Quick Reference Guide

Off-Grid Systems with SUNNY ISLAND 3.0M / 4.4M / 6.0H / 8.0H

ENGLISH

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1 Information on this Document

1.1 Validity

This document is valid for off-grid systems with the following device types:

- SI3.0M-11 (Sunny Island 3.0M) with firmware version 3.2
- SI4.4M-11 (Sunny Island 4.4M) with firmware version 3.2
- SI6.0H-11 (Sunny Island 6.0H) with firmware version 3.1
- SI8.0H-11 (Sunny Island 8.0H) with firmware version 3.1
- MC-Box-6.3-11 (Multicluster-Box 6)
- MC-Box-12.3 (Multicluster-Box 12)
- MC-Box-36.3-11 (Multicluster-Box 36)

1.2 Content and Structure of this Document

This document summarizes the specific information on off-grid systems with Sunny Island inverters. Circuitry overviews of selected off-grid systems provide the basis as to how an off-grid system can be designed. 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:

- Training in how to deal with the dangers and risks associated with installing and using electrical devices and batteries
- Training in the installation and commissioning of electrical devices
- Knowledge of and adherence to the local standards and directives
- Knowledge of and compliance with the documentation of the Sunny Island inverter 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
"SUNNY ISLAND System Guide - System Solutions for your Off-Grid Electricity Supply"	Brochure
"Off-Grid Systems"	Planning Guidelines
"PV Inverters in Off-Grid Systems"	Technical Information
"Sunny Island Generator - Whitepaper"	Technical File
"External Energy Sources"	Technical Information
"Multicluster Systems with Stand-Alone Grid or Increased Self-Consumption and Battery-Backup Function"	Installation Quick Reference Guide
"Grounding in Off-Grid Systems"	Technical Information

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
🛈	Information that is important for a specific topic or goal, but is not safety-relevant
☐	Indicates a requirement for meeting a specific goal
☑	Desired result
✖	A problem that might occur

1.6 Typographies

Typography	Use	Example
bold	• Display messages • Parameter • Terminals • Slots • Elements to be selected • Elements to be entered	• Connect the grounding conductor to **AC2 Gen/ Grid**. • Select the parameter **235.01 GnAutoEna** and set to **Off**.
>	• Several elements that are to be selected	• Select **600# Direct Access > Select Number.**
[**Button**] [**Key**]	• Button that is to be selected or clicked on	• Select [**Enter**].

1.7 Nomenclature

Complete designation	Designation in this document
Sunny Boy, Sunny Mini Central, Sunny Tripower	PV inverter
Battery charge controllers not supplied by SMA Solar Technology AG	Charge controllers from a third-party supplier
Grid-forming generators such as electric generators or utility grids	External energy sources
Sunny Explorer, Sunny Portal, Sunny Home Manager	Communication product

The term "parameter" includes parameters with configurable values as well as parameters for displaying values.

2 Safety

2.1 Intended Use

Off-grid systems with Sunny Island inverters are self-sufficient utility grids that are being fed with energy from several AC sources in the stand-alone grid (e.g., PV inverter), from a generator, and/or with DC charge controllers (e.g., Sunny Island Charger). The Sunny Island forms the stand-alone grid as a voltage source. The Sunny Island regulates the balance between the energy fed-in and energy used and has a management system with battery and generator management and load control.

Off-grid systems with Sunny Island are single-phase or three-phase AC distribution grids. The local standards and provisions must be observed. Loads in off-grid systems are not protected against power failure.

The Sunny Island is not suitable for supplying life-sustaining medical devices. A power outage must not lead to personal injury.

Several Sunny Island inverters can be operated in an off-grid system. Three Sunny Island inverters are connected in parallel on the DC side and form a cluster. The circuitry of the Sunny Island inverters forming a cluster and the circuitry of several clusters in a system must be carried out in accordance with this documentation (see Section 3 "Information and System Description", page 11).

The Sunny Island can synchronize with a generator and connect directly, if necessary. When the stand-alone grid is connected to the generator, the voltage in the stand-alone grid is regulated by the generator.

The output power of the AC sources in the stand-alone grid is controlled via the frequency and voltage of the stand-alone grid. The AC sources must be suitable for stand-alone mode with Sunny Island (see technical information "PV Inverters in Off-Grid Systems" at www.SMA-Solar.com). The maximum output power of the AC sources in a stand-alone grid must be observed (see the Sunny Island inverter installation manual).

The Sunny Island uses batteries for energy storage. The nominal voltage of the battery must correspond to the input voltage on the DC connection. A fuse switch-disconnector (e.g., BatFuse) 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).

If connecting a lithium-ion battery, the following must be observed:

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

In off-grid systems with lead-acid batteries only, a maximum of four Sunny Island Charger charge controllers can be connected per cluster. The battery management must record the DC current when charging and discharging the battery. A battery current sensor may be installed to allow precise measurement of the battery current. The Sunny Island is not suitable for establishing a DC distribution grid.

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 appropriate.

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.

⚠ WARNING

Danger to life from electric shock due to live voltage

High voltages are present in the off-grid system. When covers (e.g., an enclosure lid) are removed, live components can be touched, which can result in death or serious injury due to electric shock.

- When carrying out any work on the electrical installation, wear suitable personal protective equipment.
- Switch off or disconnect the following components in the following order:
  - Loads
  - Generator
  - Sunny Island
  - In the distribution board, the circuit breakers of the Sunny Island inverter and of the generator.
  - Load-break switch of the battery
- Ensure that the off-grid system cannot be reconnected.
- Open the enclosure lid on the Sunny Island inverter and ensure that no voltage is present in the device.
- Ground and short-circuit the AC conductors outside the Sunny Island inverter.
- Cover or isolate any adjacent live components.

⚠ WARNING

Danger to life from electric shock due to damaged components

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

- Only use the off-grid system when it is technically faultless and in an operationally safe state.
- Regularly check the off-grid system for visible damages.
- Ensure that all safety equipment is freely accessible at all times.
- Make sure that all safety equipment is in good working order.

⚠ WARNING

Danger to life from electric shock due to circuit breakers that cannot be tripped

In the stand-alone grid/battery-backup grid, only the circuit breakers that can be tripped by the Sunny Island can be tripped in the event of a grid failure. Circuit breakers with a higher operating current cannot be tripped. Under fault conditions, a voltage that poses a danger to life may be present on accessible parts for several seconds. This can result in death or serious injury.

- Check if a circuit breaker has a higher trip characteristic than the following circuit breakers which can be tripped:
  - SI3.0M-11 and SI4.4M-11: circuit breaker with trip characteristic B6 (B6A)
  - SI6.0H-11 and SI8.0H-11: circuit breaker with trip characteristic B16 (B16A) or circuit breaker with trip characteristic C6 (C6A)
- If a circuit breaker has a higher trip characteristic than the specified circuit breaker that can be tripped, you should also install a residual-current device of type A.

⚠ 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.

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

⚠ WARNING

Danger to life due to explosive gases

Explosive gases may escape from the battery and cause an explosion. This can result in death or serious injury.

- 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 heat the battery above the temperature permitted or burn the battery.
- Ensure that the battery room is sufficiently ventilated.

⚠ WARNING

Chemical burns and poisoning due to battery electrolyte

If handled inappropriately, battery electrolyte can cause irritation to the eyes, respiratory system and skin, and it can be toxic. This may result in blindness or serious chemical burns.

- Protect the battery enclosure against destruction.
- Do not open or deform the battery.
- Whenever working on the battery, wear suitable personal protective equipment such as rubber gloves, apron, rubber boots and goggles.
- Rinse acid splashes thoroughly for a long time with clear water, and consult a doctor.
- If acid fumes have been inhaled, consult a doctor.
- Install, operate, maintain and dispose of the battery according to the manufacturer's specifications.

⚠ WARNING

Risk of injury due to short-circuit currents

Short-circuit currents in the battery can cause heat build-up and electric arcs. Burns or eye injuries due to flashes may result.

- Remove watches, rings and other metal objects.
- Use insulated tools.
- Do not place tools or metal parts on the battery.

⚠ WARNING

Risk of crushing injuries due to moving PV array parts

Moving parts in the PV array can crush or sever body parts. A generator can be started automatically by the Sunny Island.

- Operate the generator only with the safety equipment.
- Carry out work on the generator in accordance with the manufacturer's specifications.

⚠ CAUTION

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

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

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

NOTICE

Damage to the battery due to incorrect settings

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

- 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). Note that the battery charging behavior names used by SMA Solar Technology AG and the battery manufacturer may, in some cases, differ in meaning (for the battery charging behavior of the Sunny Island inverter, see technical information "List of Approved Lithium-Ion Batteries").
- Set the battery capacity for a ten-hour electric discharge (C10). The battery manufacturer specifies the battery capacity in relation to discharge time.

NOTICE

Damage of components due to electrostatic discharges

If enclosure parts are removed, the devices (e.g. Sunny Island or PV inverter) can be damaged or destroyed if electronic components or terminals are touched.

- Do not touch any electronic components in open devices.
- Ground yourself before touching any terminals.

3 Information and System Description

3.1 Off-Grid System Functions

Multicluster systems set up as off-grid systems can form self-sufficient utility grids fed with energy from multiple AC sources in the stand-alone grid (e.g. PV inverter), from a grid-forming PV array and/or with DC charge controllers (e.g. Sunny Island Charger). As a voltage source, the Sunny Island inverter forms the stand-alone grid. The Sunny Island inverter regulates the balance between the energy that is fed in and the energy that is used and features a battery, PV array and load management system.

Battery Management

Battery management of the Sunny Island inverter is based on precise determination of the state of charge. By combining the three most common methods for recording the state of charge, the Sunny Island reaches a measuring accuracy of more than 95%. This way, battery overcharge and deep discharge are avoided.

Another feature of battery management is the extremely gentle charging control. It automatically selects the optimum charging strategy for the battery type and the situation in which it is used. This means that overcharging can be reliably prevented and that the battery can be fully charged regularly. The available charge energy is used optimally at all times (see technical information "Battery Management" at www.SMA-Solar.com).

Generator Management

The Sunny Island can synchronize with a generator and connect directly, if necessary. When the stand-alone grid is connected to the PV array, the voltage and frequency in the stand-alone grid are regulated by the PV array.

The Sunny Island inverter generator management allows for uninterruptible connection of the stand-alone grid to the generator and uninterruptible isolation from the generator. The generator management controls the generator via a start and stop signal. A generator current control ensures that the generator always remains at the optimum operating point. The generator management allows the use of generators that have a low output power in proportion to the nominal load (see technical document "Sunny Island Generator - Whitepaper" at www.SMA-Solar.com)

Load Control

The load control enables control of the AC sources in stand-alone grids, control of a generator, and the specific disconnection of loads.

The AC sources in the stand-alone grid are limited in their power output by the stand-alone grid frequency. In case of excess energy, the load control system increases the power frequency. This limits the output power of the PV inverters, for example.

If there is not enough energy available for all loads or the battery is to be preserved, load control can request energy from a generator by means of the generator management. The generator management starts the generator and the off-grid system is supplied with sufficient energy.

If no generator is present in the off-grid system or the energy is not sufficient despite the generator being available, load control turns the loads off using load shedding. All loads are shed simultaneously with one-stage load shedding. A load shedding contactor sheds the noncritical loads during the first stage with two-stage load shedding. The remaining loads are shed during the second stage only when the state of charge declines further. This can further increase the availability of the off-grid system for critical loads.

3.2 Modular Design

3.2.1 Single System

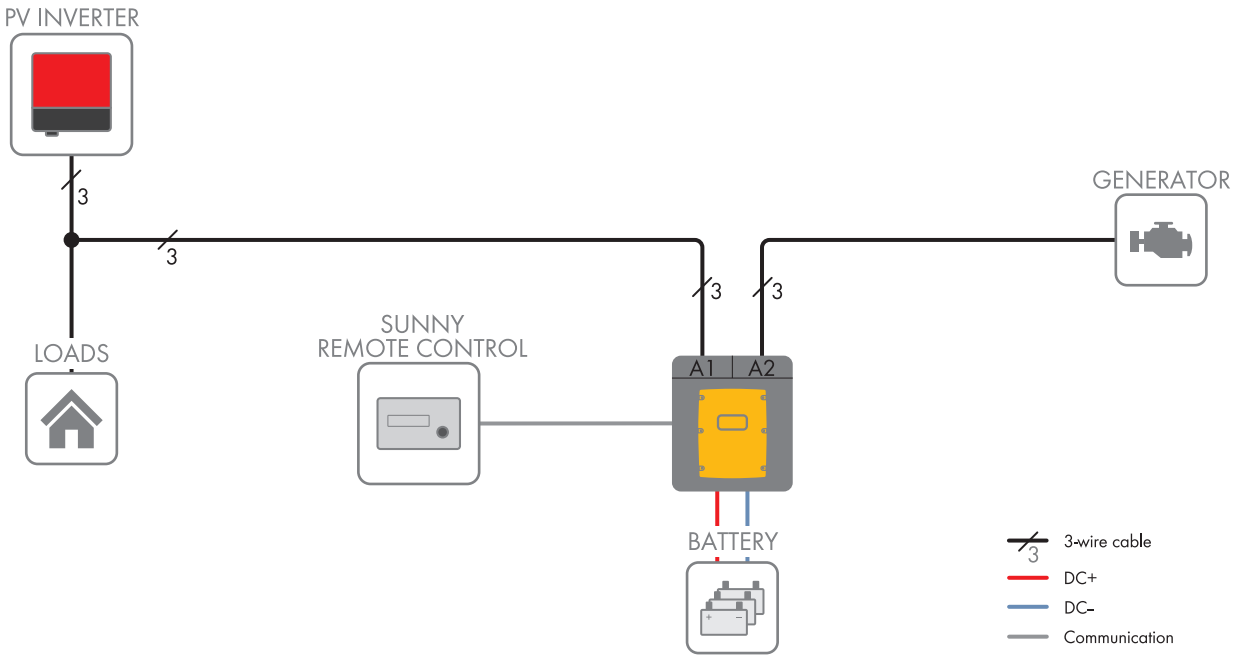


Figure 1: Principle of a single system

In a single system, one Sunny Island forms a single-phase stand-alone grid.

3.2.2 Single-Cluster System (Single-Phase)

Required device types for single-phase single-cluster systems

In single-phase single-cluster systems, the Sunny Island inverters must be of device type SI6.0H-11 or SI8.0H-11.

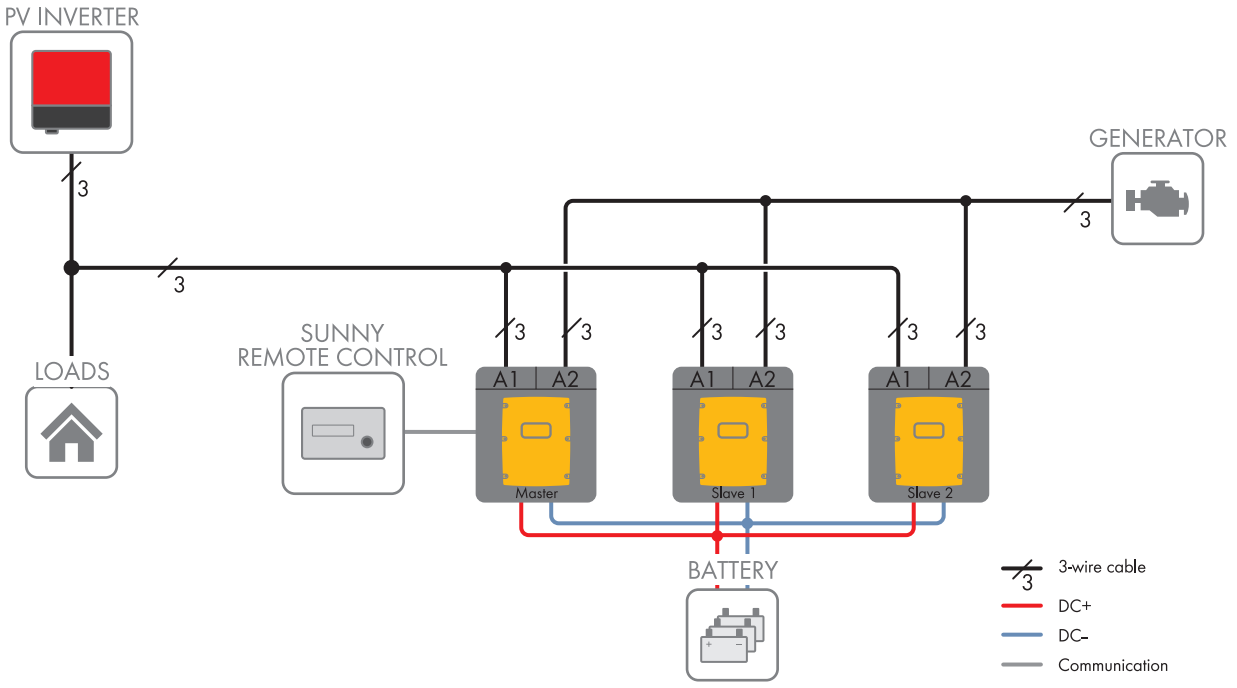


Figure 2: Principle of a single-phase single-cluster system

In a single-phase single-cluster system up to three Sunny Island inverters are connected to one battery forming a cluster. The Sunny Island inverters are connected on the AC side to the same line conductor. If the device types within the cluster are different, the master must be an SI8.0H-11.

3.2.3 Single-Cluster System (Three-Phase)

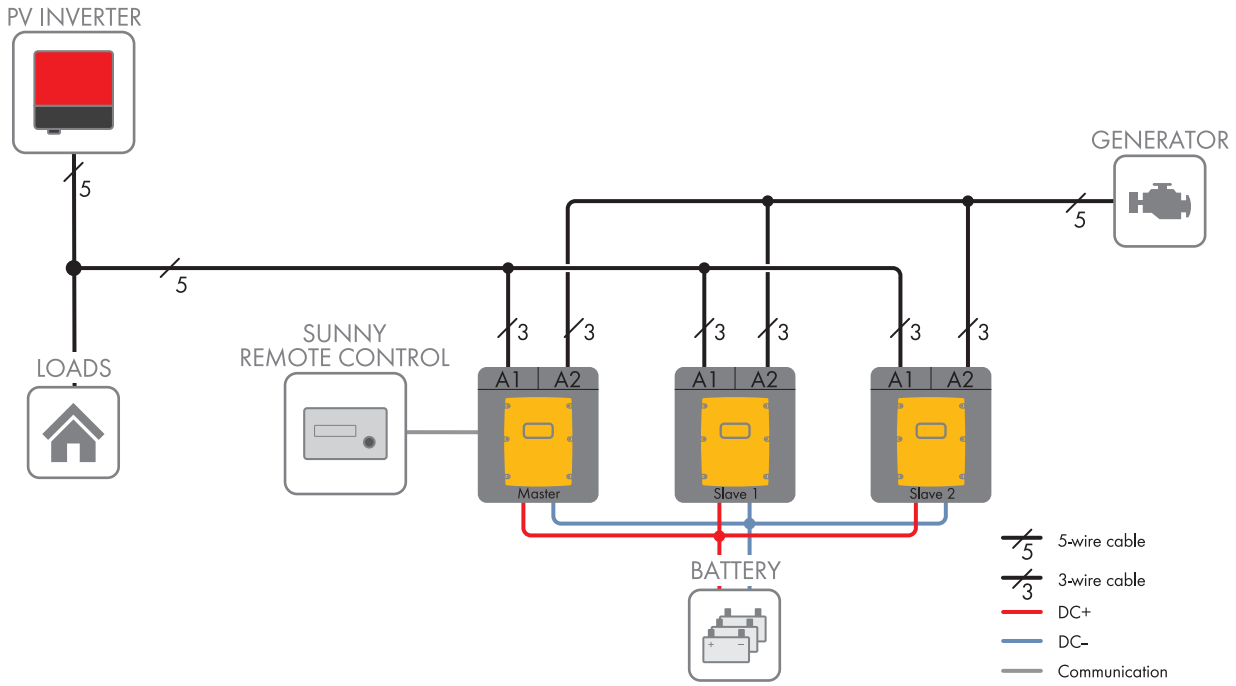


Figure 3: Block circuit diagram

In a three-phase single-cluster system up to three Sunny Island inverters are connected to one battery forming a cluster. The Sunny Island inverters are connected on the AC side to three different line conductors.

A cluster that consists of different device types is only supported by SI6.0H-11 and SI8.0H-11. If the device types within the cluster are different, the master must be an SI8.0H-11 (see Section 3.3 "Information on Off-Grid Systems", page 14).

3.2.4 Multicluster System

Required device types for multicluster systems

In multicluster systems for stand-alone grids, the following device types must be used:

- SI6.0H-11 (Sunny Island 6.0H)
- SI8.0H-11 (Sunny Island 8.0H)
- MC-BOX-6.3-11 (Multicluster-Box 6)
- MC-BOX-12.3-20 (Multicluster-Box 12)
- MC-Box-36.3-11 (Multicluster-Box 36)

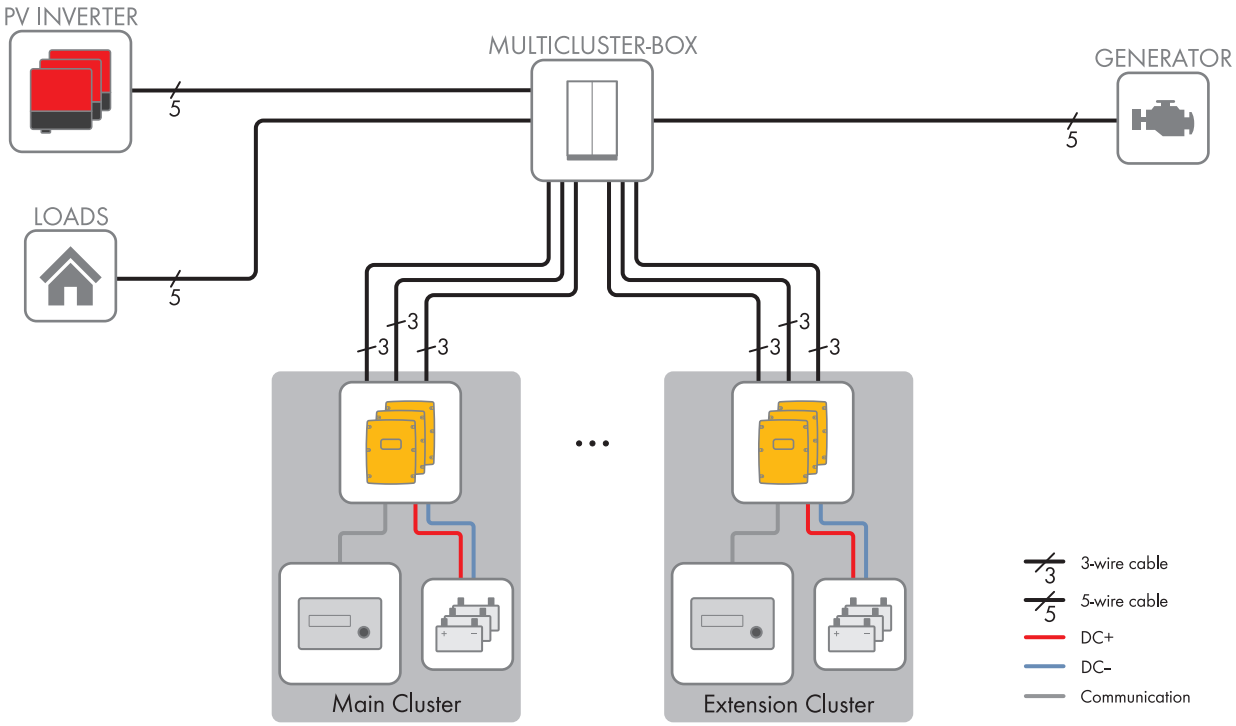


Figure 4: Principle of a Multicluster-Box

Multicluster systems consist of several three-phase clusters. The individual clusters must be connected to a Multicluster-Box. The Multicluster-Box is an SMA multicluster technology device for off-grid systems, battery-backup systems and systems for increased self-consumption.

The Multicluster-Box is a main AC distribution board to which you can connect up to four clusters. Each three-phase cluster is made up of three DC-side, parallel-switched Sunny Island.

Only Sunny Island inverters of the same device type may be installed in a cluster: SI6.0H-11 or SI8.0H-11.

3.3 Information on Off-Grid Systems

Information on Batteries

Lithium-ion batteries in off-grid systems

In order to meet the requirements of off-grid systems, the Sunny Island has a high overload capacity. This overload capacity is subject to the battery being able to supply sufficient current. With lithium-ion batteries, this ampacity cannot be taken for granted.

- Check with the battery manufacturer whether the battery is suitable for off-grid systems with Sunny Island inverters. Pay special attention to the ampacity.

Recommendations for battery capacity

SMA Solar Technology AG recommends the following minimum battery capacities.

- Minimum battery capacity per Sunny Island inverter:
  - SI3.0M-11: 100 Ah
  - SI4.4M-11: 150 Ah
  - SI6.0H-11: 190 Ah
  - SI8.0H-11: 250 Ah
- Minimum battery capacity per 1000 Wp power of the PV system: 100 Ah

The sum of the individual battery capacities is the total minimum battery capacity and applies to a ten-hour electric discharge (C10). The minimum battery capacity must be observed to ensure stable operation of the system.

Information on Clusters

Clusters in multicluster systems

Device type	Potential device types within a cluster	Explanation
SI3.0M-11	In all multicluster systems, the Sunny Island inverters must be device type SI6.0H-11 or SI8.0H-11.	
SI4.4M-11		
SI6.0H-11	SI6.0H-11 or SI8.0H-11	Only Sunny Island inverters of the same device type may be installed in a cluster: SI6.0H-11 or SI8.0H-11.
SI8.0H-11	SI6.0H-11 or SI8.0H-11	

Clusters in three-phase single-cluster systems

Device type	Potential device types within a cluster	Explanation
SI3.0M-11	SI3.0M-11	A cluster must consist of the same device types.
SI4.4M-11	SI4.4M-11	
SI6.0H-11	SI6.0H-11 or SI8.0H-11	A cluster can consist of one or both device types. If both device types within the cluster are used, the master must be of device type SI8.0H-11.
SI8.0H-11	SI6.0H-11 or SI8.0H-11	

Clusters in single-phase single-cluster systems

Device type	Potential device types within a cluster	Explanation
SI3.0M-11	In single-phase single-cluster systems, the Sunny Island inverters must be of device type SI6.0H-11 or SI8.0H-11.	
SI4.4M-11		
SI6.0H-11	SI6.0H-11 or SI8.0H-11	A cluster can consist of one or both device types. If both device types within the cluster are used, the master must be of device type SI8.0H-11.
SI8.0H-11	SI6.0H-11 or SI8.0H-11	

Connecting the Sunny Island inverters in single-phase single-cluster systems

In a single-phase single cluster system, the following cable lengths and conductor cross-sections must be designed the same way:

- From the generator to each Sunny Island
- From each Sunny Island to the AC distribution board
- From the BatFuse to each Sunny Island

The same design is a requirement for stable and symmetrical operation of the off-grid system.

Information on the PV System

Maximum PV system power

In off-grid systems, the maximum PV system power depends on the total power of the Sunny Island inverters.

- Maximum output power of the PV system per SI3.0M-11: 4600 W
- Maximum output power of the PV system per SI4.4M-11: 4600 W
- Maximum output power of the PV system per SI6.0H-11: 9200 W
- Maximum output power of the PV system per SI8.0H-11: 12000 W

The maximum output power of the PV system must be observed to ensure stable operation of the off-grid system.

3.4 Optional Devices and Functions

The following devices can be used optionally in an off-grid system:

Component	Description
Load-shedding contactor	Contactor controlled by the Sunny Island for isolation of loads
Sunny WebBox	Remote monitoring and system configuration of the off-grid system
Sunny Island Charger 50	Charge controller for off-grid systems with lead-acid batteries A maximum of four Sunny Island Charger charge controllers can be connected to a cluster. In multicluster systems, four Sunny Island Charger charge controllers can be connected to each cluster. If lithium-ion batteries are used, no charge controllers can be connected.
Battery current sensor	Shunt for measuring the battery current A battery current sensor is required in off-grid systems with DC loads or with charge controllers from third-party suppliers (see Section 2.1 "Intended Use", page 7).

Sunny Island offers the following functions for off-grid systems via two multifunction relays (see the Sunny Island inverter installation manual):

Function	Description
Controlling PV arrays	A multifunction relay activates if a PV array request is received from the Sunny Island inverter's generator management system. With the multifunction relay, you can control PV arrays with an electrical remote-start function or connect a signal generator for PV arrays with no autostart function.
Controlling load-shedding contactors	A multifunction relay is activated depending on the state of charge of the battery. Depending on the configuration, you can install a one-level load shedding with one multifunction relay or a two-level load shedding with two multifunction relays. You can also adjust the thresholds for the state of charge of the battery depending on the time of day.
Time control for external processes	External processes can be time-controlled with a multifunction relay.

Function	Description
Display of operating states and warning messages	You can connect message devices to the multifunction relays to allow operating states and warning messages from the Sunny Island inverter to be output. One of the following operating states and warning messages can be displayed for each multifunction relay: • The PV array is running and is connected. • A Sunny Island displays an error message of level 2 or higher. Only the error messages within a cluster are evaluated here. • A Sunny Island displays a warning. Only the warnings within a cluster are evaluated here. • The Sunny Island is in operation in a single system. • The respective cluster is in operation in a cluster system. • The Sunny Island is in derating in a single system. • The respective cluster is in derating in a cluster system.
Control of a battery-room fan	The multifunction relay is activated when the charging current causes the battery to emit gasses. A connected battery room fan is switched on for at least one hour.
Control of an electrolyte pump	Depending on the nominal energy throughput, the multifunction relay is activated at least once a day.
Use of excess energy	During the constant voltage phase, a multifunction relay is activated and thus controls additional loads that can put any excess energy of AC sources in the stand-alone grid (e.g., of a PV system) to good use.

4 Single System

4.1 Circuitry Overview

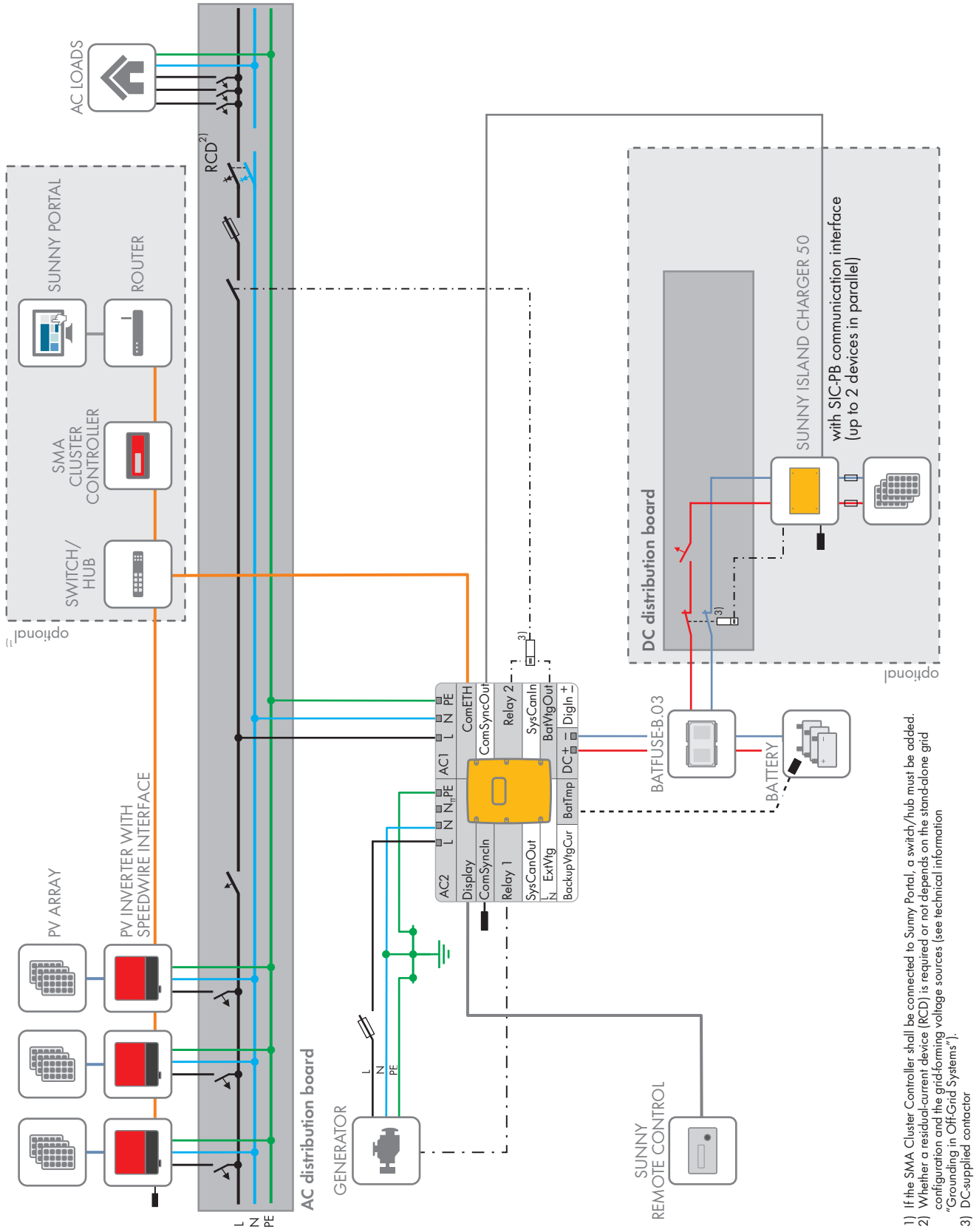


Figure 5: Single System

4.2 Connecting the Sunny Island Inverter

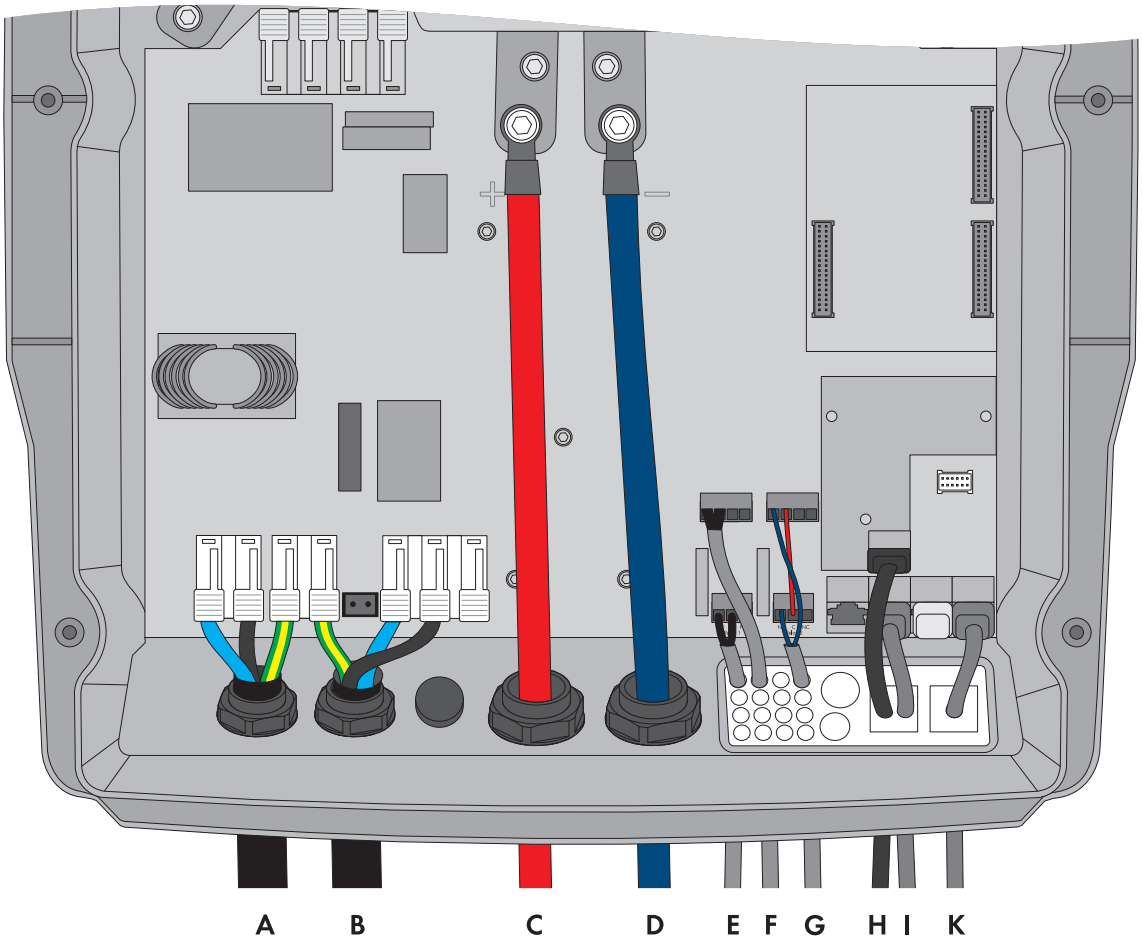


Figure 6: Connecting the Sunny Island inverter

Position	Designation	Description / information
A	AC power cable of the stand-alone grid	Sunny Island: connection to **AC1 Loads/SunnyBoys** terminals **L**, **N**, and **grounding conductor** Conductor cross-section: maximum 16 mm^2
B	AC power cable of the generator	Sunny Island: connection to **AC2 Gen/Grid** terminals **L**, **N** and **grounding conductor** Conductor cross-section: maximum 16 mm^2 The Sunny Island must be connected via a grounding conductor on the terminal **AC1** or **AC2** to the ground potential. The conductor cross-section of the grounding conductor must be at least 10 mm^2. If the conductor cross-section is smaller, an additional grounding conductor on the enclosure with the conductor cross-section of the AC power cable must connect the Sunny Island with the ground potential.

Position	Designation	Description / information
C	DC+ cable	Battery connection Conductor cross-section: from 50 mm^2 to 95 mm^2 Cable diameters: 14 mm to 25 mm Torque: 12 Nm
D	DC- cable	
E	Control cable, generator	Sunny Island: terminals **Relay1 NO** and **Relay1 C** Conductor cross-section: from 0.2 mm^2 to 2.5 mm^2
F	Measuring cable of the battery temperature sensor	Sunny Island: connection **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.
G	Control cable, load shedding	Sunny Island: connect the control cable to terminals **Relay2 NO** and **BatVtgOut -**. Inside the Sunny Island inverter, connect terminals **Relay2 C** and **BatVtgOut+**. Conductor cross-section: from 0.2 mm^2 to 2.5 mm^2
H	Speedwire network cable	Terminal **ComETH** In order to connect the router/network switch, the Speedwire data module Sunny Island must be mounted in the Sunny Island (see Sunny Island Speedwire data module installation manual). The connection **ComETH** is on the data module.
I	Data cable to Sunny Remote Control display	Sunny Island: terminal **Display**
K	Data cable to Sunny Island Charger	Sunny Island: terminal **ComSync In** An additional data cable must be connected from the terminal **ComSync Out** to the battery only when lithium-ion batteries are used. The communication bus must be equipped with a terminator on both ends.
–	Data cable to lithium-ion battery	Only with lithium-ion batteries: additional data cable on terminal **ComSync In**

4.3 Basic Configuration of the Sunny Island

NOTICE

Damage to the battery due to incorrect settings

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

- 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). Note that the battery charging behavior names used by SMA Solar Technology AG and the battery manufacturer may, in some cases, differ in meaning (for the battery charging behavior of the Sunny Island inverter, see technical information "List of Approved Lithium-Ion Batteries").
- Set the battery capacity for a ten-hour electric discharge (C10). The battery manufacturer specifies the battery capacity in relation to discharge time.

Requirements:

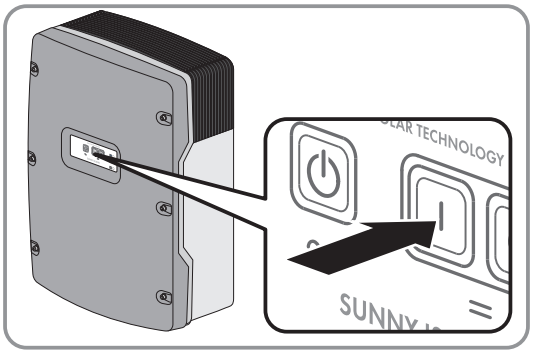
☐ The off-grid system must be installed according to the circuitry (see Section 4.1, page 18).

☐ All device enclosures must be closed except for the BatFuse. This protects all live components from being touched.

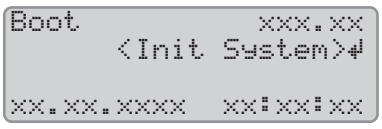
☐ All circuit breakers in the AC distribution board must be open. Thus, the Sunny Island is not connected to an AC source.

Procedure:

1. Check the wiring (see installation manual of the Sunny Island inverter).
2. Close all devices except the BatFuse. This protects all live components from being touched.
3. Close the BatFuse load-break switch and press the activation button on the Sunny Island.



4. When the Sunny Remote Control shows **<Init System>**, press and hold the button on the Sunny Remote Control.

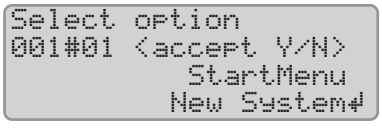


☑ A signal sounds three times and the Sunny Remote Control displays the Quick Configuration Guide.

5. Turn the button on the Sunny Remote Control and select **New System**.

6. Press the button. This confirms your selection of **New System**.

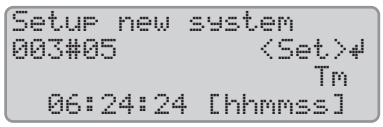
☑ An entry confirmation appears.



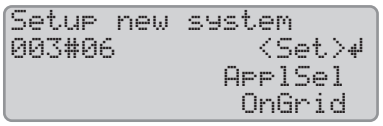
7. Set **Y** and press the button.

8. Set the date.

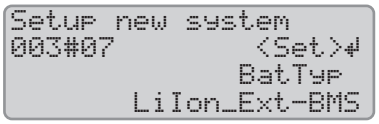
9. Set the time.

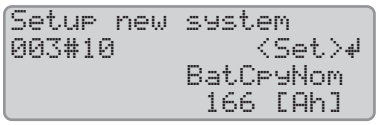
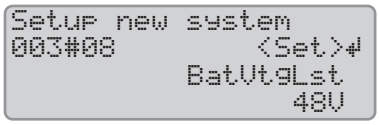
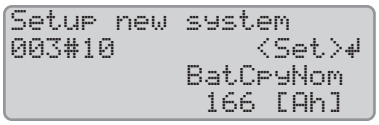


10. Set **OffGrid**.

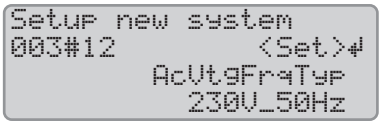


11. Set the battery type:



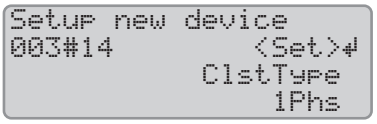
Battery type	Settings	
LiIon_Ext-BMS: Lithium-ion battery	• Set the battery capacity for ten-hour electric discharge (for determining the battery capacity, see installation manual of the Sunny Island).	
VRLA lead-acid battery with immobilized electrolyte in AGM (Absorbent Glass Mat Separator) or gel **or** **FLA** lead-acid battery with liquid electrolyte	• Set the nominal voltage of the battery.	
	• Set the battery capacity for ten-hour electric discharge (for determining the battery capacity, see installation manual of the Sunny Island).	

12. Set the grid voltage and power frequency of the stand-alone grid:

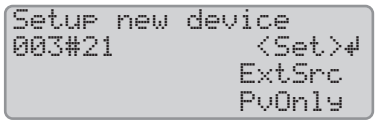


Setting	Description
230V_50Hz	Grid voltage 230 V, power frequency 50 Hz
220V_60Hz	Grid voltage 220 V, power frequency 60 Hz

13. Set **1 Phs**:

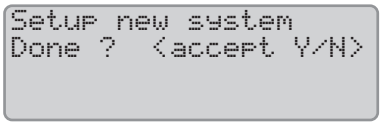


14. Set the type of energy sources:

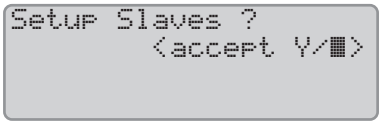


Energy source	Setting
No generator is connected to terminal **AC2** of the Sunny Island inverter.	• Set **PvOnly**.
One generator is connected to terminal **AC2** of the Sunny Island inverter.	• Set **Gen**. • Set the maximum generator current for continuous operation.

15. Confirm the basic configuration with **Y**.



16. Decline **Setup Slaves ?** with **N**.



☑ The basic configuration is complete. If an SD memory card is inserted into the Sunny Remote Control, the message **Do not remove MMC/SD memory card ...** appears and the SD memory card is integrated in the file system.

17. Commission the off-grid system (see Section 7, page 38).

5 Single-Cluster System

5.1 Circuitry Overview Single-Phase Single-Cluster System

Required device types for single-phase single-cluster systems

In single-phase single-cluster systems, the Sunny Island inverters must be of device type SI6.0H-11 or SI8.0H-11.

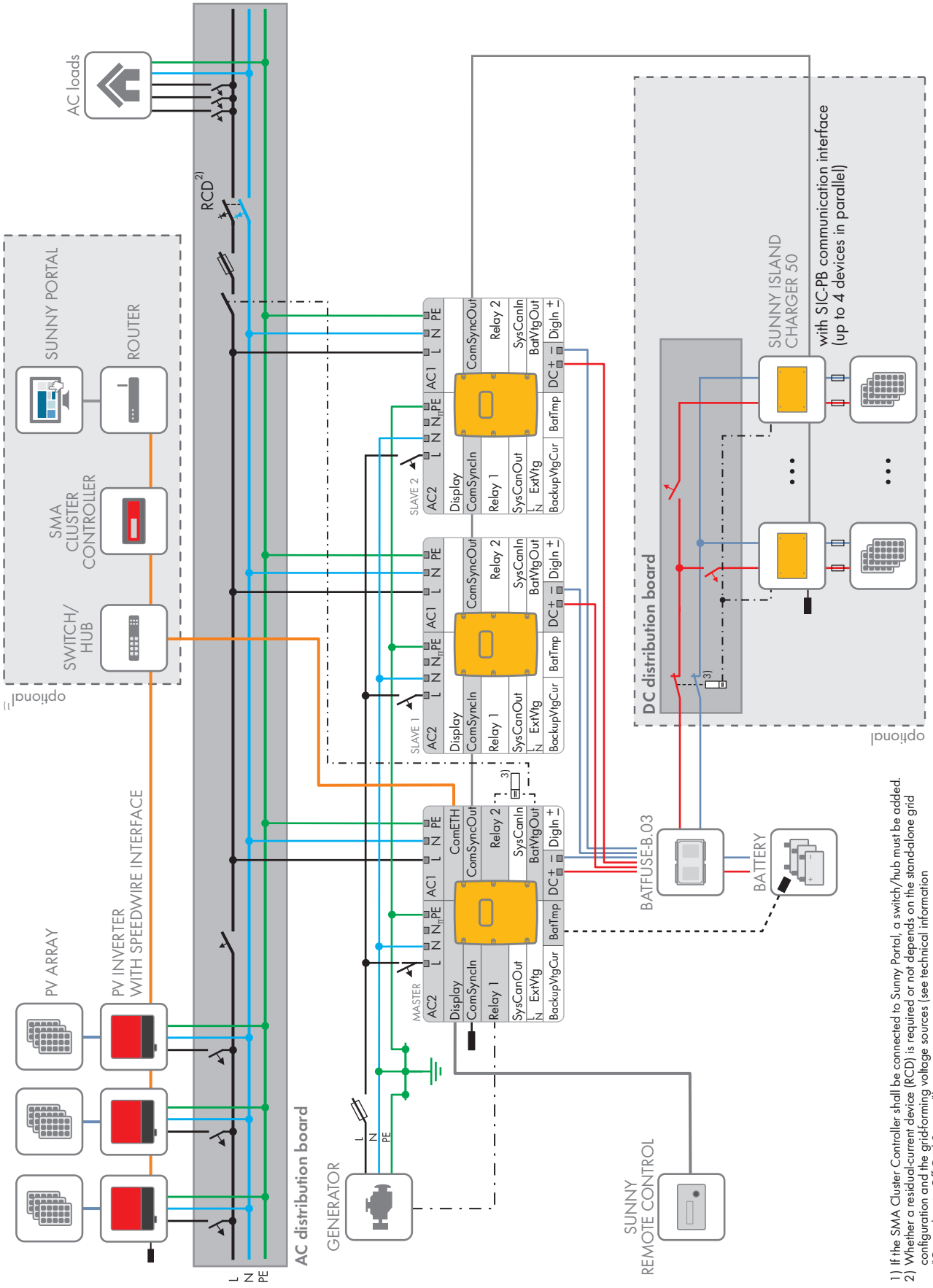


Figure 7: Circuitry overview single-phase single-cluster system, only possible with SI6.0H-11 or SI8.0H-11

5.2 Circuitry Overview Three-Phase Single-Cluster System

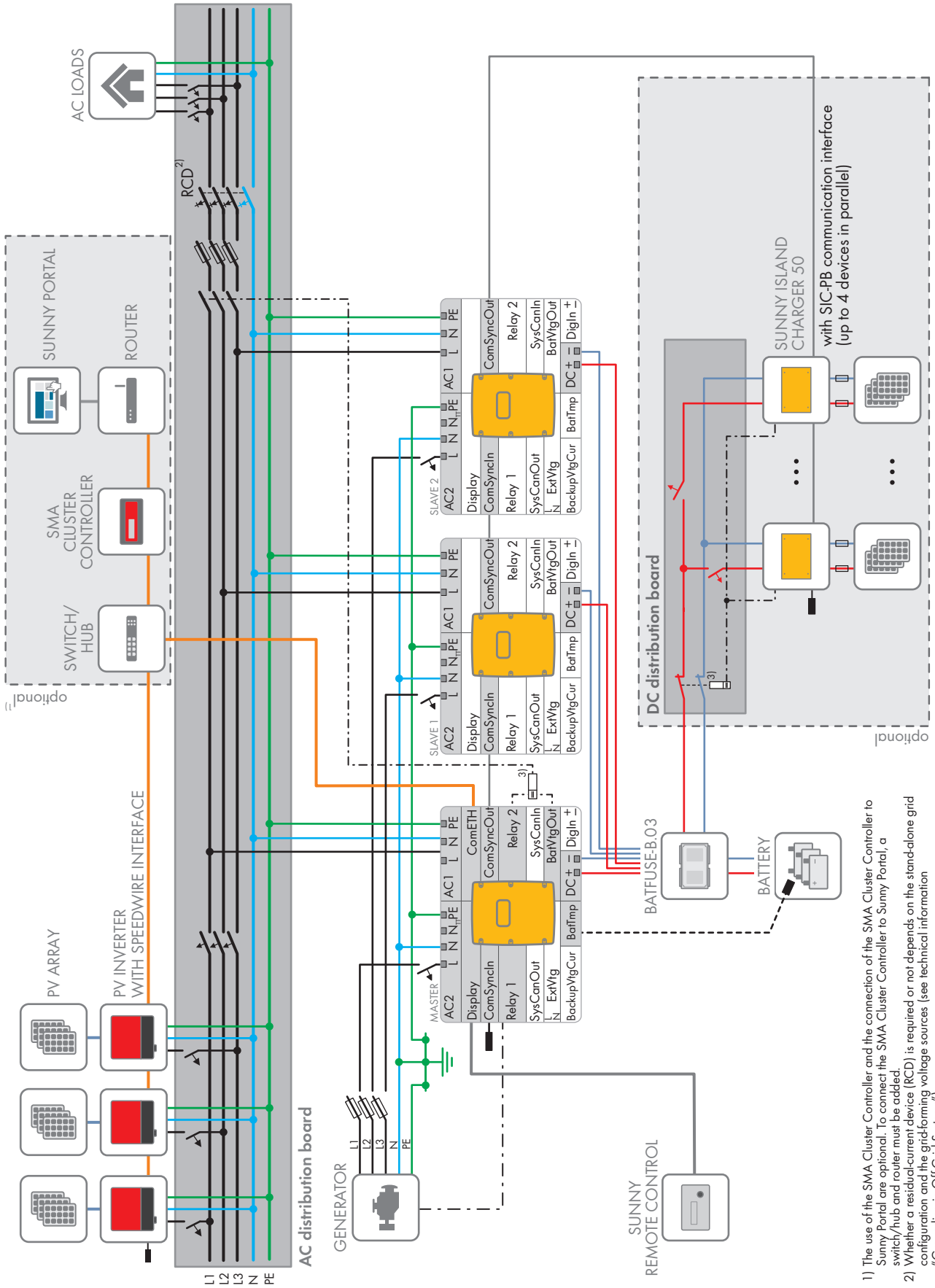


Figure 8: Circuitry overview three-phase single-cluster

5.3 Connecting Sunny Island Inverters

5.3.1 Connecting the Master

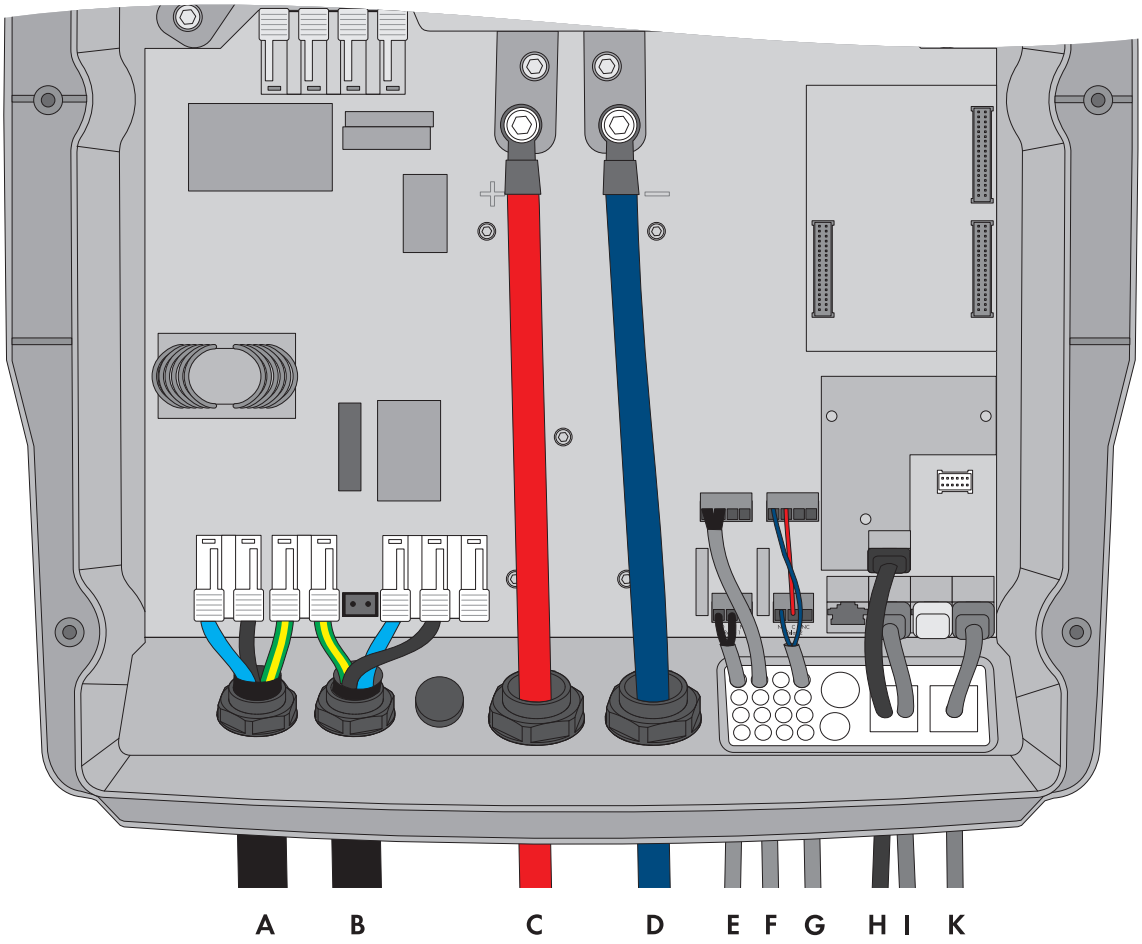


Figure 9: Connecting the master in the single-cluster system

Position	Designation	Description / information
A	AC power cable of the stand-alone grid	Sunny Island: connection to **AC1 Loads/SunnyBoys** terminals **L**, **N**, and **grounding conductor** Stand-alone grid: connect master to line conductor L1. For a single-phase system, the cable length and the conductor cross-section must be identical on each Sunny Island. Conductor cross-section: maximum 16 mm^2

Position	Designation	Description / information
B	AC power cable of the generator	Sunny Island: connection to **AC2 Gen/Grid** terminals **L**, **N** and **grounding conductor** Generator: connect master to line conductor L1. Conductor cross-section: maximum 16 mm^2 For a single-phase system, the cable length and the conductor cross-section must be identical on each Sunny Island. The Sunny Island must be connected via a grounding conductor on the terminal **AC1** or **AC2** to the ground potential. The conductor cross-section of the grounding conductor must be at least 10 mm^2. If the conductor cross-section is smaller, an additional grounding conductor on the enclosure with the conductor cross-section of the AC power cable must connect the Sunny Island with the ground potential.
C	DC+ cable	Battery connection For a single-phase system, the cable length and the conductor cross-section must be identical on each Sunny Island. Conductor cross-section: from 50 mm^2 to 95 mm^2 Cable diameters: 14 mm to 25 mm Torque: 12 Nm
D	DC- cable	
E	Control cable, generator	Sunny Island: terminals **Relay1 NO** and **Relay1 C** Conductor cross-section: from 0.2 mm^2 to 2.5 mm^2
F	Measuring cable of the battery temperature sensor	Sunny Island: connection **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.
G	Control cable, load shedding	Connect the control cable to terminals **Relay2 NO** and **BatVtgOut -** in the Sunny Island. Inside the Sunny Island inverter, connect terminals **Relay2 C** and **BatVtgOut+**. Conductor cross-section: from 0.2 mm^2 to 2.5 mm^2
H	Speedwire network cable	Terminal **ComETH** In order to connect the router/network switch, the Speedwire data module Sunny Island must be mounted in the Sunny Island (see Sunny Island Speedwire data module installation manual). The connection **ComETH** is on the data module.
I	Data cable to Sunny Remote Control display	Sunny Island: terminal **Display**

Position	Designation	Description / information
K	Data cable for the internal communication in the cluster	Sunny Island: terminal **ComSync Out** Only with lithium-ion batteries: additional data cable on terminal **ComSync In** The communication bus must be equipped with a terminator on both ends.
–	Data cable to lithium-ion battery	Only with lithium-ion batteries: additional data cable on terminal **ComSync In**

5.3.2 Connecting the Slaves

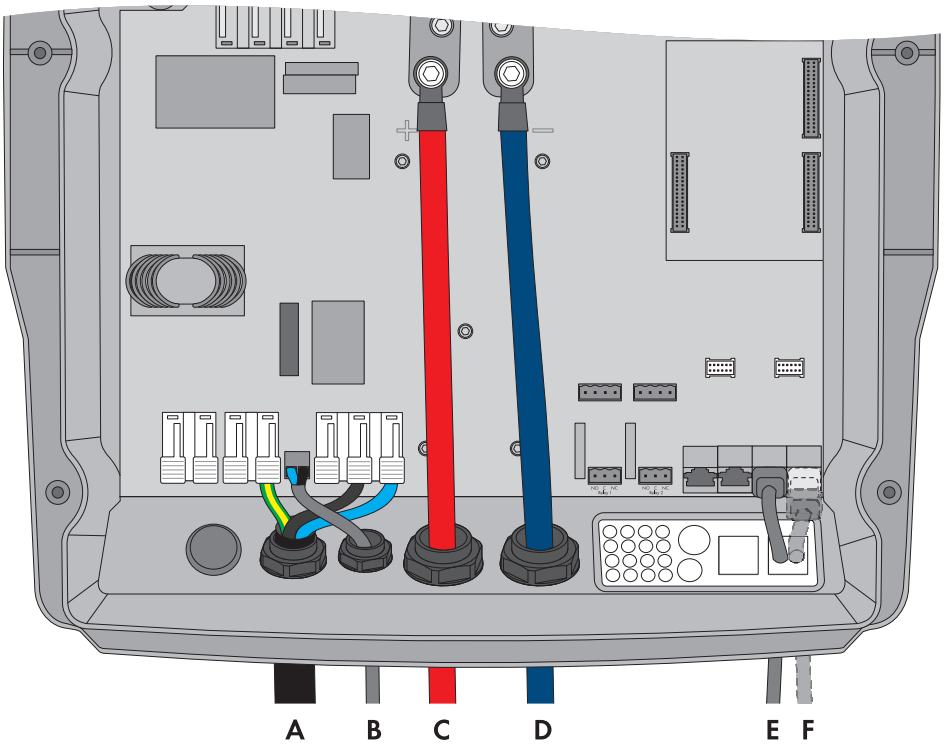


Figure 10: Connection of the Slaves in a single-cluster system

Position	Designation	Description / information
A	AC power cable of the stand-alone grid	Sunny Island: connection to **AC1 Loads/SunnyBoys** terminals **L**, **N**, and **grounding conductor** Stand-alone grid: connect slave 1 to line conductor L2, connect slave 2 to line conductor L3. For a single-phase system, the cable length and the conductor cross-section must be identical on each Sunny Island. Conductor cross-section: maximum 16 mm^2

Position	Designation	Description / information
B	AC power cable of the generator	Sunny Island: connection of generator to **AC2 Gen/Grid** terminals **L**, **N**, and **grounding conductor** Generator: connect slave 1 to line conductor L2, connect slave 2 to line conductor L3. Conductor cross-section: maximum 16 mm^2 For a single-phase system, the cable length and the conductor cross-section must be identical on each Sunny Island. The Sunny Island must be connected via a grounding conductor on the terminal **AC1** or **AC2** to the ground potential. The conductor cross-section of the grounding conductor must be at least 10 mm^2. If the conductor cross-section is smaller, an additional grounding conductor on the enclosure with the conductor cross-section of the AC power cable must connect the Sunny Island with the ground potential.
C	DC+ cable	Battery connection For a single-phase system, the cable length and the conductor cross-section must be identical on each Sunny Island. Conductor cross-section: from 50 mm^2 to 95 mm^2 Cable diameters: 14 mm to 25 mm
D	DC− cable	
E	Data cable for the internal communication in the cluster	Sunny Island: terminal **ComSync In**
F		Sunny Island: terminal **ComSync Out** On slave 2 either connect the data cable of the Sunny Island Charger charge controller or insert the terminator into the terminal.

5.4 Performing Basic Configuration of the Sunny Island

NOTICE

Damage to the battery due to incorrect settings

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

- 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). Note that the battery charging behavior names used by SMA Solar Technology AG and the battery manufacturer may, in some cases, differ in meaning (for the battery charging behavior of the Sunny Island inverter, see technical information "List of Approved Lithium-Ion Batteries").
- Set the battery capacity for a ten-hour electric discharge (C10). The battery manufacturer specifies the battery capacity in relation to discharge time.

Requirements:

☐ The off-grid system must be installed according to the circuitry (see Section 5.1, page 24 and Section 5.2, page 26).

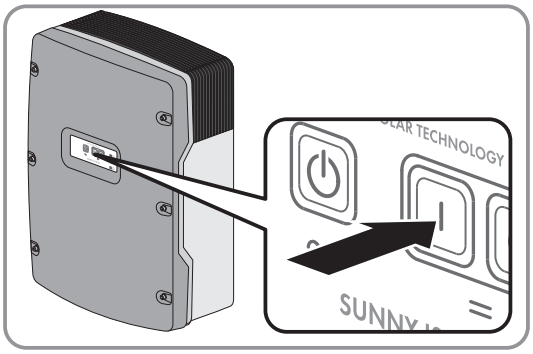
☐ All device enclosures must be closed except for the BatFuse. This protects all live components from being touched.

☐ All circuit breakers in the AC distribution board must be open. Thus, the Sunny Island is not connected to an AC source.

☐ The Sunny Remote Control must be connected to the master. This determines which Sunny Island is the master during the basic configuration.

Procedure:

1. Check the wiring (see installation manual of the Sunny Island inverter).
2. Close all devices except the BatFuse. This protects all live components from being touched.
3. Close the BatFuse and press and hold the activation button on the master until you hear an acoustic signal.



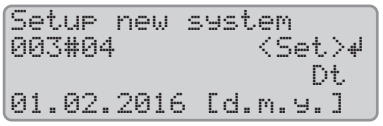
4. When the Sunny Remote Control shows **<Init System>**, press and hold the button on the Sunny Remote Control.

   ☑ A signal sounds three times and the Sunny Remote Control displays the Quick Configuration Guide.

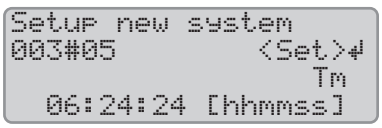
5. Turn the button on the Sunny Remote Control and select **New System**.

6. Press the button. This confirms your selection of **New System**.
   ☑ An entry confirmation appears.

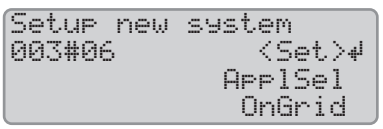
7. Set **Y** and press the button.
8. Set the date.



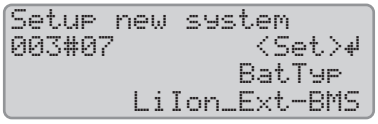
9. Set the time.

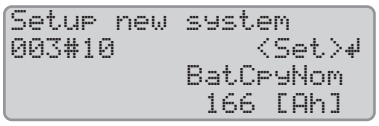
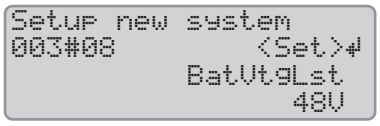
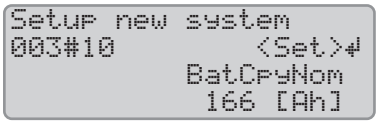


10. Set **OffGrid**.

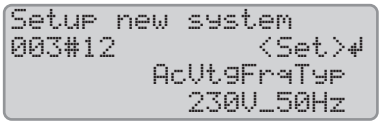


11. Set the battery type:



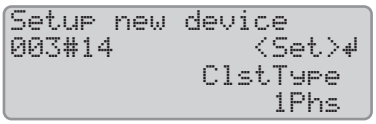
Battery type	Settings	
LiIon_Ext-BMS: Lithium-ion battery	• Set the battery capacity for ten-hour electric discharge (for determining the battery capacity, see installation manual of the Sunny Island).	
VRLA Lead-acid battery with electrolyte absorbed in glass mat or immobilized in gel **or FLA** Lead-acid battery with liquid electrolyte	• Set the nominal voltage of the battery.	
	• Set the battery capacity for ten-hour electric discharge (for determining the battery capacity, see installation manual of the Sunny Island).	

12. Set the grid voltage and power frequency of the stand-alone grid:



Setting	Description
230V_50Hz	Grid voltage 230 V, power frequency 50 Hz
220V_60Hz	Grid voltage 220 V, power frequency 60 Hz

13. Set the number of line conductors in the system:



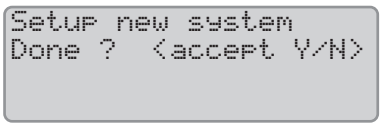
Phases	Settings	
Single-phase off-grid system	• Set **1Phase**.	
Three-phase off-grid system	• Set **3Phase**.	
	• Set **SingleClst**.	

14. Set the type of energy sources:

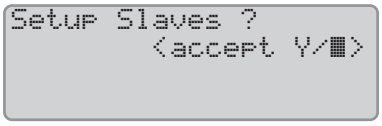
Energy source	Settings
No generator is connected to terminal **AC2** of the Sunny Island inverter.	• Set **PvOnly**.

Energy source	Settings	
One generator is connected to terminal **AC2** of the Sunny Island inverter.	• Set **Gen**.	
	• Set the maximum generator current for continuous operation.	

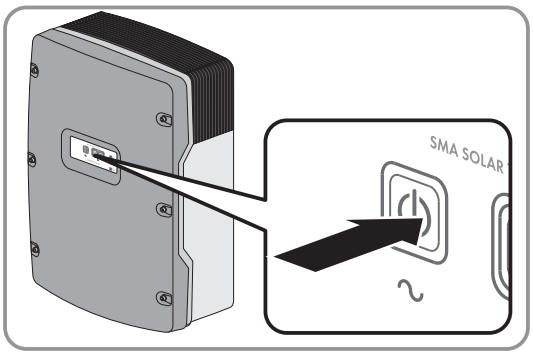
15. Confirm the basic configuration with **Y**.



16. Confirm **Setup Slaves ?** with **Y**.



17. Wait until the upper LED (inverter LED) on slave 1 is flashing and the Sunny Remote Control is displaying **To identify Slave1, press Tss on the Slv**.
18. Press the start-stop button on slave 1.



19. Wait until the Sunny Remote Control displays **To identify Slave2, press Tss on the Slv**.
20. Depending on the system, perform the following steps:

System	Setting
Off-Grid Systems without Slave 2	• Press the button on the Sunny Remote Control.
Off-grid systems with slave 2	• Wait until the inverter LED of slave 2 blinks. • Press the start-stop button on slave 2.

☑ The basic configuration is complete. If an SD memory card is inserted into the Sunny Remote Control, the message **Do not remove MMC/SD memory card ...** appears and the SD memory card is integrated in the file system.

21. Commission the off-grid system (see Section 7, page 38).

6 Multicluster System

6.1 Circuitry Overview and Connection of the Sunny Island Inverters

Required device types for multicluster systems

In multicluster systems for stand-alone grids, the following device types must be used:

- SI6.0H-11 (Sunny Island 6.0H)
- SI8.0H-11 (Sunny Island 8.0H)
- MC-BOX-6.3-11 (Multicluster-Box 6)
- MC-BOX-12.3-20 (Multicluster-Box 12)
- MC-Box-36.3-11 (Multicluster-Box 36)

You can find a circuitry overview in the Multicluster-Box documentation.

6.2 Performing Basic Configuration of the Sunny Island in the Multicluster System

NOTICE

Damage to the battery due to incorrect settings

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

- 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). Note that the battery charging behavior names used by SMA Solar Technology AG and the battery manufacturer may, in some cases, differ in meaning (for the battery charging behavior of the Sunny Island inverter, see technical information "List of Approved Lithium-Ion Batteries").
- Set the battery capacity for a ten-hour electric discharge (C10). The battery manufacturer specifies the battery capacity in relation to discharge time.

Requirements:

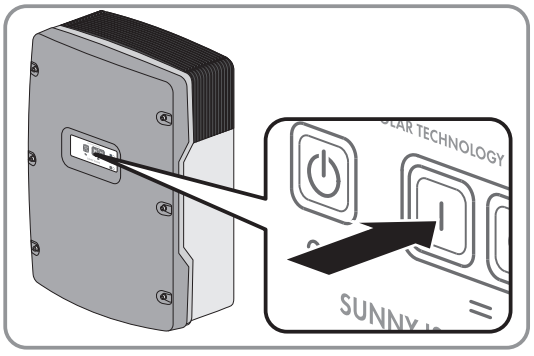
☐ The off-grid system must be installed according to the circuitry (see Multicluster-Box documentation).

☐ In the Multicluster-Box, all Sunny Island circuit breakers must be open. As a result, the Sunny Island inverters are not connected to an AC source.

☐ The Sunny Remote Control must be connected to the master of each cluster. This determines which Sunny Island is the master during the basic configuration.

Procedure:

1. Check the wiring (see installation manual of the Sunny Island inverter).
2. Close all devices except the BatFuse. This protects all live components from being touched.
3. Close the BatFuse and press and hold the activation button on each master until you hear an acoustic signal.



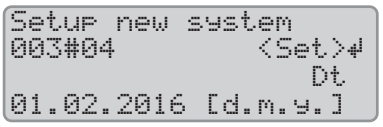
4. When the Sunny Remote Control shows **<Init System>**, press and hold the button on the Sunny Remote Control.

   ☑ A signal sounds three times and the Sunny Remote Control displays the Quick Configuration Guide.

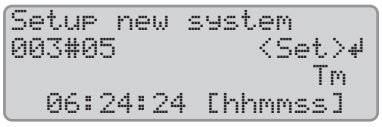
5. Turn the button on the Sunny Remote Control and select **New System**.

6. Press the button. This confirms your selection of **New System**.
   ☑ An entry confirmation appears.

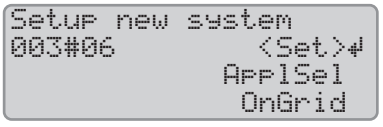
7. Set **Y** and press the button.
8. Set the date.



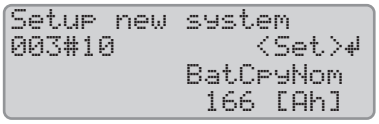
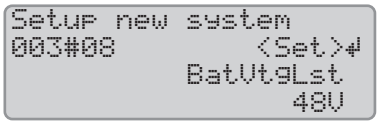
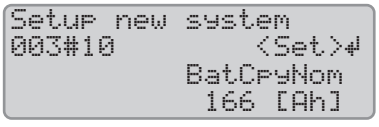
9. Set the time.



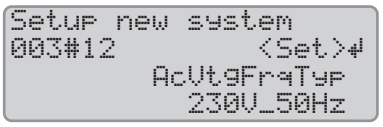
10. Set **OffGrid**.



11. Set the battery type:

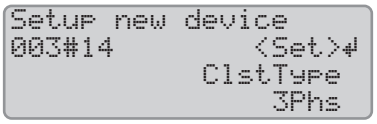
Battery type	Settings	
LiIon_Ext-BMS: Lithium-ion battery	• Set the battery capacity for ten-hour electric discharge (for determining the battery capacity, see installation manual of the Sunny Island).	
VRLA lead-acid battery with immobilized electrolyte in AGM (Absorbent Glass Mat Separator) or gel **or** **FLA** lead-acid battery with liquid electrolyte	• Set the nominal voltage of the battery.	
	• Set the battery capacity for ten-hour electric discharge (for determining the battery capacity, see installation manual of the Sunny Island).	

12. Set the grid voltage and power frequency of the stand-alone grid:



Setting	Description
230V_50Hz	Grid voltage 230 V, power frequency 50 Hz
220V_60Hz	Grid voltage 220 V, power frequency 60 Hz

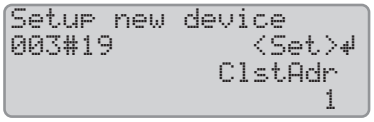
13. Set **3Phase**.



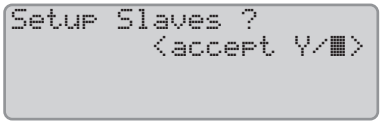
14. Set **MultiClst**.

15. Set the type of cluster:

Type of cluster	Settings
The cluster is a main cluster	• Set **MainClst**.
	• Set the device type of the Multicluster-Box. Tip: The device type is indicated on the type label of the Multicluster-Box.
	• Set the maximum generator current per line conductor for continuous operation.
The cluster is an extension cluster	• Set **ExtnClst**.
	• Set the address of the extension cluster (e.g. set extension cluster 1 to **1**).

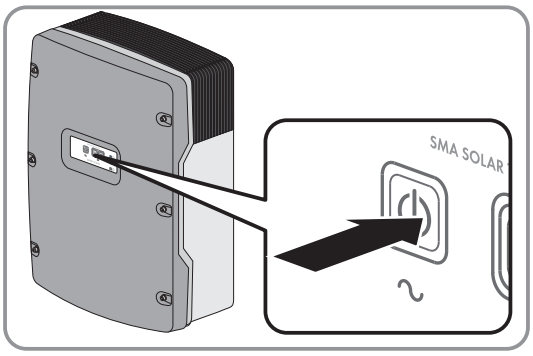


16. Confirm the basic configuration with **Y**.



17. Wait until the upper LED (inverter LED) on slave 1 is flashing and the Sunny Remote Control is displaying **To identify Slave1, press Tss on the Slv**.

18. Press the start-stop button on slave 1.



19. Wait until the inverter LED on slave 2 is flashing and the Sunny Remote Control is displaying **To identify Slave2, press Tss on the Slv**.
20. Press the start-stop button on slave 2.
    ☑ The basic configuration is complete. If an SD memory card is inserted into the Sunny Remote Control, the message **Do not remove MMC/SD memory card ...** appears and the SD memory card is integrated in the file system.
21. Configure all other clusters. For this purpose, perform the steps of the Quick Configuration Guide for each master separately.
22. Commission the off-grid system (see Section 7, page 38).

7 Commissioning

7.1 Switching to Installer Mode or Expert Mode

The installer mode is protected with an installer password. The installer password changes constantly and must be recalculated every time. Expert mode can be accessed only via installer mode.

NOTICE

System failures due to entry of incorrect parameter values

The system can become unstable and fail due to entry of incorrect parameter values. All parameters that could affect the operational safety of the system are protected by the installer password.

- Only a qualified person is permitted to set and adjust system parameters.
- Give the installer password only to qualified persons and operators.

Procedure:

1. On the Sunny Remote Control, select the setting page **Password (1/1)** in user mode.
2. Calculate the checksum of the operating hours **Runtime**. This determines the installer password.

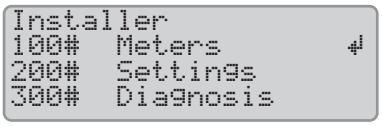
   Example: Calculating the checksum

   The operating hours **Runtime** are 1234 h. The checksum is the sum of all digits:

   1 + 2 + 3 + 4 = 10

   The checksum is 10.

3. Select the parameter **Set** and set the installer password calculated.



   ☑ The Sunny Remote Control is in installer mode.

4. To switch to expert mode, select the parameter **700.01 ActLev** and set to **Expert** (see operating manual of the Sunny Island inverter).

7.2 Commissioning the Multifunction Relays

- Set the functions of the multifunction relays on the Sunny Remote Control or the communication product (see the Sunny Island inverter installation manual). Tip: In the circuitry overviews, the multifunction relays are connected based on the default values of the Sunny Island inverter.

7.3 Starting the System

Requirements:

☐ All Sunny Island inverters must be switched on.

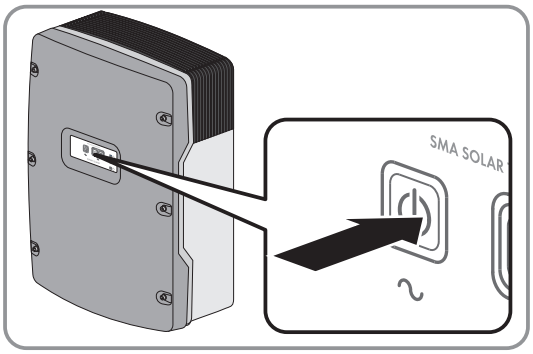
☐ The circuit breakers for the AC sources in the stand-alone grid must be switched off in the AC distribution board.

☐ The load-break switch of the PV array must be open.

☐ The circuit breakers for the charge controllers must be switched off in the DC distribution board.

Procedure:

- Press the start-stop button on the Sunny Island and hold it until an acoustic signal sounds.
  or
  Press and hold the button on the Sunny Remote Control until an acoustic signal sounds.
  ☑ The inverter LED on each Sunny Island is glowing green.



7.4 Testing the Battery Current Sensor

If a charge controller from a third-party supplier, a DC load, or more than four Sunny Island Charger charge controllers are installed in the off-grid system, an additional battery current sensor must be installed (see the Sunny Island installation manual).

Requirement:

☐ The Sunny Island must be in operation (see Section 7.3 "Starting the System", page 38).

Procedure:

1. Switch on a load (e.g., a 1 kW radiant heater) and all associated protective devices in the AC distribution board.
2. Measure the battery current with a current clamp.
3. Read off the Sunny Island inverter's parameter for the battery current:
   - Log in to the communication product as Installer (see the user manual of the Communication Product) or switch to installer mode on the Sunny Remote Control (see Section 7.1, page 38).
   - Read off the parameter **Battery current** or **120.06 TotBatCur**.

   ☑ The value is positive and is within the measuring tolerance range.

   ✖ Is the value not positive or is it outside the measuring tolerance range?

   The value is negative because the measuring cables of the battery current sensor are connected with reverse polarity or the value itself is not within the measuring tolerance range since the incorrect battery current sensor type has been set.
   - Install the battery current sensor correctly (see the Sunny Island inverter installation manual).
   - Set the correct battery current sensor type (see the Sunny Island inverter installation manual).

7.5 Testing the Generator

Requirement:

☐ The Sunny Island must be in operation (see Section 7.3 "Starting the System", page 38).

Procedure:

1. Switch on the protective devices for the generator in the AC distribution board.
2. Switch on the circuit breakers of the AC loads.

3. Close the load-break switch of the generator.
   ☑ The generator starts.
   ✖ Does the generator not start?

   The generator management does not request the generator.
   or

   The control cable connected does not transmit the start signal.
   or

   The generator is not ready for operation.
   - On the Sunny Remote Control, select the setting page **Generator > Mode** in user mode and set to **Start**. This starts the generator manually (see the Sunny Island inverter operating manual).
   - Eliminate any faults in the wiring.
   - Find out possible causes using the manual from the manufacturer and eliminate these.
4. Check whether the parameter **Generator > Power** displays the feed-in power on the Sunny Remote Control in user mode. This ensures that the Sunny Island has switched the stand-alone grid to the generator after completing the warm-up time **234.12 GnWarmTm**.
   If no power is displayed after completion of the warm-up time, check the error messages:
   - Select the **410# Error active** menu and rectify the cause of the displayed warning or error (see the Sunny Island inverter operating manual).

7.6 Testing the Load Shedding

Requirements:

☐ This system is not a multicluster system. Load shedding is part of the Multicluster-Box in multicluster systems.

☐ The Sunny Island must be in operation (see Section 7.3 "Starting the System", page 38).

Procedure:

1. Log in to the communication product as Installer (see the user manual of the Communication Product) or switch to installer mode on the Sunny Remote Control (see Section 7.1, page 38).
2. Select the parameter of the multifunction relay for the load-shedding contactor, e.g., on the Sunny Remote Control **241.02 Rly2Op** for the **Relay2** multifunction relay of the master.
3. Note the parameter value.
4. Set the parameter to **Off**.
   ☑ The load-shedding contactor sheds the loads.
   ✖ Does the load-shedding contactor not shed the loads?

   The multifunction relay for triggering the load-shedding contactor was incorrectly configured or the wiring of the load-shedding contactor is faulty.
   - Check the configuration and eliminate the fault.
   - Ensure that the multifunction relay is correctly wired.
5. Set the parameter to the setting that has been noted down.

7.7 Commissioning the PV System

For operation in an off-grid system, the PV system must be configured for stand-alone mode.

Procedure:

1. Commission the PV system (see PV inverter documentation).
2. If the SMA PV inverters are not configured for stand-alone mode ex works, configure the country standard or country data set of the PV inverters for stand-alone mode (see the PV inverter documentation).

7.8 Testing Communication in the Multicluster System

1. Activate the communication test on any master within the multicluster system:
   - Connect the Sunny Remote Control to the selected master (see the Sunny Island inverter installation manual).
   - Switch to expert mode on the Sunny Remote Control (see the Sunny Island operating manual).
   - Select the parameter **510.08 TstClstCom** and set it to the value **Transmit**.
2. Check the status of the communication test on the master within the multicluster system For this, execute the following steps:
   - Connect the Sunny Remote Control to the selected master (see the Sunny Island inverter installation manual).
   - Switch to expert mode on the Sunny Remote Control (see the Sunny Island operating manual).
   - Select the parameter **510.09 ClstComStt** and read off the value.

   ☑ The parameter **510.09 ClstComStt** has the value. **OK**. The communication test is completed on the respective master.

   ✖ The parameter **510.09 ClstComStt** has the value **Wait**?

   It is possible that the wiring of the communication bus is faulty.
   - Ensure that the cable length for the multicluster communication is not exceeded.
   - Ensure that all cables of the multicluster communication are correctly connected (see installation manual of the Sunny Island inverter).
   - Ensure that the terminators for the multicluster communication are correctly inserted (see installation manual of the Sunny Island inverter).
3. When the communication test on each master within the multicluster system is completed, deactivate the communication test:
   - Reconnect the Sunny Remote Control to the master on which the communication test has been activated (see the Sunny Island inverter installation manual).
   - Switch to expert mode on the Sunny Remote Control (see the Sunny Island operating manual).
   - Select the parameter **510.08 TstClstCom** and set it to the value **Off**.

7.9 Complete Commissioning.

1. On the Sunny Remote Control, adjust the configuration to the system (see the Sunny Island inverter installation manual). This way, you can increase the service life of the battery, for example.
2. When full charge of the battery is complete, switch on all circuit breakers and load-break switches. Tip: The state of charge of the battery is displayed on the Sunny Remote Control in standard mode.
3. 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 and made available to Service (for information sheet see www.SMA-Solar.com).

i Load shedding in the first two operating hours

The state of charge (SOC) recorded by battery management and the available battery capacity (SOH) will deviate strongly from the actual values of SOC and SOH for a newly connected battery. During operation, the values recorded by battery management will gradually approach the real values. In the first two operating hours with the new battery, these deviations can lead to corresponding entries in the **400# Failure/Event** menu.

8 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).

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United Arab Emirates	SMA Middle East LLC Abu Dhabi +971 2234 6177	India	SMA Solar India Pvt. Ltd. Mumbai +91 22 61713888
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