System description

SMA FLEXIBLE STORAGE SYSTEM

Increased self-consumption with SUNNY ISLAND 4.4M / 6.0H / 8.0H and SUNNY HOME MANAGER



Legal Provisions

The information contained in these documents is property of SMA Solar Technology AG. Any publication, whether in whole or in part, requires prior written approval by SMA Solar Technology AG. Internal reproduction used solely for the purpose of product evaluation or other proper use is allowed and does not require prior approval.

SMA Warranty

You can download the current warranty conditions from the Internet at www.SMA-Solar.com.

Trademarks

All trademarks are recognized, even if not explicitly identified as such. Missing designations do not mean that a product or brand is not a registered trademark.

Modbus® is a registered trademark of Schneider Electric and is licensed by the Modbus Organization, Inc.

QR Code is a registered trademark of DENSO WAVE INCORPORATED.

Phillips® and Pozidriv® are registered trademarks of Phillips Screw Company.

Torx® is a registered trademark of Acument Global Technologies, Inc.

SMA Solar Technology AG

Sonnenallee 1

34266 Niestetal

Germany

Tel. +49 561 9522-0

Fax +49 561 9522-100

www.SMA.de

Email: info@SMA.de

Status: 9/12/2017

Copyright © 2017 SMA Solar Technology AG. All rights reserved.

Table of Contents

1 Information on this Document 4
1.1 Validity 4
1.2 Content and Structure of this Document 4
1.3 Target Group 4
1.4 Additional Information 4
1.5 Symbols 4
1.6 Typographies 5
1.7 Nomenclature 5
2 Safety 6
2.1 Intended Use 6
2.2 Safety Information 6
2.3 Battery Safety Information 9
3 Functions and Design 11
3.1 Functions of the SMA Flexible Storage System 11
3.2 Requirements of VDE Application Guide 2510-2 11
3.3 Requirements for Communication 12
4 System with One Sunny Island 13
4.1 Circuitry Overview for a System with One Sunny Island Inverter 13
4.2 Connection of the Sunny Island 14
5 System With Three Sunny Island Inverters 16
5.1 Circuitry Overview for a System with Three Sunny Island Inverters 16
5.2 Connecting the Master 17
5.3 Connecting the Slaves 18
6 Commissioning 20
6.1 Commissioning Procedure 20
6.2 Adjusting the Configuration of the Sunny Island 20
6.3 Commissioning a System With Increased Self-Consumption 22
7 Contact 24

1 Information on this Document

1.1 Validity

This document is valid for the SMA Flexible Storage System with the following SMA products:

- HM-20 (Sunny Home Manager 2.0) from firmware version 2.00.00.R
- SI4.4M-12 (Sunny Island 4.4M) from firmware version 1.00.xx.R
- SI6.0H-12 (Sunny Island 6.0H) from firmware version 1.00.xx.R
- SI8.0H-12 (Sunny Island 8.0H) from firmware version 1.00.xx.R

1.2 Content and Structure of this Document

This document summarizes the specific information for the SMA Flexible Storage System.

Circuitry overviews provide the basic principle of how an system must be connected. The structure of the document specifies the chronological sequence for configuration and commissioning. This document does not replace the documentation of the individual products. You will find details and help in the event of difficulties in the documentation of the respective product.

1.3 Target Group

The tasks described in this document must only be performed by qualified persons. Qualified persons must have the following skills:

- Knowledge of how an inverter works and is operated
- Knowledge of how batteries work and are operated
- Training in the installation and commissioning of electrical devices and installations
- Knowledge of the applicable standards and directives
- Knowledge of and compliance with this document and all safety information
- Knowledge of and compliance with the documents of the battery manufacturer with all safety information

1.4 Additional Information

Links to additional information can be found at www.SMA-Solar.com:

Document title and content	Document type
"SMA Smart Home"	Planning guidelines
"SMA Flexible Storage System with Battery Backup Function"	Planning guidelines

1.5 Symbols

Symbol	Explanation
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	Indicates a hazardous situation which, if not avoided, can result in death or serious injury
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, can result in minor or moderate injury
NOTICE	Indicates a situation which, if not avoided, can result in property damage
i	Information that is important for a specific topic or goal, but is not safety-relevant

Symbol	Explanation
☐	Indicates a requirement for meeting a specific goal
☑	Desired result
✖	A problem that might occur

1.6 Typographies

Typography	Use	Example
bold	• Terminals • Slots • Parameters • Elements on the user interface • Elements to be selected • Elements to be entered	• The value can be found in the field **Energy**. • Select **Settings**. • Enter **10** in the field **Minutes**.
>	• Connects several elements to be selected	• Select **Settings > Date**.
[**Button**]	• Button to be selected or pressed	• Select [**Next**].

1.7 Nomenclature

Complete designation	Designation in this document
SMA Flexible Storage System	Battery storage system
Sunny Boy, Sunny Mini Central, Sunny Tripower	PV inverter
Sunny Places, Sunny Portal, Sunny Home Manager	Communication product
SMA Speedwire	Speedwire

2 Safety

2.1 Intended Use

The SMA Flexible Storage System is a battery storage system and optimizes self-consumption of PV energy by the following measures:

- Intermediate storage of excess PV energy with the Sunny Island
- Visualization of PV system data in Sunny Portal

The SMA Flexible Storage System does not form a battery-backup grid in the event of utility grid failure (for installation of a battery-backup system, see the system description "SMA FLEXIBLE STORAGE SYSTEM with Battery-Backup Function" at www.SMA-Solar.com).

The SMA Flexible Storage System must only be used in those countries for which it is licensed or in those countries for which it is approved by SMA Solar Technology AG and the grid operator. The grid configuration of the utility grid must be a TN or TT system.

Grid feed-in and purchased electricity are recorded with an SMA Energy Meter only. An SMA Energy Meter does not replace the energy meter of the electric utility company.

The entire battery voltage range must be completely within the permissible DC input voltage range of the Sunny Island. The maximum permissible DC input voltage of the Sunny Island must not be exceeded. A battery fuse must be installed between the battery and the Sunny Island.

With lead-acid batteries, the battery room must be ventilated in accordance with the requirements of the battery manufacturer and with the locally applicable standards and directives (see documentation of the battery manufacturer).

The following conditions must be satisfied for lithium-ion batteries:

- The lithium-ion battery must comply with the locally applicable standards and directives and must be intrinsically safe.
- The battery management of the lithium-ion battery used must be compatible with the Sunny Island (see the technical information at “List of Approved Batteries”).

An DC supply grid may not be established with the Sunny Island.

DC charge controller must not be connected in the battery storage system.

Loads connected to the Sunny Island must have an CE, RCM or UL identification label.

Single-phase clusters are not permitted. Only Sunny Island inverters of the same device type may be installed in a three-phase cluster. Several clusters may only be interconnected if the Multicluster-Box 12 (MC-BOX-12.3-20) is used for it.

The SMA Flexible Storage System can be installed at altitudes of up to 2000 m above MSL.

Use this product only in accordance with the information provided in the enclosed documentation and with the locally applicable standards and directives. Any other application may cause personal injury or property damage.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of SMA Solar Technology AG. Unauthorized alterations will void guarantee and warranty claims and in most cases terminate the operating license. SMA Solar Technology AG shall not be held liable for any damage caused by such changes.

Any use of the product other than that described in the Intended Use section does not qualify as the intended use.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and observe all instructions contained therein.

2.2 Safety Information

This section contains safety information that must be observed at all times when working on or with the product.

To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

⚠ DANGER

Danger to life from electric shock due to live voltage

High voltages are present in the live components of the inverter when in operation. Touching live components results in death or serious injury due to electric shock.

- Wear suitable personal protective equipment for all work on the product.
- Do not touch any live components.
- Observe all warning messages on the inverter and in the documentation.
- Observe all safety information of the battery manufacturer.
- Switch off or disconnect the following components from voltage sources in the following order before carrying out any work:
  - Sunny Island
  - The circuit breakers of the Sunny Island, the control and measurement voltages
  - All circuit breakers and load-break switches of the connected AC sources
  - Load-break switch of the battery fuse
- Ensure that no disconnected devices can be reconnected.
- After disconnecting the Sunny Island from voltage sources, wait at least 15 minutes for the capacitors to discharge completely before opening the doors.
- Before carrying out any work make sure that all devices are completely voltage-free.
- Cover or isolate any adjacent live components.

⚠ DANGER

Danger to life due to electric shock

Overvoltages (e. g. in the case of a flash of lightning) can be further conducted into the building and to other connected devices in the same network via network cables or other data cables if there is no overvoltage protection.

- Ensure that all devices in the same network and the battery are integrated in the existing overvoltage protection.
- When laying the network cables or other data cables outdoors, attention must be given to suitable overvoltage protection at the cable transition from the inverter or the battery outdoors to the inside of a building.

⚠ WARNING

Danger to life from electric shock due to overvoltages

Overvoltages of up to 1500 V can occur in the stand-alone grid and in the battery-backup grid. If the connected loads have not been designed for these overvoltages, a voltage that poses a danger to life may be present on accessible parts for several seconds.

- Only connect loads that have a CE, RCM or UL designation. Loads with a CE, RCM or UL designation are designed for overvoltages of up to 1500 V.
- Operate the loads only when they are technically faultless and in an operationally safe state.
- Check the loads regularly for visible damage.

⚠ WARNING

Danger to life from electric shock due to damaged inverter

Operating a damaged inverter can lead to hazardous situations that can result in death or serious injuries due to electric shock.

- Only use the inverter when it is technically faultless and in an operationally safe state.
- Check the inverter regularly for visible damage.
- Make sure that all external safety equipment is freely accessible at all times.
- Make sure that all safety equipment is in good working order at any time.

⚠ CAUTION

Risk of burns due to short-circuit currents on the disconnected inverter

The capacitors in the DC input area of the inverter store energy. After the battery is isolated from the inverter, battery voltage is still temporarily present at the DC terminal. A short circuit at the DC terminal of the inverter can lead to burns and may damage the inverter.

- Wait 15 minutes before performing any work at the DC terminal or on the DC cables. This allows the capacitors to discharge.

⚠ CAUTION

Risk of burns due to hot enclosure parts

Some parts of the enclosure can get hot during operation.

- Mount the inverter in such a way that it cannot be touched inadvertently during operation.

NOTICE

Damage to the product due to sand, dust or moisture penetration

Sand, dust or moisture penetration can damage the inverter or impair its functionality.

- Do not open the inverter during a sandstorm, precipitation or when humidity exceeds 95%.
- Only perform maintenance work on the inverter when the environment is dry and free of dust.

NOTICE

Damage to the inverter due to electrostatic discharge

Touching electronic components can cause damage to or destroy the inverter through electrostatic discharge.

- Ground yourself before touching any component.

NOTICE

Damage to seals on the enclosure lids in subfreezing conditions

If you open the enclosure lid when temperatures are below freezing, the enclosure lid seal could be damaged. This can lead to moisture entering the inverter.

- Only open the enclosure lid if the ambient temperature is not below -5 °C
- If a layer of ice has formed on the seal of the lid when temperatures are below freezing, remove it prior to opening the enclosure lid (e.g. by melting the ice with warm air). Observe the applicable safety regulations.

2.3 Battery Safety Information

This section contains safety information that must be observed at all times when working on or with batteries.

To prevent personal injury or property damage and to ensure long-term operation of the batteries, read this section carefully and observe all safety information at all times.

⚠ WARNING

Danger to life due to incompatible lithium-ion battery

An incompatible lithium-ion battery can lead to a fire or an explosion. With incompatible lithium-ion batteries, it is not ensured that battery management is intrinsically safe and will protect the battery.

- Ensure that the lithium-ion batteries are approved for use with the Sunny Island (see technical information "List of Approved Batteries" at www.SMA-Solar.com).
- If no lithium-ion batteries approved for the inverter can be used, lead-acid batteries can be used.
- Verify that the battery complies with locally applicable standards and directives and is intrinsically safe.

⚠ WARNING

Danger to life due to explosive gases

Explosive gases may escape from the battery and cause an explosion.

- Protect the battery environment from open flames, embers and sparks.
- Install, operate and maintain the battery in accordance with the manufacturer's specifications.
- Do not burn the battery and do not heat it beyond the permitted temperature.
- Additional measures for lead-acid batteries: Ensure that the battery room is sufficiently ventilated.

⚠ WARNING

Chemical burns due to battery electrolyte

If handled inappropriately, battery electrolyte can leak from the battery and cause irritation to the eyes, respiratory system and skin.

- Install, operate, maintain and dispose of the battery according to the manufacturer's specifications.
- Whenever working on the battery, wear suitable personal protective equipment such as rubber gloves, an apron, rubber boots and goggles.
- Rinse acid splashes thoroughly for a long time with clear water, and consult a doctor immediately.
- If acid fumes have been inhaled, consult a doctor immediately.

⚠ WARNING

Risk of burns due to flashes

Short-circuit currents in the battery can cause heat build-up and flashes.

- Remove watches, rings and other metal objects prior to carrying out any work on the battery.
- Use insulated tools for all work on the battery.
- Do not place tools or metal parts on the battery.

⚠ CAUTION

Risk of burns due to hot battery components

Improper battery connection may result in excessively high transition resistances. Excessive transition resistances give rise to localized heat build-up.

- Ensure that all pole connectors are connected with the connecting torque specified by the battery manufacturer.
- Ensure that all DC cables are connected with the connecting torque specified by the battery manufacturer.

NOTICE

Damage to the battery due to incorrect settings

The set battery parameters influence the charging behavior of the inverter. The battery can be damaged by incorrect settings of the battery type, nominal voltage and capacity parameters.

- Set the correct battery type as well as the correct values for nominal voltage and battery capacity when configuring.
- Ensure that the values recommended by the manufacturer are set for the battery (refer to the technical data of the battery in the manufacturer documentation).

NOTICE

Permanent damage to the battery due to improper handling

Improper set-up and maintenance of the battery can cause it to become permanently damaged. Logs can help to determine the cause.

- Comply with all requirements of the battery manufacturer with regard to mounting location.
- Check and log the status of the battery before performing maintenance work.
  Useful hint: Many battery manufacturers provide suitable logs.
  - Check the battery for visible damage and log.
  - Measure and log the fill level and acid density of FLA batteries.
  - In the case of lead-acid batteries, measure and log the voltages of the individual cells.
  - Perform and log the test routines required by the battery manufacturer.

3 Functions and Design

3.1 Functions of the SMA Flexible Storage System

The SMA Flexible Storage System supports increased self-consumption through the following measures:

- Intermediate storage of excess PV energy with Sunny Island
- Load control and PV system monitoring with Sunny Home Manager

The Sunny Island uses the connected battery for the intermediate storage of excess PV energy. To do this, Sunny Island measures, for example, the grid feed-in and the purchased electricity with the Sunny Home Manager 2.0. The battery management uses this data to regulate the charging and discharging of the battery. The data for the grid feed-in and for purchased electricity are transmitted to the Sunny Island via Speedwire.

If the Sunny Home Manager is connected to the Internet, the Sunny Home Manager receives location-based weather forecasts and uses them to create yield forecasts for the PV system. In addition, the Sunny Home Manager determines how much energy is typically consumed in a household at different times of the day and uses this to create a load profile of the household. The Sunny Home Manager uses the production forecast and the load profile to determine favorable times for increased self-consumption and selectively switches, for example, the loads connected to the SMA radio-controlled sockets on and off. If required by the grid operator, the Sunny Home Manager also monitors the active power feed-in of the PV system. If the set maximum value for active power feed-in is exceeded, the Sunny Home Manager sends power reduction commands to the SMA PV inverters.

Preventing Derating Losses

The SMA Flexible Storage System prevents derating losses which may arise due to the limitation of active power feed-in. This is achieved by regulating the operation times of time-independent loads and the time and duration of battery charging in accordance with the PV production forecast and the consumption forecast.

Example:

The current daily forecast of the system predicts a limitation of active power feed-in around noon when the energy requirement of the loads is very low and PV production is high. For this reason, derating losses can be expected.

According to this forecast, the system only begins to charge the battery in the late morning. The derating losses will be reduced or avoided by charging the battery at this later time. The total excess PV energy generated in the morning will be fed into the utility grid without derating losses (for details on power control, see planning guidelines "SMA Smart Home").

Deactivating the Increased Self-Consumption Function during Certain Charging Procedures

When using lead-acid batteries, the SMA Flexible Storage System carries out full and equalization charges on a regular basis (see technical information "Battery Management" at www.SMA-Solar.com). During this charging process, the increased self-consumption function is deactivated and electricity may have to be purchased to perform the full and equalization charges.

Regular full and equalization charges increase the service life of lead-acid batteries.

3.2 Requirements of VDE Application Guide 2510-2

The requirements below apply only for systems for which the following properties are all applicable:

- The system is a system with increased self-consumption (SMA Flexible Storage System) or a system with increased self-consumption and battery-backup function (battery-backup system).
- The grid operator or the locally applicable standards and guidelines require compliance with the above-mentioned Application Guide.

  Currently, only the grid operators in Germany require compliance with the above-mentioned Application Guide.

In accordance with the scope of VDE application guide 2510-2, a manufacturer's system is regarded as a complete energy storage system only if products are used that have been approved by the manufacturer (see the technical information “List of Approved Batteries”; for a battery-backup system also refer to the planning guidelines "SMA Flexible Storage System with Battery Backup Function", and for the SMA Flexible Storage System to the planning guidelines "SMA Smart Home"). If products are used that have not been approved by SMA Solar Technology AG, the installer is deemed to be the manufacturer of the system.

The requirements of VDE application guide 2510-2 are fulfilled if the installation is carried out in accordance with the technical documentation of the Sunny Island inverter.

3.3 Requirements for Communication

Requirements for the Speedwire network

The Sunny Island and the Sunny Home Manager 2.0 can be directly interconnected via Speedwire. If more than two devices are to communicate via Speedwire or the Sunny Home Manager 2.0 is to establish an internet connection to the Sunny Portal, a Speedwire network is required.

Requirements:

- ☐ All Speedwire devices must be connected to the same router.
- ☐ The router and the optional network switch must fully support Multicast.
- ☐ The router must support "Internet Enabled Devices" with the SIP and STUN interfaces.

Most common routers and network switches support Multicast and "Internet Enabled Devices".

4 System with One Sunny Island

4.1 Circuitry Overview for a System with One Sunny Island Inverter

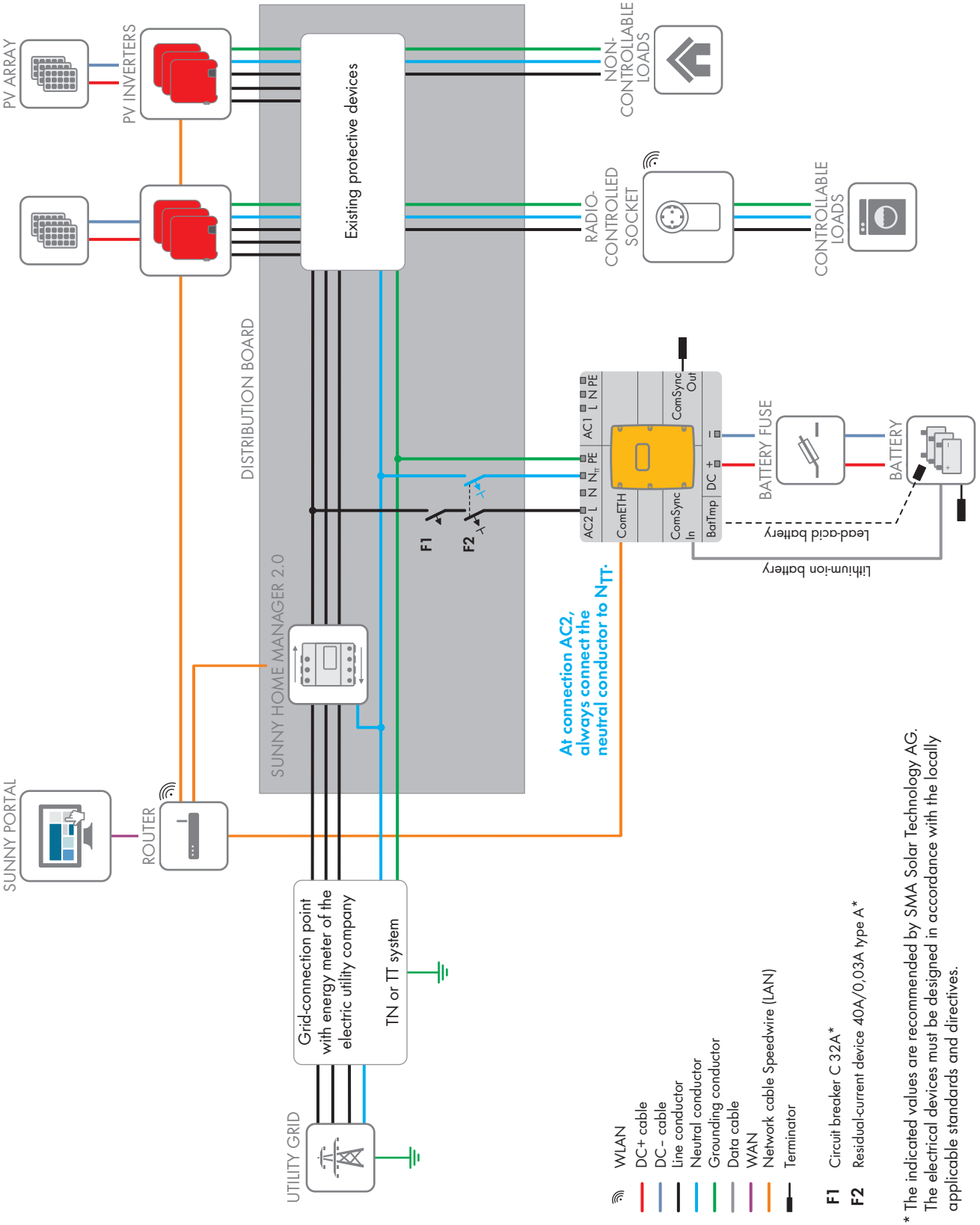


Figure 1: Circuitry of the SMA Flexible Storage System for TN and TT systems

4.2 Connection of the Sunny Island

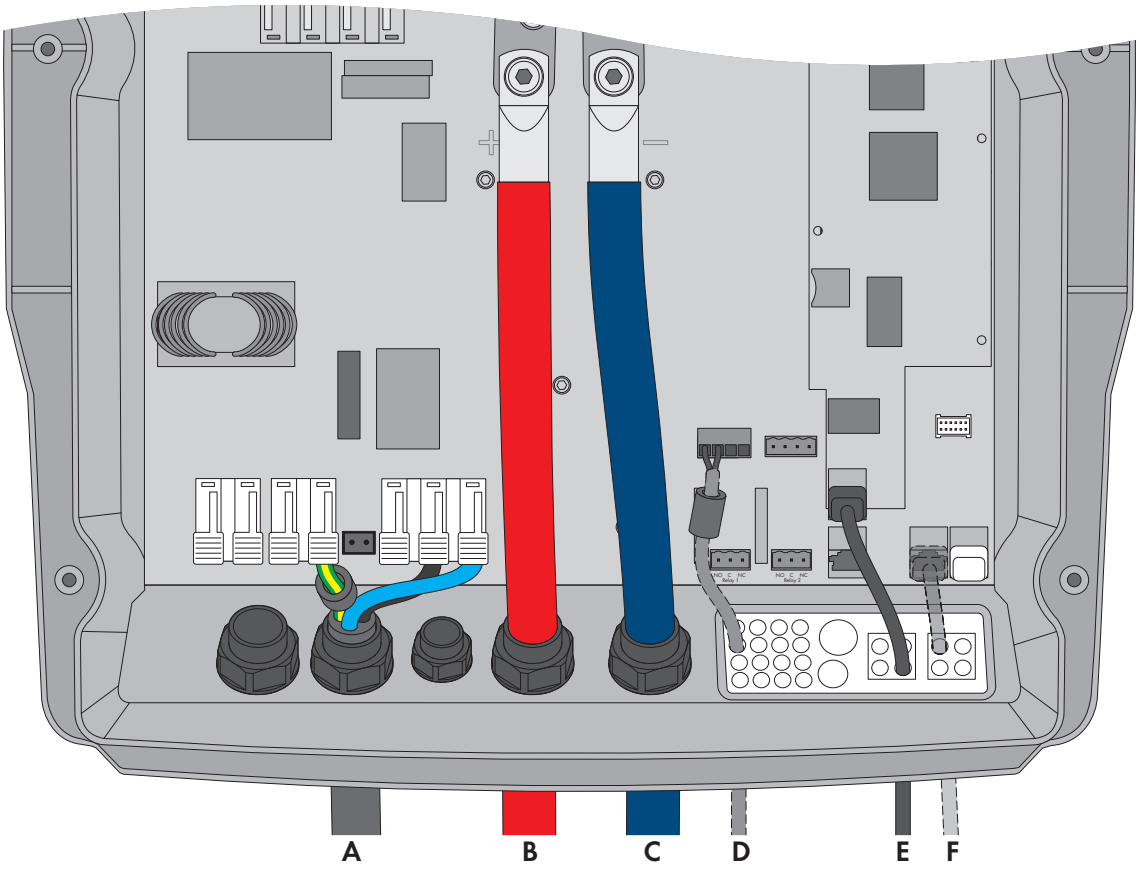


Figure 2: Connection of the Sunny Island

Position	Designation	Description / information
A	AC power cable	Terminal **AC2 Gen/Grid** terminals **L**, **N_{TT}** and **PE** Utility grid connection with a three-wire cable Conductor cross-section: from 6 mm^2 to 16 mm^2 Only use the supplied ferrite for **PE**.
B	DC+ cable	Battery connection Conductor cross-section: from 50 mm^2 to 95 mm^2 Cable diameters: 14 mm to 25 mm
C	DC- cable	
D	Measuring cable of the battery temperature sensor	Terminal **BatTmp** You only have to connect a battery temperature sensor if lead-acid batteries are used. Mount the battery temperature sensor in the middle of the battery-storage system, in the upper third of the battery cell. Use the supplied ferrite.

Position	Designation	Description / information
E	Speedwire network cable	Terminal **ComETH**
F	Data cable to lithium-ion battery	Terminal **ComSyncIn** Connection of the battery management of the lithium-ion battery The communication bus must be connected to the lithium-ion battery and the terminator must remain plugged into the terminal **ComSyncOut**.

5 System With Three Sunny Island Inverters

5.1 Circuitry Overview for a System with Three Sunny Island Inverters

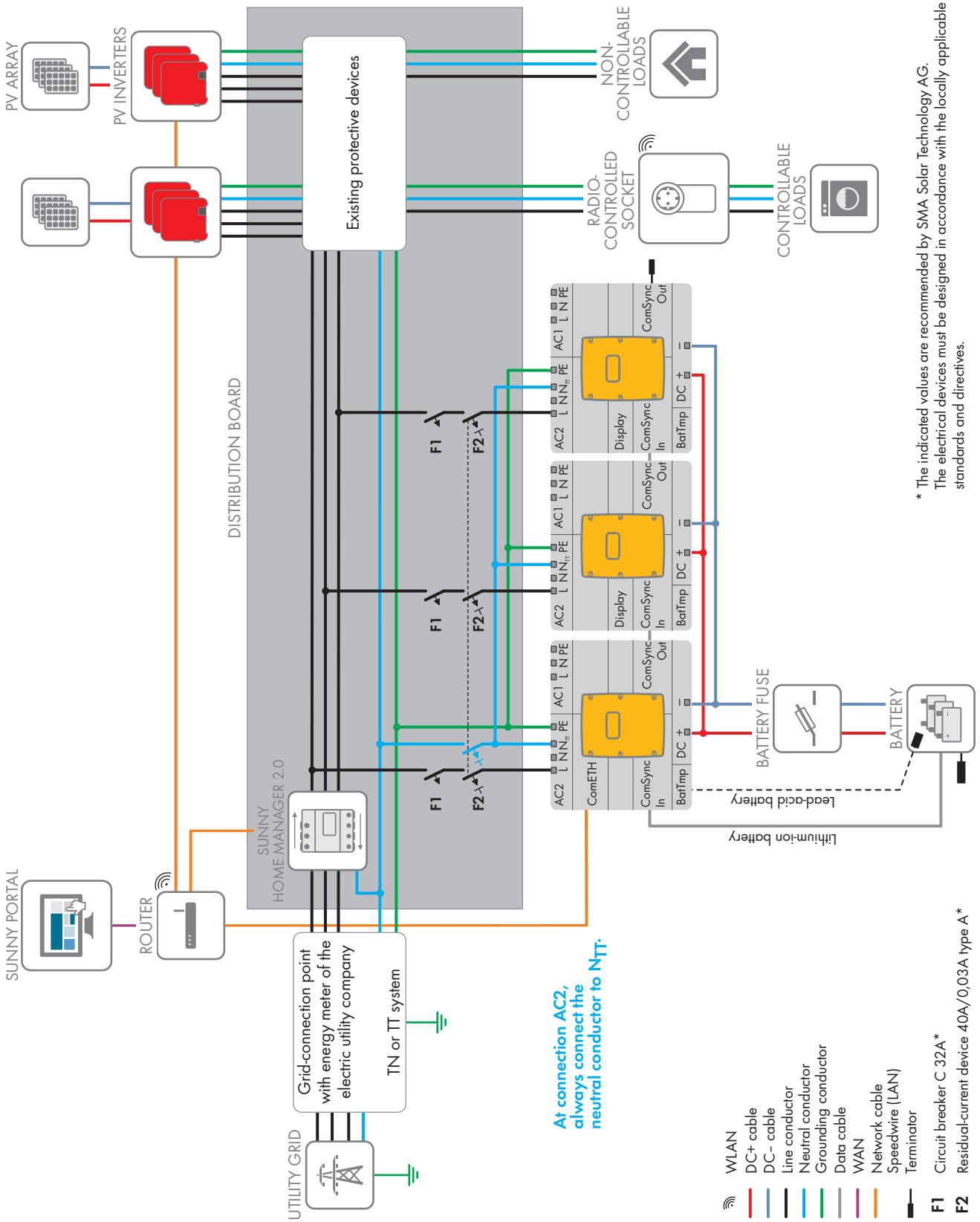


Figure 3: SMA Flexible Storage System for TN and TT systems

5.2 Connecting the Master

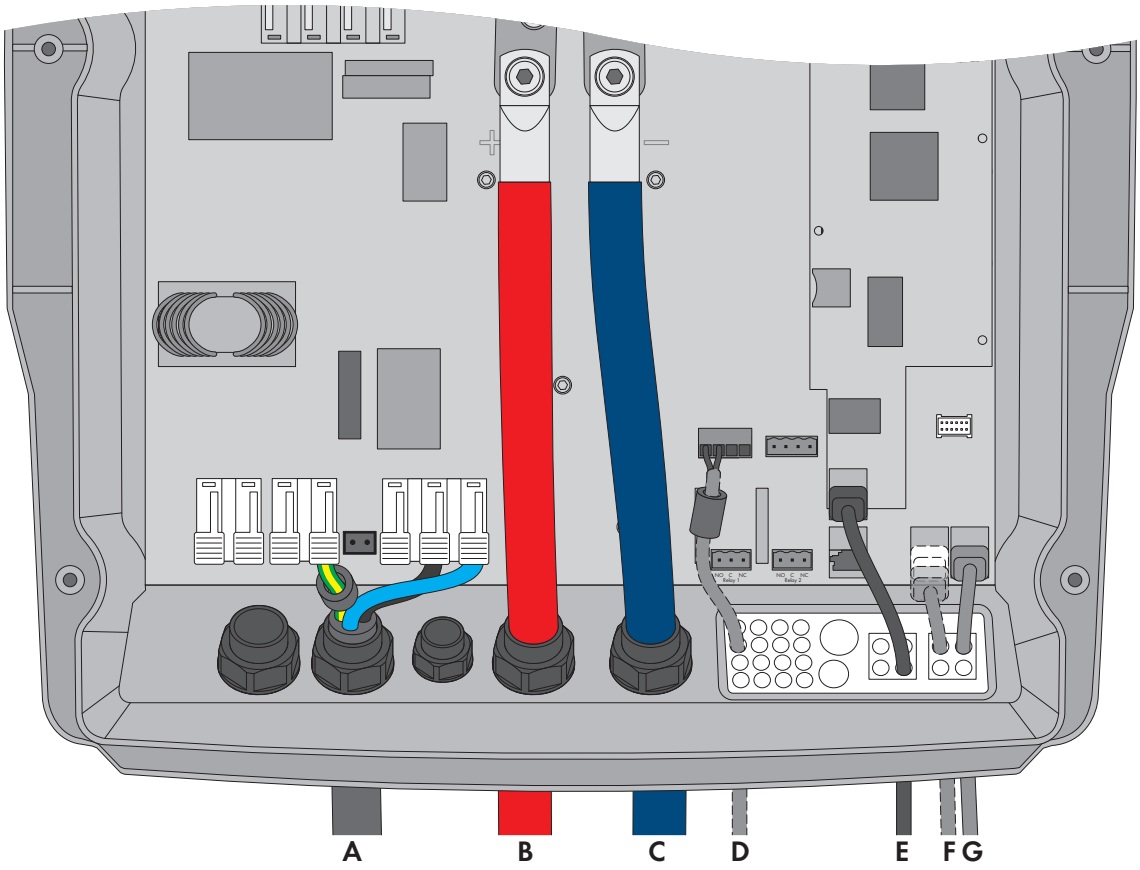


Figure 4: Connection of the master

Position	Designation	Description / information
A	AC power cable	Terminal **AC2 Gen/Grid** terminals **L**, **N_{TT}** and **PE** Utility grid connection with a three-wire cable to the line conductor L1 Conductor cross-section: from 6 mm^2 to 16 mm^2 Only use the supplied ferrite for **PE**.
B	DC+ cable	Battery connection Conductor cross-section: from 50 mm^2 to 95 mm^2 Cable diameters: 14 mm to 25 mm
C	DC- cable	
D	Measuring cable of the battery temperature sensor	Terminal **BatTmp** You only have to connect a battery temperature sensor if lead-acid batteries are used. Mount the battery temperature sensor in the middle of the battery-storage system, in the upper third of the battery cell. Use the supplied ferrite.
E	Speedwire network cable	Terminal **ComETH**

Position	Designation	Description / information
F	Data cable to lithium-ion battery	Terminal **ComSyncIn** Connection of the battery management of the lithium-ion battery The communication bus must be connected to the lithium-ion battery. If no lithium-ion batteries are used, plug the terminator into the terminal **ComSyncIn**.
G	Data cable for the internal communication in the cluster	Terminal **ComSyncOut** Connection of internal communication bus of **Slave 1**

5.3 Connecting the Slaves

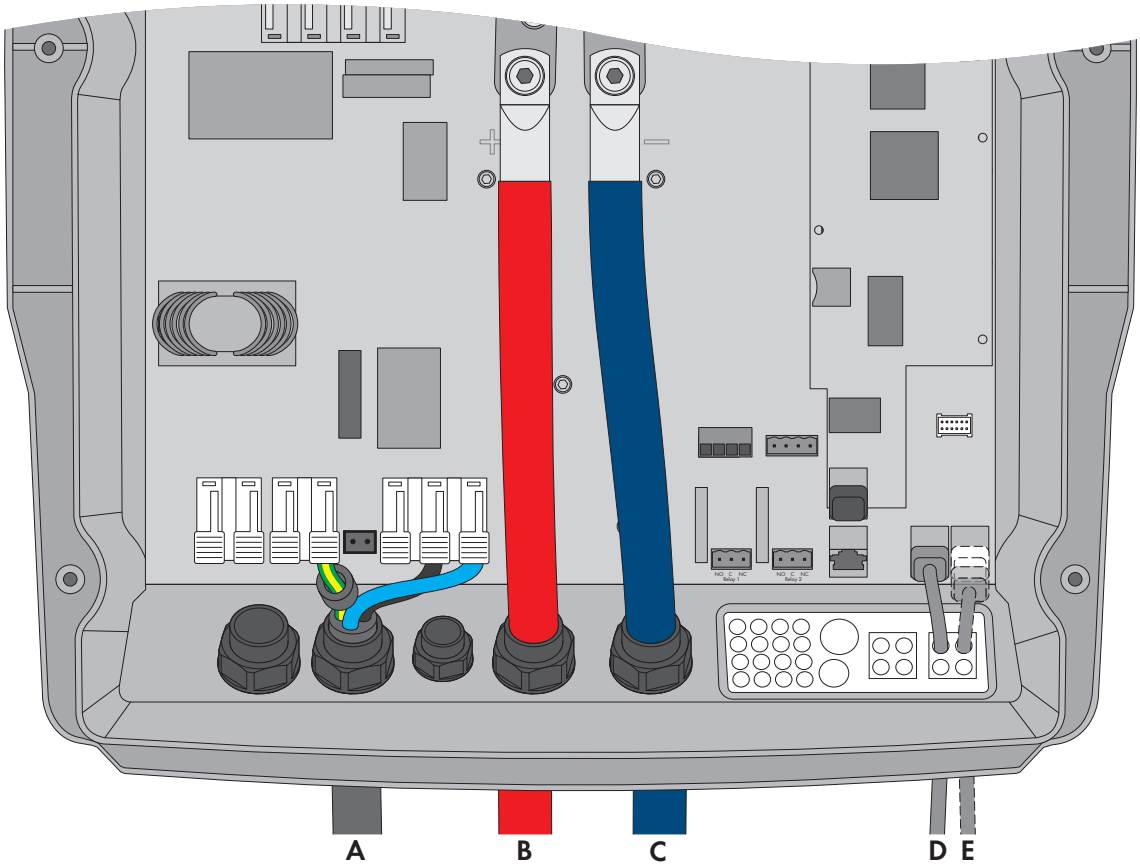


Figure 5: Connection of the slave

Position	Designation	Description / information
A	AC power cable	Terminal **AC2 Gen/Grid** terminals **L**, **N_{TT}** and **PE** Utility grid connection with a three-wire cable Connect slave 1 to line conductor L2, connect slave 2 to line conductor L3. Conductor cross-section: from 6 mm^2 to 16 mm^2 Only use the supplied ferrite for **PE**.

Position	Designation	Description / information
B	DC+ cable	Battery connection Conductor cross-section: from 50 mm^2 to 95 mm^2 Cable diameters: 14 mm to 25 mm
C	DC- cable	
D	Data cable for the internal communication in the cluster	Terminal **ComSyncIn** With slave 1: connection of internal communication bus of the master With slave 2: connection of internal communication bus of slave 1
E	Data cable for the internal communication in the cluster	Terminal **ComSyncOut** With slave 1: connection of internal communication bus of slave 2 With slave 2: leave terminator plugged in. Slave 2 is connected to slave 1 only.

6 Commissioning

6.1 Commissioning Procedure

Before commissioning the system, you must make various settings. This section describes the procedure and gives an overview of the steps, which must always be performed in the prescribed sequence.

Procedure		See
1.	Commission the inverter.	Sunny Island operating manual
2.	Establish a connection to the user interface of the inverter. There are the following connection options available to choose from: • Direct connection via WLAN • Direct connection via Ethernet • Connection via Ethernet in the local network	Sunny Island operating manual
3.	Log into the user interface.	Sunny Island operating manual
4.	Perform the basic configuration via the installation assistant: • Single system (system with one Sunny Island) • Single-cluster-system (system with three Sunny Island) Please note, that the personal SMA Grid Guard code for changing the grid-relevant parameters must be available after completion of the first ten operating hours (see "Application for the SMA Grid Guard code" available at www.SMA-Solar.com).	Sunny Island operating manual
5.	Adjust the configuration of the Sunny Island.	Section 6.2, page 20
6.	Commission the SMA Flexible Storage System	Section 6.3, page 22

6.2 Adjusting the Configuration of the Sunny Island

In the SMA Flexible Storage System, the Sunny Island inverters are connected to the utility grid and must meet the requirements of the grid operators. The Sunny Island inverters fulfill the requirements of application guide VDE-AR-N 4105:2011-08. In the Sunny Island, this application guide is defined as standard country data set **VDE-AR-4105**.

The configuration must be adjusted as follows for Denmark, Austria and Switzerland (status as of June 2017):

Country	Operating condition	Parameters	Set value
Denmark	When using the Sunny Island 6.0H / 8.0H, the discharge/charging current must be reduced.	Maximum AC battery charging current	16.0 A
	When using the Sunny Island 4.4M, you can retain the default setting of the discharge/charging current.	–	–

Country	Operating condition	Parameters	Set value
Austria	If your grid operator does not permit frequency-dependent control of active power feed-in in the case of overfrequency, this function must be deactivated (see VDE-AR-N 4105 item 5.7.3.3).	Operating mode of active power limitation in the case of overfrequency P(f)	Off
	If your grid operator specifies a maximum grid feed-in per line conductor, the electric discharge/charging current must be reduced.	Maximum AC battery charging current	Grid operator specifications
Switzerland	The maximum grid frequency must be observed.	Frequency monitoring upper maximum threshold	50.2 Hz
	The upper frequency difference for valid grid connection must be observed.	Frequency monitoring hysteresis maximum threshold	0.05 Hz
	The minimum observation time for grid voltage and frequency before grid connection must be observed.	Grid monitoring time	30 s
	If your grid operator specifies a maximum grid feed-in per line conductor, the electric discharge/charging current must be reduced.	Maximum AC battery charging current	Grid operator specifications

In Belgium and Germany, the configuration may only be adjusted upon request or with permission of the grid operator (status: June 2017):

Use in other countries is possible with the agreement of the grid operator. Consult the grid operator on whether adjustment is necessary.

Requirements:

☐ The grid-relevant parameters must be changed within the first ten operating hours of the inverter, otherwise the SMA Grid Guard code must be available (see "Application for SMA Grid Guard Code" at http://www.SMA-Solar.com).

☐ The parameter **Set country standard** must be set to **VDE-AR-N4105**.

Procedure:

1. Activate the user interface of the inverter (see the inverter operating manual).
2. Log in as Installer.
3. Adjust the parameters for Denmark, Austria or Switzerland (see the Sunny Island operating manual).
4. When installing in Switzerland, attach the label "VDE 0126-1-1" next to the type label of the Sunny Island inverter.

6.3 Commissioning a System With Increased Self-Consumption

Deactivation of the intermediate storage of PV energy during certain charging procedures

When using lead-acid batteries, the SMA Flexible Storage System carries out full and equalization charges on a regular basis (see technical information "Battery Management" at www.SMA-Solar.com). During this charging process, the increased self-consumption function is deactivated and electricity may have to be purchased to perform the full and equalization charges.

The battery life of lead-acid batteries increases with full and equalization charges.

Representation of Sunny Island in Sunny Portal

The Sunny Island inverters of a three-phase cluster will be displayed as one device in Sunny Portal. The data is either added up via the three phases or displayed for each Sunny Island as a phase-specific single value.

Required data for registration in Sunny Portal:

Device / customer data	Required data and explanation
Sunny Home Manager 2.0	• Serial number (PIC) and registration ID (RID) Register the new system in Sunny Portal using the PIC and RID. • Only when two SMA Energy Meters are installed, note down the serial number and purpose (e.g. PV production meter) in each case. This way you can identify the energy meters in the Sunny Portal.
PV inverter	• System Password The PV system password is the same as the device password for the user group "Installer." All devices in a PV system must be set to the same password (for user groups and security concept, see the Sunny Explorer operating manual). The default password is 1111. • Serial number of the PV inverters You can uniquely identify the PV inverters in Sunny Portal using the serial number. • PV array power in kWp
Radio-controlled socket	• The serial number and connected load of each SMA radio-controlled socket In Sunny Portal, configure the SMA radio-controlled socket in accordance with the requirements of the connected load. To do so, you require the serial number of the SMA radio-controlled socket.
Customer data	• E-mail address • Password for Sunny Portal access • Address of the PV system • Electricity tariff data – Electricity price for purchased electricity – Tariff times, if applicable (e.g. for tariffs with peak and off-peak tariff) – Feed-in tariff – Self-consumption tariff, if applicable

Requirements:

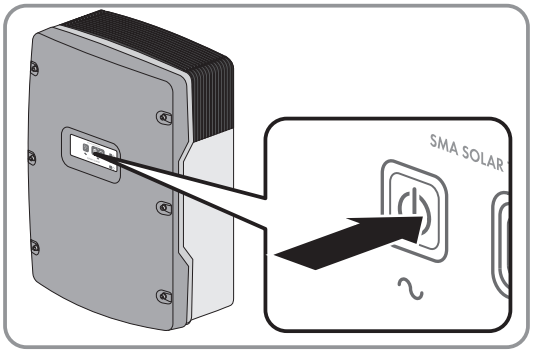
☐ The basic configuration of the Sunny Island must have been performed (see the Sunny Island operating manual).

☐ All other Speedwire devices must be connected to the same router.

☐ The router must meet the requirements for the design of a Speedwire communication network (see Section 3.3, page 12).

Procedure:

1. In the distribution board, switch on circuit breaker **F1** and residual-current device **F2**.
2. Commission the PV system (see PV inverter documentation).
3. Press the start-stop button on the Sunny Island and hold it until an acoustic signal sounds. This starts the system.



4. Only when one Sunny Home Manager 2.0 and one SMA Energy Meter are installed in the local network, assign the grid feed-in meter and purchased electricity meter to the Sunny Island via the user interface. To do this, enter the serial number of the grid feed-in meter and purchased electricity meter (see the Sunny Explorer operating manual).
5. Open Sunny Portal via http://www.SunnyPortal.com/Register and run the PV System Setup Assistant. The required data for registration in Sunny Portal must be at hand.
6. Activate the automatic update of the Sunny Home Manager and the PV system in Sunny Portal.
7. In order to activate the forecast-based charging function, call up the device properties of the Sunny Home Manager in Sunny Portal and activate the **Forecast-based battery charging** checkbox. For further information on the forecast-based battery charging, see planning guidelines "SMA Smart Home").
8. Only in systems with active power limitation, ensure that the limitation of the active power feed-in is configured and functioning in Sunny Portal ("Configuring Active Power Feed-In Limitation", see the operating manual "Sunny Home Manager in Sunny Portal" at http://www.SunnyPortal.com).

7 Contact

If you have technical problems with our products, please contact the SMA Service Line. We require the following information in order to provide you with the necessary assistance:

- Type of system installed (e.g., three-phase single-cluster system)
- Number and type of the Sunny Island inverters
- Serial number of the Sunny Island inverters
- Firmware version of the Sunny Island inverters
- Error message displayed
- Type of battery connected
- Nominal battery capacity
- Nominal battery voltage
- Type of the communication products connected
- Type and size of additional energy sources
- If a generator is connected:
  - Type
  - Power
  - Maximum current
- If a Multicluster-Box is connected, device type of the Multicluster-Box

In order to receive service assignments for the Sunny Island system, all system data must be recorded in the information sheet for Sunny Island systems during commissioning and made available to Service (for information sheet see www.SMA-Solar.com).

Deutschland Österreich Schweiz	SMA Solar Technology AG Niestetal Sunny Boy, Sunny Mini Central, Sunny Tripower: +49 561 9522-1499 Monitoring Systems (Kommunikationsprodukte): +49 561 9522-2499 Fuel Save Controller (PV-Diesel-Hybridsysteme): +49 561 9522-3199 Sunny Island, Sunny Boy Storage, Sunny Backup: +49 561 9522-399 Sunny Central, Sunny Central Storage: +49 561 9522-299 SMA Online Service Center: www.SMA-Service.com	Belgien Belgique België Luxemburg Luxembourg Nederland	SMA Benelux BVBA/SPRL Mechelen +32 15 286 730 SMA Online Service Center: www.SMA-Service.com
		Česko Magyarország Slovensko	SMA Service Partner TERMS a.s. +420 387 6 85 111 SMA Online Service Center: www.SMA-Service.com
		Türkiye	SMA Service Partner DEKOM Ltd. Şti. +90 24 22430605 SMA Online Service Center: www.SMA-Service.com
France	SMA France S.A.S. Lyon +33 472 22 97 00 SMA Online Service Center : www.SMA-Service.com	Ελλάδα Κύπρος	SMA Service Partner AKTOR FM. Αθήνα +30 210 8184550 SMA Online Service Center: www.SMA-Service.com

España Portugal	SMA Ibérica Tecnología Solar, S.L.U. Barcelona +34 935 63 50 99 SMA Online Service Center: www.SMA-Service.com	United Kingdom	SMA Solar UK Ltd. Milton Keynes +44 1908 304899 SMA Online Service Center: www.SMA-Service.com
Italia	SMA Italia S.r.l. Milano +39 02 8934-7299 SMA Online Service Center: www.SMA-Service.com	Australia	SMA Australia Pty Ltd. Sydney Toll free for Australia: 1800 SMA AUS (1800 762 287) International: +61 2 9491 4200
United Arab Emirates	SMA Middle East LLC Abu Dhabi +971 2234 6177 SMA Online Service Center: www.SMA-Service.com	India	SMA Solar India Pvt. Ltd. Mumbai +91 22 61713888
ไทย	SMA Solar (Thailand) Co., Ltd. กรุงเทพฯ +66 2 670 6999	대한민국	SMA Technology Korea Co., Ltd. 서울 +82-2-520-2666
South Africa	SMA Solar Technology South Africa Pty Ltd. Cape Town 08600SUNNY (08600 78669) International: +27 (0)21 826 0600 SMA Online Service Center: www.SMA-Service.com	Argentina Brasil Chile Perú	SMA South America SPA Santiago de Chile +562 2820 2101
Other countries	International SMA Service Line Niestetal 00800 SMA SERVICE (+800 762 7378423) SMA Online Service Center: www.SMA-Service.com		


ENERGY
THAT
CHANGES
SMA