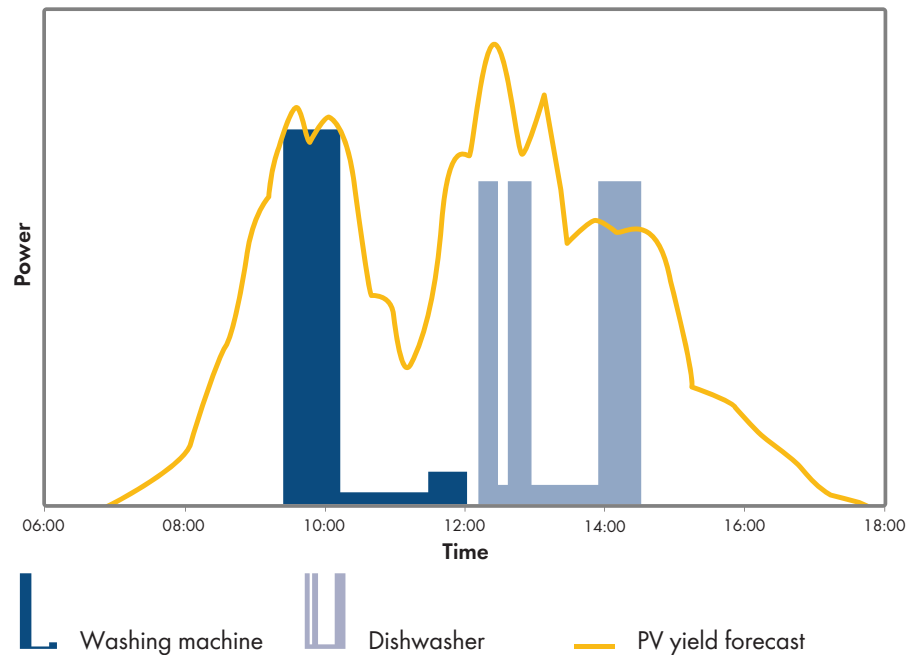
The Sunny Home Manager integrates loads such as dishwashers or washing machines in such a way as to ensure that their typical load profiles fit perfectly with the forecasted PV generation. An appliance's running time and consumption profile are compared with the actual on-site PV generation forecast which was calculated by the Sunny Home Manager. Even during inconsistent irradiation, the load is started with the initial heating phase corresponding to solar energy generation. Furthermore, certain loads can be programmed to only start if sufficient surplus electric current is available, such as current which would otherwise be lost due to active power limitation.

Compatible with cutting-edge technologies

The SMA Smart Home's switchboard is not only compatible with the Miele@home system solution from premium manufacturer in Gütersloh, Germany, which is a system that allows respectively equipped devices to be controlled directly, but is also compatible with heat pumps from Stiebel Eltron, the leading manufacturer of house and system technology. Furthermore, a heating element can be used to harness surplus solar energy for water heating.

Storage system integration

Within the framework of the SMA Smart Home, we recommend combining the Sunny Home Manager with a storage system to optimize load management. The Sunny Island in the SMA Flexible Storage System and the Sunny Boy Smart Energy in the upcoming SMA Integrated Storage System are both highly efficient storage solutions which can be easily integrated.



The load profile displays the optimal integration of household appliances with realistic consumption profiles. Basic consumption is not taken into account in this visual representation.



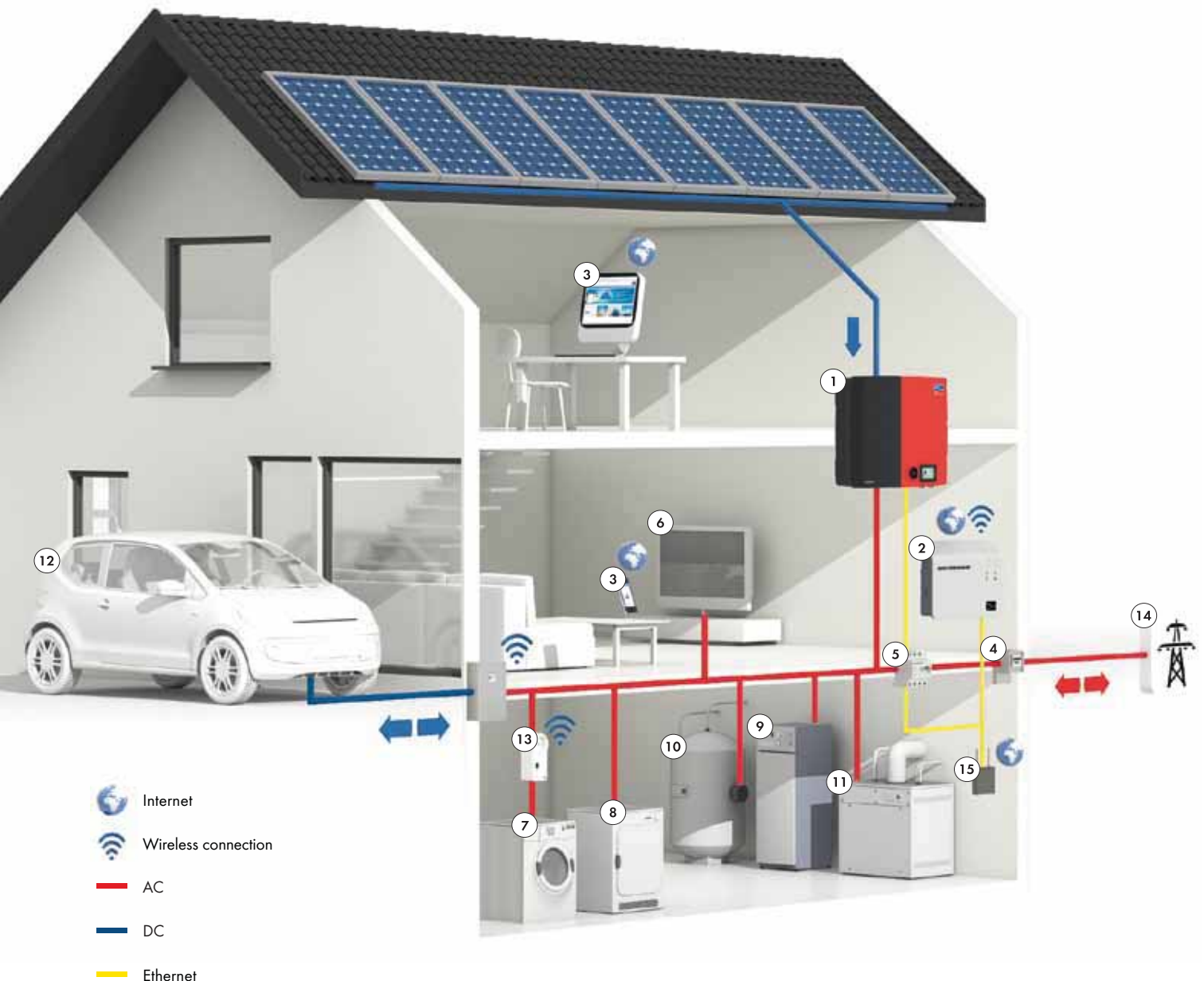
BENEFITS AT A GLANCE:

- » Greater planning security and independence from costs related to future developments in the energy market
- » Self-consumption rate boosted from 30 percent to 40 percent*
- » Capable of automatically starting appliances at the perfect time (taking grid requirements into account)
- » 40 percent less electricity from utility companies*
- » Transparency for all household energy flows and a live display of power values
- » Free online monitoring of the PV system via Sunny Portal (basic function)

* All figures are based on an annual PV generation of 5000 kWh and an equally high annual power consumption.

SMA INTEGRATED STORAGE SYSTEM

The turn-key solution for new PV systems.*



With the SMA Integrated Storage System, which will be available as of the end of October 2013, SMA furnishes a simple and economical solution to help anyone begin their own energy transition. The system's core elements are the Sunny Home Manager, the Sunny Boy Smart Energy, our high-quality, modern PV inverters with integrated storage capacity and the SMA Energy Meter.

The optimal storage capacity

The lithium-ion battery integrated into the Sunny Boy Smart Energy has an effective

capacity of around 2 kilowatt hours. This is a decisive value, as it facilitates economically optimal operation: As the increase in self-consumption levels off with increasing storage capacity, the storage utilization ratio decreases. Furthermore, the battery's capacity leads to virtually all generated solar energy being consumed, even with active power limitation, and increases the rate of self-consumption to up to 55 percent. For PV system operators, greater self-consumption means greater independence from rising electricity prices. A further benefit of this system concept – the lithium-ion

battery is designed with a useful life of 10 years, reducing the initial investment and the overall costs over a period of 20 years as well as the risk of failure.

1 Sunny Boy Smart Energy**2 Sunny Home Manager****3 Sunny Portal**

The Sunny Portal is used to operate and configure the Sunny Home Manager. These functions are available via any Internet browser and can be accessed using a PC or smartphone. The live display of all power and energy values provides further energy saving incentives.

4 Energy meter**5 SMA Energy Meter****6 Uncontrollable loads**

Stoves, TVs, computers etc. are not controlled by the Sunny Home Manager. The Sunny Home Manager does, however, memorize the typical load profile of the building and takes it into account during automatic controllable load management planning.

Controllable loads

Electrical appliances that do not have specific turn-on times can be remotely activated by the Sunny Home Manager and hence included in the intelligent load management system.

7 Washing machine**8 Clothes dryer****9 Heat pump****10 Thermal energy storage with heating element**

The heating element converts electrical energy into thermal energy to increase self-consumption.

11 Heating system**12 Electric car****13 SMA Bluetooth® radio-controlled socket****14 Utility grid****15 Router****BENEFITS AT A GLANCE:**

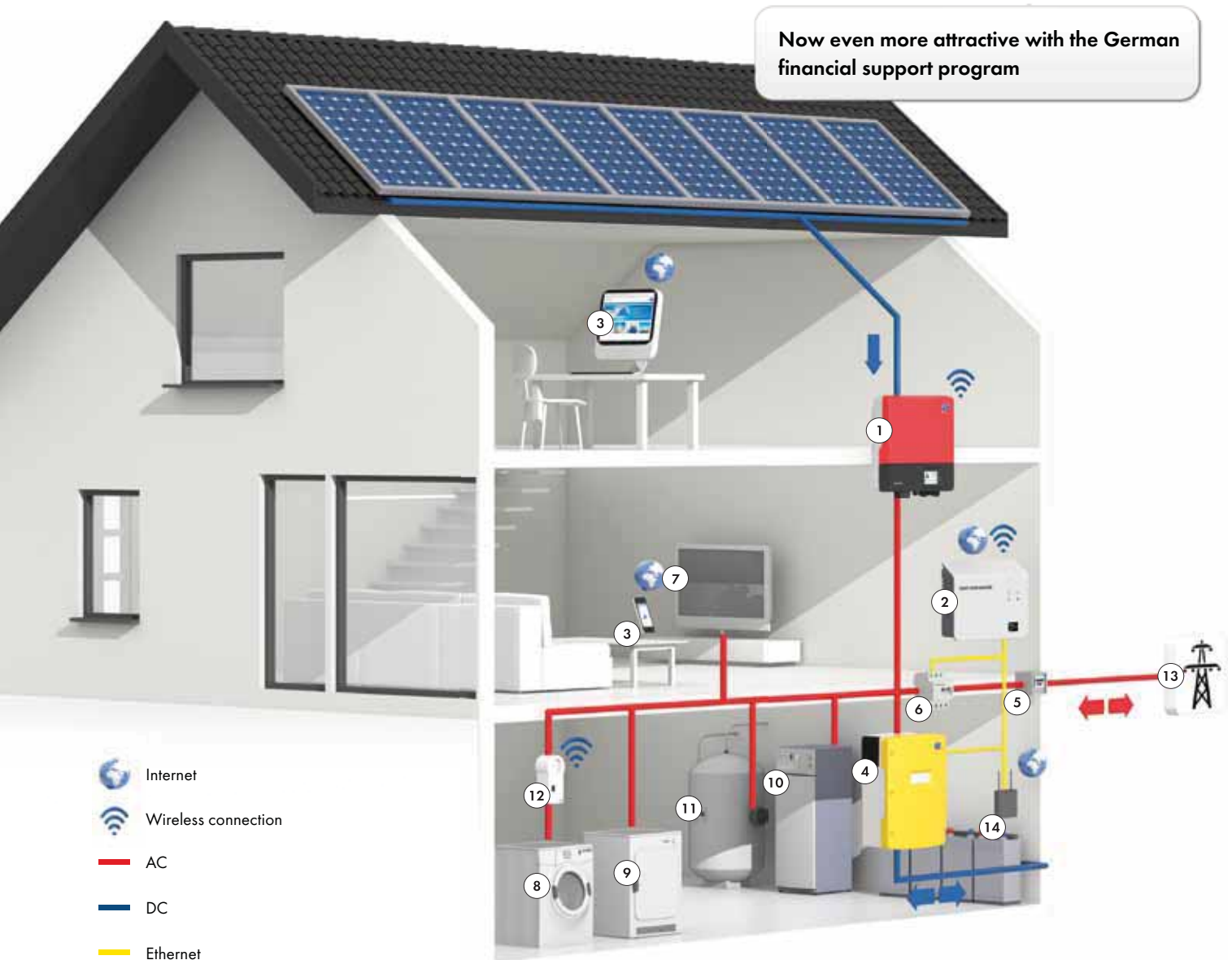
- » Significantly reduced initial investment thanks to application-oriented battery capacity
- » Self-consumption rate boosted to up to 55 percent (up from 30 percent)**
- » Use of solar energy possible 24 hours a day
- » Up to 55 percent less electricity from utility companies**
- » All PV power generated annually is used, even when the power feed-in is limited to 70 percent or less of nominal PV array power
- » Outstanding efficiency in power conversion and temporary storage of power
- » Maximum reliability and dependability with specially developed lithium-ion cells from LG Chem with integrated battery management

* System not available in all countries

** All figures are based on an annual PV generation of 5000 kWh, annual power consumption corresponding to PV generation, an effective battery capacity of 2 kWh and the use of a Sunny Home Manager.

SMA FLEXIBLE STORAGE SYSTEM

The versatile solution for new and retrofit PV systems.*



The SMA Flexible Storage System is the flexible storage solution for new and existing systems and keeps generated solar energy on reserve until it is needed in the household. With this advancement, SMA provides all the components necessary for system operators to design their own energy transition.

Tailored storage capacity

From self-sufficiency to increased self-consumption: The effectiveness and efficiency of a storage solution is directly linked to the

increase and decrease in battery capacity. A relatively large battery capacity is needed to bridge prolonged grid failures but has a significant impact on the economic efficiency of the system. If independence from rising electricity prices is a priority, then at least a medium-sized battery is required. However, an additional energy source is needed during periods of low solar irradiation. If system costs are your main concern, then a small battery is recommended. SMA offers a flexible system solution for all of these requirements with the SMA Flexible Storage System, which consists of the Sunny

Island battery inverter, the speedwire data module, Sunny Remote Control and Sunny Home Manager. In addition, they can be combined with an SMA PV inverter, SMA radio-controlled sockets as well as an individual number of battery modules.

1 Sunny Boy 5000TL**2 Sunny Home Manager****3 Sunny Portal**

The Sunny Portal is used to operate and configure the Sunny Home Manager. These functions are available via any Internet browser and can be accessed using a PC or smartphone. The live display of all power and energy values provides further energy-saving incentives.

4 Sunny Island 6.0H**5 Energy meter****6 SMA Energy Meter****7 Uncontrollable loads**

Stoves, TVs, computers etc. are not controlled by the Sunny Home Manager. The Sunny Home Manager does, however, memorize the typical load profile of the building and takes it into account during automatic controllable load management planning.

Controllable loads

Electrical appliances that do not have specific turn-on times can be remotely activated by the Sunny Home Manager and hence included in the intelligent load management system.

8 Washing machine**9 Clothes dryer****10 Heat pump****11 Thermal energy storage with heating element**

The heating element converts electrical energy into thermal energy to increase self-consumption.

12 SMA Bluetooth® radio-controlled socket**13 Utility grid****14 Router****BENEFITS AT A GLANCE:**

- » Self-consumption rate boosted to up to 65 percent (up from 30 percent)**
- » Use of solar power possible 24 hours a day
- » Up to 65 percent less electricity from utility companies**
- » All PV power generated annually is used, even when the power feed-in is limited to 70 percent or less of nominal PV array power
- » Can be used to upgrade almost any existing PV system
- » Maximum flexibility in terms of storage, battery type and battery capacity
- » Future-oriented with Smart Grid compatibility

* System not available in all countries

** All figures are based on an annual PV generation of 5000 kWh, annual power consumption corresponding to PV generation, an effective battery capacity of 5 kWh and the use of a Sunny Home Manager.



Innovative

- Active power limitation at the grid-connection point
- Consumption analysis for each individual load
- Display of recommended actions for load management

Easy-to-Use

- Automatic, intelligent control of loads via a maximum of 10 SMA radio-controlled sockets
- Convenient commissioning with the system setup assistant
- Free standard access to Sunny Portal with all basic functions

Transparent

- Convenient system monitoring via Sunny Portal
- Overview of all energy flows in the home
- Visualization of weather and PV forecast data

Flexible

- Several standardized meter interfaces
- Individual specifications for controlled devices
- Easily combined with SMA Smart Home components

SUNNY HOME MANAGER

The control center for intelligent energy management*

The Sunny Home Manager is the ideal solution for intelligent energy management within the SMA Smart Home, thanks to the standard access to Sunny Portal. It provides an overview of all energy flows in the household, automatic load control and the integration of storage into the SMA Flexible Storage System, available now and in the upcoming SMA Integrated Storage System. The Sunny Home Manager includes PV forecast data allowing for optimum load management and a considerably higher rate of self-consumption. In addition, the active power fed into the utility grid can be limited to any value between 10 and 100 percent of the installed PV array power via remote parameterization.

*PV forecast data and SMA radio-controlled sockets are not available in all countries.



Precise determination of generation, consumption and self-consumption



Energy data displayed live in Sunny Portal



PV forecast data and variable electricity tariffs taken into account



Info page with recommendations for optimizing load management



Presentation and management of home consumption – even from remote locations



Analysis of power consumed by individual devices via SMA radio-controlled sockets



Safe transmission of energy data



Convenient monitoring via Sunny Portal

Technical Data	Sunny Home Manager
Communication	
Inverter communication	Bluetooth® / Speedwire
Sunny Portal communication	Ethernet
Connections	
Inverter	See inverter communication
Ethernet	10 / 100 Mbit, RJ45
Energy meter	Three 2 x 4-pole plugs for connection of S0 cable or D0 optical probes
Max. Number of Connected SMA Devices	
SMA devices	16
SMA inverters	12
SMA radio-controlled sockets	10
Max. Radio Range	
Bluetooth in free-field conditions	Up to 100 m (can be extended with an SMA radio-controlled socket)
Speedwire	100 m
Voltage Supply	
Voltage supply	External plug-in power supply
Input voltage	100 V – 240 V AC; 50 / 60 Hz
Power consumption	< 6 W (max. 14.3 W)
Ambient Conditions in Operation	
Ambient temperature	-25 °C ... +60 °C (-13 °F ... +140 °F)
Degree of protection (according to EN IEC 60529)	IP20
Max. permissible value for relative humidity (non-condensing)	5 % ... 95 %
Storage System	
Internal cache for PV system data	5 days
General Data	
Dimensions (W / H / D)	170 / 124.5 / 41.5 mm (6.7 / 4.9 / 1.6 inch)
Weight	0.22 kg (0.5 lb)
Mounting location	Indoors
Installation options	Top-hat rail mounting, wall mounting
Status display	2 LEDs
Language of the manual	German, English, Italian, Spanish, French, Dutch, Portuguese, Greek, Czech
Features	
Operation	Via Sunny Portal
Update function	Manually or automatically for the Sunny Home Manager and the connected SMA devices
Warranty	5 years
Certificates and approvals	www.SMA-Solar.com
Accessories	
SMA radio-controlled socket with Bluetooth Wireless Technology	Wireless control and energy measurement of household loads and increase of Bluetooth range
Input voltage	100 V – 240 V
Frequency	50 Hz / 60 Hz
Max. current	16 A
Max. switching power with resistive load	3680 W
Heating element	Power 500 W – 3500 W
Type designation	HM-BT-10



Easy-to-Use

- Installed like a PV inverter
- All-in-one enclosure
- Integrated battery module
- No battery sizing required
- Easily and flexibly combined with SMA Smart Home components

Economical

- Optimal, all-year effective battery capacity of 2 kWh
- Maximization of self-consumption through efficient charge and load management

Safe

- VDE-tested lithium-ion battery and inverter
- Battery partner LG Chem is world leader

Communicative

- Integrated Webconnect function to Sunny Portal via Ethernet
- Multifunction relay for simple load management

SUNNY BOY 3600 / 5000 SMART ENERGY

The easy combination of PV inverter and battery

It comes with everything. The new Sunny Boy Smart Energy is currently the easiest and most affordable solution for common household PV applications. This combination of a modern PV inverter and a battery with an effective capacity of two kilowatt hours not only optimizes increased self-consumption but also makes it possible to use home-generated solar energy around-the-clock. The Sunny Boy Smart Energy is the first wall-mountable, series-produced PV inverter to sport an integrated lithium-ion battery, and is thus perfect for use in the SMA Smart Home and tailored to meet energy transition requirements. Moreover, the integrated Webconnect function provides worldwide access to consumption and yield data via Sunny Portal.

Technical Data	Sunny Boy 3600 Smart Energy	Sunny Boy 5000 Smart Energy
Input (DC)		
Max. DC power (@ $\cos \varphi = 1$)	5200 W	6600 W
Max. input voltage	750 V	750 V
MPP voltage range / rated input voltage	125 V – 500 V / 400 V	125 V – 500 V / 400 V
Min. input voltage / initial input voltage	125 V / 150 V DC	125 V / 150 V DC
Max. input current input A / input B	15 A / 15 A	15 A / 15 A
Max. input current per string input A / input B	15 A / 15 A	15 A / 15 A
Number of independent MPP inputs / strings per MPP input	2 / A:2; B:2	2 / A:2; B:2
Output (AC)		
Rated power (@ 230 V, 50 Hz)	3680 W	4600 W
Max. apparent AC power	3680 VA	5000 VA*
Nominal AC voltage / range	220 V, 230 V, 240 V / 180 V – 280 V	220 V, 230 V, 240 V / 180 V – 280 V
AC power frequency / range	50 Hz, 60 Hz / ± 5 Hz	50 Hz, 60 Hz / ± 5 Hz
Rated power frequency / rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	16 A	22 A
Power factor at rated power	1	1
Adjustable displacement power factor	0.8 overexcited ... 0.8 underexcited	0.8 overexcited ... 0.8 underexcited
Feed-in phases / connection phases	1 / 1	1 / 1
Efficiency		
Max. efficiency / European efficiency	97 % / 96.5 %	97 % / 96.5 %
Max. battery charging / battery discharging efficiency	97 % / 97 %	97 % / 97 %
Max. battery efficiency	98 %	98 %
Battery		
Manufacturer	LG Chem	LG Chem
Technology	Li-ion	Li-ion
Continuous power	1.5 kW	1.5 kW
Effective capacity	2 kWh	2 kWh
Rated battery voltage	150 V	150 V
Protective Devices		
DC disconnection device	●	●
Ground-fault monitoring / grid monitoring	● / ●	● / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / –	● / ● / –
All-pole sensitive residual-current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
General Data		
Dimensions (W / H / D)	850 / 750 / 250 mm (33.5 / 29.5 / 9.8 inch)	850 / 750 / 250 mm (33.5 / 29.5 / 9.8 inch)
Weight of inverter / battery	30 kg / 25 kg (66.1 lb / 55.1 lb)	30 kg / 25 kg (66.1 lb / 55.1 lb)
Operating temperature range in battery operation	0 °C ... +40 °C (+32 °F ... +104 °F)	0 °C ... +40 °C (+32 °F ... +104 °F)
Noise emission (typical)	≤ 25 dB(A)	≤ 25 dB(A)
Self-consumption (night)	< 0.5 W	< 0.5 W
Topology	Transformerless	Transformerless
Cooling concept	Convection	Convection
Degree of protection (according to IEC 60529) inverter / battery section	IP54 / IP21	IP54 / IP21
Climatic category (according to IEC 60721-3-4)	3K5	3K5
Max. permissible value for relative humidity (non-condensing)	95 %	95 %
Features		
DC connection / AC connection	Sunclix / spring-cage terminal	Sunclix / spring-cage terminal
Display	Graphic	Graphic
Interface: Speedwire / Webconnect	●	●
Multifunction relay	○	○
Certificates and approvals (more available on request)	CE, UTE C15-712-1, VDE-AR-N 4105, VDE0126-1-1	CE, UTE C15-712-1, VDE-AR-N 4105, VDE0126-1-1
Certificates and approvals (planned)	AS 4777, C10/11, CEI0-21, EN 50438**, G59/2, G83/2, IEC 62109-1, IEC 62109-2 PPC, PPDS, RD 1699, SI 4777	AS 4777, C10/11, CEI0-21, EN 50438**, G59/2, G83/2, IEC 62109-1, IEC 62109-2 PPC, PPDS, RD 1699, SI 4777
Technical data is preliminary and subject to change		
● Standard features ○ Optional features – Not available		
Data at nominal conditions		
*4600 VA with VDE-AR-N 4105 / **Does not apply to all national appendices of EN 50438		
Type designation	SB 3600SE-10	SB 5000SE-10

AVAILABLE



Flexible

- Compatible with many battery capacities and types
- Suitable for virtually all system sizes and PV inverters
- For new and existing systems
- Can be upgraded with secure power function

Easy-to-Use

- System planning using planning guidelines and Sunny Design
- Installation similar to that of the Sunny Boy PV inverter
- Flexibly combined with SMA Smart Home components

Efficient

- Maximum self-consumption by controlling to the three-phase aggregate power
- High overall system efficiency

- Increased self-consumption thanks to dynamic power limitation at feed-in point

SUNNY ISLAND 6.0H for Grid-connected Applications

The battery inverter for maximum flexibility

The flexible, retrofittable battery inverter for maximum energy storage and self-consumption rate: As one of the core elements of the SMA Flexible Storage System, the new Sunny Island 6.0H has optimal features for temporarily storing self-generated solar energy for later consumption. It not only guarantees flexibility when it comes to system size and choice of inverter but also with regards to battery capacity and type. This means that lithium-ion batteries from leading battery manufacturers are also already supported. Furthermore, the Sunny Island is perfectly suited to carry out intelligent energy management functions in combination with the Sunny Home Manager within the SMA Smart Home.

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Easy-to-Use

- Quick plug and play installation
- Graphic visualization of current measured values in Sunny Portal

Flexible

- Space-saving top-hat rail mounting in household distribution thanks to compact enclosure
- Use of standard Ethernet cables for Speedwire communication

- Universal deployment options regardless of existing energy meter
- Easily and flexibly combined with SMA Smart Home components

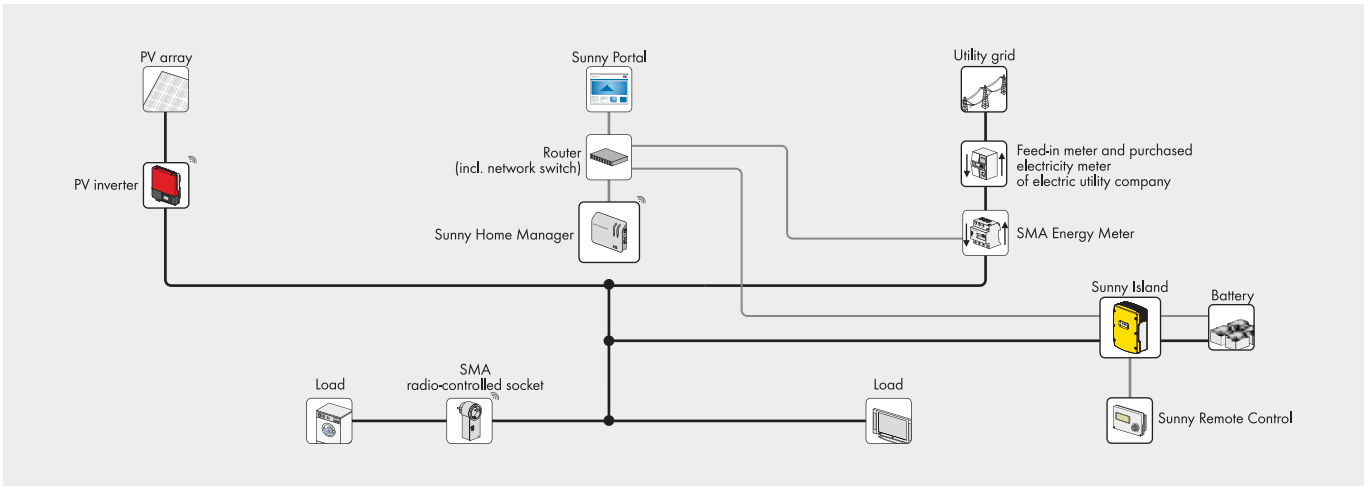
High Performance

- Fast three-phase reading of measured values for effective energy management
- Fast Speedwire communication

SMA ENERGY METER

Universal reading of measured values for intelligent energy management

The powerful measurement solution for intelligent energy management within the SMA Smart Home: The SMA Energy Meter takes phase-exact and balanced electrical measured values as a grid feed-in and purchased electricity meter and communicates these values via Speedwire. Thanks to its ability to quickly acquire measured values, the SMA Energy Meter is the ideal supplier of data for intelligent energy management within the SMA Smart Home. All PV generation data, purchased electricity and grid feed-in can be transmitted via standard Ethernet cable to the Sunny Home Manager, for example, or, in the future, to the Sunny Boy Smart Energy. This, in turn, facilitates optimal energy monitoring, effective load and battery management and reliable active power limitation at the grid feed-in point while taking self-consumption into account.



Provisional Technical Data	SMA Energy Meter
Communication	
Fieldbus	Speedwire, 10 / 100 Mbit/s
Max. Radio Range	
Speedwire / fast Ethernet	100 m (between two devices)
Inputs (Voltage and Current)	
Nominal voltage	230 V / 400 V
Frequency	50 Hz, 60 Hz / ±5 %
Nominal current / limit current	5 A / 63 A
Start-up current	< 25 mA
Connection cross-section	1.0 mm² to 25 mm²
Torque for screw terminals	2.0 Nm
Ambient Conditions in Operation	
Ambient temperature	-25 °C ... +40 °C (-13 °F ... +104 °F)
Storage temperature range	-25 °C ... +70 °C (-13 °F ... +158 °F)
Protection class (according to IEC 62103)	II
Degree of protection (according to IEC 60529)	IP2X
Max. permissible value for relative humidity (non-condensing)	5 % ... 95 %
General Data	
Dimensions (W / H / D)	88 / 70 / 65 mm (3.46 / 2.76 / 2.56 inch)
Individual units	4
Weight	0.3 kg (0.66 lb)
Mounting location	switch or meter cabinet
Mounting type	Top-hat rail mounting
Status display	2 LEDs
Self-consumption	2 W / line conductor
Measurement accuracy	1.5 %
Languages of the manual	German, English, Italian, French, Spanish, Dutch, Portuguese, Greek
Features	
Warranty	2 years
Certificates and approvals (more available on request)	www.SMA-Solar.com
Last updated: April 2013	
● Standard features ○ Optional features — Not available, data at nominal conditions	
Type designation	EMETER-10



Yield Stability

- Smooth PV system operation ensured
- Yield optimization via environmental analyses
- Early error detection

Time Saving

- Complete inverter monitoring by SMA
- Fewer service calls for initial diagnostics
- Faster response times

Professional Support

- More effective service calls thanks to on-hand data
- Fast solutions provide system operators with security
- Proactively managed service intervals

Transparency

- Regular reporting on system events
- Calculation of the system's performance ratio
- Increased customer satisfaction thanks to a proactive approach

SMA REMOTE SERVICE

Always on the safe side

With SMA Remote Service*, SMA controls an inverter's function via remote monitoring. System operators can thus rest easy with the knowledge that their PV systems will run continuously and without any disturbance, and that they will be able to protect themselves from unforeseen system failures preventing possible yield losses. As soon as our system reports an irregularity, we get in touch with the system operator's contact person. This also allows us to work together in ensuring even faster response times for service calls, since the relevant data has already been analyzed. SMA is your partner for proactive and comprehensive service.

* Please note that a Sunny WebBox with an uninterrupted connection to the Internet and a fixed public IP address is required for the use of SMA Remote Service.

** A prerequisite for this service is use of a multimeter (e.g., the Sunny SensorBox).

OUR SERVICES

SMA provides complete inverter monitoring. Here, our experts have an eye on all system parameters and detect irregularities immediately. If a service call is required, we get in touch with the contact person and provide sound solutions. As a result, the PV system goes back into operation as quickly as possible.

Our services:

- Complete, almost real-time, inverter monitoring**
- Error notification by e-mail within just a few minutes
- Contact by telephone within four hours***
- Automatic creation of service notification
- Error pattern analysis by SMA Service Line experts
- Development of recommended solution
- Proactive planning of service intervals*
- Individual environmental analysis for yield optimization*

ADVANTAGES

In order to prevent system failures, SMA offers proactive service at planned intervals and provides additional support in optimizing yields via environmental analyses.*

Advantages:

- Preferential treatment during service calls
- Professional error diagnostics and recommended solutions
- Transparency through reporting
- Direct contact with SMA Service Line experts
- Optimized PV system capacity

CONTRACT MODELS

Our customers can sign SMA Remote Service contracts at any time for a minimum term of one year.

COMBINED WITH THE SMA WARRANTY CONCEPT

SMA offers comprehensive service by combining SMA Remote Service and the SMA warranty concept. Should service assistance be required, both the replacement device and support from a service technician are naturally free of charge during the warranty period.

Are you interested? Then call us directly at +49 561 9522-435000 or send an e-mail to Service.Sales@SMA.de.

* Anticipated availability – 2014

** Data retrieval in 10-second intervals depending on data connection

*** During regional SMA Service Line business hours

You can find the order form as well as additional information on the SMA Remote Service on our website at www.SMA.de/Service.

SMA REMOTE SERVICE

Monthly reporting
Telephone call with recommended solutions
Proactive error pattern analysis
Notification by e-mail
Creation of a service notification
Inverter monitoring
Analysis for yield optimization ¹
Service interval planning ¹

¹Anticipated availability – 2014



Tailor-Made

- SMA analyzes the system design and puts together a tailored offer
- The inverter fits the PV modules perfectly
- Replacement of one or more inverters possible

High Quality

- The device maintains the quality standards of a new SMA device
- The inverter has a higher degree of efficiency
- One year comprehensive warranty on the replacement device

Optimized

- Improved PV system power
- Lower inverter maintenance costs
- The replacement device is fully updated
- Modern SMA communication products can be integrated

Fast

- The tailored offer is usually sent by SMA on the same day
- System operation is resumed faster

SMA UPGRADE

For more system power

During a service call, SMA analyzes the design of the PV system based on detailed system data and offers a replacement inverter that fits the system perfectly. Upon request, instead of a standard replacement device, our customers receive an inverter from our latest product portfolio with new technology and a higher degree of efficiency. The result: system operators and installers increase the PV system's power and continue to benefit from the highest in quality standards. SMA's quality standards.

* The SMA upgrade depends on the defective inverter type, technical feasibility and the availability of suitable replacement devices. SMA decides in each individual case whether an upgrade is possible.

SMA inverters are designed with a service life of 20 years or longer, even under extreme conditions. If an irregularity should happen to come up in connection with one of our devices, we support our customers with fast and competent service – now and in the future.

During a service call, the SMA Upgrade is an attractive offer.* SMA collects and analyzes exact system data such as modules, inverters and system location. We then put together a tailored offer of one or more inverters which fit best with the PV system. These modern replacement devices have a higher degree of efficiency and all updates. Installing the replacement inverters is easy

for electrically qualified persons, as fresh cabling is usually not required.

State-of-the-art technology and less maintenance

In order to reach the maximum capacity of the PV system, older PV systems usually feature several inverters. With devices from newer SMA product families, even larger PV systems can be operated with only one inverter. The SMA Upgrade often replaces several devices with a single SMA product. This reduces maintenance. The integration of state-of-the-art SMA communication products, which can be offered by install-

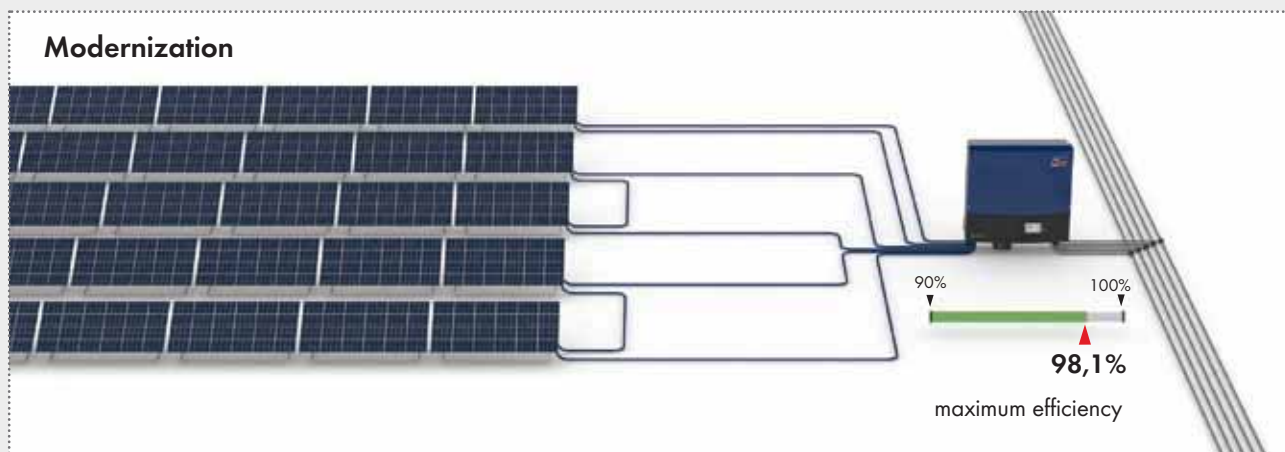
ers to their customers, is still possible. One thing is clear: SMA Upgrade is the smart alternative to a standard SMA replacement device.

A prerequisite for the SMA Upgrade is a defective inverter which no longer has a valid warranty. As is standard, SMA grants a one-year comprehensive warranty on replacement devices.

Former Plant System



Modernization





Profitable

- Up to 1 megawatt system power as standard
- Significantly reduced specific price thanks to increased power
- Maximum yields with low system costs

Robust

- Full nominal power in continuous operation at ambient temperatures of up to 50 °C
- Direct installation on-site, optimized for extreme climatic conditions between -40 °C and 62 °C
- Intelligent power management with OptiCool™

Flexible

- Wide DC input voltage range for flexible use of various module configurations
- Perfectly adjusted for the temperature-dependent behavior of PV arrays

Versatile

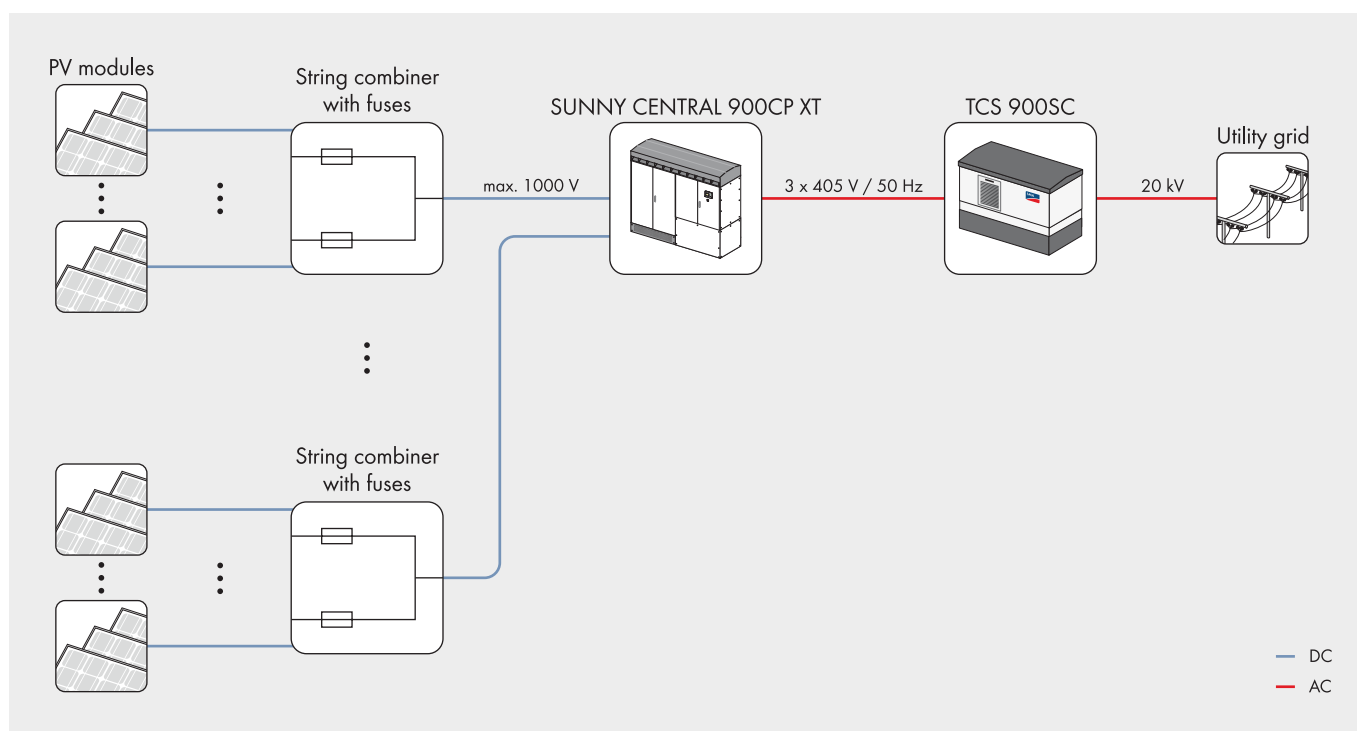
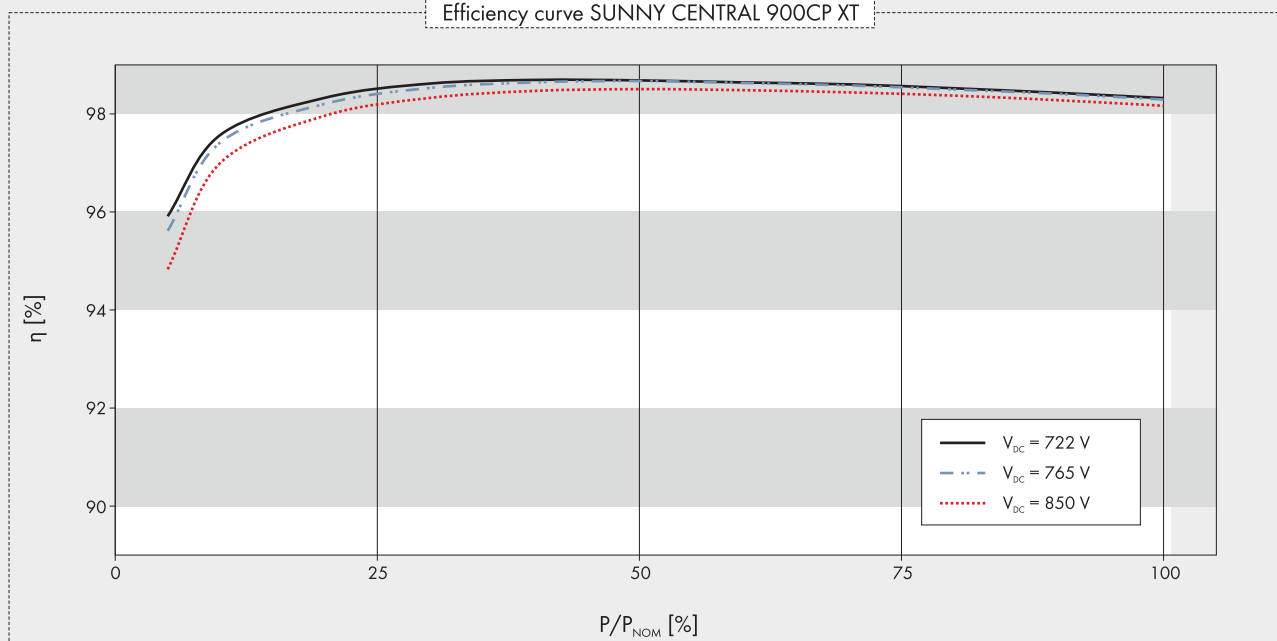
- Encompasses all grid management functions, including nighttime reactive power operation
- Customized computer platform for optimal monitoring and inverter control

SUNNY CENTRAL 800CP XT / 850CP XT / 900CP XT

The extended CP: peak output up to 1 megawatt

For increased power: With its expanded functions, the new Sunny Central CP XT series is now even more powerful. Moreover, the specific price is going down, meaning that maximum yields are achieved with lower system costs. Apart from providing full nominal power in continuous operation up to 50 °C, the Sunny Central CP XT is also optimized for operation in cold temperatures as low as -40 °C. The inverter encompasses all grid management functions, including Q at Night. The customized computer platform can be used for optimal monitoring and control.

Efficiency curve SUNNY CENTRAL 900CP XT



SUNNY CENTRAL

800CP XT / 850CP XT / 900CP XT

Technical Data	Sunny Central 800CP XT	Sunny Central 850CP XT
Input (DC)		
Max. DC power (@ cos φ = 1)	898 kW	954 kW
Min. input voltage / max. input voltage	500 V / 1000 V	536 V / 1000 V
U _{MPP,min} at I _{MPP} < I _{DCmax}	530 V	568 V
MPP voltage range (@ 25 °C / @ 50 °C at 50 Hz) ^{1, 2}	641 – 850 V / 583 – 850 V	681 – 850 V / 625 – 850 V
MPP voltage range (@ 25 °C / @ 50 °C at 60 Hz) ^{1, 2}	641 – 850 V / 583 – 850 V	681 – 850 V / 625 – 850 V
Rated input voltage	641 V	681 V
Max. input current	1400 A	1400 A
Number of independent MPP inputs	1	1
Number of DC inputs	9 / 32 (Optiprotect)	9 / 32 (Optiprotect)
Output (AC)		
Rated power (@ 25 °C) / nominal AC power (@ 50 °C)	880 kVA / 800 kVA	935 kVA / 850 kVA
Nominal AC voltage / nominal AC voltage range	360 V / 324 – 414 V	386 V / 348 – 443 V
AC power frequency / range	50 Hz, 60 Hz / 47 ... 63 Hz	50 Hz, 60 Hz / 47 ... 63 Hz
Rated power frequency / rated grid voltage	50 Hz / 360 V	50 Hz / 386 V
Max. output current / max. total harmonic distortion	1,411 A / 0.03	1,411 A / 0.03
Power factor at rated power / displacement power factor adjustable	1 / 0.9 leading ... 0.9 lagging	
Feed-in phases / connection phases	3 / 3	3 / 3
Efficiency³		
Max. efficiency / European efficiency / CEC efficiency	98.6 % / 98.4 % / 98.5 %	98.6 % / 98.4 % / 98.5 %
Protective devices		
DC disconnection device	Motor-driven load-break switch / circuit breaker (Optiprotect)	
AC disconnection device	AC circuit breaker	AC circuit breaker
DC overvoltage protection	Type I surge arrester	Type I surge arrester
Lightning protection (according to IEC 62305-1)	Lightning Protection Level III	Lightning Protection Level III
Stand-alone grid detection active / passive	● / –	● / –
Grid monitoring	●	●
Ground-fault monitoring / remote-controlled ground-fault monitoring	○ / ○	○ / ○
Insulation monitoring	○	○
Surge arrester for auxiliary power supply	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
General data		
Dimensions (W / H / D)	2562 / 2272 / 956 mm (101 / 89 / 38 inch)	
Weight in kg	1900 kg / 4200 lb	1900 kg / 4200 lb
Operating temperature range	-25 ... +62 °C / -13 ... +144 °F	
Noise emission ⁴	61 dB(A)	61 dB(A)
Max. self-consumption (operation) ⁵ / self-consumption (night)	1900 W / < 100 W	1900 W / < 100 W
External auxiliary supply voltage	230 / 400 V (3 / N / PE)	230 / 400 V (3 / N / PE)
Cooling concept	OptiCool	OptiCool
Degree of protection: electronics / connection area (according to IEC 60529) / according to IEC 60721-3-4	IP54 / IP43 / 4C2, 4S2	IP54 / IP43 / 4C2, 4S2
Application in unprotected outdoor environments / indoor	● / ○	● / ○
Maximum permissible value for relative humidity (non-condensing)	15 ... 95 %	15 ... 95 %
Maximum operating altitude above MSL 2,000 m / 4,000 m	● / ○	● / ○
Fresh air consumption (inverter)	3000 m³/h	3000 m³/h
Features		
DC connection / AC connection	Ring terminal lug / screw terminal (Optiprotect) / ring terminal lug	
Display	HMI touch display	HMI touch display
Communication / protocols	Ethernet (optical fiber optional), Modbus	
Communication with Sunny String-Monitor	RS485 / none (Optiprotect)	RS485 / none (Optiprotect)
SC-COM / Plant monitoring	● / ○ (via Sunny Portal)	● / ○ (via Sunny Portal)
Color enclosure / door / base / roof	RAL 9016 / 9016 / 7004 / 7004	
Guarantee: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○
Configurable grid management functions	Power reduction, reactive power setpoint, dynamic grid support (e.g. LVRT)	
Certificates and approvals (more available on request)	EN 61000-6-2, EN 61000-6-4, EMC conformity, CE conformity, BDEW-MSRL / FGW / TR8°, Arrêté du 23/04/08, R.D. 1663 / 2000, R.D. 661 / 2007, P.O. 12.3 / IEEE 1547 ⁷	
● Standard features ○ Optional features – Not available		
Type designation	SC 800CP-10	SC 850CP-10

- 1) At $1.05 U_{AC, nom}$ and $\cos \varphi = 1$
- 2) Further AC voltages, DC voltages and power classes can be configured (for more detailed information, see technical information "Innovations_CP" at www.SMA.de)
- 3) Efficiency measured without internal power supply
- 4) Sound pressure level at a distance of 10 m
- 5) Self-consumption at rated operation
- 6) With complete dynamic grid support
- 7) Designed and type-tested in accordance with IEEE 1547, serial tests optional available

Technical Data	Sunny Central 900CP XT	
Input (DC)		
Max. DC power (@ $\cos \varphi = 1$)	1010 kW	
Min. input voltage / max. input voltage	562 V / 1000 V	
$U_{MPP, min}$ at $I_{MPP} < I_{DCmax}$	596 V	
MPP voltage range (@ 25 °C / @ 50 °C at 50 Hz) ^{1, 2}	722 – 850 V / 656 – 850 V	
MPP voltage range (@ 25 °C / @ 50 °C at 60 Hz) ^{1, 2}	722 – 850 V / 656 – 850 V	
Rated input voltage	722 V	
Max. input current	1400 A	
Number of independent MPP inputs	1	
Number of DC inputs	9 / 32 (Optiprotect)	
Output (AC)		
Rated power (@ 25 °C) / nominal AC power (@ 50 °C)	990 kVA / 900 kVA	
Nominal AC voltage / nominal AC voltage range	405 V / 365 – 465 V	
AC power frequency / range	50 Hz, 60 Hz / 47 ... 63 Hz	
Rated power frequency / rated grid voltage	50 Hz / 405 V	
Max. output current / max. total harmonic distortion	1,411 A / 0.03	
Power factor at rated power / displacement power factor adjustable	1 / 0.9 leading ... 0.9 lagging	
Feed-in phases / connection phases	3 / 3	
Efficiency³		
Max. efficiency / European efficiency / CEC efficiency	98.6 % / 98.4 % / 98.5 %	
Protective devices		
DC disconnection device	Motor-driven load-break switch / circuit breaker (Optiprotect)	
AC disconnection device	AC circuit breaker	
DC overvoltage protection	Type I surge arrester	
Lightning protection (according to IEC 62305-1)	Lightning Protection Level III	
Stand-alone grid detection active / passive	● / –	
Grid monitoring	●	
Ground-fault monitoring / remote-controlled ground-fault monitoring	○ / ○	
Insulation monitoring	○	
Surge arrester for auxiliary power supply	●	
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	
General data		
Dimensions (W / H / D)	2562 / 2272 / 956 mm (101 / 89 / 38 inch)	
Weight in kg	1900 kg / 4200 lb	
Operating temperature range	-25 ... +62 °C / -13 ... +144 °F	
Noise emission ⁴	61 dB(A)	
Max. self-consumption (operation) ⁵ / self-consumption (night)	1900 W / < 100 W	
External auxiliary supply voltage	230 / 400 V (3 / N / PE)	
Cooling concept	OptiCool	
Degree of protection: electronics / connection area (according to IEC 60529) / according to IEC 60721-3-4	IP54 / IP43 / 4C2, 4S2	
Application in unprotected outdoor environments / indoor	● / ○	
Maximum permissible value for relative humidity (non-condensing)	15 ... 95%	
Maximum operating altitude above MSL 2,000 m / 4,000 m	● / ○	
Fresh air consumption (inverter)	3000 m³/h	
Features		
DC connection / AC connection	Ring terminal lug / screw terminal (Optiprotect) / ring terminal lug	
Display	HMI touch display	
Communication / protocols	Ethernet (optical fiber optional), Modbus	
Communication with Sunny String-Monitor	RS485 / none (Optiprotect)	
SC-COM / Plant monitoring	● / ○ (via Sunny Portal)	
Color enclosure / door / base / roof	RAL 9016 / 9016 / 7004 / 7004	
Guarantee: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○	
Configurable grid management functions	Power reduction, reactive power setpoint, dynamic grid support (e.g. LVRT)	
Certificates and approvals (more available on request)	EN 61000-6-2, EN 61000-6-4, EMC conformity, CE conformity, BDEW-MSRL / FGW / TR8 ⁶ , Arrêté du 23/04/08, R.D. 1663 / 2000, R.D. 661 / 2007, P.O. 12.3 / IEEE 1547 ⁷	
● Standard features ○ Optional features – Not available		
Type designation	SC 900CP-10	



Outdoor

- Compact and weatherproof enclosure for outdoor installation
- OptiCool™ cooling system for ambient temperatures of up to 62 °C

Efficient

- Peak efficiency of 98 %
- Cost reduction thanks to low self-consumption

Robust

- Salt corrosion resistant
- Sand and dust resistant
- Suitable for all climate zones

Reliable

- High operational safety and easy maintenance
- Comprehensive grid management functions (including LVRT)

SUNNY CENTRAL 630CP-JP / 800CP-JP

The perfect solution for PV power plants in Japan

The durable and high-performance Sunny Central 800CP-JP guarantees maximum yields in all climate zones, a fact that has been clearly demonstrated in numerous stress tests. With the integrated OptiCool™ cooling system, the Sunny Central 800CP-JP feeds solar power into the utility grid even at ambient temperatures of up to 62 °C. The compact and durable enclosure equipment allows for easy and uncomplicated outdoor installation – without complex enclosures and external cooling systems. This significantly reduces costs and self-consumption. With its comprehensive grid management functions, the Sunny Central 800 CP-JP already meets grid operators' requirements for the future.

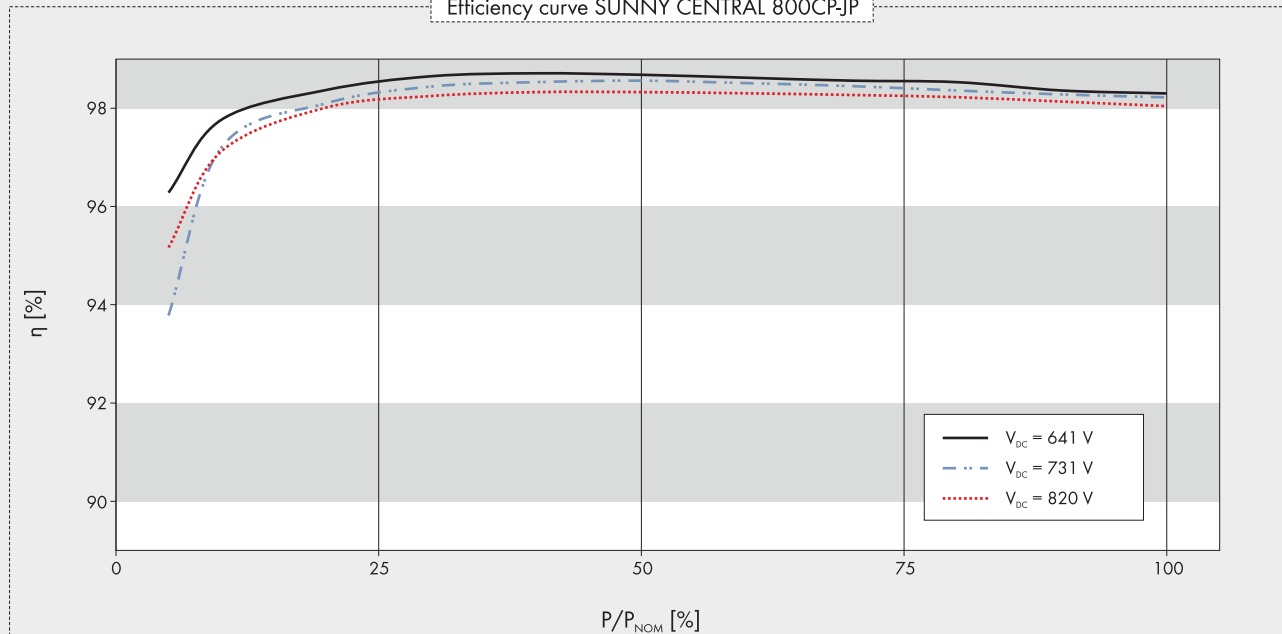


SUNNY CENTRAL 630CP-JP / 800CP-JP

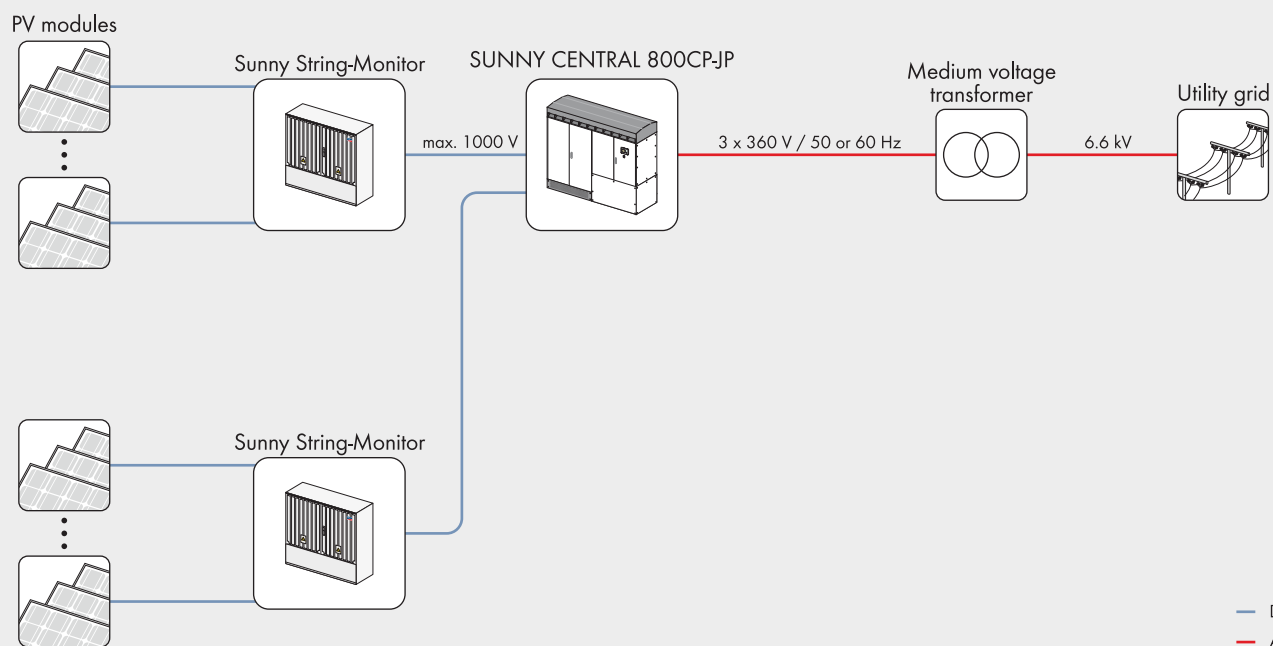
Technical Data	Sunny Central 630CP-JP	Sunny Central 800CP-JP
Input (DC)		
Max. DC power (@ $\cos \varphi = 1$)	713 kW	898 kW
Max. input voltage	1000 V	1000 V
Min. input voltage	498 V	500 V
MPP voltage range (50 Hz)	500 V – 850 V ¹	583 V – 850 V ¹
MPP voltage range (60 Hz)	505 V – 850 V ¹	583 V – 850 V ¹
Rated input voltage	529 V	641 V
Max. input current	1350 A	1400 A
Number of independent MPP inputs	1	1
Number of DC inputs	9 fused inputs	9 fused inputs
Output (AC)		
Rated power (@ 25 °C) / nominal AC power (@ 50 °C)	700 kVA / 630 kVA	880 kVA / 800 kVA
Nominal AC voltage / range	315 V / 284 V – 362 V	360 V / 324 V – 414 V
AC power frequency / range	50 Hz, 60 Hz / 47 Hz ... 63 Hz	50 Hz, 60 Hz / 47 Hz ... 63 Hz
Rated power frequency / rated grid voltage	50 Hz / 315 V	50 Hz / 360 V
Max. output current	1283 A	1411 A
Max. total harmonic distortion	< 3 %	< 3 %
Power factor at rated power / displacement power factor adjustable	1 / 0.9 leading ... 0.9 lagging	
Feed-in phases / connection phases	3 / 3	3 / 3
Efficiency ⁵		
Max. efficiency / European efficiency / CEC efficiency	98.7 % / 98.5 % / 98.5 %	98.6 % / 98.4 % / 98.5 %
Protective Devices		
DC disconnection device	Motor-driven DC load-break switch	
AC disconnection device	AC circuit breaker	AC circuit breaker
DC overvoltage protection	Surge arrester type I	Surge arrester type I
Lightning protection (according to IEC 62305-1)	Lightning protection level III	Lightning protection level III
Grid monitoring	●	●
Stand-alone grid detection	Active, passive	Active
Ground-fault monitoring / remote ground-fault monitoring	○ / ○	○ / ○
Insulation monitoring	○	○
Surge arrester for auxiliary power supply	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
General Data		
Dimensions (W / H / D)	2562 / 2272 / 956 mm	2562 / 2272 / 956 mm
Weight	Approx. 1900 kg	Approx. 1900 kg
Operating temperature range	-25 °C ... +62 °C	-25 °C ... +62 °C
Noise emission ⁴	60 db(A)	61 db(A)
Max. self-consumption (operation) / self-consumption (night)	1900 W ² / < 100 W	1900 W ² / < 100 W
External auxiliary supply voltage	230 / 400 V (3 / N / PE)	230 / 400 V (3 / N / PE)
Cooling concept	OptiCool	OptiCool
Degree of protection: electronics / connection area (according to IEC 60529)	IP54 / IP43	IP54 / IP43
Degree of protection (according to IEC 60721-3-4)	4C2, 4S2	4C2, 4S2
Application	In unprotected outdoor environments	In unprotected outdoor environments
Max. permissible value for relative humidity (non-condensing)	15 % ... 95 %	15 % ... 95 %
Maximum operating altitude above MSL	2000 m	2000 m
Fresh air consumption	3000 m ³ /h	3000 m ³ /h
Features		
DC connection / AC connection	Ring terminal lug / ring terminal lug	
Display	HMI touch display	HMI touch display
Communication protocols	Ethernet (optical fiber optional), Modbus	Ethernet (optical fiber optional), Modbus
Sunny String-Monitor / SC-COM	RS485 / ●	RS485 / ●
Color enclosure / door / base / roof	RAL 9016 / 9016 / 7004 / 7004	RAL 9016 / 9016 / 7004 / 7004
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○
Configurable grid management functions	Power reduction, reactive power setpoint, dynamic grid support (e.g. LVRT)	
Certificates and approvals (more available upon request)	EN 61000-6-2, EN 61000-6-4, CE-compliant, EEG-compliant, BDEW-MSRL / FGW / TR8 ⁴ , Arrêté du 23/04/08, R.D. 1663 / 2000, R.D. 661 / 2007 / IEEE 1547	
● Standard features ○ Optional features – Not available		
Type designation	SC 630CP-10-JP	SC 800CP-10-JP

- 1) At $1.05 U_{AC, nom}$ and $\cos \varphi = 1$
- 2) Self-consumption at rated operation
- 3) Sound pressure level at a distance of 10 m
- 4) With complete dynamic grid support
- 5) Efficiency measured without internal power supply

Efficiency curve SUNNY CENTRAL 800CP-JP



PLANT DIAGRAM





Economical

- Outdoor enclosure allows for direct field deployment
- Small footprint and light weight for easy shipping and installation

Efficient

- Highest efficiency in its power class
- Full nominal power at ambient temperatures up to 50 °C

Flexible

- Integrated AC disconnect for NEC 2011 compliance
- Optional DC disconnects

Reliable

- Easy and safe installation with large, separate connection area
- Powerful grid management functions (incl. FRT)
- Full UL 1741 and IEEE 1547 compliance

SUNNY CENTRAL 500CP-US 600V

Cost-optimized solution for commercial and utility-scale projects

The Sunny Central CP-US series delivers outstanding performance. In combination with an external transformer, the Sunny Central CP-US can be connected to commercial building power or any utility grid. The UL listed CP-US also supports grid stability through leading grid management functions including Low Voltage Ride Trough. Both the outdoor enclosure featuring OptiCool™ active temperature management and a separate connection area ensure simple installation while maximizing returns. With peak efficiency greater than 98 percent, it outperforms all other inverters in its class. The Sunny Central CP-US can also be integrated with the Power Plant Controller as well as the Medium-Voltage Power Platform for utility-scale applications.

- 1) Specifications apply to irradiation values under STC
- 2) Measured without internal voltage supply at $V_{DC} = 330\text{ V}$
- 3) Measured efficiency includes all auxiliary power
- 4) By external 400 V auxiliary power supply

Technical Data	Sunny Central 500CP-US 600V
Input Data	
Max. DC power (@ $\cos \varphi = 1$)	560 kW ¹
Max. DC voltage	600 V
MPP voltage range (@ 25 °C at 60Hz)	550 kW / 363 – 480 Vdc
MPP voltage range (@ 50 °C at 60Hz)	500 kW / 330 – 480 Vdc
Rated input voltage	360 V
Max. input current	1600 A
Min. input voltage / V_{MPPmin} at $I_{MPP} < I_{DCmin}$	330 V
Number of independent MPP inputs	1
Number of DC inputs: busbar / fuses	Busbar / 6–9
Output Data	
Nominal AC power	500 kVA @ 50 °C (122 °F)
Intermediate AC power	530 kVA @ 35 °C (95 °F)
Maximum AC power	550 kVA @ 25 °C (77 °F)
Max. AC current	1588 A
Nominal AC current	1444 A
AC grid frequency	60 Hz
AC voltage range	180 V – 220 V
AC voltage range, full active power	196 V – 210 V
Power factor (adjustable)	1 / 0.8 leading ... 0.8 lagging
THD	< 5 %
Efficiency ²	
Max. efficiency	> 98.1 %
CEC efficiency ³	> 97.5 %
Ambient Conditions	
Operating temperature range	-25 °C ... +50 °C (-13 °F ... +122 °F)
Max. temperature for nominal conditions	+50 °C (+122 °F)
Protection rating	NEMA 3R
Installation indoors / outdoors	● / ●
Relative humidity	15 % ... 95 %
Fresh air consumption	3000 m ³ /h
Internal consumption at nominal power	< 1800 W
Standby consumption (P_{night})	< 150 W ⁴
General Data	
Dimensions (W / H / D)	2562 / 2272 / 956 mm (101 / 90 / 38 inch)
Weight	< 1870 kg (4123 lb)
Grid monitoring	●
Ground-fault monitoring / remote-ground fault monitoring	○ / ○
Insulation monitoring	○
Surge arrester for auxiliary power supply	●
Cooling concept	OptiCool
Degree of protection: electronics / connection area / degree of protection according to IEC 60721-3-4	NEMA 3R / NEMA 3R / 4C2, 4S2
Application	In unprotected outdoor environments
Certificates / Listings	
Certificates, approvals and compliants	UL 1741, UL 1998, IEEE 1547
EMC conformity	FCC, Part 15, Class A
Features	
DC connection	Ring terminal lug
AC connection	Ring terminal lug
HMI touchscreen	HMI touch display
Communication / protocols	Ethernet (optical fiber optional), Modbus
Auxiliary power supply via external 208 V / external 400 V / external 480 V / integrated green power	○ / ○ / ○ / ○
SC-COM	●
Color of enclosure, door, base, roof	RAL 9016 / 9016 / 7004 / 7004
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○
● Standard features ○ Optional features – Not available	
Type designation	SC 500CP-US-10 600V



Reduced LCOE

- Reduced balance of system costs with 1000 VDC design
- Auxiliary HVAC not required, even in desert environments
- Factory-integrated grid management, including reactive power control and LVRT

Efficient

- Best-in-class system efficiencies above 97 % peak
- 10 % additional power for continuous operation at ambient temperatures up to 25 °C
- Low loss transformer engineered for PV application

Certified

- Rigorous environmental testing
- NRTL listing of entire platform
- NEC 2011 compliant

Turnkey

- Simplified shipping and installation process
- Extensive service offerings and O&M support
- Integrated AC disconnects, optional DC disconnects and various configuration options

COMPACT MEDIUM VOLTAGE POWER PLATFORM

Simplified solution means maximum ROI for utility-scale projects

The Compact MV Power Platform is a turnkey power conversion solution for utility-scale PV plants. Designed for use with the Sunny Central CP-US and the Sunny Central CP XT central inverter lines, this solution minimizes risk and maximizes energy production, providing 110 percent power output at temperatures up to 25 °C. The Compact MV Power Platform is engineered for maximum ROI, offering reduced system costs, high reliability and best-in-class system efficiencies above 97 percent. Simple installation, easy data monitoring and superior service offerings make the Compact MV Power Platform the preferred choice for large scale projects in North America.

The SMA Advantage



Maximized energy yield

Best-in-class system efficiency, low self consumption, and matched components result in increased energy yield, speeding your return on investment.



LCOE reduction

Your levelized cost of energy is significantly reduced through SMA's superior energy harvest, reliability, acceleration of installation velocity, and world-renowned bankability.



Grid Integration

At the heart of every Compact MV Power Platform are SMA's award-winning Sunny Central inverters, delivering all of the grid management functionality demanded.



Serviceability

Engineered for ease of transport, installation, and maintenance, and backed by the best service capabilities in the industry.



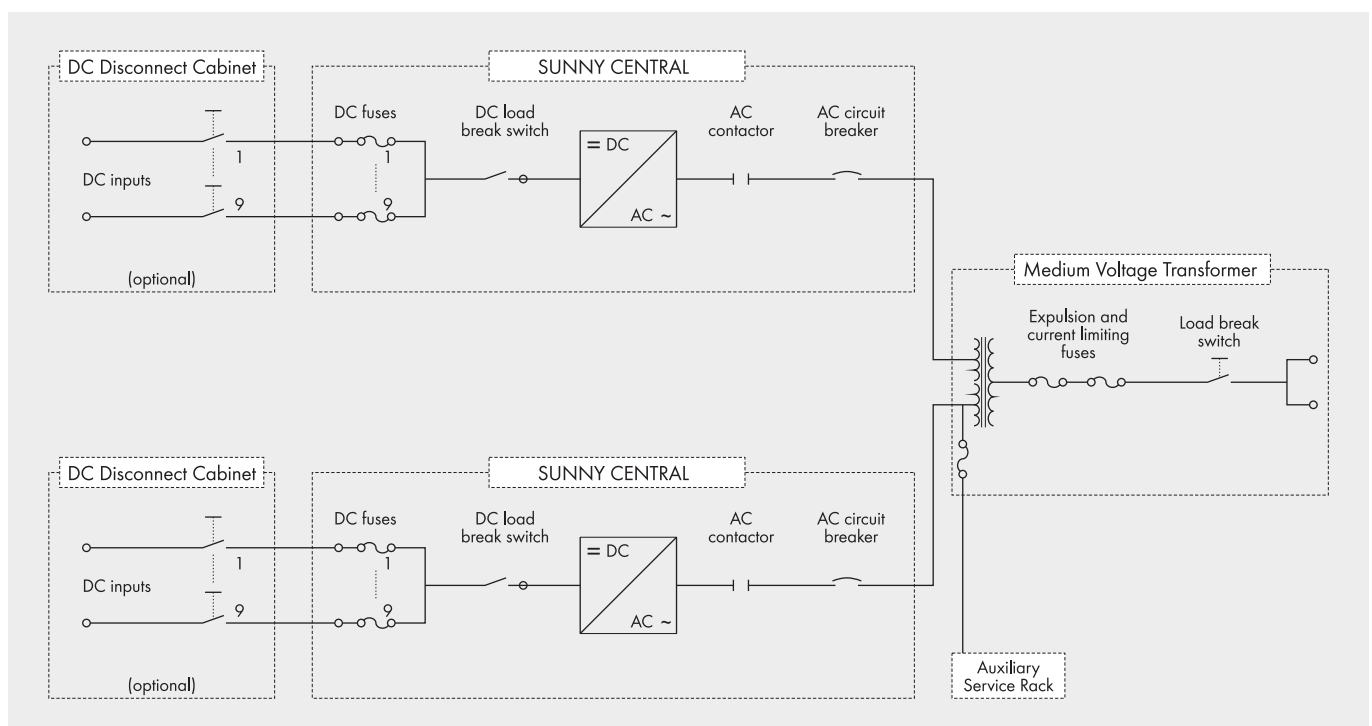
Quality

Another industry first, the SMA Compact MV Power Platform is a suite of factory assembled and tested pre-engineered solutions carrying an NRTL listing.



System-oriented Design

Designed as a cost-effective, turn-key solution from the DC feeders, to the medium voltage collection loop, the Compact MV Power Platform is the ideal building block for today's utility scale PV plants.



COMPACT MEDIUM VOLTAGE POWER PLATFORM

Technical Data	SUNNY CENTRAL CP-US CoMVPP 1.0 MW	SUNNY CENTRAL CP-US CoMVPP 1.25 MW
Input (DC)		
MPP voltage range at 25 °C (77 °F) / at 50 °C (122 °F) at 60Hz	430 V ... 820 V / 430 V ... 820 V ⁽²⁾	500 V ... 820 V / ⁽²⁾
Max. DC voltage	1000 V	1000 V
Max. DC input current	2500 A	2700 A
Number of independent MPP inputs	2	2
Number of fused DC inputs	18	18
Output (AC)		
Nominal AC power	1000 kVA @ 50 °C (122 °F)	1260 kVA @ 50 °C (122 °F)
Maximum AC power	1100 kVA @ 25 °C (77 °F)	1400 kVA @ 25 °C (77 °F)
Nominal AC voltage options	12.47 kV; 13.8 kV; 20.6 kV; 24.9 kV; 27.6 kV; 34.5 kV	
Grid frequency	60 Hz	60 Hz
Power factor (adjustable)	0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging
Transformer vector group	Dy1y1	Dy1y1
Transformer no load taps	±2.5 % & ±5.0 %	±2.5 % & ±5.0 %
Transformer cooling type	KNAN	KNAN
Power Consumption		
Internal consumption in operation (inverter + MV-transformer) ⁴	< 3800 VA + < 10.1 kVA	< 3800 VA + < 12.4 kVA
Standby consumption (inverter + MV-transformer)	< 300 VA + < 1100 VA	< 300 VA + < 1350 VA
Integrated control power supply / external control power supply	● / ○	● / ○
External auxiliary supply voltage	480 V; 600 V	480 V; 600 V
Efficiency		
Max. efficiency / CEC efficiency inverter	98.10 % / 97.50 %	98.50 % / 98.00 %
MVPP System Efficiency Peak	> 97 %	> 97.5 %
Protection Rating and Ambient Conditions		
Protection rating	NEMA 3R	NEMA 3R
Operation temperature range @ nominal power	-25 °C (-13 °F) ... 50 °C (+122 °F)	-25 °C (-13 °F) ... 50 °C (+122 °F)
Storage temperature standard / low temperature option (@Pnom)	-25 °C (-13 °F) ... 60 °C (+140 °F) / -40 °C (-40 °F) ... 60 °C (+140 °F)	-25 °C (-13 °F) ... 60 °C (+140 °F) / -40 °C (-40 °F) ... 60 °C (+140 °F)
Relative humidity	15 % ... 95 %	15 % ... 95 %
Snow load, maximum (psf)	40	40
Wind load, maximum (mph)	110	110
Fresh air consumption (CFM)	3532	3532
Max. altitude above MSL	6562 ft	6562 ft
Design lifetime (years)	> 20	> 20
Compliance and Certificates		
Seismic rating according UBC sec. 1632 and IBC sec. 1613 ⁵	Site class D, Ss =2.25g, S1=1.24g	
NEC 2011 / OSHA 1910	● / ●	● / ●
NRTL Listing: UL1741, UL857, UL891, NFPA79	●	●
PE stamped Structural Calculations	●	●
Features		
DC Disconnect Unit / AC Disconnect	○ / ●	○ / ●
Tracker Motor Supply (10kVA@460VAC / 10kVA@480VAC / 20kVA@480VAC / 30kVA@480VAC)	○ / ○ / ○ / ○	○ / ○ / ○ / ○
Auxiliary Services Power (none / 2kVA / 7.5kVA)	● / ○ / ○	● / ○ / ○
Customer SCADA system Accommodation	864 / 762 / 305 mm (34 / 30 / 12 inch), supply: 120 V / 60 Hz / max. 250 W	
Convenience Receptacles	2 x 120 V / max. 250 W each	
Transformer alarm contacts: (Temp / Pressure / Liquid level / Analog Temp)	● / ○ / ○ / ○	● / ○ / ○ / ○
Transformer oil containment	○	○
Monitoring (extended I/O): 4 DI, 3 AI	○	○
Delivery Terms: FCA-Origin	●	●
Platform Design		
W / H / D (Platform including External Disconnect Units)	9296 / 2591 / 2591 mm (366 / 102 / 102 inch)	
Weight (Platform including External Disconnect Units)	< 17690 kg (< 39000 lb)	< 17690 kg (< 39000 lb)
W / H / D (Platform excluding External Disconnect Units)	7696 / 2591 / 2591 mm (303 / 102 / 102 inch)	
Weight (Platform excluding External Disconnect Units)	< 15876 kg (< 35000 lb)	< 15876 kg (< 35000 lb)
● Standard features ○ Optional features — Not available		
Type designation	MVPP 1.0 MW	MVPP 1.25 MW

- 1) @ 1.05 $U_{AC, nom}$ and $\cos \varphi = 1$
 2) @ 1.00 $U_{AC, nom}$ and $\cos \varphi = 1$
 3) Standard: 1000 V DC, optional 1100 V DC with a start-up < 1000 V DC
 4) Not including platform auxiliary service loads
 5) Pier height 3 ft max.

SUNNY CENTRAL CP-US CoMVPP 1.44 MW	SUNNY CENTRAL CP-US CoMVPP 1.5 MW	SUNNY CENTRAL CP-US CoMVPP 1.6 MW	
525 V ... 820 V ²	545 V ... 820 V / 545 V ... 820 V ²	570 V ... 820 V / 570 V ... 820 V ²	
1000 V	1000 V	1000 V	
3200 A	3200 A	3200 A	
2	2	2	
18	18	18	
1440 kVA @ 50 °C (122 °F)	1500 kVA @ 50 °C (122 °F)	1600 kVA @ 50 °C (122 °F)	
1584 kVA @ 25 °C (77 °F)	1650 kVA @ 25 °C (77 °F)	1760 kVA @ 25 °C (77 °F)	
12.47 kV; 13.8 kV; 20.6 kV; 24.9 kV; 27.6 kV; 34.5 kV			
60 Hz	60 Hz	60 Hz	
0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging	
Dy1y1	Dy1y1	Dy1y1	
-5.0 %; -2.5 %; +2.5 %; +5.0 %; +7.5 %; +10.0 %			
KNAN	KNAN	KNAN	
< 3800 VA + < 14.6 kVA	< 3800 VA + < 14.6 kVA	< 3800 VA + < 15.7 kVA	
< 300 VA + < 1600 VA	< 300 VA + < 1600 VA	< 300 VA + < 1700 VA	
● / ○	● / ○	● / ○	
480 V; 600 V	480 V; 600 V	480 V; 600 V	
98.60 % / 98.00 %	98.60 % / 98.00 %	98.70 % / 98.50 %	
> 97.5 %	> 97.5 %	> 97.5 %	
NEMA 3R	NEMA 3R	NEMA 3R	
-25 °C (-13 °F) ... 50 °C (+122 °F)	-25 °C (-13 °F) ... 50 °C (+122 °F)	-25 °C (-13 °F) ... 50 °C (+122 °F)	
-25 °C (-13 °F) ... 60 °C (+140 °F) /	-25 °C (-13 °F) ... 60 °C (+140 °F) /	-25 °C (-13 °F) ... 60 °C (+140 °F) /	
-40 °C (-40 °F) ... 60 °C (+140 °F)	-40 °C (-40 °F) ... 60 °C (+140 °F)	-40 °C (-40 °F) ... 60 °C (+140 °F)	
15 % ... 95 %	15 % ... 95 %	15 % ... 95 %	
40	40	40	
110	110	110	
3532	3532	3532	
6562 ft	6562 ft	6562 ft	
> 20	> 20	> 20	
Site class D, Ss = 2.25g, S1 = 1.24g			
● / ●	● / ●	● / ●	
●	●	●	
●	●	●	
○ / ●	○ / ●	○ / ●	
○ / ○ / ○ / ○	○ / ○ / ○ / ○	○ / ○ / ○ / ○	
● / ○ / ○	● / ○ / ○	● / ○ / ○	
864 / 762 / 305 mm (34 / 30 / 12 inch), supply: 120 V / 60 Hz / max. 250 W			
2 x 120 V / max. 250 W each			
● / ○ / ○ / ○	● / ○ / ○ / ○	● / ○ / ○ / ○	
○	○	○	
○	○	○	
●	●	●	
9296 / 2591 / 2591 mm (366 / 102 / 102 inch)			
< 17690 kg (< 39000 lb)	< 17690 kg (< 39000 lb)	< 17690 kg (< 39000 lb)	
7696 / 2591 / 2591 mm (303 / 102 / 102 inch)			
< 15876 kg (< 35000 lb)	< 15876 kg (< 35000 lb)	< 15876 kg (< 35000 lb)	
MVPP 1.44 MW	MVPP 1.5 MW	MVPP 1.6 MW	



Flexible

- Suitable for power classes from 500 to 1800 kVA and line voltages up to 36 kV
- Optimal integration of Communit and other accessories
- Delivery of two stations per delivery vehicle

Robust

- Ideally protected from snow and sandstorms
- Perfect for extreme locations
- Protected against small floods with stilts

Easy-to-Use

- Pre-installed and mechanically protected cabling
- Easy transport including shipping thanks to low weight
- Global turnkey delivery
- Plug & play concept

Cost Effective

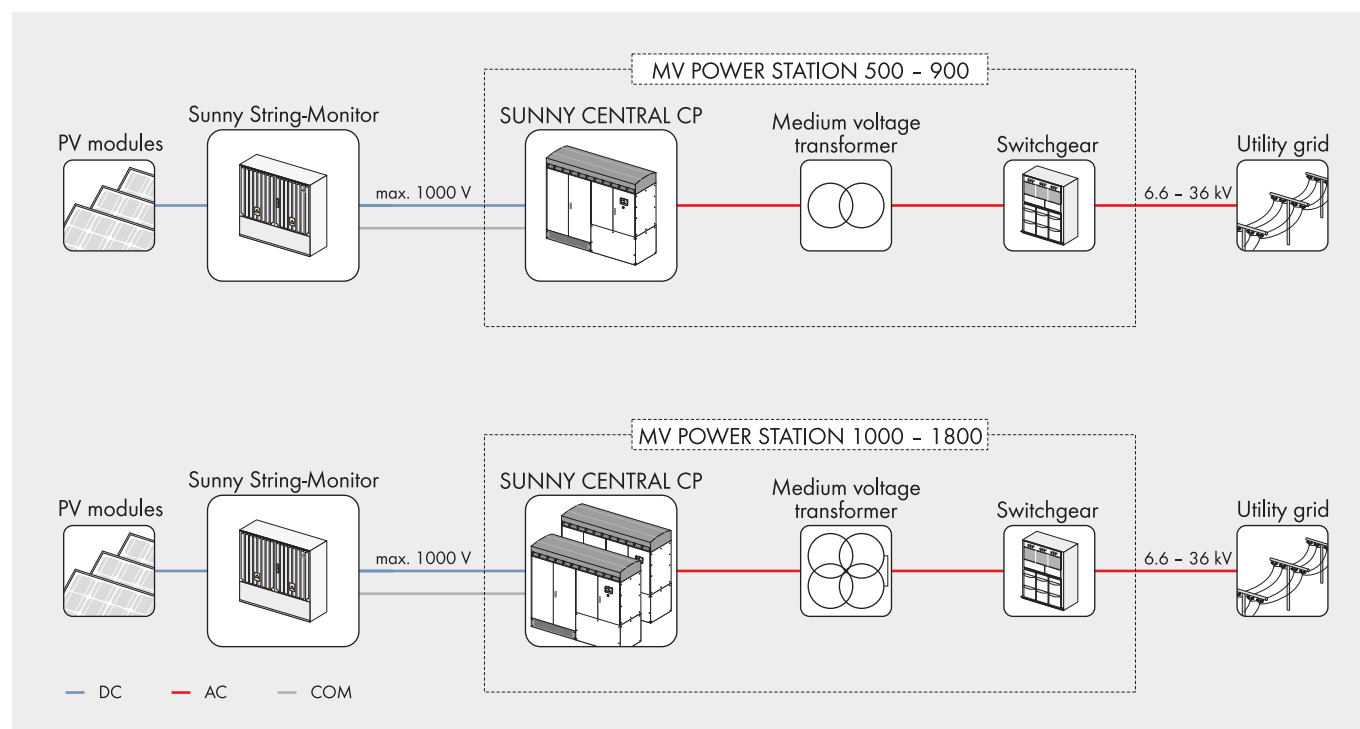
- Low maintenance thanks to fanless transformer
- Increased plant availability leading to higher yields
- Lower transport costs thanks to standardized dimensions

MV POWER STATION 500SC / 630SC / 800SC / 900SC / 1000SC / 1250SC / 1600SC / 1800SC

Turnkey system solution with the Sunny Central CP XT

With the power of either one or two robust Sunny Central CP XT inverters in the power class of your choice and the corresponding transformers, the SMA MV Power Station is the perfect turnkey system solution for PV power plants, and is available worldwide. The MV Power Station is protected against small floods with stilts. Thanks to improved plant availability, energy yields go up significantly while transport costs and maintenance go down as a result of the light-weight enclosure principle – Commissioning is an easy plug & play procedure. Apart from simplified planning and installation, all cabling both on the ground and underneath is eliminated resulting from perfectly combined system components.

Turnkey System Solution



Technical Data	MV Power Station 500 – 1800
Output (AC)	
Nominal AC power	500 to 1800 kVA
Rated grid voltage	6.6 ... 36 kV
Rated power frequency	50 Hz / 60 Hz
MV transformer	Oil-sealed transformer with iron core
Dimensions and Weight	
Dimensions (W / H / D)	6058 / 2438 / 2591 mm
Total weight	Up to 12 tons
Degree of Protection and Ambient Conditions	
Degree of protection (according to IEC 60529)	IP54 (inverter and transformer) / IP23D (MV switchgear)
Operating temperature range	-25 °C ... +40 °C / +50 °C
Maximum operating altitude above MSL	1000 m to 4000 m

Installation with either one or two inverters

Inverter area:

Two inverters: Both Sunny Central CP XT inverters are installed back-to-back with an air outlet facing downward. The DC cables can be connected to either the front or the back. Optional rain protection and service platform are available.

One inverter: The Sunny Central CP XT inverter is installed in a central position. This allows for short cable routes and the DC connection can be made from either the front or the back.

Transformer area:

Outdoor transformer optimized for PV with additional protective cover for the connection area. The side panels are secured with either a protective grid or a barrier.

Closed area:

A sub-distribution, SCAS 6 kVA or Communit are located here. The medium-voltage switchgear is mounted on a base to release pressure in case of an arcing fault. An optional service platform is also available.



Reliable

- Seamless plant operation secured
- Minimized downtime

Extensive

- Comprehensive services for medium-voltage components
- Services for all components delivered by SMA

Improved Performance

- Optimal PV plant operation, increased profits

Global

- Our service technicians work for you worldwide
- Our experts are quickly on-site should service be required
- Technical support from teams of experts on the SMA Service Line

Service for Medium-Voltage Components

Service from a single source

SMA combines cutting-edge technology with professional service. We have now expanded our range of services for large-scale PV power plants. In addition to the Sunny Central service concept for inverters, we now offer comprehensive service for medium-voltage components. From initial commissioning to routine maintenance and quick repairs: SMA Service promises maximum protection for all components delivered by SMA.

In order to guarantee authentic full service, SMA Service is continually expanding its product portfolio. Our latest offer is comprehensive service for medium-voltage components. The value to our customers: Maximum protection and certainty that the PV plant runs smoothly and optimally at all times. And should a service call be necessary at any time, SMA Service quickly puts the plant back into seamless operation.

Outlook

Customers will also be able to combine our services for medium-voltage components individually and flexibly. For optimal security, SMA Service will also expand the modular Sunny Central service concept in the future to include tailored services for medium-voltage components.

Are you interested in our new range of services or have questions you would like to ask? Then call us directly at +49 561 9522-435000 or send an e-mail to Service.Sales@SMA.de. Further information on the Sunny Central service concept can also be found at www.SMA.de/Service.

We offer the following services for medium-voltage components:

Commissioning
Maintenance
Spare parts
Repairs during servicing



AVAILABLE



Information about on-grid applications can be found on page 46/47 and 52/53 or at www.SMA.de/SmartHome



Easy-to-Use

- OptiUse: quick installation and commissioning, simplified operation
- OptiBat: state of charge calculation keeps you informed at all times

Robust

- IP54: optimal protection from dust and humidity
- OptiCool: greater temperature range
- OptiPower: secure operation in any situation

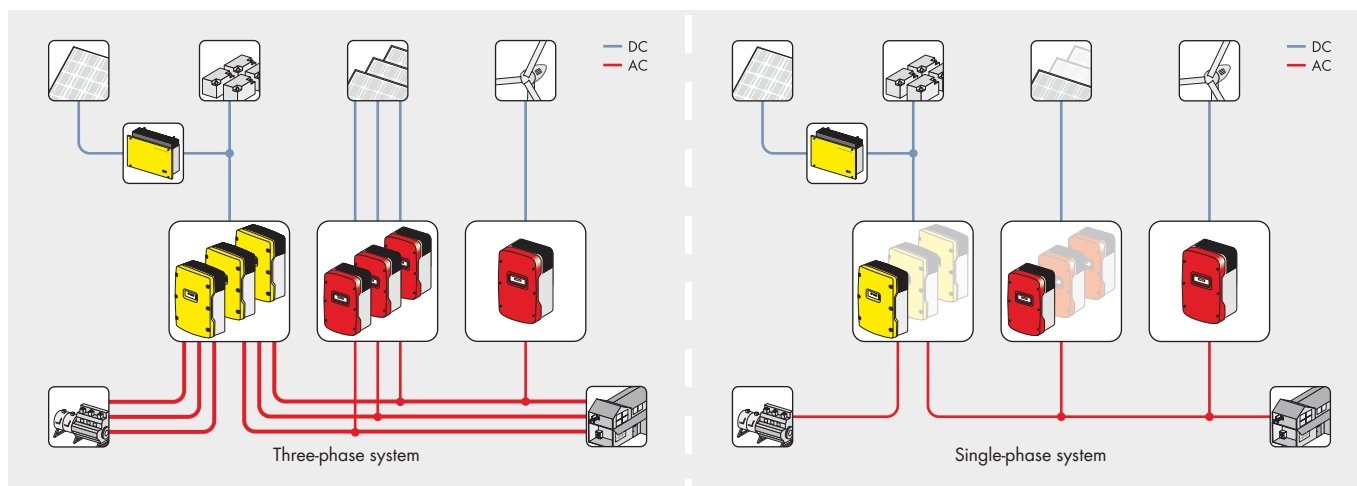
Flexible

- For systems from 3 to 300 kW
- Precise design
- Supports multicuster technology

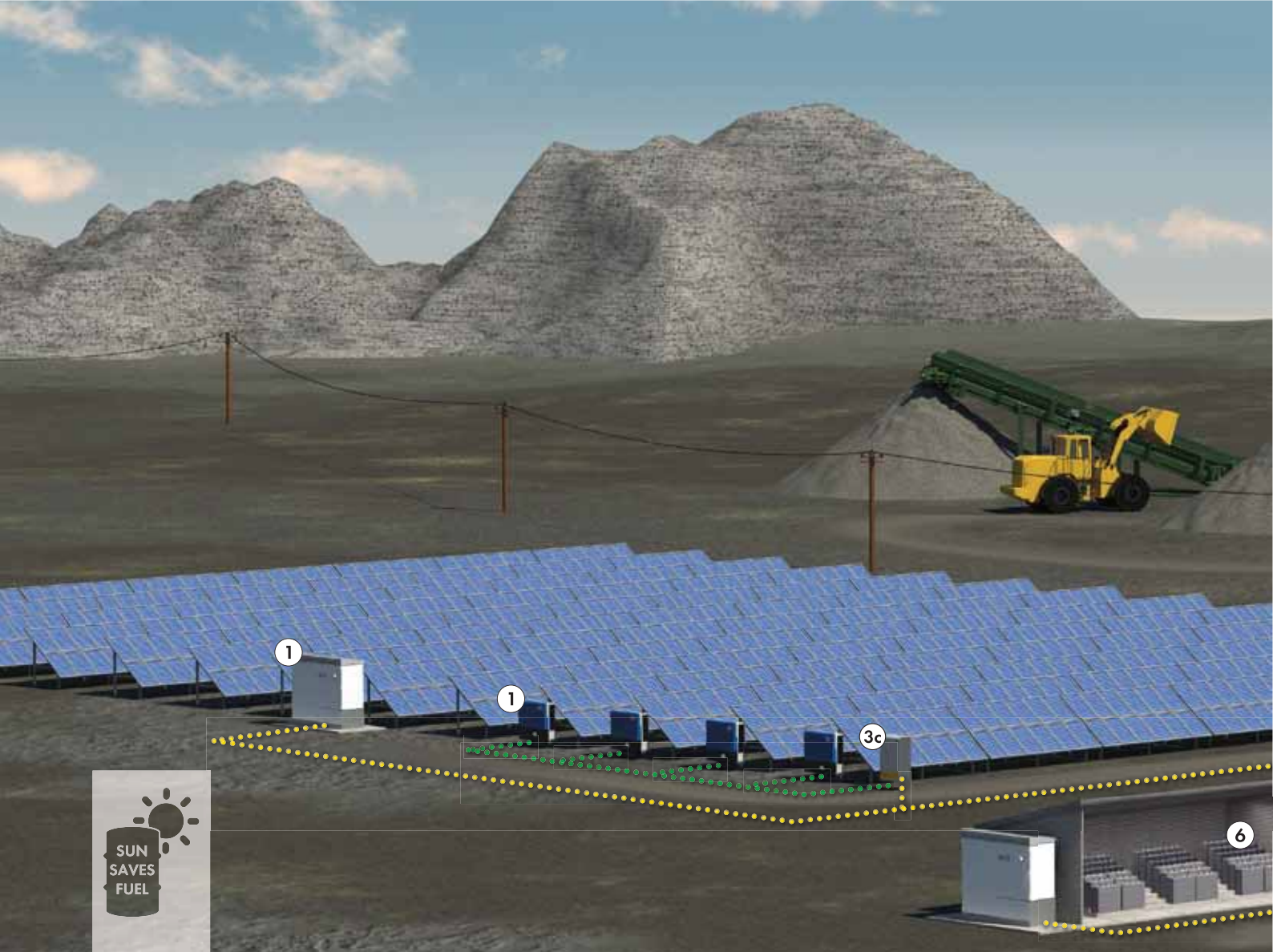
SUNNY ISLAND 6.0H/8.0H for Off-grid Systems

Easy to use. Robust. Flexible.

More durable than its predecessors: The new Sunny Island impresses with its high protection class and wide temperature range. Moisture, dust and temperature fluctuations will not impair its reliable operation, even after 20 years. Thanks to OptiCool, there is no need to compromise when it comes to overload capacity and economic viability. And there is more: OptiPower, the intelligent load and energy management system, ensures operation, even in critical situations. OptiUse makes installation, commissioning and daily use easier than ever with automatic rotating magnetic field detection, an optimized quick configuration guide and intuitive operation. Plus, the intelligent OptiBat battery management automatically controls the most important charging and discharging procedures, which extends the service life of sensitive energy storage. Sunny Island is a truly comprehensive package for a worry-free, reliable and self-sufficient electricity supply.



Technical Data	Sunny Island 6.0H	Sunny Island 8.0H
AC Output (Loads / Stand-Alone Grid)		
Rated grid voltage / AC voltage range	230 V / 202 V - 253 V	230 V / 202 V - 253 V
Rated frequency / frequency range (adjustable)	50 Hz / 45 Hz ... 65 Hz	50 Hz / 45 Hz ... 65 Hz
Rated power (@ V_{nom} , f_{nom} / 25 °C / $\cos \phi = 1$)	4600 W	6000 W
AC power at 25 °C for 30 min / 5 min / 3 sec	6000 W / 6800 W / 11000 W	8000 W / 9100 W / 11000 W
Rated current / maximum output current (peak)	20 A / 120 A	26 A / 120 A
Total harmonic distortion output voltage / power factor with rated power	< 4 % / -1 ... +1	< 4 % / -1 ... +1
AC Input (Generator, Grid or MC Box)		
Rated input voltage / AC input voltage range	230 V / 172.5 V - 264.5 V	230 V / 172.5 V - 264.5 V
Rated input frequency / approved input frequency range	50 Hz / 40 Hz ... 70 Hz	50 Hz / 40 Hz ... 70 Hz
Maximum AC input current / adjustable	50 A / 0 ... 50 A	50 A / 0 ... 50 A
Maximum AC input power	11.5 kW	11.5 kW
Battery DC Input		
Rated input voltage / DC voltage range	48 V / 41 V - 63 V	48 V / 41 V - 63 V
DC rated charging current / DC rated discharging current / maximum battery charging current	90 A / 103 A / 110 A	115 A / 136 A / 140 A
Battery type / battery capacity (range)	FLA, VRLA / 100 Ah ... 10000 Ah	FLA, VRLA / 100 Ah ... 10000 Ah
Charge control	IUoU charge procedure with automatic full charge and equalization charge	IUoU charge procedure with automatic full charge and equalization charge
Efficiency / Self-Consumption		
Maximum efficiency	95 %	95 %
Self-consumption without load / standby	< 26 W / < 4 W	< 26 W / < 4 W
Protective Devices (Inverter)		
AC short-circuit / AC overload	● / ●	● / ●
DC reverse polarity protection / DC fuse	- / -	- / -
Overtemperature / battery deep discharge	● / ●	● / ●
Overvoltage category according to IEC 60664-1	III	III
General Data		
Dimensions (W / H / D)	467 / 612 / 242 mm (18.4 / 24.1 / 9.5 inch)	467 / 612 / 242 mm (18.4 / 24.1 / 9.5 inch)
Weight	63 kg	63 kg
Operating temperature range	-25 °C ... +60 °C	-25 °C ... +60 °C
Protection class according to IEC 62103	I	I
Climatic category according to IEC 60721	3K6	3K6
Degree of protection according to IEC 60529	IP54	IP54
Features / Function		
Operation and display / multifunction relay	external via SRC-20 / 2	external via SRC-20 / 2
Three-phase systems / parallel connection	● / ●	● / ●
Integrated bypass / multicuster operation	- / ●	- / ●
State of charge calculation / full charge / equalization charge	● / ● / ●	● / ● / ●
Integrated soft start / generator support	● / ●	● / ●
Battery temperature sensor / data cables	● / ●	● / ●
Warranty: 5 years	●	●
Certificates and approvals	www.SMA-Solar.com	www.SMA-Solar.com
Accessories		
Battery cable / battery fuse	○ / ○	○ / ○
Interface SI-COM SMA (RS485) / SI-SYSCAN (Multicuster)	○ / ○	○ / ○
Extended generator start "GenMan"	○	○
Load-shedding contactor / external battery current measurement	○ / ○	○ / ○
● Standard features ○ Optional features - Not available		
Data at nominal conditions - provisional data, as of March 2013		
Type designation	SI6.0H-11	SI8.0H-11



Sun Saves Fuel: The SMA Fuel Save Solution

SMA system technology for industrial photovoltaic diesel hybrid applications

Energy-intensive industrial and commercial businesses in regions with weak or without existing grid structure. Often use diesel gensets to generate electricity supply. However, rising diesel prices and expensive transport, storage and fueling of the diesel lead to ever increasing operating costs. At the same time, decreasing PV system costs are already making photovoltaic energy significantly cheaper than pure diesel power supplies, especially in sunny regions.

Intelligently combined

Intelligently combining diesel and photovoltaics to create a photovoltaic diesel hybrid system allows system operators to minimize fuel costs and CO₂ emissions. The key components of the SMA Fuel Save Solution are

the SMA Sunny Tripower or Sunny Central inverter and the SMA Fuel Save Controller. This smart PV control solution significantly increases the yields of applications running on diesel, if:

- The effective cost of diesel is above 1 U.S. dollar
- Local irradiation conditions allow for the use of PV (especially economical with yields above 1500 kWh/kWp)
- Sufficient space for a PV system is available

International experience

The requirements placed on energy supply systems – especially in the industrial and commercial sectors – are high. Low costs, quick operational readiness, maximum reliability and availability all count as key factors. At the same time, each system is unique, as load profiles and external conditions vary from location to location. SMA has been developing scalable hybrid solutions for the electrification of off-grid regions for more than 30 years and boasts many years experience as a supplier of system technology for the installation of PV power plants with a total capacity in the three digit megawatt range. With over 30 gigawatts of installed inverter capacity worldwide, SMA is the global market leader in the field



of PV inverters. More than 1000 employees work daily researching and developing the highest quality solutions with state-of-the-art technology for each and every kind of application, and at an affordable specific price. SMA provides its customers with comprehensive support: from the initial planning stages to installation and commissioning. If service is needed, the Global Service Network provides competent support, making SMA the ideal partner for PV diesel hybrid systems.

Example of a PV Diesel Hybrid System

- 1 **PV inverter**
(Sunny Central or Sunny Tripower)
A central component of the SMA Fuel Save Solution. Specifically designed to operate in weak grids under harsh environmental conditions.
- 2 **Photovoltaic array**
(Photovoltaic modules)
SMA inverters are compatible with all PV module types and technologies currently available on the market.
- 3a **SMA Fuel Save Controller**
(PV Main Controller Module)
Controls PV power fed into the diesel grid. Ensures optimal PV feed-in capacity by taking load profiles and genset status into account.
- 3b **SMA Fuel Save Controller**
(Data Acquisition Module)
Quickly and precisely analyzes current grid and load conditions in the system and transmits the data directly to the PV Main Controller Module.
- 3c **SMA Fuel Save Controller**
(Interface Module)
For decentralized PV system structures with the Sunny Tripower. Interface for calculating and transmitting data and setpoints between the PV Main Controller and the inverters.
- 4 **Diesel generator**
The primary component in conventional energy supply systems: It creates the local grid and supplies electricity to connected loads.
- 5 **Genset system house**
Central connection and coupling point. Includes management and control systems for the diesel genset system.
- 6 **Battery banks**
Increase the efficiency of the entire energy supply system. Battery banks compensate for fluctuations in load and insufficient solar irradiation, make reserve power available and optimize diesel genset operation.
- 7 **Industrial loads**
Application-specific load profiles such as heavy-duty industrial loads for mining or raw material processing as well as for applications such as agriculture or water desalinization.



Photovoltaic Diesel Hybrid System in the Megawatts

South African mine minimizes fuel costs and CO₂ emissions

Thabazimbi is a sparsely populated region characterized by mines, in the South African province of Limpopo. The utility grid is located far away, connection possibilities are limited and the transport of diesel fuel is expensive. However, the high rate of solar irradiation in the region provides ideal conditions for the use of solar energy.

Minimizing fuel-dependency

Since November 2012, a PV system with a power of one megawatt has complemented the existing diesel energy supply at a chrome ore mine. With up to 1.8 gigawatt hours of solar energy per year, the operator can significantly reduce fuel costs and CO₂ emissions. The scalable PV system consists of 4200 PV modules and the SMA Fuel Save Solution with 63 Sunny Tripower PV inverters and a smart control unit, the SMA Fuel Save Controller. Through inter-

action with SMA Sunny Tripower inverters, the Fuel Save Controller manages the demand-based PV feed-in to meet the system's load and generation profile requirements. In this way, the mine operator Cronimet Chrome Mining SA (Pty) Ltd. can reduce fuel dependency to a minimum during the day.



System size

- Installed PV power: 1 MW
- 63 x Sunny Tripower 17000TL
- Nominal power of diesel generator:
2 x 800 kVA

System information

- Thabazimbi, Limpopo Province, South Africa
- Coordinates: 24° 36' S, 27° 23' E
- Operator: Cronimet Chrome Mining SA (Pty) Ltd.
- Planning and realization: Solea AG, Solea Renewables (Pty) Ltd.
- Date of commissioning: November 2012
- Fuel reduction: up to 450000 L of diesel per year
- No grid access

System components

- 63 x Sunny Tripower 17000TL
- SMA Fuel Save Controller





User-friendly

- Simple connection to the generator system
- Exchange realtime data via Modbus®

Stable

- Optimal control of solar energy feed-in
- Reverse power protection functionality
- Several optimization and communication functions available

Flexible

- Plant and system parameters are fully configurable
- Modular design allows for most system setups
- PLC-based modular system with high-quality industrial grade components

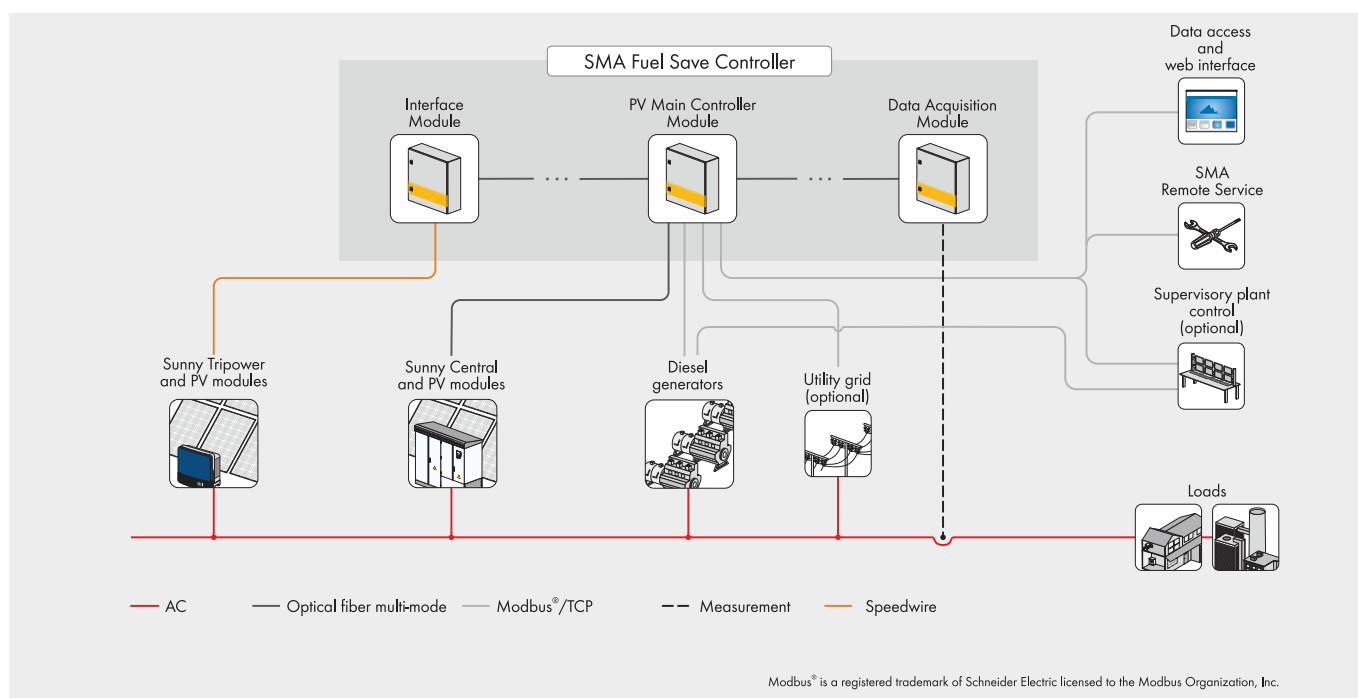
Scalable

- Supports future system expansion
- Prepared for future integration of energy storage systems

SMA FUEL SAVE CONTROLLER

Integrating photovoltaics into fossil-fueled power generation systems

The SMA Fuel Save Controller is a key component in photovoltaic diesel hybrid system solutions. As the link between diesel generator, photovoltaic system and load, the SMA Fuel Save Controller takes on all demand-based control of PV feed-in depending on the load and generation profiles. This ensures maximum security of supply with reduced fuel costs and also minimizes CO₂ emissions. Together with Sunny Tripower and Sunny Central, the SMA Fuel Save Controller meets comprehensive grid management functions within the system. SMA hybrid systems can be expanded on a modular basis at any time and provide reliable system control through remote monitoring.



Technical Data	SMA FUEL SAVE CONTROLLER		
	PV Main Controller Module	Data Acquisition Module	Interface Module
General Data			
Dimensions (W / H / D) in mm (approx.)	600 / 600 / 210	600 / 600 / 210	600 / 600 / 210
Weight (approx.)	30 kg	30 kg	30 kg
Degree of protection according to DIN IEC 60529	IP65	IP65	IP65
Ambient Conditions			
Operating temperature range	-10 °C ... +50 °C		
Maximum operating altitude	2000 m above MSL		
Humidity	5 % ... 95 % (non-condensing)		
Electricity Supply			
Voltage supply (nominal value)	110 ... 240 VAC (50 ... 60 Hz)		
Power consumption (approx.)	200 W	200 W	200 W
Communication			
Plant communication for supervisory plant control, SCADA and remote monitoring	Modbus / TCP, http, FTP via Ethernet 10 BASE-T and 100 BASE-T(X) Remote monitoring via UMTS/GSM (optional)		
Communication between modules / maximum cable length	Ethernet via optical fiber through SC connector Ethernet copper based (optional) / 2000 m		
Communication with inverters / maximum cable length	STP: Speedwire, 10/100 Mbit/s SC: Ethernet 100 BASE-FX and 100 BASE-TX (optional) / STP: 100 m, SC: 2000 m		
Communication protocol for connection to generator controllers	MODBUS / TCP via Ethernet 10 BASE-T and 100 BASE-T(X)		
Other Interfaces			
Multi-functional digital inputs (for potential-free contacts, maximum voltage drop at 10 mA: 5 V)	8	2	-
Multi-functional digital outputs (potential-free contacts)	4	-	-
Voltage / current measurement	-	VT (for grid voltages higher than 415 V) / CT (5 A)	-
Visualization & Data Recording			
Visualization and configuration interface	Web interface for local and remote monitoring		
Data & event recording	5 second values for 2 days, 5 minute average values for 30 days		
Compatible Inverters			
Inverter	Sunny Central CP-XT series, Sunny Tripower (STP 10000TL, STP 12000TL, STP 15000TL, STP 15000TLEE, STP 17000TL, STP 20000TLEE)		
General System Design			
System size (PV system size)	300 kVA ... 6 MVA		
Maximum PV power ratio	60 % of the max. generator capacity (parallel operation)		
Maximum number of handled generators	5 (no restriction if power limitation is available through supervisory control)		
Type designation	FSC10CONT	FSC10DAQ	FSC10IFM



RESIDENTIAL PV SYSTEM



COMMERCIAL PV SYSTEM



PV POWER PLANT

THE RIGHT SOLUTION FOR EVERY APPLICATION

Why is system monitoring so important?

From residential PV systems to giant PV power plants: Reliable monitoring is essential for achieving long-term high yields in electricity production. A system that operates continuously is the only way to ensure ecological and economical benefits – to ease the burden on the environment and your wallet. SMA offers monitoring solutions for every application that provide more than just continuous monitoring. Intelligent concepts and products for comprehensive system monitoring – our part in the global energy transition.

What should you keep in mind when choosing a residential PV system?

SMA offers solutions for residential PV systems that not only enable you to easily keep an eye on electricity production but also provide intelligent household energy management. For PV systems installed on single-family homes, SMA recommends using the Sunny Home Manager, Sunny View or the Sunny Explorer software or logging on to the Sunny Portal.

Solar power professionals benefit from the ability to assist system operators by diagnosing problems remotely, which saves travel time, cuts costs and offers customers a broad product portfolio to fit all their needs.

Modern PV system monitoring is much more than simple surveillance, especially for residential PV systems. It provides information regarding system operation in an easy-to-read manner and, thanks to apps for iPhone and Android mobile devices, is accessible from anywhere in the world. System data, such as the current PV power generation capacity, is presented in a simple, clear and professional format.

Communication via Sunny Portal thanks to Webconnect: System monitoring is economically attractive even for very small systems due to integration of the new data interface into inverters. After easy plug & play commissioning, the most important system data can be retrieved and displayed in a clear format at any time.

What is the smart way to guarantee investment security in commercial PV systems?

For larger PV systems, a variety of components can be assembled to create a customized monitoring solution. In combination with SMA inverters, operators and solar power professionals benefit from a perfectly coordinated system. The product spectrum of system monitoring products includes Sunny Portal, Sunny WebBox, Sunny WebBox with *Bluetooth* and the SMA Meteo Station for the expert collection of performance-related meteorological data.

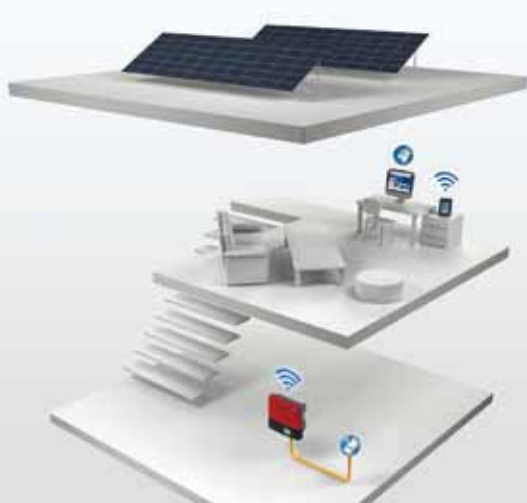
SMA system monitoring also provides many benefits to solar power professionals. In the event of a problem, installers have quick access to all system data. This information allows them to draw conclusions about a specific event and troubleshoot problems remotely. This can sometimes eliminate the need for long distance service visits. SMA products are also useful for systems maintenance and parameterization.

What guarantees professional system management in PV power plants?

The larger the PV plant, the faster small reductions in power negatively affect yields – if they go undetected. Even megawatt plants can be accurately and comprehensively monitored with our solutions designed especially for PV power plants. In this way, they help to reduce costs and guarantee yields. The modular system concept with the Power Plant Controller, Cluster Controller and the Ethernet-based Speedwire fieldbus enable you to flexibly scale plant power, regardless of whether it has a decentralized or centralized plant architecture.

SMA products, with their features and flexible solutions for PV farm control meet and exceed global requirements for grid management capabilities for PV power plants up to the three-digit megawatt range. Our central inverters, together with the SMA Power Plant Controller, feature state-of-the-art data interfaces, supporting various serial and Ethernet-based protocols.

1



RESIDENTIAL PV SYSTEM

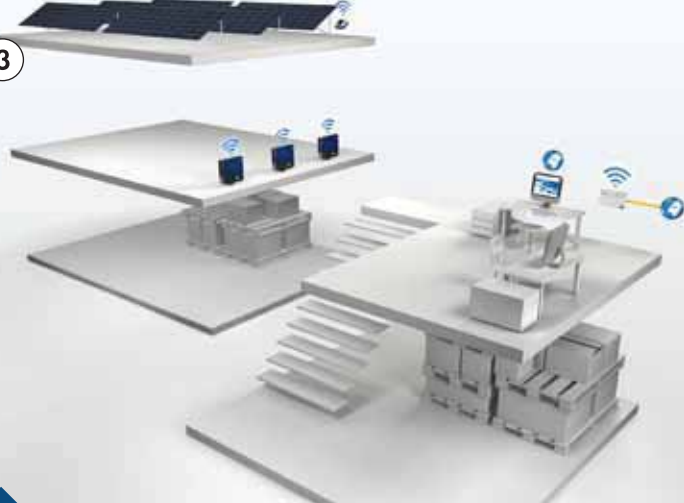
2



Wireless Communication

Local Monitoring

3



COMMERCIAL PV SYSTEM

4



Remote Monitoring

The Perfect Product for Every Solution

Why is SMA also the right partner to provide system management?

Because we are aware that there are a variety of requirements when it comes to monitoring. Because system operators have specific needs. Because each and every PV system is unique. And because our products meet these needs in terms of power, functions and features. The basic scenarios here are just an example of what is possible.

Residential PV system, scenario 1: The all-inclusive service package

The ideal package for private system operators looking for an automatic monitoring solution. It provides an elegant way to keep an eye on all key factors. The new Sunny View and communication via *Bluetooth* provide a local monitoring solution with real-time system data in color: The large, easy to read 5" color touchscreen displays all key PV data. If an economically attractive remote monitoring system is desired for a private residential PV system, system data is sent directly to Sunny Portal via Web-

connect technology. System operators and installers have access to key data at any time and from anywhere thanks to this tool with monitoring, management and display features.

5



PV POWER PLANT

6



Wired Communications

Connection to the Operation Control System

Residential PV system, scenario 2: Intelligent energy management

The Sunny Home Manager, Sunny Portal and Sunny Island work in concert here to optimize use of generated solar power as well as make system monitoring more convenient. In this way system operators have an overview of all energy flows in the household, can display the recommended actions and automatically control up to ten household appliances via SMA radio-controlled sockets. The advantages are clear: an increase in self-consumption and a reduction in overall power consumption.

Commercial PV system, scenario 3: The basic solution: smart and wireless

Smart monitoring: Customers stay up-to-date on the operational status of their commercial PV system around-the-clock and from anywhere wirelessly with only minimal effort spent on installation. The Sunny WebBox with Bluetooth receives system data wirelessly and presents it in combination with meteorological data from the Sunny SensorBox via Sunny Portal in a professional analysis.

Commercial PV system, scenario 4: Complete monitoring, wired

For plants larger than 100 kWp, a wired investment: The Sunny WebBox and Power Reducer Box enable monitoring of all aspects of solar power production via the Sunny Portal. The new SMA Meteo Station with pyranometer professionally measures power-relevant meteorological data. This monitoring solution helps to guarantee yields and, at the same time, provides the required grid management.



**PV power plant, scenario 5:
The perfect solution for decentralized
PV power plants**

Modular structure and high-performance: the optimum solution for decentralized large-scale PV power plants with the SMA Cluster Controller, Power Plant Controller and new Ethernet-based Speedwire field-bus. In this manner, SMA provides a 100-percent guarantee on the future of the plant management system, including the optimum data transfer rates for plant monitoring and fast processing of the measured values, status updates and plant control commands. One SMA Cluster Controller can reliably monitor and control up to 75 string inverters per cluster. PV power plants of any size can be operated with central PV farm control using the Power Plant Controller and, at the same time, comply with all valid directives and standards.

**PV power plant, scenario 6:
Plant management, up to the
gigawatt range**

Bundled monitoring expertise in the spotlight: Industrial-sized power plants with centralized architecture can benefit from the exceptional qualities of Sunny Central inverters and their accessories and features for plant monitoring and control. This includes the Power Plant Controller with an integrated interface and the flexible and economical Sunny String-Monitor. Power plant operators can monitor, regulate and optimize their yields and power plant functioning.



AVAILABLE



User-Friendly

- Large, easy-to-read color touchscreen
- Freely configurable user interface

Innovative

- Slide show with automatically changing information
- WLAN interface for display of online data

Easy-to-Use

- Intuitive operation via touchscreen
- Easy-to-understand display of all key plant data

Safe

- Audio and visual alarm
- Data archiving and backup via microSD

SUNNY VIEW

Stylish visualization for the home

Now your system data is live and in color. The Sunny View offers more than just a reliable visualization of the energy yield. System operators can use the large, easy-to-read 5" color touchscreen to display all key PV data, as well as to receive news, meteorological data and posts from social networks via WLAN. All relevant information can be presented in an individually configurable slide show. Fully-automatic monitoring included – the device can communicate via *Bluetooth* with up to 12 inverters and sends a visual and acoustic warning signal in the event of a failure.



Wireless communication with inverters via *Bluetooth*



Large, easy-to-read color touchscreen



Audio and visual alarm



MicroSD card slot for data archiving, storage and export



WLAN interface for news and weather



SMA CT Meter: to measure household power consumption

Technical Data	Sunny View	
Communication		
Inverter communication	<i>Bluetooth</i>	
PC communication	SDHC card (microSD)	
Number of SMA Devices		
<i>Bluetooth</i>	max. 12	
Max. Radio Range		
<i>Bluetooth</i> in free-field conditions	Up to 100 m (can be extended with an SMA <i>Bluetooth</i> Repeater)	
Voltage Supply		
Voltage supply	External plug-in power supply	
Input voltage	90 V – 240 V, 50 / 60 Hz	
Power consumption	typ. 3.75 W, max. 8 W	
Ambient Conditions in Operation		
Ambient temperature	0 °C ... 40 °C (32 °F ... 104 °F)	
Max. permissible value for relative humidity (non-condensing)	5 % ... 95 %	
Degree of protection (according to IEC 60529)	IP20	
Memory		
Internal	16 MB as ring buffer	
External	SDHC card (microSD), max. 8 GB	
General Data		
Dimensions (W / H / D) with tabletop stand	109 / 165 / 75 mm	
Dimensions (W / H / D) without tabletop stand	109 / 152 / 23.5 mm	
Weight with tabletop stand	0.293 kg (0.6 lb)	
Weight without tabletop stand	0.245 kg (0.5 lb)	
Mounting location	Indoors	
Mounting type	Wall mounting, tabletop device	
Software languages	German, English, Italian, French, Dutch, Greek, Japanese	
Languages of the manual	German, English, Italian, French, Dutch, Greek, Japanese	
Features		
Display	5 inch (12.75 cm), 16 million colors, resolution 480 x 800 pixels	
Operation	Touch screen	
Warranty	2 years	
Certificates and approvals	www.SMA-Solar.com	
Accessories		
USB plug-in power supply	●	
SMA <i>Bluetooth</i> ® Repeater	For extending the maximum <i>Bluetooth</i> radio range	
SMA CT Meter	For measuring household power consumption (only Japan)	
Type designation	VIEW-10	



AVAILABLE

Professional

- Measurement of the global radiation using Kipp & Zonen pyranometers
- Measurement of additional meteorological data (air temperature, air pressure, relative humidity, PV module temperature)

Convenient

- Data analysis via Sunny WebBox or Sunny Portal
- Flexible integration into the existing RS485 communication system

Easy-to-Use

- Simple and safe mast mounting
- Fast installation with only one cable

SMA METEO STATION

The professional weather station equipped with a pyranometer

A must-have for professional measurement of power-related meteorological data: The SMA Meteo Station not only measures air temperature, air pressure and relative humidity with great accuracy; it also determines global radiation. Different systems can now be compared to one another by using the horizontally installed pyranometer to measure the incident light. This makes it possible to determine the key parameters required for an optimum configuration, such as the module tilt angle. All measured values are made available for analysis via the Sunny WebBox or Sunny Portal.



Easy-to-Use

- Straightforward plug and play commissioning
- No additional SMA devices required

Economical

- Reasonable investment costs and low installation effort
- Most effective and efficient system monitoring method

Communicative

- Easy online monitoring via Sunny Portal
- Clear display of the most important system data via Sunny Portal

Direct

- Data exchange with Sunny Portal without data logger
- Free Sunny Portal app for data visualization on smartphones

WEBCONNECT

Direct data exchange with Sunny Portal

Ideally suited for online monitoring of small PV systems with a maximum number of up to four inverters: Webconnect provides free access to Sunny Portal without additional data logger – easily via an existing Internet access and a DSL router. After the simple installation of the inverter interface which is optionally available or already integrated at the factory, you can commission the Webconnect. Basically, it is plug and play. Once configured, key system data can be accessed and displayed in a clear format whenever you need it. Moreover, automatic product updates ensure that the device firmware is always up-to-date.



Optional Webconnect interface of type data module¹ or type Piggy-Back²



SB 240-10 and Sunny Multigate with integrated Webconnect functionality



STP 5000 / 6000 / 7000 / 8000 / 9000TL-20 with integrated Webconnect functionality

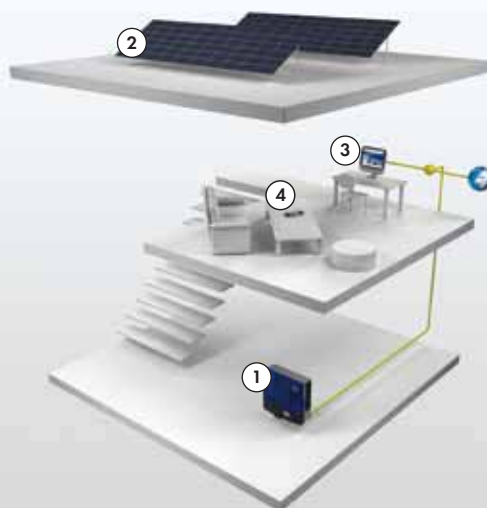


SB 3600 / 5000SE-10 with integrated Webconnect functionality

¹ Supported inverters: STP 15000TL-10 / 20000TL-10, 15000TLHE-10 / 20000TLHE-10, 10000TL-10 / 12000TL-10 / 15000TL-10 / 17000TL-10, 12000TLUS-10 / 15000TLUS-10 / 20000TLUS-10 / 24000TLUS-10 / SB 2500TLST-21 / 3000TLST-21, 3000TL-21 / 3600TL-21 / 4000TL-21 / 5000TL-21 / 3000TLUS-22 / 4000TLUS-22 / 5000TLUS-22 /

² Supported inverters: SB 1300TL-10 / 1600TL-10 / 2100TL, 3300-11 / 3800-11 / 3000US-12 / 3800US-12 / 4000US-12 / 5000US / 5000US-11 / SB 5000US-12 / SB 6000US / SB 6000US-11 / SB 6000US-12 / SB 6000TLUS-12 / SB 7000US / SB 7000US-11 / SB 7000US-12 / SB 7000TLUS-12 / 8000US / 8000TLUS-10 / 8000US-11 / 8000US-12 / 8000TLUS-12 / 9000TLUS-10 / 9000TLUS-12 / 10000TLUS-10 / 10000TLUS-12 / 11000TLUS-12 / SMC 6000A-11

Technical Data	Inverter with Webconnect functionality	Micro inverter with Webconnect functionality
Communication		
Sunny Portal	SMA Webconnect via Ethernet	
PC communication	SMA Speedwire via Ethernet	
Connections		
Ethernet	RJ45	
Maximum Radio Range		
Ethernet	100 m	
Supported Sunny Portal Functions		
Online device updates	●	
Plant and Device Information		
Live data	—	●
Panel Level Monitoring	—	●
System description	Overview of the key properties of the PV plant	
Annual comparison	Quick yield overview of the entire operating period	
System log book	Access to messages regarding plant events	
Device overview	Properties and parameters of the devices in the PV plant	
Status reports	E-mail reports provide regular information on plant yields and plant events	
Data management	Data consolidation after two years	
Monitoring		
Inverter comparison	Fully automatic and continuous yield comparison and e-mail notifications	
Communication monitoring	Ongoing monitoring of the connection between Sunny Portal and the PV plant	
Individual Access		
Publication of specific pages	Access via the public area on Sunny Portal by all Internet users, ideal for personalized presentations on personal websites	
User roles	By assigning the roles of "guest", "standard user", "installer" and "plant administrator", viewing and configuration rights of the different roles can be defined.	
Access		
Website	www.sunnyportal.com, www.SMA.de/webconnect	
Smartphone	www.sunnyportal.mobi, Sunny Portal App for iPhone and Android	
Tools required for commissioning	SMA Connection Assist, Sunny Explorer	
● Standard features ○ Optional features — Not available		



Typical plant design

Power generation

- ① Example – Sunny Tripower with Speedwire / Webconnect data module
- ② PV array

System monitoring

- ③ Sunny Explorer
Sunny Portal
- ④ Mobile access



Convenient

- Monitoring and control of up to 75 string inverters
- Exchange of real-time data with other devices and systems using the standard Modbus® communications protocol

Versatile

- Complies with national and international requirements for grid integration
- Integrated analog and digital interfaces for sensors and active / reactive power setpoints

Professional

- Easy installation thanks to top-hat rail mounting and connectors with push-in, spring-cage terminals
- Optimized for industrial use thanks to a robust enclosure and high-quality components

Safe

- Immediate e-mail notification in the event of a failure
- Remote monitoring and maintenance via the integrated user interface and Sunny Portal

SMA CLUSTER CONTROLLER

Professional monitoring and control for decentralized large-scale PV plants

Combined with the highly efficient SMA string inverters, the SMA Cluster Controller is the perfect system solution for decentralized large-scale PV power plants. The SMA Cluster Controller offers reliable monitoring and control of up to 75 string inverters thanks to the Ethernet-based Speedwire fieldbus and the high-performance dual-core processor. Plant operators receive advantages such as optimum data transfer rates for plant monitoring and fast processing of measured values, status information and system control commands. Furthermore, the many different connection options for the sensors enable more precise evaluation of plant power. In addition to the status updates, relevant plant power can be viewed using Sunny Portal and its variety of features.

Technical Data	SMA Cluster Controller
Communication	
Inverter	Speedwire, 10 / 100 Mbit/s
Data network (LAN)	Fast Ethernet, 10 / 100 Mbit/s
Data interfaces	HTTP, FTP, Modbus TCP / UDP, SMTP, Sunny Portal
Connections	
Inverters / data network (LAN)	2 ports / 10BASE-T or 100BASE-TX, RJ45, switched
Data storage	2 USB 2.0 high-speed pin connectors, type A
Voltage supply / analog and digital signals	Connector, push-in spring-cage terminal
Maximum Number of SMA Devices	
Speedwire	75
Maximum Radio Ranges	
Speedwire / LAN	100 m (between two devices)
Voltage Supply	
Voltage supply	External power supply unit (available as an accessory)
Input voltage	18 V DC – 30 V DC
Power consumption	typ. 12 W / max. 30 W
Ambient Conditions in Operation	
Ambient temperature	-25 °C ... +60 °C (-13 °F ... +140 °F)
Relative humidity	4 % ... 95 %, non-condensing
Altitude above MSL	0 m to 3000 m
Display	
Type	LC display, monochromatic, back-lit
Display languages	German, English
Memory	
Internal	1.7 GB as ring buffer
External	USB mass storage (optional, available as an accessory)
USB Interfaces	
Quantity / specification / sockets	2 / USB 2.0 high-speed / type A
Digital Inputs	
Quantity	8
Usage	Setpoints for active and reactive power
Analog Inputs	
Quantity	3 x current signal, 1 x voltage signal
Measurement range	0 mA to 20 mA or 0 V – +10 V
Usage	Irradiation measurement, setpoints for active and reactive power or current / voltage measurement
Temperature Measurement	
Quantity / sensor type	2 / PT100 / PT1000 (two or four-cable connection)
Measurement range	-40 °C ... +85 °C (-40 °F ... +185 °F)
Usage	Measurement of ambient and cell temperature
Digital Outputs	
Quantity / design	3 / potential-free relay contacts
Max. load tolerance	48 V DC / 30 W
Usage	Error message, warning and active power limitation
Analog Outputs	
Quantity / signal current	2 / 4 mA to 20 mA
Usage	Feedback from active and reactive power setpoints
General Data	
Dimensions (W / H / D)	275 / 133 / 71 mm (10.8 / 5.2 / 2.8 inch)
Weight	0.9 kg (2.0 lb)
Mounting location / degree of protection of enclosure	Indoors / IP20
Mounting type	Top-hat rail mounting
Status display	LC display, LEDs
Software languages, languages of the manual	German, English, Italian, Spanish, French, Dutch, Portuguese, Greek, Czech
Features	
Operation	Integrated web server, display, keypad
Clock	Realtime clock (RTC) with maintenance-free buffering
Advanced functions using the Sunny Portal	Plant and yield monitoring, measured value processing, performance analysis, presentation, status reports, mobile data access
Warranty	5 years
Certificates and approvals	www.SMA-Solar.com
Accessories (Optional)	
Top-hat rail power supply	Input: 100 V – 240 V AC / 45 ... 65 Hz, output: 24 V DC / 2.5 A
USB flash drive	4 GB or 8 GB, highly reliable industrial quality
Type designation	CLCON-10



Safe

- Meets CEI 0-21 requirements
- Certified protective functions
- Integrated short-term energy storage for standard operation in case of grid failure

Flexible

- Binding for all PV plants larger than 6 kWp in Italy
- Universally applicable

Easy-to-Use

- With the default settings, no parameterization is needed
- Easy computer or laptop configuration thanks to Sunny Explorer
- Easy installation due to top-hat rail mounting

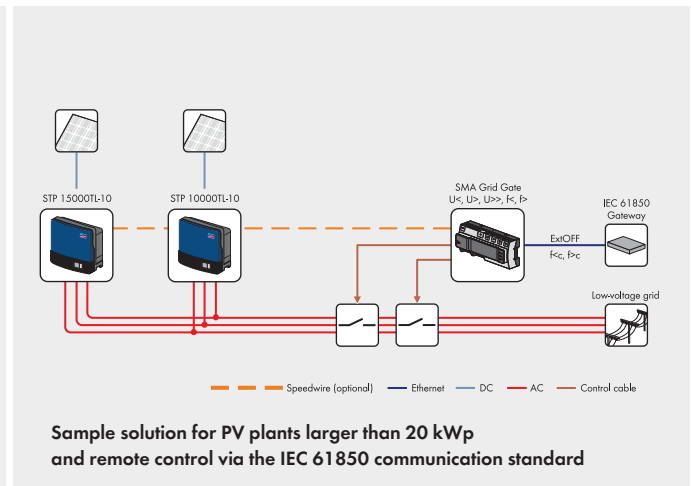
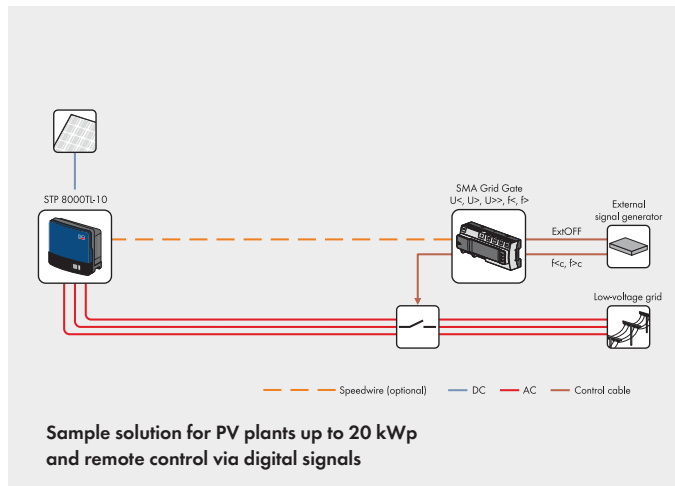
Innovative

- Supports the communication standard IEC 61850-7-2
- Compatible for SMA Speedwire network system integration

SMA GRID GATE

The system solution for Italy

The system solution for PV plants larger than 6 kWp connected to low-voltage grids in Italy: The SMA Grid Gate makes it possible for PV plants to operate in compliance with the CEI 0-21 standard. SMA Grid Gate is compatible with all plant sizes connected to low-voltage grids. If islanding detection is required, this must be included in the inverter, as is the case with SMA inverters. Disconnection and frequency limit setting by remote control can be done either through digital inputs or an Ethernet connection using the communication standard IEC 61850-7-2. Thanks to the integrated maintenance-free, short-term energy storage, standard operation is maintained for at least five seconds in the case of a grid failure. Installation of an additional uninterruptible power supply (UPS) is not required.



Technical Data	
Communication	
Data network (LAN)	
IEC 61850-7-2	
Inverter (for future applications)	
Terminals	
Communication	
Inputs	
AC grid connection	
Maximum Radio Range	
Ethernet / Speedwire	
Inputs	
Digital inputs	
Analog inputs (for future applications)	
Connection Data (AC)	
Nominal AC voltage	
Nominal AC voltage range	
Nominal AC frequency	
AC power frequency range	
Nominal AC current	
Control of tie switch $I_{AC \max}$	
Control of tie switch $V_{AC \max}$	
Connection phases	
Protective Devices	
AC short-circuit current capability	
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	
Ambient Conditions in Operation	
Ambient temperature	
Relative humidity	
Altitude above MSL	
General Data	
Dimensions (W / H / D)	
Weight	
Mounting location	
Mounting type	
Degree of protection (according to IEC 60529)	
Language of the manual	
Software language	
Features	
Remote control	
Short-term energy storage	
Bridging time in case of supply voltage failure	
Status display	
Event display and configuration	
Operation	
Clock	
Warranty	
Certificates and approvals	
Last updated: April 2013	
Type designation	

SMA Grid Gate	
	fast Ethernet, 10 / 100 Mbit/s
	fast Ethernet, 10 / 100 Mbit/s
	Speedwire, 10 / 100 Mbit/s
	10BASE-T or 100BASE-TX, RJ45
	Connector, push-in spring-cage terminal
	Screw terminals
	100 m (between two devices)
	6
	3
	230 V
	46 V - 299 V
	50 Hz
	47 Hz ... 52 Hz
	70 mA
	6 A
	380 V
	3
	16 A
	I / III
	-25 °C ... +55 °C (-13 °F ... +131 °F)
	10 % ... 95 % (non-condensing)
	0 m to 3000 m
	210 / 75 / 90 mm (8.27 / 2.95 / 3.54 inch)
	0.3 kg (0.66 lb)
	Switch or meter cabinet
	Top-hat rail mounting
	IP20
	Italian, German
	See Sunny Explorer
	Digital inputs, IEC 61850-7-2
	Integrated, maintenance-free
	At least 5 s
	LEDs
	Sunny Explorer
	Keys
	Real-time clock (RTC)
	5 years
	CEI 0-21
	GRIDGATE-20



Flexible

- For all plant topologies
- Modular system concept for individual requirements
- Simple to expand with new protocols and standards

Precise

- Exact grid voltage control
- Regulation of active and reactive power and power factor
- Individual activation of single inverters in the farm

Easy-to-Use

- Configuration and parameterization via Remote Access
- Easy installation thanks to compact design
- Integrated web server

Profitable

- Reliable plant operation with minimal downtime
- Fulfillment of global requirements for grid integration and international plant certification

POWER PLANT CONTROLLER

Flexible park control for all PV power plants

The SMA Power Plant Controller offers intelligent and flexible solutions for the park control of all PV power plants in the megawatt range. It is suitable for PV power plants with central inverters as well as for those with decentralized string inverters. With the help of simulation tools valuable predictions on the behavior of the Power Plant Controller and the design of the plant are already possible before the commissioning of a PV power plant. The parameterization and configuration of the Power Plant Controller can be performed with ease via remote access. With easy expandability for new communication protocols, standards for individual connections and a modular design, the SMA Power Plant Controller is well suited to meet the future requirements of PV power plants.

Top Yields – Stable Utility Grids

The Power Plant Controller guarantees plant operators maximum yields and contributes to the stability of grids. It fulfills the requirements of grid operators worldwide with its ability to regulate voltage, reactive and active power, and the power factor at the grid feed-in point quickly and precisely. The SMA Power Plant Controller allows large-scale PV power plants to meet all requirements of modern competitive PV power plants.

Higher yields for plant operators

Quick and precise regulation guarantees plant operators optimized yields. Downtime can be reduced and smooth plant operation can be guaranteed. Remote configuration and monitoring reduce maintenance costs in the module array.

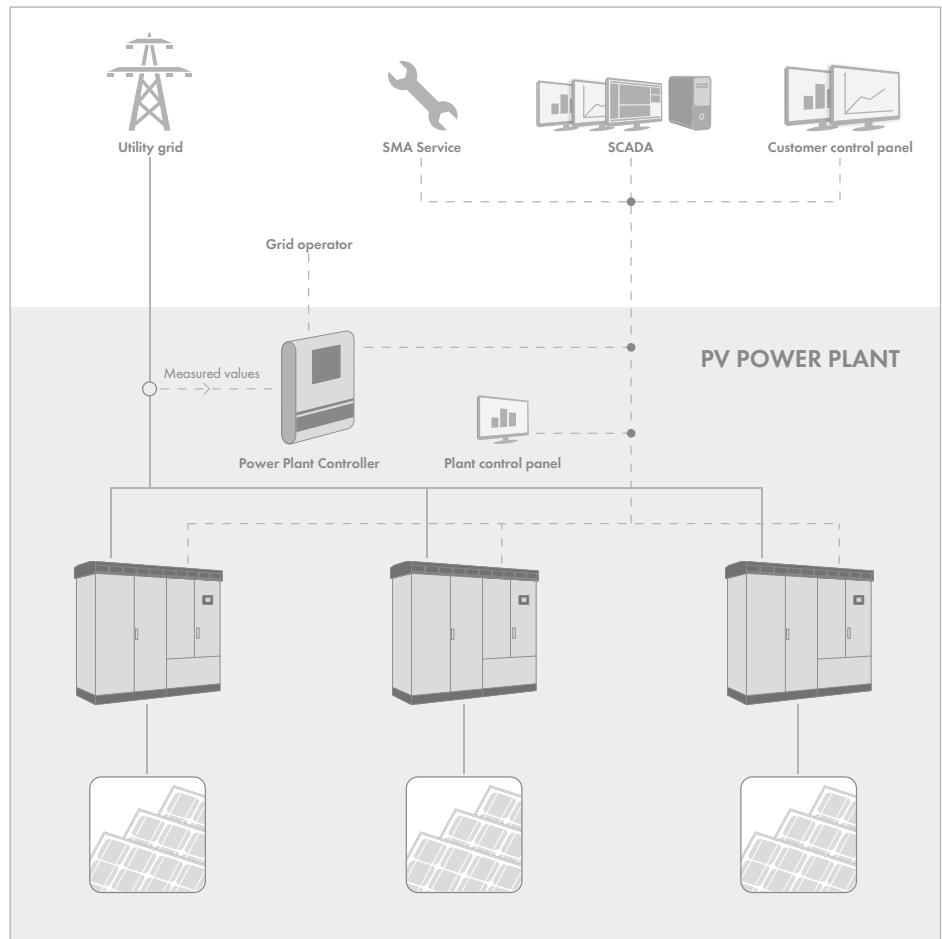
Greater stability for grid operators

The Power Plant Controller makes your PV power plants' behavior a calculable variable in the utility grid. It fulfills all requirements for grid control, guaranteeing grid stability at all times. The advantage: reliable integration of large PV power plants into the grids.

Greater Security for Planners

Implement megawatt-scale power plant projects with SMA solutions. The Power Plant Controller is compliant with grid operators' requirements worldwide. Its compact design allows simple and flexible use in all plant topologies.

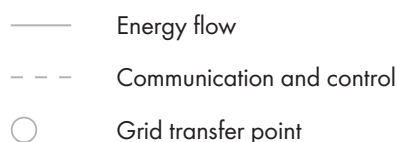
SMA Plant Control System



Power Plant Controller – Central PV Power Plant Control Unit

The Power Plant Controller controls PV power plants to ensure that they adapt to the requirements of the utility grid or grid operator in every phase of operation.

- Efficient PV plant controller with fast communication infrastructure
- Central hub for recording, evaluating and applying measurements
- Receiver for all internal and external control and regulation commands
- Central control unit for coordinating inverters in the power plant
- Real-time recording of all conditions in the power distribution grid (V, f, Q) and in the power plant
- Flexible, expandable concepts for individual hardware and software solutions





Reliable

- Precise monitoring and detection of string failures
- Improved plant and module safety
- Integrated combination arrester for lightning and overvoltage protection

Robust

- Glass-fiber reinforced plastic enclosure for outdoor installation
- Robust enclosure for wall and base mounting
- Low maintenance costs and minimal wear thanks to longer service life

Flexible

- Numerous system versions for flexible plant design
- Matching fuses for each module type
- Easy and flexible connection possibilities

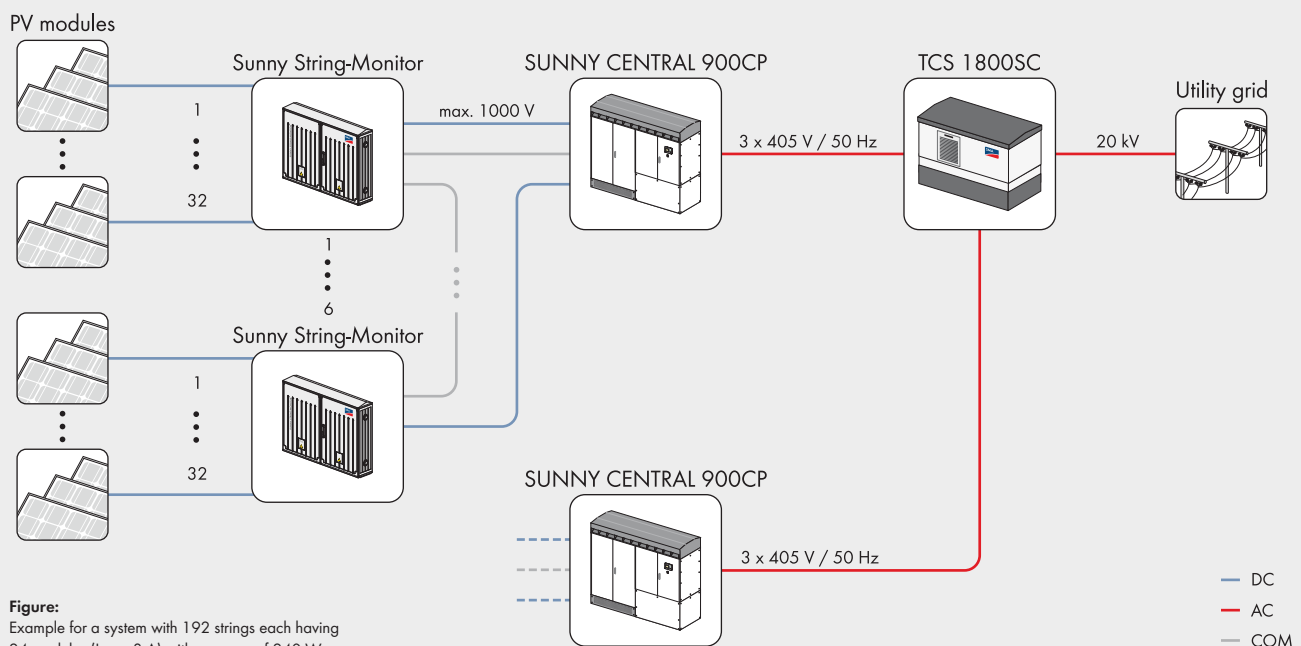
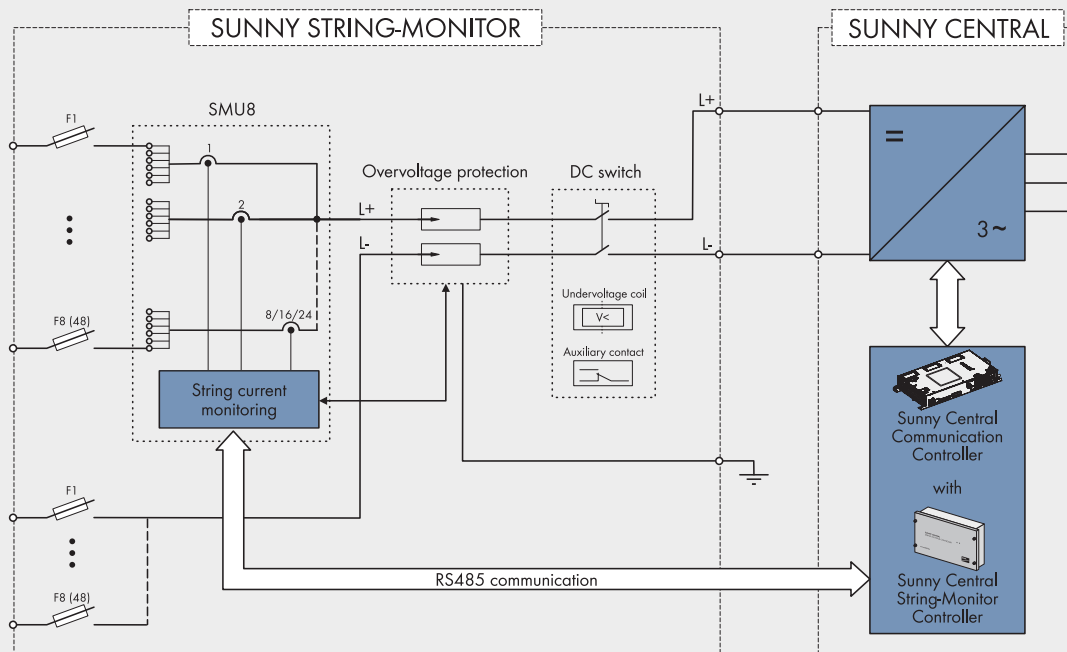
Profitable

- Substantial cost savings thanks to improved safeguard measures
- Reduced costs due to multiple allocation of the measuring channels
- Precise PV yield monitoring with improved measurement accuracy

SUNNY STRING-MONITOR


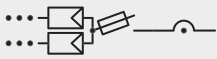

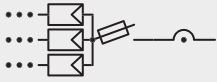

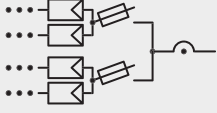
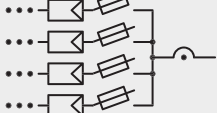
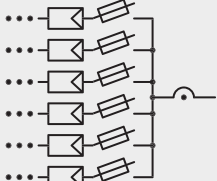
Insurance for energy yields

Reliability and precision in monitoring systems – the Sunny String-Monitor compares and analyzes individual string currents, which enables you to precisely and reliably monitor your solar energy yields. Thanks to the numerous system variants available, plant design becomes even more flexible. The Sunny String-Monitor can guarantee the highest level of plant safety and protection for modules by immediately disconnecting defective strings. Yet another benefit is the new combination arrester that provides excellent lightning and overvoltage protection. It is ideally suited for wall and base mounting due to its robust uni-size enclosure. Likewise, its glass-fiber reinforced plastic makes it able to withstand extreme ambient conditions.



SUNNY STRING-MONITOR

SSM 8 / SSM 16 / SSM 24

Wiring versions	Sunny String-Monitor 8 String inputs / fuses	Sunny String-Monitor 16 String inputs / fuses	Sunny String-Monitor 24 String inputs / fuses
	8 / 8	16 / 16	24 / 24
	16 / 8	32 / 16	48 / 24
	16 / 16	32 / 32	48 / 48
	24 / 8	48 / 16	
	24 / 24	48 / 48	
	32 / 16		
	32 / 32		
	48 / 48		

The Sunny String-Monitors are available in different system versions which have different numbers of string inputs and string fuses, guaranteeing maximum flexibility when designing plants. In this way, tailored, optimized solutions to safeguard and monitor all PV strings can be implemented in perfect harmony with the plant architecture.

Technical Data	Sunny String-Monitor 8	Sunny String-Monitor 16	Sunny String-Monitor 24
Input (DC)			
Max. input voltage	1000 V	1000 V	1000 V
Number of measuring channels	8	16	24
Max. string current per measuring channel	25 A	25 A	25 A
Nominal string fuse current	6 A, 10 A, 12 A, 15 A, 20 A, 25 A, 30 A	6 A, 10 A, 12 A, 15 A, 20 A, 25 A, 30 A	6 A, 10 A, 12 A, 15 A, 20 A, 25 A, 30 A
Fuse characteristics	gPV	gPV	gPV
Fuse layout	10 x 38	10 x 38	10 x 38
Number of string inputs	8 / 16 / 24 / 32 / 48	16 / 32 / 48	24 / 48
Number of string fuses	8 / 16 / 24 / 32 / 48	16 / 32 / 48	24 / 48
String cable connection	Cable gland / connector	Cable gland / connector	Cable gland / connector
Sealing range of the cable gland	5 mm to 10 mm	5 mm to 10 mm	5 mm to 10 mm
Plug connector type	Sunclix 6 mm² / Sunclix 16 mm²	Sunclix 6 mm² / Sunclix 16 mm²	Sunclix 6 mm² / Sunclix 16 mm²
Output (DC)			
Max. output voltage	1000 V	1000 V	1000 V
Max. output current	200 A	280 A	280 A
DC output	Busbar / terminal	Busbar / terminal	Busbar / terminal
Terminal type	V-box terminal Al / Cu	V-box terminal Al / Cu	V-box terminal Al / Cu
Wire size	25 to 400 mm²	25 to 400 mm²	25 to 400 mm²
Connection to busbars	Ring terminal lugs M12	Ring terminal lugs M12	Ring terminal lugs M12
Number of DC outputs	1 / 2	1 / 2	1 / 2
General Data			
Degree of protection (according to IEC 60529)	IP54	IP54	IP54
Enclosure material	Glass-fiber reinforced plastic	Glass-fiber reinforced plastic	Glass-fiber reinforced plastic
Protection class (according to IEC 62103)	II	II	II
Wall unit dimensions (W / H / D)	1058 mm / 848 mm / 245 mm (41.65 / 33.39 / 9.65 inch)	1058 mm / 848 mm / 245 mm (41.65 / 33.39 / 9.65 inch)	1058 mm / 848 mm / 245 mm (41.65 / 33.39 / 9.65 inch)
Wall unit weight (depending on configuration)	70 kg (154.3 lb)	70 kg (154.3 lb)	70 kg (154.3 lb)
Operating temperature range	-25 °C ... +50 °C	-25 °C ... +50 °C	-25 °C ... +50 °C
Max. permissible value for relative humidity (condensing)	0 % ... 95 %	0 % ... 95 %	0 % ... 95 %
Maximum operating altitude above MSL	2000 m	2000 m	2000 m
Communication	RS485	RS485	RS485
Data recording	Synchronized via broadcast	Synchronized via broadcast	Synchronized via broadcast
Features			
Load-break switch	○	○	○
Load-break switch with alarm contact	○	○	○
Load-break switch with remote tripping	○	○	○
Surge arrester	Type 2 / combination (1 / 2)	Type 2 / combination (1 / 2)	Type 2 / combination (1 / 2)
Base mounting	○	○	○
Digital input	Monitoring surge arrester	Monitoring surge arrester	Monitoring surge arrester
● Standard features ○ Optional features – Not available			
Type designation	SSM8-21	SSM16-21	SSM24-21



Easy-to-Use

- Easy connection of SMA inverters
- Documented protocol standard for quick system integration

Flexible

- Use of individual profiles possible
- Manufacturer-independent interoperability of system components through uniform protocol language

Communicative

- Protocols uploaded directly to inverter
- Retrieval of detailed values possible
- High-performance Ethernet interface for the connection of data loggers or control room operated PV systems

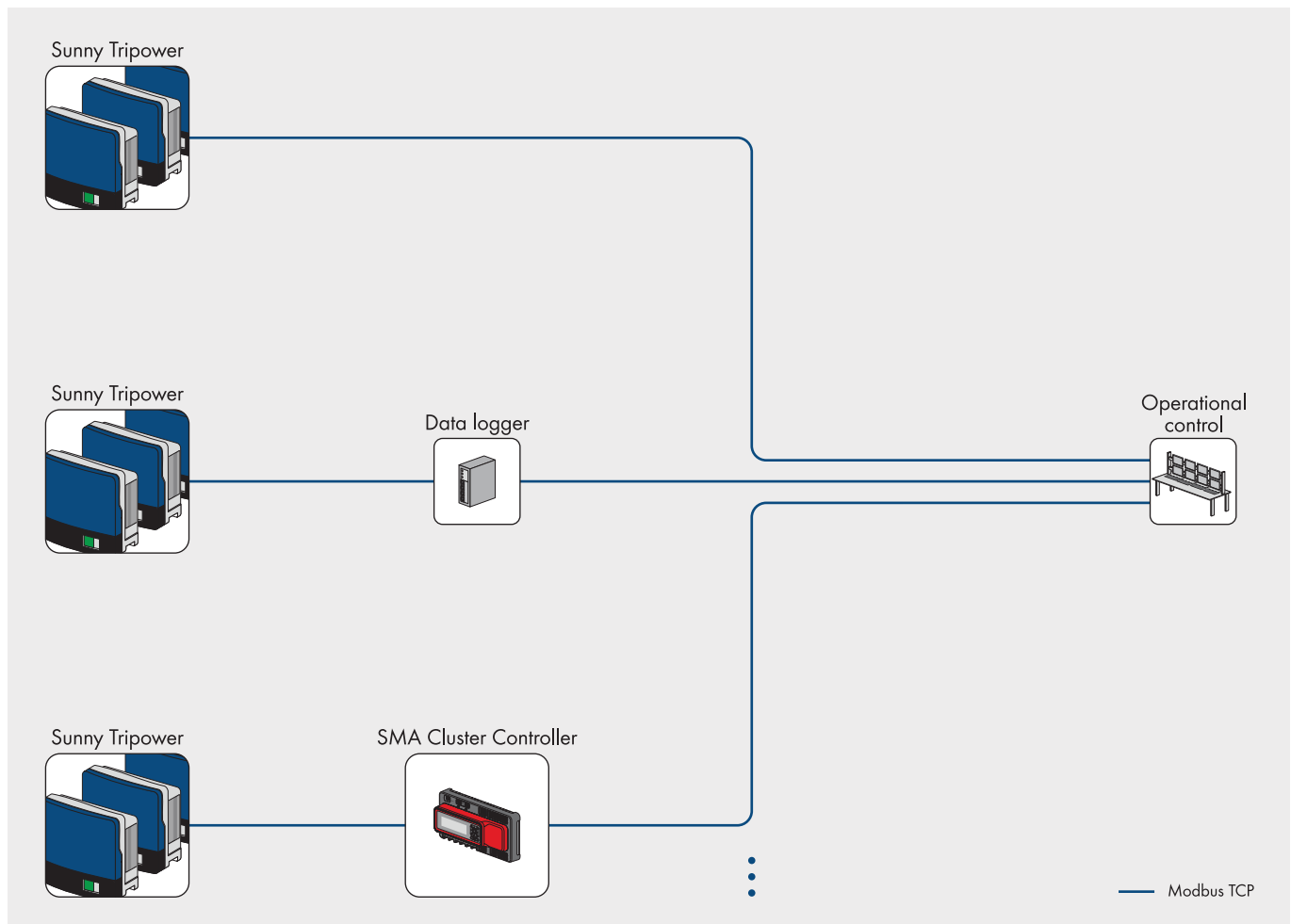
Safety

- Modbus recognized as an international and widespread industry standard
- SMA, a SunSpec Alliance member, contributes to implementation of a protocol standard for PV systems

MODBUS PROTOCOL INTERFACE

The established protocol for easy integration of SMA inverters

With the Modbus protocol interface, SMA makes the flexible integration of inverters possible. The benefits are obvious. Through the use of this well-known, public industry standard, other providers can integrate SMA devices into their systems without having to follow the SMA-specific inverter protocol. System data is transferred via this standardized protocol for further processing and can, as such, be flexibly integrated into any system regardless of the manufacturer. The importance for system planning: You can use SMA inverters in your preferred standard system at any time without having to take manufacturer specifics into account. Direct inverter integration into control room systems or the connection of inverters in building automation systems are both ideal applications.



Manufacturer-independent standard

Modbus is a well-known, public industry standard, which has recently been utilized more frequently in applications in the solar sector. Thanks to this documented protocol standard, quick system integration and the connection of SMA devices is possible. SMA is a member of the SunSpec Alliance, a collaboration of manufacturers in the field of photovoltaics with the goal of standardizing data and communication pathways in PV systems independent of the manufacturer.

Apply an individual data logger

As a system integrator, you have the option of either quickly and easily using the SunSpec profile activated by default for system integrations or replacing the SunSpec profile with your own individually modified profile (data point mapping) and use it in combination with SMA inverters with the advantage of individual data recording. You can continue to use your own data logger solutions along with this individual profile. In addition, detailed inverter data, for example, can also be retrieved within the necessary framework. By using the Modbus protocol via the Speedwire interface (SMA Ethernet), retrieval takes place via a high-performance interface.

Optimized system costs

Reduce system costs with direct data retrieval via a connection to the inverter. This can even be done without an extra manufacturer-issued data logger serving as a data transfer device for a Modbus connection. As a system monitor, you save time and effort, as you only need to manage your own standard system instead of several parallel manufacturer systems.





Reliable

- Future-proof system for plant monitoring, control and regulation
- Technology implementing standard components

Convenient

- Efficient plant management thanks to cluster forming
- Monitoring and control of 75 inverters per cluster in line or star topology

Powerful

- Ethernet-based high-performance bus system (100 Mbit technology) right down to the inverter

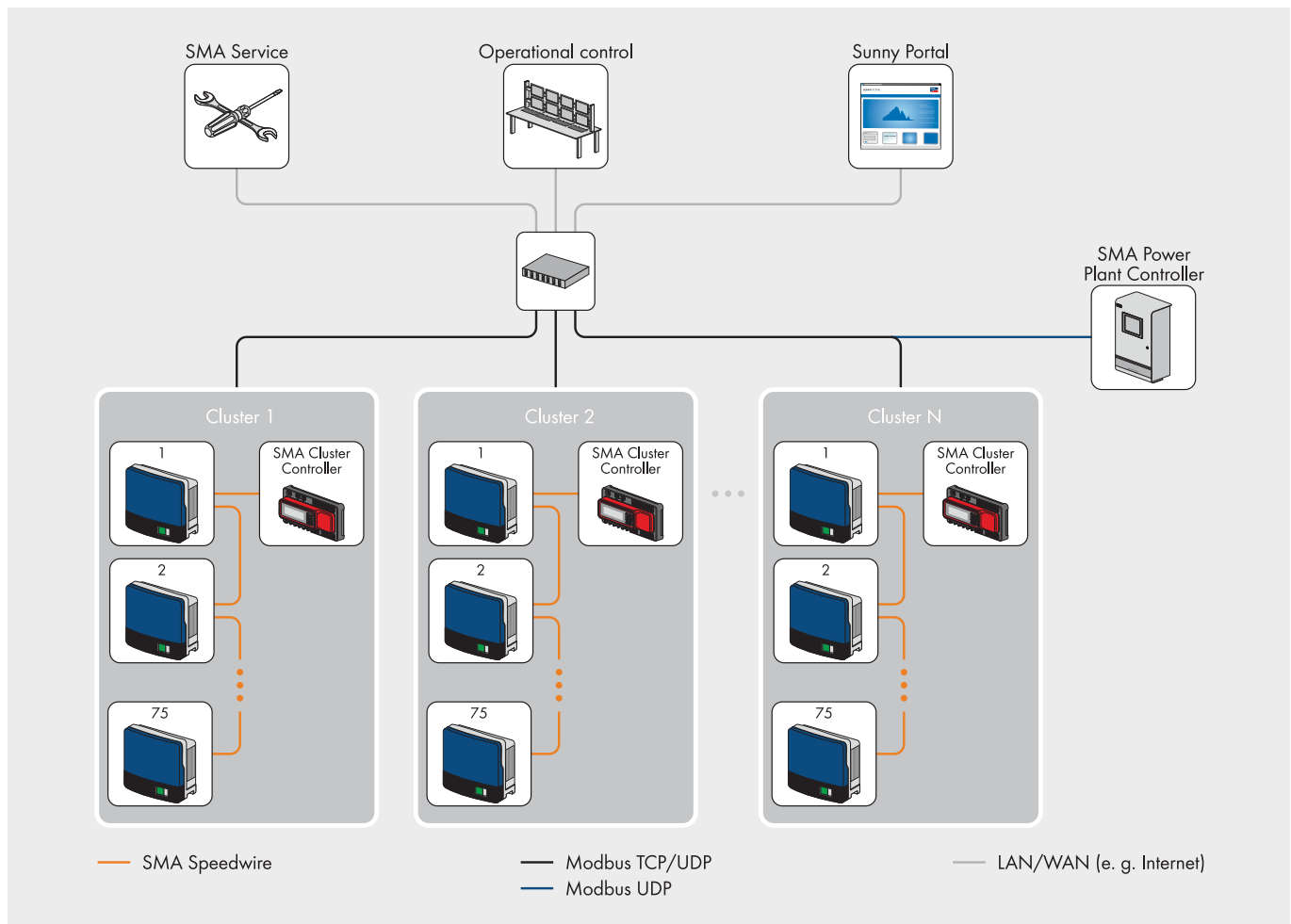
Flexible

- System can be scaled via Cluster Controllers

SPEEDWIRE

Highest data transfer rates with Ethernet-based fieldbus

The perfect solution for decentralized PV power plants in terms of functionality and flexibility: Speedwire as a new Ethernet-based fieldbus offers top-notch performance right down to the inverter. The system can be controlled using the SMA Cluster Controller, the digital interface or the Modbus TCP, guaranteeing optimum network management and compliance with all standards and regulations. The line topology allows you to operate up to 75 inverters per SMA Cluster Controller. The system can be managed efficiently, and this solution offers powerful monitoring and alarm features. Furthermore, the simple "daisy chain" wiring offers flexibility and saves costs.



System overview: decentralized large-scale PV plant with SMA Speedwire fieldbus, SMA Cluster Controllers, SMA Power Plant Controller

Future-proof with wired connection

The SMA Speedwire fieldbus offers more than just a wired connection for the inverters. The system is ideally matched to provide everything as a package and serves as the basis for a future-proof communications network of decentralized PV power plants with a large number of distributed inverters. Up to 75 devices can be integrated, monitored and controlled in a cluster with the SMA Cluster Controller.

Speedwire is a means to provide a continuous high-speed bus system for a future-proof plant monitoring system that also enables you to reliably control and regulate the plant. In this manner, compliance with both national and international standards and regulations can be ensured.

High performance for professional plant management

Speedwire from SMA offers continuously fast data rates right down to the inverter. Plant operators can rely on the system's 100 Mbit technology for their monitoring, control and regulation needs.

The ability to form clusters allows you to efficiently manage plants and provide high-performance monitoring and notifications in the event of a failure. With Speedwire, you are able to conveniently "daisy chain" the wiring, which saves a substantial amount of time and money. It is easy to commission thanks to the plug and play option for automatic network configuration (DHCP).

Flexibility provided as a standard

Flexibility is a major factor for integration into operational control. The modular system can be expanded as needed by simply adding clusters. It is possible to expand to the cluster level or flexibly integrate into the operation control system or SCADA system via Modbus TCP.

The ability to use standard network components ensures high flexibility and attractive savings in terms of time and money.

In addition, there is the option of using the SMA Power Plant Controller as an interface to the grid operator for expansion purposes.

FAQ – Straightforward Answers to Frequently Asked Questions

1. Why is it smart to use Speedwire for communication purposes?

It is not possible to comply with the current standards and regulations using standard RS485 technology. Our solution is the high-performance Speedwire bus system with a future-proof inverter protocol. It enables you to comply with any requirements placed on plants both nationally and internationally.

2. Is Speedwire the same as Ethernet?

No. Speedwire and Ethernet are not the same thing. Speedwire is an Ethernet-based system that uses a protocol optimized for inverters.

3. Which SMA inverters support Speedwire?

The following inverters feature an optional port for the Speedwire interface:

STP 20000TLHE-10, STP 15000TLHE-10, STP 20000TLEE-10, STP 15000TLEE-10, STP 10000TL-10, STP 12000TL-10, STP 15000TL-10, STP 17000TL-10, STP 5000TL-20, STP 6000TL-20, STP 7000TL-20, STP 8000TL-20, STP 9000TL-20, SB 2500TLST-21, SB 3000TLST-21, SB 3000TL-21, SB 3600TL-21, SB 4000TL-21, SB 5000TL-21, SB 1300TL-10, SB 1600TL-10, SB 2100TL, SB 3300-11, SB 3800-11, SMC 6000A-11

4. How can I take advantage of the Speedwire interface?

The corresponding interfaces are either offered as an option or directly installed in the inverter.

5. Which solution does SMA offer as a third-party interface?

A Modbus TCP inverter interface is currently in planning.

6. Are Speedwire and Webconnect the same thing?

No. Webconnect is a feature based on Speedwire and is primarily intended for residential PV systems. It enables data to be sent to the Sunny Portal without the need for additional SMA devices.

7. How can I upgrade an existing system to use the Speedwire bus system?

It is easy. We have an RS485 / Speedwire gateway in planning that can be used to integrate the two systems.

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