

# SMA FLEXIBLE STORAGE SYSTEM



Now even more attractive with the German incentive program for storage systems

### Easy to use

- Comprehensive and easy-to-understand visualizations of all energy flows via live display
- Simple planning and design of the system via Sunny Design

### Efficient

- High overall system efficiency
- Maximum self-consumption through PV and load forecast-supported battery charging

### Flexible

- Can be used to upgrade almost any existing PV system
- For single and three-phase systems
- Free choice for battery type and capacity

### Future-proof

- All components can be updated
- Easy extension of PV system size and battery capacity
- Optional battery-backup function

## SMA FLEXIBLE STORAGE SYSTEM

The versatile solution for new and existing PV systems

The SMA Flexible Storage System is the adaptable solution for new and existing systems and keeps generated solar energy on reserve until it is needed in the household. It is comprised of the Sunny Island battery inverter, Sunny Home Manager and SMA Energy Meter. These can be combined with an SMA PV inverter, SMA radio-controlled sockets and an individually customized number of batteries. With great flexibility in terms of storage capacity and system power, this system offers the ideal solution for high self-consumption and intelligent energy management for nearly all applications within the SMA Smart Home system.

# SMA FLEXIBLE STORAGE SYSTEM

The versatile solution for new and existing PV systems



1 Sunny Boy 5000TL

2 Sunny Home Manager

3 Sunny Portal / Sunny Places

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. Via the community portal Sunny Places, users can actively exchange information with others in the solar community and compare PV systems.

4 Sunny Island 3.0M / 4.4M / 6.0H / 8.0H

5 Electricity meter

6 SMA Energy Meter

7 Uncontrolled loads

Stoves, TVs, computers, etc. are not controlled by the Sunny Home Manager. The Sunny Home Manager memorizes the typical load profile of the building and takes it into account during automatic

controllable load management planning.

**Controlled loads**

Electrical appliances that do not have specific turn-on times can be remotely activated by the Sunny Home Manager and thus 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 increases self-consumption by converting electric energy into thermal energy.

12 SMA Bluetooth® radio-controlled socket

13 Utility grid

14 Router



## SUNNY HOME MANAGER

The control center for smart energy management

With its standard access to Sunny Portal, the Sunny Home Manager enables optimized load management. It not only records all energy flowing in the home and integrates the PV generation forecast into its planning, but also incorporates the charging and discharging of batteries. In addition, it can also activate controllable household devices via the optional SMA radio-controlled sockets.



## SUNNY ISLAND 3.0M / 4.4M / 6.0H / 8.0H for grid-tied applications

The battery inverter for maximum flexibility

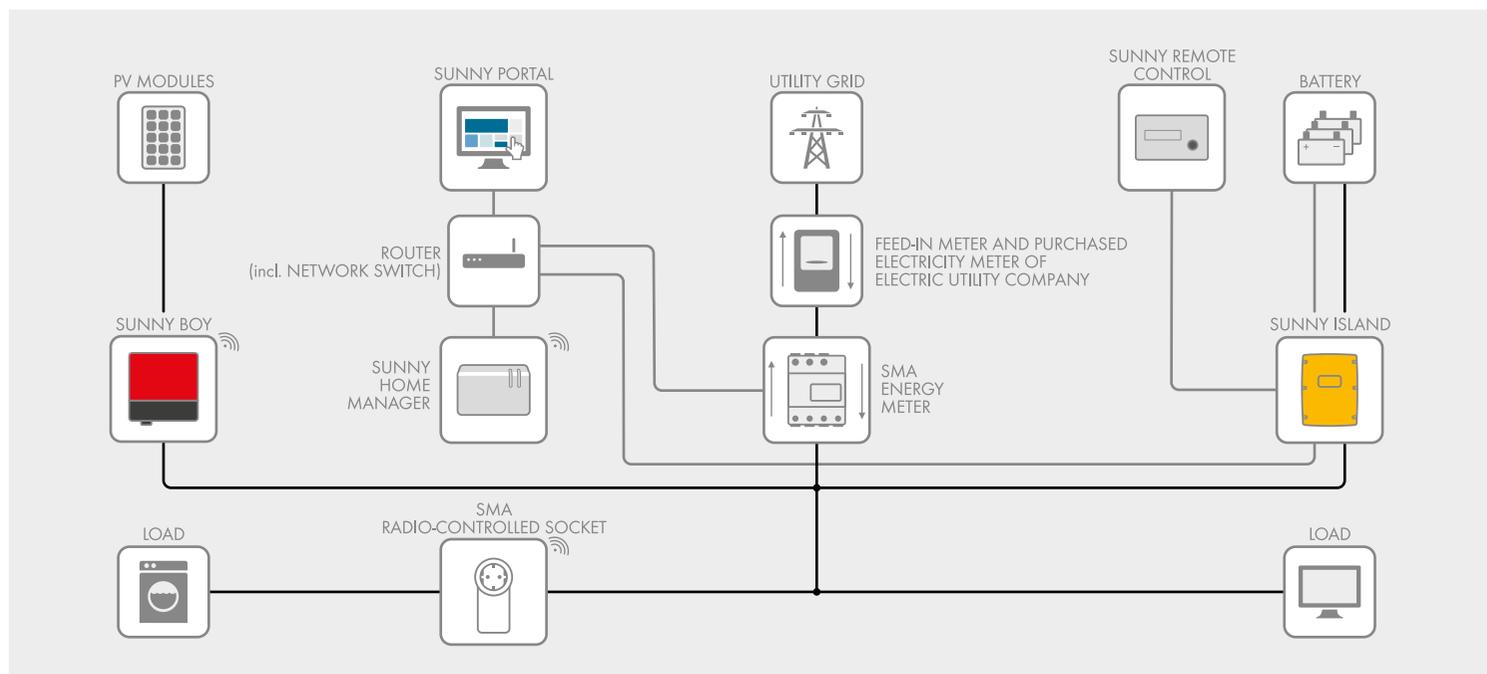
The flexible, retrofittable Sunny Island battery inverter offers the perfect features for operators to temporarily store their self-generated solar electricity for later consumption. Thanks to the fast closed-loop control of the total current, it is also able to accurately balance consumption on the other phases. Reliable and rapid communication with other system components is ensured with the integrated Speedwire data module.



## SMA ENERGY METER

Universal recording of measured values for intelligent energy management

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. In this way, all of the data relating to PV generation, purchased electricity and grid feed-in can be transmitted via standard Ethernet cables, for example to the Sunny Home Manager or to the Sunny Island.



Example of single-phase SMA Flexible Storage System

# Information on Integrating Storage Systems with the SMA FLEXIBLE STORAGE SYSTEM

## DC connection vs. AC connection of the storage system

In principle, it is possible to connect the storage system on either the DC side or the AC side. Both solutions have their own specific advantages and disadvantages:

DC systems with higher battery voltage (150 - 400 V) have fewer energy conversion stages than AC systems, which allows DC systems to operate with greater efficiency and at lower costs. Alongside the higher degree of integration (i.e. the battery), the battery charge controller and inverter are located together in a single enclosure, giving operators the benefit of a highly efficient and cost-effective storage solution. However, the reduced flexibility makes it more difficult to add subsequent components or upgrade the system, and as a result it is often necessary to replace the existing PV inverter as well.

Connecting the storage system on the AC side offers huge advantages over the DC-side connection, both in terms of flexibility and in terms of upgrade capability. With the customizable SMA Flexible Storage System, the system operator has the ability to plan the entire PV system according to his or her personal requirements and specifications. In other words, this system offers maximum flexibility in terms of storage system performance, battery type, battery capacity and PV system design. Likewise, connecting the storage system on the AC side is also advantageous when it comes to upgrade solutions, as this allows continued use of the existing PV inverter.

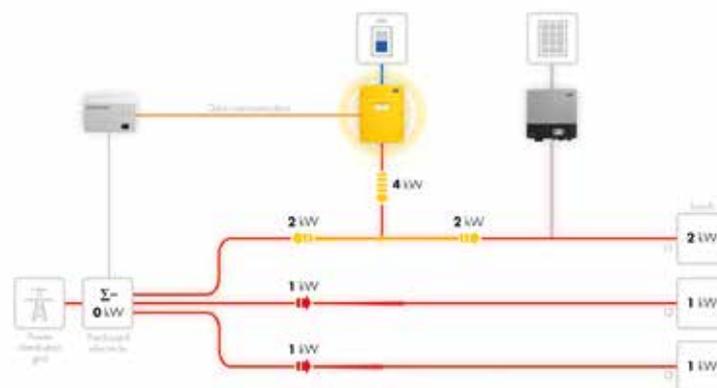
What many customers do not know is that by using highly efficient and perfectly coordinated components (all products come from the same supplier), the SMA Flexible Storage System delivers a higher overall

efficiency than many other DC-connected storage systems currently on the market.

## Reduction of purchased electricity on all three phases thanks to Sunny Island

Within the SMA Flexible Storage System, the Sunny Island is only connected to one phase of the domestic circuit. Even with single-phase connection of the Sunny Island, the control is always based on the total grid exchange power. As a result, the battery inverter is able to reduce the amount of electricity purchased for domestic use on all three phases. This also means that the system operator does not need to choose a fixed phase, as the balance calculations for generation and consumption in the overall system are sufficient.

Consumption in one phase can be offset by generating power in this phase or any other phase. This holds true even if the storage system is designed to be single-phase. As a result and based on the expected magnitude of the domestic electricity demand a more cost-effective and easy to install single-phase system is adequate.



The Sunny Island discharges the battery on phase 1, thereby also reducing power consumption on phases 2 and 3. The total output of the purchased electricity meter is 0 kW.



#### **YOUR ADVANTAGES AT A GLANCE:**

- » Use of solar power possible 24 hours a day
- » Less electricity purchased from utility companies: self-sufficiency quota of 90% possible
- » Maximum self-consumption through PV and load forecast-supported battery charging
- » All PV power generated annually is used, even when the active power is limited (e.g. to 70% or 60% of the nominal power) in accordance with the Renewable Energy Sources Act (EEG) or the energy storage subsidy (KfW)
- » Simple planning and design
- » Maximum flexibility in terms of storage, battery type, battery capacity, battery manufacturers and PV system size
- » Can be used to upgrade almost any existing PV system
- » Future-proof with smart grid compatibility \*
- » Proven safety thanks to external certification
- » Intelligent control of loads
- » Comprehensive visualization of all energy and power flows at a glance

\* Many partnerships with leading manufacturers from the areas of storage technology, home appliances, eMobility as well as heating, air conditioning and ventilation systems

# SMA FLEXIBLE STORAGE SYSTEM

## System Options

	Example 1		Example 2		Example 3	
Average power consumption	4,000 kWh		5,000 kWh		7,000 kWh	
Nominal power of the PV system	5 kWp		5 kWp		9 kWp	
Usable battery capacity*	5 kWh		5 kWh		7 kWh	
Battery inverter	3.3 kW		3.3 kW		4.6 kW	
Technology	Li-ions	Pb	Li-ions	Pb	Li-ions	Pb
Battery life	Up to 20 years	Up to 10 years	Up to 20 years	Up to 10 years	Up to 20 years	Up to 10 years
Maximum depth of discharge	Up to 90%	Up to 50%	Up to 90%	Up to 50%	Up to 90%	Up to 50%
Self-sufficiency quota (typical)	79%	77%	71%	69%	68%	66%
Self-consumption quota (typical)	40%	41%	45%	46%	53%	54%
Combinations with single-phase PV inverter	 SB 5000TL      SI 4.4M		 SB 5000TL      SI 4.4M			
	 Sunny Home Manager      Battery		 Sunny Home Manager      Battery			
Combinations with three-phase PV inverter**	 STP 5000TL      SI 4.4M		 STP 5000TL      SI 4.4M		 STP 8000TL      SI 6.0H	
	 Sunny Home Manager      Battery		 Sunny Home Manager      Battery		 Sunny Home Manager      Battery	
Other necessary system components	Speedwire data module for Sunny Island, Sunny Remote Control, SMA Energy Meter					
Optional system components	SMA Bluetooth® radio-controlled sockets, BatFuse B.01 / BatFuse B.03 battery fuse, DC cable					
Type designations	Sunny Boy: SB 1X00TL-10 / SB 2100TL / SB XX00TL-21 / SB XX00TLST-21, Sunny Tripower: STP 1X000TL-10 / STP X000TL-20 / STP XX000TLEE-10, Sunny Island 3.0M / 4.4M / 6.0H / 8.0H for grid-tie applications: 3.0M-11 / 4.4M-11, 6.0H-11 / 8.0H-11 Speedwire data module: SWDMSI-NR10, Sunny Remote Control: SRC-20, SMA Energy Meter: EMETER-10, Sunny Home Manager: HM-BT-10, Sunny Home Manager Set: HM-BT-10-SET, SMA radio-controlled socket with Bluetooth: BT-SOCKET-10, battery fuse: BATFUSE-B.01 / BATFUSE-B.03, DC cable (3 m/6 m): DC-CABLE.70-3/ DC-CABLE.70-6					

The samples are based on a calculation via Sunny Design.

\* Batteries are not supplied by SMA

\*\* In combination with a three-phase PV inverter and a single 3.0M / 4.4M / 6.0H / 8.0H, the battery-backup function can only be realized without PV support.