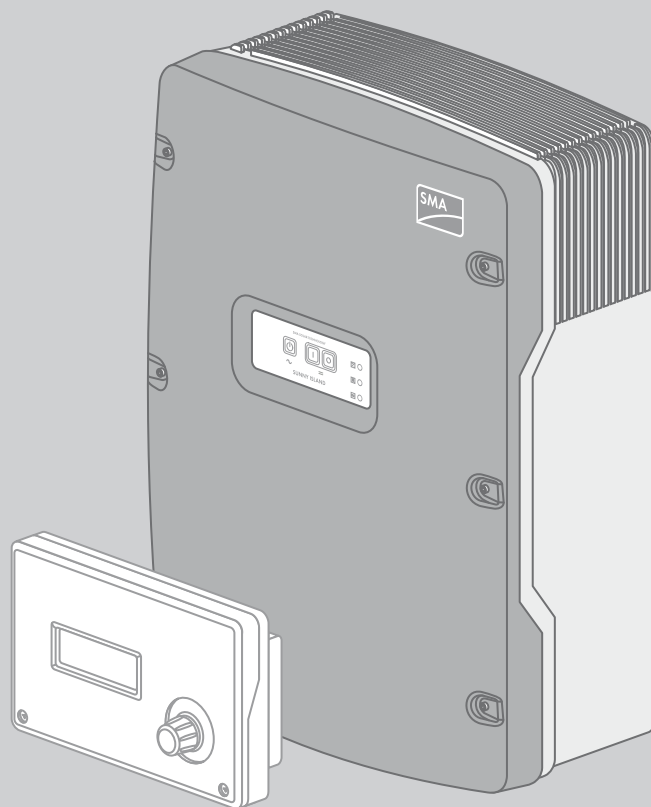




Operating Manual

**SUNNY ISLAND 6.0H / 8.0H**  
**SUNNY REMOTE CONTROL**



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# 1 Information on this Document

## Validity










This document is valid for the following device types:

- SI8.0H-11 (Sunny Island 8.0H) from firmware version 3.0
- SI6.0H-11 (Sunny Island 6.0H) from firmware version 3.0
- SRC-20 (Sunny Remote Control)

## Target Group

This document is intended for qualified persons and operators. Only persons with the appropriate skills are allowed to perform the tasks described in this document (see Section 2.2 "Skills of the Target Group", page 10). Some tasks may only be performed by qualified persons and are labeled with a warning symbol and the designation "Qualified Person". Tasks that can be performed by operators and qualified persons are not labeled and may also be performed by operators.

## Symbols

Symbol	Explanation
	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
	Indicates a hazardous situation which, if not avoided, can result in death or serious injury
	Indicates a hazardous situation which, if not avoided, can result in minor or moderate injury
	Indicates a situation which, if not avoided, can result in property damage
	Indicates that the following section contains tasks that may only be performed by qualified persons
	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

## Typographies

Typography	Usage	Example
<b>bold</b>	<ul style="list-style-type: none"> <li>• Display messages</li> <li>• Parameters</li> <li>• Terminals</li> <li>• Slots</li> <li>• Elements to be selected or entered</li> </ul>	<ul style="list-style-type: none"> <li>• Connect PE to <b>AC2Gen/Grid</b>.</li> <li>• Select the parameter <b>235.01 GnAutoEna</b> and set to <b>Off</b>.</li> </ul>
<b>&gt;</b>	<ul style="list-style-type: none"> <li>• Connects several elements to be selected</li> </ul>	<ul style="list-style-type: none"> <li>• Select <b>600# Direct Access &gt; Select Number</b>.</li> </ul>

## Nomenclature

Complete designation	Designation in this Document
Off-grid system, battery backup system, system for increased self-consumption	System
Sunny Boy, Sunny Mini Central, Sunny Tripower	PV inverter

Menus are presented as follows: menu number, pound and menu name (e.g. 150# Compact Meters).

Parameters are presented as follows: menu number, period, parameter number and parameter name (e.g. 150.01 GdRmgTm). The term parameter includes parameters with configurable values as well as parameters for displaying values.

## Abbreviations

Abbreviation	Designation	Explanation
AC	Alternating Current	-
DC	Direct Current	-
FLA	Flooded Lead Acid Batteries	-
LED	Light-Emitting Diode	-
QCG	Quick Configuration Guide	-
SOC	State of Charge	State of charge of the battery
VRLA	Valve Regulated Lead-Acid	-



## 2 Safety

### 2.1 Intended Use

#### Sunny Island

The Sunny Island is a battery inverter which controls the electrical energy balance in an off-grid system, in a battery backup system or in a system for increased self-consumption. In addition, you can use the Sunny Island in a battery backup system for increased self-consumption.

Only use this product in accordance with the enclosed documentation and with the local standards and directives. Any other application may cause personal injury or property damage. Every change to the electrical installation must be made in accordance with the Sunny Island installation manual.

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

The Sunny Island uses batteries for the storage of energy. The battery room must be ventilated complying with the requirements of the battery manufacturer and with the locally applicable standards and directives (see documentation of the battery manufacturer).

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of SMA Solar Technology AG. Making unauthorized changes will void the warranty and warranty claims and will normally result in invalidation of the operating permit. SMA Solar Technology AG shall not be held liable for damages 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. This documentation must be read, followed and stored in a convenient place for future reference.

The type label must remain permanently attached to the product.

#### Sunny Remote Control

You can configure and control the system from a central location using the Sunny Remote Control display.

Only use the product in accordance with the information provided in the enclosed documentation. Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of SMA Solar Technology AG. Making unauthorized changes will void the warranty and warranty claims and will normally result in invalidation of the operating permit. SMA Solar Technology AG shall not be held liable for damages 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. This documentation must be read, followed and stored in a convenient place for future reference.

The type label must remain permanently attached to the product.

## 2.2 Skills of the Target Group

### Operators

Operators must be given training on the following subjects by qualified persons:

- Training on the dangers involved when handling electrical devices
- Training on the operation of the Sunny Island
- Training on the safe handling of batteries
- Training on the secure disconnecting of the Sunny Island under fault conditions
- Training on how to secure a system against unintentional reactivation
- Training on the maintenance and cleaning of the Sunny Island
- Knowledge of and adherence to this document and all safety precautions

### Qualified Persons

Only qualified persons are allowed to perform the activities labeled in this document with a warning symbol and the caption "Qualified person". Qualified persons must have the following qualifications:

- Training in how to deal with the dangers and risks associated with installing and using electrical devices and batteries
- Vocational training in the installation and commissioning of electrical devices
- Knowledge of and adherence to the local standards and directives
- Knowledge of and adherence to the Sunny Island documentation and all safety precautions

## 2.3 Safety Precautions

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

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

### **⚠ WARNING**

#### **Danger to life from electric shock due to live voltage**

High voltages are present inside the Sunny Island. When the enclosure lid is 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.
- Turn off or disconnect the following components from voltage sources in the given order:
  - Sunny Island
  - The control and measurement voltages in the distribution board of the Sunny Island circuit breakers
  - Load-break switch of the battery
- Ensure that the system cannot be reconnected.
- Open the enclosure lid of the Sunny Island and ensure that no voltage is present.
- Ground and short-circuit the AC conductors outside the Sunny Island.
- Cover or shield any adjacent live components.

**⚠ WARNING****Danger to life from electric shock due to damaged Sunny Island**

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

- Only operate the Sunny Island when it is technically faultless and in an operationally safe state.
- Regularly check the Sunny Island 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.

**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 or sparks.
- Install, operate and maintain the battery according to the manufacturer's specifications.
- Do not heat or burn the battery above the temperature permitted.
- Ensure that the battery room is sufficiently ventilated.

**Chemical burns and poisoning caused by battery electrolytes**

If handled inappropriately, battery electrolytes can cause chemical burns to eyes, respiratory system and skin, and be poisonous. This may result in blindness and 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 with clear water for a long time and consult a doctor.
- Install, operate, maintain and dispose of the battery according to the manufacturer's specifications.

**Risk of injury due to short-circuit currents**

Short-circuit currents in the battery can cause heat build-up and electric arcs. Burns and eye injury 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.

**Risk of crushing injuries due to movable generator parts**

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

- Only operate the generator with the safety equipment.
- Install, maintain, and operate the generator according to the manufacturer standards.

**⚠ CAUTION****Risk of burns due to hot components**

Some components of the Sunny Island can become very hot during operation. Touching these components can result in burn injuries.

- Do not touch any parts other than the Sunny Island enclosure lid during operation.
- When the Sunny Island is open, do not touch hot surfaces.

**NOTICE****Damage to the battery due to incorrect settings**

Incorrect settings can lead to the premature aging of the battery. Settings of the parameters in the menu **220# Battery** influence the charging behavior of the Sunny Island.

- Ensure that the values recommended by the battery manufacturer are set for the battery (refer to the technical data of the battery in the manufacturer documentation).

**Destruction of the Sunny Island due to electrostatic discharge (ESD)**

By touching electronic components within the Sunny Island, you can damage or destroy the Sunny Island.

- Do not touch any electronic assemblies.
- Ground yourself before touching a connection.

## 3 Product Description

### 3.1 Sunny Island

The Sunny Island is a battery inverter and controls the electrical energy balance in off-grid systems, in battery backup systems or in systems for increased self-consumption. In addition, you can use the Sunny Island in a battery backup system for increased self-consumption.

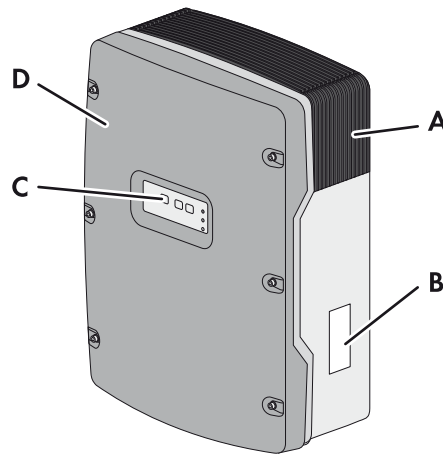


Figure 1: Layout of the Sunny Island

Position	Designation
A	Ventilation grid
B	Type label
C	Control panel
D	Enclosure lid

The Sunny Island supplies AC loads in the system from a battery or charges the battery with the energy provided by AC sources (e.g. PV inverter). AC sources supply loads and are used by the Sunny Island to recharge the battery.

### 3.2 Control Panel of the Sunny Island

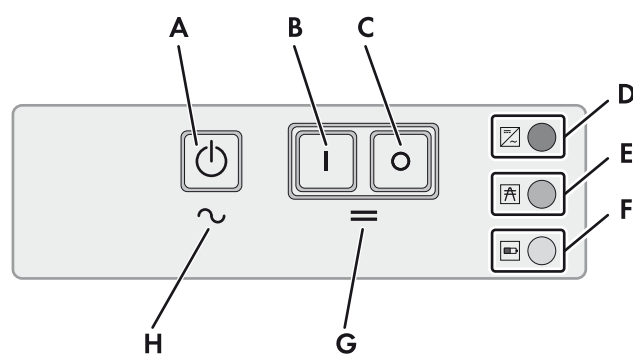








Figure 2: Layout of the control panel

Position	Symbol	Designation	Status	Explanation
A		Start-stop button <b>TSS</b>	-	By pressing the start-stop button, you can start or stop the system. In display messages on the Sunny Remote Control, the start-stop button is referred to as <b>TSS</b> .

Position	Symbol	Designation	Status	Explanation
B		"On" button	-	Pressing the "On" button will switch the Sunny Island on. The Sunny Island is in standby mode after being switched on.
C		"Off" button	-	Pressing the "Off" button will switch off the Sunny Island.
D		Inverter LED	not glowing	The Sunny Island is switched off.
			glowing green	The Sunny Island is in operation.
			glowing orange	The Sunny Island is in standby mode.
			glowing red	The Sunny Island switched off due to an error.
			flashing quickly*	The Sunny Island is not configured.
			flashing slowly**	The Sunny Island is in overnight shutdown.
E		Grid LED	not glowing	There is no voltage present from the generator or the utility grid.
			glowing green	Generator or utility grid is connected.
			glowing orange	The Sunny Island is synchronizing the stand-alone grid with the generator or the utility grid.
			glowing red	Fault at the connection of the generator or the utility grid.
F		Battery LED	glowing green	The state of charge is more than 50%.
			glowing orange	The state of charge is between 50% and 20%.
			glowing red	The state of charge is less than 20%.
G	=	Standby	-	Position of the buttons for switching on and off
H	~	AC operation	-	Position of the button for starting and stopping operation

\* Flashing at intervals of 0.5 s to 1 s

\*\* Flashing at intervals of 1.5 s to 2 s













### 3.3 Type Label

The type label clearly identifies the product. The type label is located on the right-hand side of the enclosure. You will find the following information on the type label:

- Address of SMA Solar Technology AG
- Device type (Model)
- Serial number (Serial No.)
- Device-specific characteristics

You will require the information on the type label to use the product safely and when seeking customer support from the SMA Service Line.

## Symbols on the Type Label

Symbol	Explanation
	Danger to life due to high voltages The product operates at high voltages. All work on the product must be carried out by qualified persons only.
	Risk of burns due to hot surfaces The product can get hot during operation. Avoid contact during operation. Allow the product to cool down sufficiently before carrying out any work. Wear personal protective equipment such as safety gloves.
	Observe the documentation. Observe all the documentation supplied with the product.
	AC Alternating current
	DC Direct current
	Transformer The product has a transformer.
	WEEE designation Do not dispose of the product together with the household waste but in accordance with the locally applicable disposal regulations for electronic waste.
	CE marking The product complies with the requirements of the applicable EU directives.
	Protection class I All electrical equipment is connected to the protective conductor system of the product.
 <b>IP54</b>	Degree of protection The product is protected against interior dust deposits and splashing water from all angles.
	Certified safety The product is VDE-tested and complies with the requirements of the German Equipment and Product Safety Act.
	C-Tick The product complies with the requirements of the applicable Australian EMC standards.

### 3.4 Sunny Remote Control

You can configure and control the system from a central location using the Sunny Remote Control display.

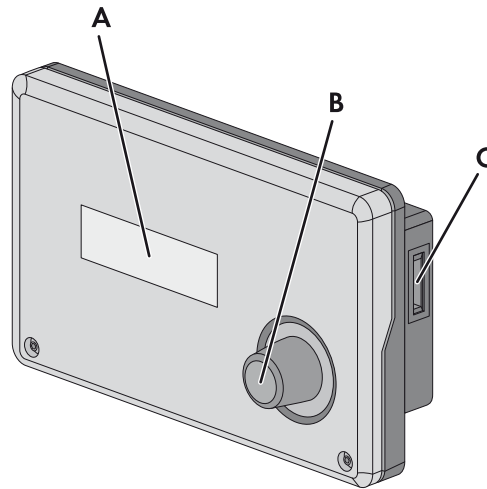


Figure 3: Layout of the Sunny Remote Control

Position	Designation	Explanation
A	Display	Four-line display shows operating data (e.g. operating state, display values) and events, warnings or errors of the Sunny Island. The display backlight is automatically deactivated after a short time of inactivity.
B	Button	Pressing the button will turn on the backlight, confirm parameters or switch the level within a menu. The return symbol " ↵ " in the display indicates when you can perform an action by pressing the button. Turning the button will switch on the backlight, change parameters or navigate within a menu level.
C	Slot for the SD memory card	-

#### Service Interface SD Memory Card

The Sunny Remote Control has a slot for SD memory cards. The SD memory card stores data for system control and facilitates service work. You can also update the firmware of the Sunny Island using the SD memory card. The following data is stored on the SD memory card:

- Parameter settings
- Every minute, measurement data from the areas:
  - Battery
  - Sunny Island
  - Generator
  - Utility grid
  - Stand-alone grid
- Events and errors
- Statistical values of the battery

The SD memory card must be formatted as FAT-12 or FAT-16. SD memory cards with a memory capacity of more than 2 GB are not supported.



## 4 Starting and Stopping the System

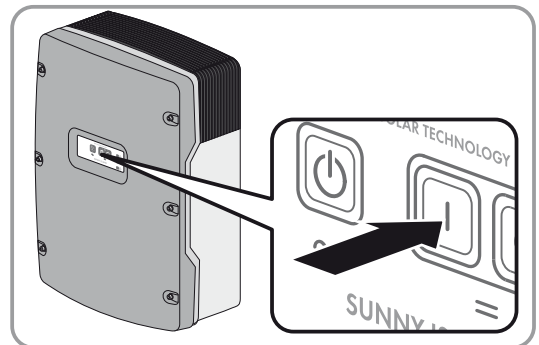
### 4.1 Switching on the Sunny Island

#### Requirements:

- The load-break switch in the DC cable must be closed.
- The Sunny Island must not have switched itself off (see Section 9.6 "Charging the Battery after Automatic Shutdown in Off-Grid Systems", page 69).

#### Procedure:

- For systems with one Sunny Island, press the "On" button on the Sunny Island.
- For systems with up to three Sunny Island inverters, press and hold the "On" button on the master until an acoustic signal sounds.
- For multicluster systems, press and hold the "On" button on each master until an acoustic signal sounds.



- The inverter LED on each Sunny Island is glowing orange and the Sunny Island inverters are in standby mode.

### 4.2 Starting the System

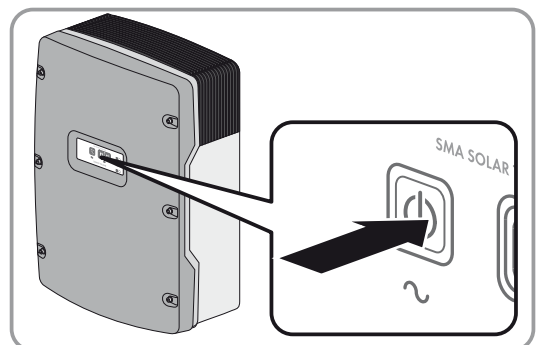
#### Requirement:

- All Sunny Island inverters must be switched on.

#### Procedure:

- Press and hold the Sunny Island start-stop button 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.

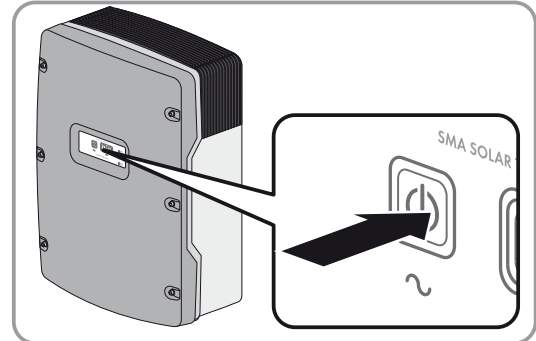
### 4.3 Stopping the System

If you stop the system, the Sunny Island switches from operation into standby mode. In standby mode, the Sunny Island discharges the battery due to its standby consumption. Tip: For longer shut-down periods, switch off the Sunny Island (see Section 4.4, page 18).

**Procedure:**

- Press and hold the start-stop button on the Sunny Island until the inverter LED glows orange.

or



Press and hold the button on the Sunny Remote Control until the progress bar has run down.

- ☑ The inverter LED on each Sunny Island is glowing orange. The Sunny Island inverters are in standby mode.

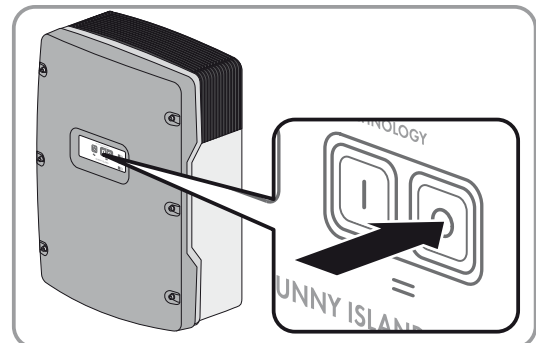
### 4.4 Switching off the Sunny Island

**Requirement:**

- ☐ The system is stopped.

**Procedure:**

- Press and hold the "Off" button on the Sunny Island until an acoustic signal sounds.



- ☑ The inverter LED is off on all Sunny Island inverters.

## 4.5 Tripping the Emergency Disconnection of the System

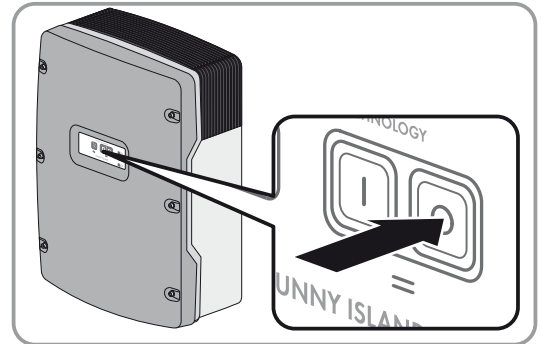
### **i** Effects of an emergency disconnection

Emergency disconnection triggers the uncontrolled shutdown of the system and unsaved data is lost.

- Only use emergency disconnection to avoid danger or consequential damages.

#### Procedure:

- Press and hold the "Off" button on the Sunny Island until an acoustic signal sounds.



- The inverter LED is off on all Sunny Island inverters.

## 4.6 Setting Time-Controlled Inverter Operation in Off-Grid Systems

### Example: Setting parameters for time-controlled inverter operation

You want to operate the Sunny Island in inverter operation every Sunday from 10:00 a.m. to 6:00 p.m., starting on Sunday, January 8, 2012. To do this, set the Sunny Island as follows:

- Str.Date: 2012-01-08
- Start Time: 10:00:00
- Run Time: 08:00:00
- Repetition: Weekly

#### Requirement:

- The Sunny Remote Control must be in user mode (see Section 5.3, page 26).

#### Procedure:

1. Select the **Inverter** display page on the Sunny Remote Control and press the button.

```

iInverter      (1/1)
Tot.Power     xx:xx kW
Timer Mode    Disable
  
```

- The Sunny Remote Control switches to the **Inverter** setting page.

```

iInverter      (1/2)
Restart      -----
Str.Date     xx.xx.xxxx
Start Time   xx:xx:xx
  
```

2. Set the time-controlled inverter operation:
    - Select the **Start Date** parameter and set it to the desired start date.
    - Select the **Start Time** parameter and set it to the desired start time.
    - Select the **Run Time** parameter and set it to the desired run time.
    - Select the **Repetition** parameter and set it to the desired repetition cycle.
  3. To activate time-controlled inverter operation, select the **Timed Start** parameter and set it to **Enable**.
- Time-controlled inverter operation is activated. If the Sunny Island has started automatically under time-control and you stop the Sunny Island, time-controlled inverter operation is deactivated automatically.

## 5 Operating the Sunny Island via Sunny Remote Control

### 5.1 Display Modes

The Sunny Remote Control uses four display modes for the display. The Sunny Remote Control will switch to standard mode if the button has not been used for over five minutes.

Mode	Page content
Standard mode <b>&lt;home&gt;</b>	<ul style="list-style-type: none"> <li>• Message regarding operating states</li> <li>• Display of energy flows</li> <li>• Display of key parameters</li> </ul> <p>In display messages on the Sunny Remote Control, <b>&lt;home&gt;</b> refers to the standard mode.</p>
User mode <b>User</b>	<ul style="list-style-type: none"> <li>• Display of and access to key operating parameters</li> </ul> <p>In display messages on the Sunny Remote Control, <b>User</b> refers to the user mode.</p>
Installer mode <b>Installer</b>	<ul style="list-style-type: none"> <li>• Display of and access to configuration and operation parameters</li> </ul> <p>The installer mode is password-protected. In display messages on the Sunny Remote Control, <b>Installer</b> refers to the installer mode.</p>
Expert mode <b>Expert</b>	<ul style="list-style-type: none"> <li>• Display of and access to all parameters for the system configuration set in QCG</li> </ul> <p>The expert mode can only be accessed via installer mode (see Section 5.4.1, page 28). In display messages on the Sunny Remote Control, <b>Expert</b> refers to the expert mode.</p>

The parameters for components that are not configured are hidden, e.g. the generator parameters are hidden for systems without a generator. The parameters for multicluster systems are only available in expert mode.

## 5.2 Standard Mode

### 5.2.1 Display of Operating States

The Sunny Remote Control displays the following operating states until the Sunny Island is started.



Figure 4: Display of operating states (example **Standby**)

Position	Designation	Explanation
A	Boot	The Sunny Island is initializing.
	Error	The Sunny Island is in error mode.
	LBM 1	The Sunny Island is in battery protection mode 1.
	LBM 2	The Sunny Island is in battery protection mode 2.
	LBM 3	The Sunny Island is in battery protection mode 3.
	Restart	The Sunny Island is performing a restart.
	Shutdown	The Sunny Island is stopped.
	Silent	The Sunny Island is in silent mode.
	Standby	The Sunny Island is in standby mode or in time-controlled operation.
	Startup	The Sunny Island is starting up.

### 5.2.2 Information Page in Systems for Increased Self-Consumption and Battery Backup Systems

When the Sunny Island is started, the Sunny Remote Control provides information on the status of the system for increased self-consumption.

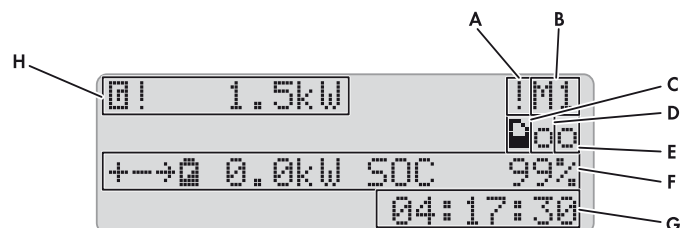













Figure 5: Energy flows and status messages of the Sunny Island

Position	Symbol	Designation	Explanation
A	!	Warning symbol	Symbol for warnings and errors that do not affect the Sunny Island operation. If this symbol is flashing, acknowledge the error or warning (see Section 9.2, page 41).

Position	Symbol	Designation	Explanation
B	M1	Device assignment	The Sunny Island connected to the Sunny Remote Control is the master.
	S1		The Sunny Island connected to the Sunny Remote Control is slave 1.
	S2		The Sunny Island connected to the Sunny Remote Control is slave 2.
C		SD memory card	The SD memory card is inserted.
	Symbol flashing		The Sunny Island is accessing the SD memory card.
	No symbol		The SD memory card is not inserted.
D		Multifunction relay 1	Multifunction relay 1 is deactivated.
			Multifunction relay 1 is activated.
E		Multifunction relay 2	Multifunction relay 2 is deactivated.
			Multifunction relay 2 is activated.
F		Battery power and state of charge	The battery is being charged.
			The battery is discharging.
			Battery power in kW, state of charge (SOC) in %
G	hh:mm:ss	Time	System time
H		Power and status of the utility grid	Power in kW
			The utility grid voltage and frequency are within the configured limits.
			The maximum reverse power in the utility grid has been exceeded.

### 5.2.3 Information Page in Off-Grid Systems

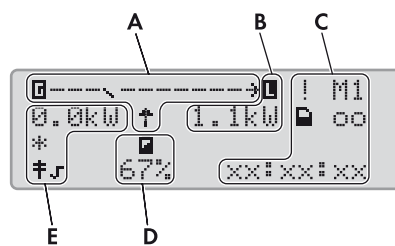


Figure 6: Energy flows and status messages of the Sunny Island (example).

Position	Designation
A	Graphical representation of the energy flows
B	Status of the stand-alone grid
C	Status of the Sunny Island
D	State of charge of the battery
E	Status of the generator

### Graphical Representation of the Energy Flows

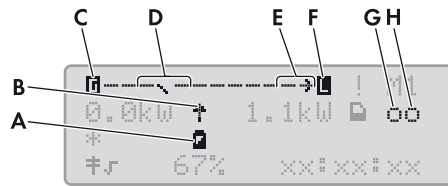


Figure 7: Energy flow diagram in standard mode (example)

Position	Symbol	Designation	Explanation
A		Battery	Battery symbol
B	↑	Direction of energy flow	The battery is supplying the loads.
	↓		The battery is being charged.
C		Generator	Generator symbol
D		Internal transfer relay	The generator is disconnected from the stand-alone grid.
			The stand-alone grid is synchronized with the generator. The generator is supplying the loads and charging the battery.
E		Direction of energy flow	Loads are being supplied.
			AC sources in the stand-alone grid are supplying more energy than is being consumed by the stand-alone grid.
F		Loads in the stand-alone grid	Symbol for loads in the stand-alone grid

### Status of the Stand-Alone Grid

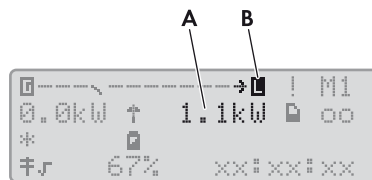


Figure 8: Status of the stand-alone grid (example)

Position	Designation	Explanation
A	Output power	Output power of the Sunny Island in kW
B	Loads in the stand-alone grid	Symbol for loads in the stand-alone grid

## Status of the Sunny Island

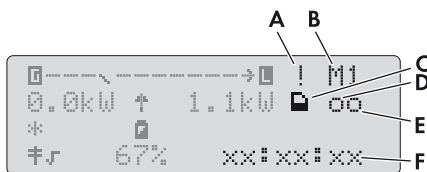


Figure 9: Status of the Sunny Island (example)

Position	Symbol	Designation	Explanation
A	!	Warning symbol	Symbol for warnings and errors that do not affect the Sunny Island operation. If this symbol is flashing, acknowledge the error or warning (see Section 9.2, page 41).
B	M1	Device assignment	The Sunny Island connected to the Sunny Remote Control is the master.
	S1		The Sunny Island connected to the Sunny Remote Control is slave 1.
	S2		The Sunny Island connected to the Sunny Remote Control is slave 2.
C		SD memory card	The SD memory card is inserted.
	Symbol flashing		The Sunny Island is accessing the SD memory card.
	No symbol		The SD memory card is not inserted.
D		Multifunction relay 1	Multifunction relay 1 is deactivated.
			Multifunction relay 1 is activated.
E		Multifunction relay 2	Multifunction relay 2 is deactivated.
			Multifunction relay 2 is activated.
F	hh:mm:ss	Time	Off-grid system time

## State of charge of the battery



Figure 10: State of charge of the battery in standard mode (example)

Position	Designation	Explanation
A	Battery	Battery symbol
B	State of charge	State of charge of the battery in percent



## Status of the external energy source

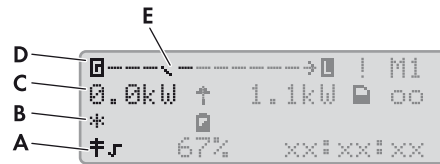


Figure 11: Status of the external energy source in standard mode (example)

Position	Symbol	Designation	Explanation
A	⚡+	Active limiting values	Electrical limiting values for the utility grid are active.
	⚡x		Electrical limits for the generator are active.
B	★	Status of the generator	Voltage and frequency of the generator are within the limiting values set.
	?		Voltage and frequency of the generator are outside of the limiting values set.
	!		The maximum reverse power in the generator has been exceeded.
	B		<b>Battery</b> Generator was requested due to state of charge.
	C		<b>Cycle</b> Generator was requested via time control.
	E		<b>Extern</b> Generator was requested by an extension cluster.
	L		<b>Load</b> Generator was requested due to load.
	S		<b>Start</b> You have manually started the generator via Sunny Remote Control or a generator was requested via the <b>DigIn</b> input.
	T		<b>Time</b> You have started the generator for one hour via Sunny Remote Control.
	C	-	Power of the generator or the utility grid
D	⚡	Generator	Generator symbol
E	⚡	Internal transfer relay	The generator is disconnected from the stand-alone grid.
	.....		The stand-alone grid is synchronized with the generator. The generator is supplying the loads and charging the battery.

## 5.3 User Mode

### 5.3.1 Displaying Parameters and Operating and Setting the System

User mode displays all important information for the system sorted by category. User mode enables the manual control of the Sunny Island or system components, e.g starting the generator.

User mode distinguishes between display pages and setting pages. Display pages show the parameters of a category. Setting pages enable the operation and setting of the system.

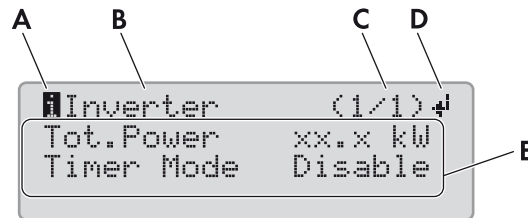


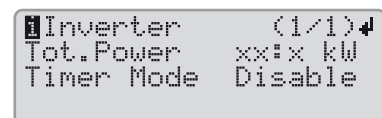
Figure 12: Layout of a page in user mode (example)

Position	Designation	Symbol or message	Explanation
A	Page type		<b>Information</b> This symbol indicates display pages.
			<b>Set</b> This symbol indicates setting pages.
B	Category	-	Category name (see Section 12 "Directory of the Parameters in User Mode", page 81)
C	Page and number of pages	-	Page and number of pages of the selected category
D	Return symbol		On display pages, this symbol means that setting pages are available for this category. On setting pages, this symbol points to the selected parameter.
		no symbol	No setting pages are available for this category.
E	Parameters	-	Parameters with the current values

#### Procedure:

1. Press the button to activate the display illumination of the Sunny Remote Control.
2. Turn the button to the right.

- The Sunny Remote Control switches from standard mode to user mode.



3. To scroll through the display pages, continue to turn the button to the right.
4. To go back to a previous page, turn the button to the left.
5. To select a setting page, scroll to the display page for the category of the desired setting (see Section 12 "Directory of the Parameters in User Mode", page 81).

**Example: Selecting the display page.**

You want to restart the Sunny Island. This setting is in the **Inverter** category.

- Select display page **Inverter (1/1)**.

6. Press the button. The Sunny Remote Control will display the setting pages belonging to the display page.

**Example: Selecting the setting page**

You have selected the display page **Inverter (1/1)**.

- Press the button.

The setting page **Inverter (1/2)** appears.

```
Inverter (1/1)
Tot.Power  xx:xx kW
Timer Mode  Disable
```

```
Inverter (1/2)
Restart    ---
Str.Date   xx.xx.xxxx
Start Time xx:xx:xx
```

7. To select the desired parameter, turn the button to the right until the return symbol appears to the right of the desired parameter.

You have selected the parameter.

8. To set the parameter, press the button and then turn it to the left or right.

9. Once you have set the required parameter, press the button. This saves the setting.

**Example: The Sunny Island is to start in time-controlled operation weekly. For this, the repetition type (Repetition) must be set to "Weekly".**

- Access the **Inverter (1/2)** setting page.

The **Inverter (1/2)** setting page appears.

```
Inverter (1/2)
Restart    ---
Str.Date   xx.xx.xxxx
Start Time xx:xx:xx
```

- Turn the button until the return symbol  $\rightarrow$  appears next to the parameter **Repetition**. The Sunny Remote Control then switches from the setting page **Inverter (1/2)** to setting page **Inverter (2/2)**.

- Press the button.

- Turn the button to the right until **Weekly** appears.

- Press the button. This saves the parameter.

You have set the repetition type to **Weekly** in time-controlled operation.

```
Inverter (2/2)
Run Time   xx:xx:xx
Repetition Weekly
Timed Start Disable
```

10. To exit the setting page, switch to the display page or the standard mode:

- Turn the button to the left until the return symbol appears in the first line.
- To return to the display page, turn the button to the left until **<back>** appears.
- To switch to standard mode, turn the button to the left until **<home>** appears.
- Press the button.

Tip: **<back>** and **<home>** also appear at the end of the list if the button is turned to the right.

## 5.4 Installer and Expert Mode

### 5.4.1 Switching to Installer Mode or Expert Mode

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

#### NOTICE

#### System failures due to entering incorrect parameter values

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

- Only a qualified person is permitted to set and adjust system parameters.
- Only give the installer password 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** is 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.

```
Installer
100# Meters      ↵
200# Settings
300# Diagnosis
```

4. To switch to expert mode, select the parameter **700.01 ActLev** and set to **Expert** (see Section 5.4.6 "Setting the Parameters", page 30).

### 5.4.2 Exiting Installer Mode or Expert Mode

If you do not press or turn the button on the Sunny Remote Control for five minutes, the Sunny Remote Control will switch from installer or expert mode to standard mode automatically.

- Select the parameter **700.01 ActLev** on the Sunny Remote Control and set to **User** (see Section 5.4.6 "Setting the Parameters", page 30).

### 5.4.3 Menus in Installer and Expert Mode

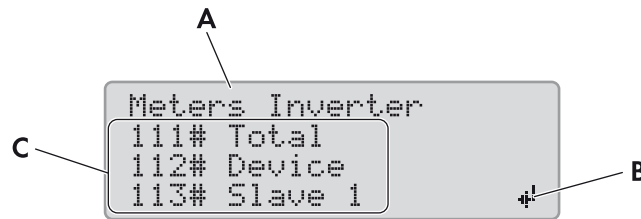


Figure 13: Layout of the menu page in installer mode (example)

Position	Designation	Explanation
A	Menu path	The two previously selected menu levels If you are in the top menu level, the display will show <b>Installer</b> in installer mode and <b>Expert</b> in expert mode.
B	Return symbol	Return symbol for selecting a menu
C	Menu	-

### 5.4.4 Parameter Page in Installer and Expert Mode

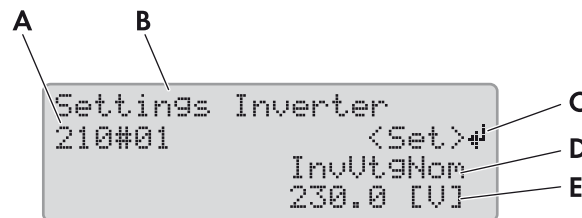


Figure 14: Layout of the parameter page in installer mode (example)

Position	Designation	Explanation
A	Menu number and parameter number	-
B	Menu path	The two previously selected menu levels
C	Return symbol	Return symbol for setting the parameter If no return symbol is displayed, the parameter cannot be set.
D	Name of the parameter	-
E	Value and unit of the parameter	-

### 5.4.5 Selecting Menus and Parameters

1. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
2. Turn the button to the right until the return symbol appears to the right of the desired menu. The Sunny Remote Control scrolls through the menu items on the display line by line.
3. Press the button. This accesses the sub-menu level.
  - The Sunny Remote Control displays the sub-menu level. The selected menu level is shown in the first line.
4. Repeat steps 2 and 3 until the Sunny Remote Control displays the first parameter page.
5. Turn the button to the right until the Sunny Remote Control displays the desired parameter.
6. Set the parameter (see Section 5.4.6, page 30).

7. To exit the parameter page, switch to the higher level or switch to standard mode:

- Turn the button to the left until the return symbol appears in the first line.
- To switch to a higher menu level, turn the button to the left until **<back>** appears.
- To switch to standard mode, turn the button to the left until **<home>** appears.
- Press the button.

Tip: **<back>** and **<home>** also appear at the end of the list if the button is turned to the right.

### 5.4.6 Setting the Parameters

1. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).

2. Select the desired parameter. You can only set the parameters for which **<Set>** is shown in the second line in the display.

```
Settings interter
210#01      (Set)
           InvUt9Non
           250.0 [U]
```

3. Press the button.

The return symbol flashes next to the value.

**✘ Stop device to change the value?** appears in the display.

The parameter can only be changed in standby mode.

- Stop the system (see Section 4.3, page 18).

**✘ No permission to change the value** appears in the display.

You are not allowed to change the parameter in installer mode.

- If you want to change the parameters for the battery, select the menu **New Battery** in the QCG (see Section 10.8 "Replacing the Battery", page 77).
- For all other settings in the QCG, select the menu **New System** (see the installation manual of the Sunny Island).

4. To set the parameter, turn the button to the left or right.

5. Press the button.

The Sunny Remote Control requests a confirmation of the set parameter.

```
Settings interter
210#01 (accept Y/N)
           InvUt9Non
           230.0 [U]
```

6. To confirm the value, turn the button to the right until **Y** flashes and then press the button.

7. To discard the value, turn the button to the right until **N** flashes and then press the button.

## 5.4.7 Directly Accessing the Parameters

Any parameter can be accessed directly by entering a five-digit number. The five-digit number is composed as follows:

- The first three digits are the menu number.
- The last two digits are the parameter number.

---

### Example: Five-digit number for direct parameter access.

You want to use parameter **111.01 TotInvPwrAt** to show the entire active power of the Sunny Island in a cluster. The five-digit number for direct access is 11101.

---

### Procedure:

1. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
2. Select the parameter **600.02 Select Number** and set the five-digit number.

The parameter is displayed.

The display shows **Item not Found?**

You cannot access the parameter in installer mode.

- Press the button and switch to expert mode (see Section 5.4.1, page 28).

The number set is incorrect.

- Press the button and enter the number again.

## 6 Data Storage and Firmware Update

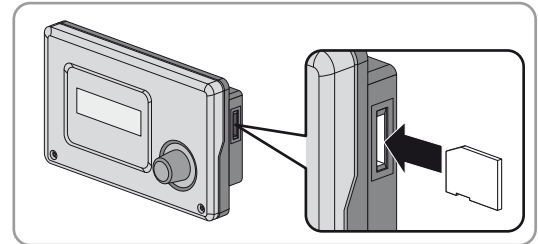
### 6.1 Inserting the SD Memory Card

#### Requirements:

- The SD memory card must be formatted as FAT-12 or FAT-16.
- The storage capacity of the SD memory card must not exceed 2 GB.
- The SD memory card must only be used as a data medium for the system.

#### Procedure:

- Insert the SD memory card, with the slanted corner facing upwards, into the SD memory card slot in the Sunny Remote Control.



### 6.2 Saving and Loading Parameters

You can load and save the current parameter settings in two different parameter sets on the SD memory card. The two parameter sets are distinguished by the Sunny Remote Control in **Set1** and **Set2**. Each parameter set saves all settings. This makes it possible to test the settings of a new parameter set without having to delete the old parameter set. Tip: As soon as you have adjusted the system to your requirements, save the parameter settings to the SD memory card. After saving, you can make further adjustments to the system. If the adjustment does not lead to the desired results, reload the saved parameter set.

#### Requirement:

- The SD memory card must be inserted.

#### Procedure:

1. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
2. To save a parameter set, select the parameter **550.01 ParaSto** and set the parameter:

Value	Explanation
Set1	Save the settings in the first parameter set.
Set2	Save the settings in the second parameter set.

3. Proceed as follows to load a parameter set:

- Switch to expert mode on the Sunny Remote Control (see Section 5.4.1, page 28).
- Select the parameter **550.02 ParaLod** and set the parameter:

Value	Explanation
Set1	Loads the settings from the first parameter set.
Set2	Loads the settings from the second parameter set.
Factory	Loads the default settings.



## 6.3 Saving the Event History and Error History

### Requirement:

- The SD memory card must be inserted.

### Procedure:

1. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
2. To save the event history, select the parameter **550.03 CardFunc** and set to **StoEvtHis**.
3. To save the error history, select the parameter **550.03 CardFunc** and set to **StoFailHis**.
4. To save the error history and the event history, select the parameter **550.03 CardFunc** and set to **StoHis**.

## 6.4 Displaying the SD Memory Card Status Message

The Sunny Remote Control determines the SD memory card status (see Section 13.3.1 "Inverter (310#)", page 115).

1. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
2. Select the parameter **312.11 CardStt** and read off the value.

## 6.5 Removing the SD Memory Card

If the SD memory card is removed without preparation, the removal will cause data loss. Data loss comprises the log data of the last 15 minutes at most.

### Procedure:

1. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
2. Select the parameter **550.03 CardFunc** and set to **ForcedWrite**. Unsaved data will now be saved to the SD memory card.
3. Remove the SD memory card.

## 6.6 Displaying the SD Memory Card Content



BATSTAT	File Folder
HISTORY	File Folder
LOGGING	File Folder
MISC	File Folder
SIPAR	File Folder
SIM.CCF	1 KB CCF-Datei
UPDATE.BIN	1.420 KB BIN-Datei
version.txt	1 KB Textdokument

Figure 15: Content of an SD memory card (example)

The files saved to the SD memory card depend on the configuration and on the system.

### Explanation of the folders:

Folder name	Explanation
BATSTAT	Folder containing battery statistics for each month The files are stored by year and month in sub-folders.
HISTORY	Folder containing event and error histories
LOGGING	Folder containing the data logging, event and error histories for each day The files are stored by year and month in sub-folders.
SIPAR	Folder containing the parameter lists

**Explanation of the files within the folders:**

File name	Explanation
evthis.log	Event history
errhis.log	Error history
si010112.evt	Event and error histories for one day The date (ddmmyy) is part of the file name.
si010112.log	Data logging for the day The date (ddmmyy) is part of the file name.
sipar1.lst	Parameter set 1
sipar2.lst	Parameter set 2
update.bin	Firmware of the Sunny Island
batstat.txt	Statistical values of the battery These values are saved every night at 10:00 p.m.
batstat.sma	Statistical values of the battery for evaluation by SMA Solar Technology AG
sim.ccf	System information of the Sunny Island
bootex.log	File generated by the operating system of the computer This file is not generated by every operating system.

**Structure of the files:**

The files are CSV files, which means that the data is saved as ASCII text. The files are structured as follows:

- The first lines in the file are used for information. Information lines start and end with the character #.
- The data in the following lines is separated by semicolons.
- Decimal places are separated by periods.
- The date format is dd.mm.yyyy.
- The time format is hh:mm:ss.
- Some of the parameter values are saved with plain text numbers (see Section 13 "Directory of the Parameters in Installer Mode and Expert Mode", page 87).

**Requirements:**

- A computer with installed spreadsheet software must be available.
- The spreadsheet software must be able to read CSV files.

**Procedure:**

1. Insert the SD memory card into the card reader and display the content.
2. Start the spreadsheet software and import the required file. When importing, set the import filter in accordance with the file structure (see spreadsheet software manual).

## 6.7 Updating the Firmware

### 6.7.1 Updating the Firmware Using an SD Memory Card

#### **i** Automatic start of the Sunny Island

If the Sunny Island was in operation before the firmware update, the Sunny Island restarts automatically upon completion of the firmware update.

#### Requirements:

- The storage capacity of the SD memory card must not exceed 2 GB.
- SD memory card with the firmware update in the main directory must be available.
- The SD memory card must only be used as a data medium for the system.
- A computer must be able to read from and write to the SD memory card.
- The Sunny Remote Control must be connected to the master.

#### Procedure:

1. Insert the SD memory card into the SD memory card slot (see Section 6.1, page 32).
2. Wait until the message **UPDATE AVAILABLE** appears. This can take up to two minutes.
3. Confirm the question **UPDATE AVAILABLE Start update now ?** with **YES**.
- The Sunny Island switches to standby and updates the firmware.

### 6.7.2 Updating the Firmware Using Sunny Explorer

#### **i** Automatic start of the Sunny Island

If the Sunny Island was in operation before the firmware update, the Sunny Island restarts automatically upon completion of the firmware update.

Using Sunny Explorer, transfer the firmware update to the SMA Speedwire data module Sunny Island. Then, the SMA Speedwire data module Sunny Island automatically transfers the firmware update to the SD memory card in the Sunny Remote Control. This transfer takes some time.

#### Requirements:

- The SMA Speedwire data module Sunny Island of the type SWDMSI-NR10 with firmware version 1.01.06.R or higher must be installed in the system.
- A computer with Sunny Explorer and the firmware update must be available.
- The Sunny Remote Control must be connected to the master.

#### Procedure:

1. Ensure that a writable SD memory card is inserted in the Sunny Remote Control and remains inserted throughout the entire update.
2. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
3. Set the parameter **250.33 UpdMode** to **Auto**.
4. Set the parameter **250.34 UpdAutoTime** to the desired firmware update time.
5. Transfer the firmware update from the computer to the Sunny Island using Sunny Explorer (see the Sunny Explorer user manual).
6. Once the transfer is complete, close Sunny Explorer.
- Once the transfer to the SD memory card is complete, the Sunny Island updates automatically at the specified time. The Sunny Island switches to standby mode and updates the firmware.

### 6.7.3 Performing a Remote Update Using Sunny Portal

#### **i** Automatic start of the Sunny Island

If the Sunny Island was in operation before the firmware update, the Sunny Island restarts automatically upon completion of the firmware update.

Sunny Portal can make the current firmware available automatically. For this, Sunny Portal first transfers the firmware update to the SMA Speedwire data module Sunny Island. Then, the SMA Speedwire data module Sunny Island automatically transfers the firmware update to the SD memory card in the Sunny Remote Control. This transfer takes some time.

#### **Requirements:**

- The Sunny Island must be registered in Sunny Portal.
- The SMA Speedwire data module Sunny Island of the type SWDMSI-NR10 must be installed in the system.

#### **i** Firmware for SMA Speedwire data module Sunny Island

The required firmware for the SMA Speedwire data module Sunny Island will be available as of week 12/2014.

- Sunny Home Manager must be integrated in the system.
- The Sunny Remote Control must be connected to the master.

#### **Procedure:**

1. Ensure that a writable SD memory card is inserted in the Sunny Remote Control and remains inserted.
  2. Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
  3. Set the parameter **250.33 UpdMode** to **Auto**.
  4. Set the parameter **250.34 UpdAutoTime** to the desired firmware update time.
  5. Activate the automatic update of the PV system in Sunny Portal (see the Sunny Home Manager user manual).
- Once the transfer to the SD memory card is complete, the Sunny Island updates automatically at the specified time. The Sunny Island switches to standby mode and updates the firmware.

## 7 Manually Controlling the Generator

### 7.1 Starting the Generator with Sunny Remote Control

#### Requirements:

- The Sunny Island must be able to control the generator via a control cable.
- The Sunny Remote Control must be in standard mode or user mode.

#### Procedure:

1. Select the **Generator** display page on the Sunny Remote Control and press the button (see Section 5.3.1 "Displaying Parameters and Operating and Setting the System", page 26).
2. To start the generator and run it permanently, select the parameter **Mode** and set to **Start**.
  - The generator starts and runs until you stop it again.
3. To start the generator and run it for one hour, select the parameter **Mode** and set to **Run1h**.
  - The generator starts. If there is no generator request after one hour, the Sunny Island stops the generator.

### 7.2 Stopping the Generator with Sunny Remote Control

#### **⚠ WARNING**

#### **Risk of crushing injuries due to movable generator parts**

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

- Before performing work on the generator, permanently stop the generator and secure it against inadvertent restarting.
- Work on the generator in accordance with the manufacturer's specifications.

#### Requirements:

- The Sunny Island must be able to control the generator via a control cable.
- The Sunny Remote Control must be in standard mode or user mode.

#### Procedure:

1. Select the **Generator** display page on the Sunny Remote Control and press the button (see Section 5.3.1 "Displaying Parameters and Operating and Setting the System", page 26).
2. Select the parameter **Mode** and set to **Stop**.
  - The generator is stopped temporarily. The generator restarts when a generator request is issued in automatic generator mode and the minimum stop time elapses.
3. To permanently stop the generator, deactivate the automatic generator mode:
  - Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
  - Select the parameter **235.01 GnAutoEna** and set to **Disable**.
  - The generator is permanently stopped.

### 7.3 Starting the Generator without Autostart Function

1. Start the generator (see manufacturer's manual).
2. Close the load-break switch between the generator and Sunny Island.
- After the warm-up period, the Sunny Island connects the stand-alone grid to the generator.

## 7.4 Stopping the Generator without Autostart Function

1. Stop the generator on the Sunny Remote Control (see Section 7.2, page 37). By doing so the Sunny Island disconnects the stand-alone grid from the generator.
  2. Open the load-break switch between the generator and Sunny Island.
  3. Stop the generator (see manufacturer's manual).
- The generator is stopped. After the power-down time and the minimum stop time, you can use the generator again.

## 8 Disconnecting the Sunny Island from Voltage Sources

### ⚠ QUALIFIED PERSON

1. Switch the system off (see Section 4.4, page 18).
2. Disconnect the circuit breakers and the load-break switches in the sub-distributions and secure against reconnection.
3. Open the load-break switch in the DC cable and secure against reconnection.

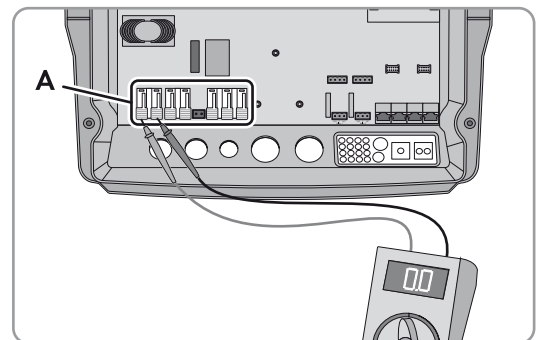
#### 4. **NOTICE**

#### **Destruction of the Sunny Island due to electrostatic discharge (ESD)**

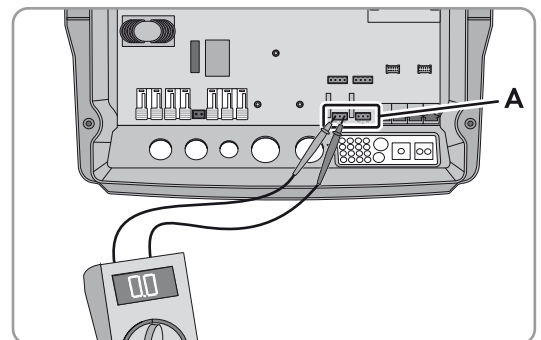
By touching electronic components within the Sunny Island, you can damage or destroy the Sunny Island.

- Do not touch any electronic assemblies.
- Ground yourself before touching a connection.

5. Loosen all screws of the enclosure lid and remove the enclosure lid.
6. Ensure that the **DC** terminal is disconnected from voltage sources.
7. Ensure that the terminals **AC1 Loads/SunnyBoys**, **AC2 Gen/ Grid** and **ExtVtg** (position A) are disconnected from voltage sources.



8. Ensure that the terminals **Relay1** and **Relay2** (position A) are disconnected from voltage sources.



9. Ground and short-circuit the AC power cables outside the Sunny Island.
10. Cover or shield any adjacent live components.

## 9 Troubleshooting

### 9.1 Behavior of the Sunny Island under Fault Conditions

#### Display of Errors, Warnings and Events

Pending warnings and errors are shown automatically on the display of the Sunny Remote Control until the cause of the warning or error is no longer logged by the Sunny Island or has been acknowledged. Events are logged by the Sunny Island. The following menus log warnings, errors and events:

- 410# Error active - display of currently pending warnings and errors
- 420# Error history - error and warning history
- 430# Event history - events history
- In systems for increased self-consumption and battery backup systems: 440# Error Grid - history of the last five utility grid errors

#### Structure of Display Numbers

Each error and each event has a unique three-digit display number that is determined based on the parameter or measurement value assignment. Events and errors use the same number range:

- 1xx - Sunny Island
- 2xx - Battery
- 3xx - Generator or utility grid
- 4xx - Generator
- 5xx - Utility grid
- 6xx - Relay
- 7xx - System
- 8xx - External devices and components
- 9xx - General

#### Meaning of abbreviations

**F** indicates an error, **W** a warning, and **E** an event.

In the event of an error, the display shows whether the error has come or gone using **!** for "Set" and **C** for "Clear".

#### Error Levels

The Sunny Island distinguishes between five different levels of errors, each requiring different user interaction.

Level	Designation	Display on the Sunny Remote Control	Explanation
1	Warning	Warning	Warning, the Sunny Island continues to run. Information in standard mode indicating that a warning has been generated.
2	Malfunction 1	Malfunction	Malfunction that is only detectable during operation. The Sunny Island shuts down. Restart can be initiated immediately (e.g. via autostart).
3	Malfunction 2	Malfunction	Malfunction that is also detectable in standby mode. The Sunny Island shuts down. Restart is blocked until the malfunction is no longer detected by the Sunny Island.



Level	Designation	Display on the Sunny Remote Control	Explanation
4	Failure	Failure	Device failure, the Sunny Island switches off. Troubleshooting, acknowledgment of the error and manual restart necessary.
5	Device defect	Defect	The Sunny Island is defective and switches itself off. The Sunny Island must be replaced.

### Treatment of Pending Errors upon Activation

During the activation procedure, all pending errors are acknowledged without the error being logged in the list **420# Error history**. Errors which are still pending are entered again after activation. Errors which were detected by the Sunny Island before activation and are no longer detected after activation are shown in the list **420# Error history**.

### Autostart

The autostart function allows automatic restarts in the event of malfunctions. If the autostart function fails in the event of a malfunction, the Sunny Island attempts to carry out the next autostart immediately. The number of autostarts is restricted. If the Sunny Island is in operation without malfunctions for ten minutes, it resets the autostart counter.

When the maximum number of autostarts has been reached, the Sunny Island reacts as follows:

- The Sunny Island waits ten minutes.
- The autostart counter is reset.
- The Sunny Island attempts to perform an autostart.
- When the maximum number of autostarts has been reached, the Sunny Island waits again for ten minutes.

## 9.2 Acknowledging Errors

If a malfunction or failure occurs, the Sunny Island switches to standby mode. Once you have remedied the cause of the malfunction, you can enable a restart of the Sunny Island by acknowledging the error.

### Procedure:

1. Eliminate the cause.
2. Press the button on the Sunny Remote Control. This acknowledges the error.
3. Start the system (see Section 4.2, page 17).

## 9.3 Logged Events

### 9.3.1 Sunny Island Category (1xx)

No.	Name	Description
E101	Standby	Waiting mode
E102	Startup	Startup process
E103	Run	Operation
E104	RunExtGn	Operation with a generator
E105	RunExtGd	Operation on the utility grid
E106	RunGdFeed	Feed-in grid operation
E108	Silent	Silent mode
E110	ErrShutdown	Shutdown due to error

No.	Name	Description
E115	EmgCharge	Emergency charging
E118	AutoStart	Automatic start
E119	ManStart	Manual start
E120	ManStop	Manual stop
E121	PwrSaveStart	Start of energy saving mode
E122	PwrSaveStop	End of energy saving mode
E129	Ext.Start	Start with external generator request
E130	Ext.Stop	Stop with external generator request
E131	AfraStart	Automatic frequency synchronization control is activated.
E132	AfraStop	Automatic frequency synchronization control is not activated.
E133	SlfCsmStart	Start of increased self-consumption
E134	SlfCsmStop	Stop of increased self-consumption
E135	SlfCsmChrgOnly	Battery is charged only when increased self-consumption is active
E136	SlfCsmBatMnt	Full charge or equalization charge when increased self-consumption active
E137	SlfCsmNormal	Switch back to increased self-consumption after completion of full or equalization charge
E138	InvShutdown	The Sunny Island shuts down.
E140	FedInOn	Setpoint activated
E141	FedInOff	Setpoint deactivated

### 9.3.2 Battery Category (2xx)

No.	Name	Description
E202	BmsNewBat	(Partial) reset of battery management due to new battery
E203	BmsFloat	Battery charge algorithm switches to float charge
E204	BmsBoost	Battery charge algorithm switches to boost charge
E205	BmsFull	Battery charge algorithm switches to full charge
E206	BmsSilent	Battery charge algorithm switches to silent mode
E207	BmsEqual	Battery charge algorithm switches to equalization charge
E224	BMS20PReCal	20% recalibration being performed.

### 9.3.3 Generator Category (4xx)

No.	Name	Description
E401	GnAutoStart	Automatic generator start (e.g. via state-of-charge-dependent generator request)
E402	GnAutoStop	Automatic generator stop
E403	GnManStart	Manual generator start
E404	GnManStop	Manual generator stop
E405	GnManAck	Manual error acknowledgement of generator error

No.	Name	Description
E406	GnDmdSrc	Generator request
E407	GnCurCtlStr	Current-controlled generator operation started.
E408	GnCurCtlStp	Current-controlled generator operation stopped.

### 9.3.4 Utility Grid Category (5xx)

No.	Name	Description
E501	GdSocOn	Grid request due to low battery state of charge
E502	GdSocOff	Grid release due to adequate battery state of charge
E503	GdPwrOn	Grid request due to power limit being exceeded
E504	GdPwrOff	Grid release due to power falling below the limit
E505	GdManOn	Manual grid request
E506	GdManOff	Manual grid release

### 9.3.5 Relay Category (6xx)

No.	Name	Description
E601	Rly1Off	Multifunction relay 1 is deactivated.
E602	Rly1On	Multifunction relay 1 is activated.
E603	Rly1Slv1Off	Multifunction relay 1 of slave 1 is deactivated.
E604	Rly1Slv1On	Multifunction relay 1 of slave 1 is activated.
E605	Rly1Slv2Off	Multifunction relay 1 of slave 2 is deactivated.
E606	Rly1Slv2On	Multifunction relay 1 of slave 2 is activated.
E609	TransferOff	Internal transfer relay is open.
E610	TransferOn	Internal transfer relay is closed.
E611	TransferSlv1Off	Internal transfer relay of slave 1 is open.
E612	TransferSlv1On	Internal transfer relay of slave 1 is closed.
E613	TransferSlv2Off	Internal transfer relay of slave 2 is open.
E614	TransferSlv2On	Internal transfer relay of slave 2 is closed.
E617	Rly2Off	Multifunction relay 2 is deactivated.
E618	Rly2On	Multifunction relay 2 is activated.
E619	Rly2Slv1Off	Multifunction relay 2 of slave 1 is deactivated.
E620	Rly2Slv1On	Multifunction relay 2 of slave 1 is activated.
E621	Rly2Slv2Off	Multifunction relay 2 of slave 2 is deactivated.
E622	Rly2Slv2On	Multifunction relay 2 of slave 2 is activated.
E625	DigInOff	No voltage at input <b>DigIn</b> (Low).
E626	DigInOn	Voltage present at input <b>DigIn</b> (High).

### 9.3.6 System Category (7xx)

No.	Name	Description
E705	PwrOn	Device start
E706	DateSet	Date or time has been changed.
E707	NewSys	New system configured in the QCG.
E708	Fw1Update	Part 1 of the firmware updated.
E709	Fw2Update	Part 2 of the firmware updated.
E710	ClstUpdate	Cluster firmware updated.
E711	CardInsert	The SD memory card is inserted.
E712	ParaUpdate	Parameter set has been loaded from SD memory card.
E715	SRCon	Sunny Remote Control is activated.
E716	PvDiscon	Disconnection from non-controllable inverters
E718	NoComMod1	Communication interface 1 is incorrectly plugged or missing.
E719	NoComMod2	Communication interface 2 is incorrectly plugged or missing.

### 9.3.7 External Device and Component Category (8xx)





No.	Name	Description
E807	StartBox	Multicluster Box ready for operation.
E808	StopBox	Multicluster Box disabled.
E824	UpdFileComplete	File for firmware update transferred.
E825	UpdFileCrcOK	File for firmware update is OK.
E826	UpdFileCrcNOK	File for firmware update is damaged.
E851	Sic1Detect	Sunny Island Charger 1 has been detected.
E852	Sic2Detect	Sunny Island Charger 2 has been detected.
E853	Sic3Detect	Sunny Island Charger 3 has been detected.
E854	Sic4Detect	Sunny Island Charger 4 has been detected.

## 9.4 Logged Warning Messages and Error Messages

### 9.4.1 Sunny Island Category (1xx)

No.	Name	Level	Cause	Corrective measures
F 109	InvTmpHi	3	Temperature of the transformer in the master is too high due to overload or ambient temperature.	<ul style="list-style-type: none"> <li>• Ensure that the Sunny Island is functional. For this, wait until the Sunny Island has cooled down and then restart it.</li> <li>• Clean the fans (see Section 10.7 "Cleaning the Fans", page 75).</li> <li>• Reduce the total power of the loads, e.g. by staggering their use over time.</li> </ul>
W 110	InvTmpHiSlv1	1	Temperature of the transformer in slave 1 is too high due to overload or ambient temperature.	
W 111	InvTmpHiSlv2	1	Temperature of the transformer in slave 2 is too high due to overload or ambient temperature.	
F 113	InvTmpHi	3	Temperature of the heat sink in the master is too high due to overload or ambient temperature.	<ul style="list-style-type: none"> <li>• Ensure that the Sunny Island is functional. For this, wait until the Sunny Island has cooled down and then restart it.</li> <li>• Reduce the total power of the loads, e.g. by staggering their use over time.</li> </ul>
W 114	InvTmpHiSlv1	1	Temperature of the heat sink in slave 1 is too high due to overload or ambient temperature.	
W 115	InvTmpHiSlv2	1	Temperature of the heat sink in slave 2 is too high due to overload or ambient temperature.	
F 117	AcCurlim	2	The power of the loads is too high for the master.	<ul style="list-style-type: none"> <li>• Ensure that the Sunny Island is functional. For this, clean the fans and restart the Sunny Island (see Section 10.7 "Cleaning the Fans", page 75).</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that there are no short circuits in the system and that the power of the loads is not greater than the power of the Sunny Island.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Use a star delta electronic circuit to start three-phase loads with a high start-up electricity demand (e.g. engines).</li> <li>• <b>⚠ QUALIFIED PERSON</b> Connect the loads with very high power directly to the generator whenever possible. Ensure that the generator is not overloaded.</li> </ul>
W 118	AcCurlimSlv1	1	The power of the loads is too high for slave 1.	
W 119	AcCurlimSlv2	1	The power of the loads is too high for slave 2.	

No.	Name	Level	Cause	Corrective measures
F 121	InvVtgHi	3	An overvoltage has occurred at terminal <b>AC1</b> of the master.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the Sunny Island is functional. For this, disconnect all AC sources and loads from the Sunny Island and restart the Sunny Island.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Find the cause of the overvoltage through measurement and step-for-step connection of the AC sources and loads.</li> </ul>
W 122	InvVtgHiSlv1	1	An overvoltage has occurred at terminal <b>AC1</b> of slave 1.	
W 123	InvVtgHiSlv2	1	An overvoltage has occurred at terminal <b>AC1</b> of slave 2.	
F 129	InvFrqHi	3	An overfrequency has occurred at terminal <b>AC1</b> of the master.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the Sunny Island is functional. For this, disconnect all AC sources and loads from the Sunny Island and restart the Sunny Island.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Find the cause of the overfrequency through measurement and step-by-step connection of the AC sources and loads.</li> </ul>
W 130	InvFrqHiSlv1	1	An overfrequency has occurred at terminal <b>AC1</b> of slave 1.	
W 131	InvFrqHiSlv2	1	An overfrequency has occurred at terminal <b>AC1</b> of slave 2.	
F 133	InvFrqLo	3	An underfrequency has occurred at terminal <b>AC1</b> of the master.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the Sunny Island is functional. For this, disconnect all AC sources and loads from the Sunny Island and restart the Sunny Island.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Find the cause of the underfrequency through measurement and step-by-step connection of the AC sources and loads.</li> </ul>
W 134	InvFrqLoSlv1	1	An underfrequency has occurred at terminal <b>AC1</b> of slave 1.	
W 135	InvFrqLoSlv2	1	An underfrequency has occurred at terminal <b>AC1</b> of slave 2.	
W 137	Derate	1	The master has reduced the battery charging current due to overtemperature in the Sunny Island.	<ul style="list-style-type: none"> <li>• Clean the fans (see Section 10.7 "Cleaning the Fans", page 75).</li> <li>• Reduce the total power of the loads, e.g. by staggering their use over time.</li> <li>• <b>⚠ QUALIFIED PERSON</b> If the Sunny Island frequently reduces its power, increase power by replacing the Sunny Island with a higher-powered version or by installing additional Sunny Island inverters.</li> </ul>
W 138	DerateSlv1	1	Slave 1 has reduced the battery charging current due to overtemperature in the Sunny Island.	
W 139	DerateSlv2	1	Slave 2 has reduced the battery charging current due to overtemperature in the Sunny Island.	

No.	Name	Level	Cause	Corrective measures
F 141	InvVtgLo	2	The voltage at terminal <b>AC1</b> of the master is too low due to AC sources in the system.	<ul style="list-style-type: none"> <li>  <b>QUALIFIED PERSON</b>            Ensure that the Sunny Island is functional. For this, disconnect all AC sources and loads from the Sunny Island and restart the Sunny Island.         </li> </ul>
W 142	InvVtgLoSlv1	1	The voltage at terminal <b>AC1</b> of slave 1 is too low due to AC sources in the system.	
W 143	InvVtgLoSlv2	1	The voltage at terminal <b>AC1</b> of slave 2 is too low due to AC sources in the system.	<ul style="list-style-type: none"> <li>  <b>QUALIFIED PERSON</b>            Find the cause of the undervoltage through measurement and step-by-step connection of the AC sources and loads.         </li> </ul>
F 158	VtgOnAC1Det	2	The master has measured an undesired voltage at terminal <b>AC1</b> .	<p>A bypass switch may have bridged the internal transfer relay.</p> <ul style="list-style-type: none"> <li>Ensure that the bypass switch is in the position for operation with the Sunny Island.</li> </ul>
W 159	VtgOnAC1DetSlv1	1	Slave 1 has measured an undesired voltage at terminal <b>AC1</b> .	<ul style="list-style-type: none"> <li>  <b>QUALIFIED PERSON</b>            Ensure that the Sunny Island is functional. For this, disconnect all AC sources and loads from the Sunny Island and restart the Sunny Island.         </li> </ul>
W 160	VtgOnAC1DetSlv2	1	Slave 2 has measured an undesired voltage at terminal <b>AC1</b> .	<p>A voltage source (e.g. generator) may have been connected to the terminal <b>AC1</b>.</p> <ul style="list-style-type: none"> <li>  <b>QUALIFIED PERSON</b>            Disconnect the voltage source from terminal <b>AC1</b> and connect to terminal <b>AC2</b> (see the Sunny Island installation manual).         </li> </ul>
F 162	OvrCurDet	2	Too much current is flowing through the <b>DC</b> terminal of the master.	<ul style="list-style-type: none"> <li>Reduce the power of the loads.</li> </ul>
W 163	OvrCurDetSlv1	1	Too much current is flowing through the <b>DC</b> terminal of slave 1.	
W 164	OvrCurDetSlv2	1	Too much current is flowing through the <b>DC</b> terminal of slave 2.	
F 166	Overload5min	3	The five minute overload capacity of the master has been exceeded.	<ul style="list-style-type: none"> <li>Reduce the power of the loads.</li> </ul>
W 167	Overload5minSlv1	1	The five minute overload capacity of slave 1 has been exceeded.	
W 168	Overload5minSlv2	1	The five minute overload capacity of slave 2 has been exceeded.	

No.	Name	Level	Cause	Corrective measures
F 169	Overload30min	3	The 30 minute overload capacity of the master has been exceeded.	<ul style="list-style-type: none"> <li>Reduce the power of the loads.</li> </ul>
W 170	Overload30minSlv1	1	The 30 minute overload capacity of slave 1 has been exceeded.	
W 171	Overload30minSlv2	1	The 30 minute overload capacity of slave 2 has been exceeded.	
F 172	Overload	3	The overload capacity of the master has been exceeded.	<ul style="list-style-type: none"> <li>Reduce the power of the loads.</li> </ul>
W 173	OverloadSlv1	1	The overload capacity of slave 1 has been exceeded.	
W 174	OverloadSlv2	1	The overload capacity of slave 2 has been exceeded.	
F 175	StopSlvError	2	A slave has disconnected.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>

### 9.4.2 Battery Category (2xx)

No.	Name	Level	Cause	Corrective measures
F 201	VBATMAX	2	Battery voltage on the master is above the permissible measurement range.	<ul style="list-style-type: none"> <li>Check whether the value of the parameter <b>120.02 BatVtg</b> is above 65.0 V. If the value is above 65.0 V, check the settings of the DC sources and ensure that the battery capacity is sufficient. Observe the technical data of the battery at the <b>DC</b> terminal (see the Sunny Island installation manual).</li> </ul>
W 202	VBATMAXSL1	1	Battery voltage on slave 1 is above the permissible measurement range.	
W 203	VBATMAXSL2	1	Battery voltage at slave 2 is above the permissible measurement range.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Ensure that the DC sources are correctly connected and configured.</li> </ul>
F 206	BatTmpHi	3	The battery temperature is too high.	<ul style="list-style-type: none"> <li>Wait for the battery to cool down. Tip: Protect the battery against temperatures above 25°C. This helps prevent premature aging of the battery.</li> <li><b>⚠ QUALIFIED PERSON</b> Check whether the electrical resistance of the battery temperature sensor is approx. 2,000 Ω at 20°C to 25°C. If the resistance deviates strongly from this value, replace the sensor.</li> </ul>
F 208	BatVtgHi	3	The battery voltage is greater than the target charge voltage.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Ensure that all DC sources are correctly configured.</li> <li><b>⚠ QUALIFIED PERSON</b> Ensure that all SMA inverters are configured to the country data set for stand-alone grid operation.</li> </ul>







No.	Name	Level	Cause	Corrective measures
W 209	BatVtgWrnHi	1	The battery voltage is too high and has not been generated by the Sunny Island.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that all DC sources are correctly configured.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that all SMA inverters are configured to the country data set for stand-alone grid operation.</li> </ul>
W 210	BatVtgHiWarn	1	Battery voltage is temporarily too high.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that all DC sources are correctly configured.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that all SMA inverters are configured to the country data set for stand-alone grid operation.</li> </ul>
W 211	BatTmpLoWarn	1	The battery temperature is too low.	<ul style="list-style-type: none"> <li>• Ensure that the battery room is sufficiently warm.</li> </ul>
W 212	BatTmpHiWarn	1	The battery temperature is too high.	<ul style="list-style-type: none"> <li>• Wait for the battery to cool down. Tip: Protect the battery against temperatures above 25°C. This helps prevent premature aging of the battery.</li> </ul>
F 213	BatVtgLow	3	Battery voltage is too low.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Charge the battery in emergency charge operation or using an external battery charger (see Section 9.6 "Charging the Battery after Automatic Shutdown in Off-Grid Systems", page 69).</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that DC loads are shed via a load-shedding contactor when the battery state of charge is low.</li> </ul>
W 220	BatSOH70Warn	1	Available battery capacity is below 70%.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Verify the plausibility of the error message and replace the battery if necessary.</li> </ul>
F 221	InvalidBatType	4	External battery management detected although no external energy management is configured.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Start QCG and configure a new system with external energy management (e.g. system with lithium-ion battery).</li> </ul>
W 222	CheckBat	1	The 20% recalibration resulted in a jump of more than 10%.	<ul style="list-style-type: none"> <li>• Check the battery.</li> </ul>

### 9.4.3 Generator or Utility Grid Category (3xx)

No.	Name	Level	Cause	Corrective measures
W 309	RlyProtect	1	Excessive current has been applied to the internal transfer relay of the master.	<ul style="list-style-type: none"> <li>Reduce the total power of the loads, e.g. by staggering their use over time.</li> <li><b>⚠ QUALIFIED PERSON</b></li> </ul>
W 310	RlyProtectSlv1	1	Excessive current has been applied to the internal transfer relay of slave 1.	Connect the loads with very high power directly to the generator whenever possible or connect the utility grid. Ensure that the generator is not overloaded.
W 311	RlyProtectSlv2	1	Excessive current has been applied to the internal transfer relay of slave 2.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b></li> </ul> In off-grid systems, ensure that the country data sets of the SMA inverters are set to stand-alone grid operation (see the installation manuals of the SMA inverters).
F 314	ExtVtgLoss	2	Voltage and/or frequency of the generator or the battery backup grid are outside of the limiting values set.	<p><b>Corrective measures for a generator:</b></p> <ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b></li> </ul> Adjust the limiting values for frequency and/or voltage of the generator on the Sunny Island (see installation manual of the Sunny Island). Observe and analyze the measured values <b>134.02 ExtVtg</b> and <b>134.04 ExtFrq</b> during operation. <ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b></li> </ul> Adjust the generator voltage and/or generator frequency.
				<p><b>Corrective measures for a battery backup grid:</b></p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> </ul>
W 315	ExtVtgLo	1	Voltage at terminal <b>AC2</b> of the master is too low.	<p><b>Corrective measures for a generator:</b></p> <ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b></li> </ul> Adjust the limiting values for voltage of the generator on the Sunny Island (see installation manual of the Sunny Island). Observe and analyze the measured values <b>134.02 ExtVtg</b> during operation.
W 316	ExtVtgLoSlv1	1	Voltage at terminal <b>AC2</b> of slave 1 is too low.	
W 317	ExtVtgLoSlv2	1	Voltage at terminal <b>AC2</b> of slave 2 is too low.	
W 319	ExtVtgHi	1	Voltage at terminal <b>AC2</b> of the master is too high.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b></li> </ul> If possible, adjust the generator voltage.
W 320	ExtVtgHiSlv1	1	Voltage at terminal <b>AC2</b> of slave 1 is too high.	<p><b>Corrective measures for a battery backup grid:</b></p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> </ul>
W 321	ExtVtgHiSlv2	1	Voltage at terminal <b>AC2</b> of slave 2 is too high.	

No.	Name	Level	Cause	Corrective measures
W 323	ExtFrqLo	1	Frequency at terminal <b>AC2</b> of the master is too low.	<p><b>Corrective measures for a generator:</b></p> <ul style="list-style-type: none"> <li>The generator may be overloaded. Reduce the total power of the loads by staggering their use over time.</li> <li><b>⚠ QUALIFIED PERSON</b> Adjust the limiting values for generator frequency on the Sunny Island (see installation manual of the Sunny Island). Observe and analyze the measured values <b>134.04 ExtFrq</b> during operation.</li> <li><b>⚠ QUALIFIED PERSON</b> Adjust the frequency of the external energy source.</li> </ul> <p><b>Corrective measures for a utility grid:</b></p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> <li><b>⚠ QUALIFIED PERSON</b> Ensure that the insulated wires at terminal <b>AC2</b> are securely connected and that the conductors in the terminals are free of insulation.</li> </ul> <p><b>Corrective measures for a generator:</b></p> <p>This may be caused by a contactor between the generator and the Sunny Island.</p> <ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Implement control of the contactor via a Sunny Island multifunction relay. Set the parameter of the multifunction relay, e.g. <b>241.01 Rly1Op</b>, to AutoGn.</li> <li><b>⚠ QUALIFIED PERSON</b> Set the parameter <b>234.20 GdAiSns</b> to a lower sensitivity.</li> </ul> <p><b>Corrective measures for a utility grid:</b></p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul> <p><b>Corrective measures for a generator:</b></p> <ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Adjust the limiting values for voltage of the generator on the Sunny Island (see installation manual of the Sunny Island). Observe and analyze the measured values <b>134.02 ExtVtg</b> during operation.</li> <li><b>⚠ QUALIFIED PERSON</b> If possible, adjust the generator voltage.</li> </ul> <p><b>Corrective measures for a utility grid:</b></p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> </ul>
W 324	ExtFrqLoSlv1	1	Frequency at terminal <b>AC2</b> of slave 1 is too low.	
W 325	ExtFrqLoSlv2	1	Frequency at terminal <b>AC2</b> of slave 2 is too low.	
W 327	ExtFrqHi	1	Frequency at terminal <b>AC2</b> of the master is too high.	
W 328	ExtFrqHiSlv1	1	Frequency at terminal <b>AC2</b> of slave 1 is too high.	
W 329	ExtFrqHiSlv2	1	Frequency at terminal <b>AC2</b> of slave 2 is too high.	
W 331	Antisl	1	Undesired stand-alone grid is present at terminal <b>AC2</b> of the master.	<p><b>Corrective measures for a generator:</b></p> <p>This may be caused by a contactor between the generator and the Sunny Island.</p> <ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Implement control of the contactor via a Sunny Island multifunction relay. Set the parameter of the multifunction relay, e.g. <b>241.01 Rly1Op</b>, to AutoGn.</li> <li><b>⚠ QUALIFIED PERSON</b> Set the parameter <b>234.20 GdAiSns</b> to a lower sensitivity.</li> </ul> <p><b>Corrective measures for a utility grid:</b></p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 332	AntislSlv1	1	Undesired stand-alone grid is present at terminal <b>AC2</b> of slave 1.	
W 333	AntislSlv2	1	Undesired stand-alone grid is present at terminal <b>AC2</b> of slave 2.	
W 335	ExtVtgRdtErr	1	Voltage at terminal <b>AC2</b> of the master is outside the configured limiting values (redundant measurement).	<p><b>Corrective measures for a generator:</b></p> <ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Adjust the limiting values for voltage of the generator on the Sunny Island (see installation manual of the Sunny Island). Observe and analyze the measured values <b>134.02 ExtVtg</b> during operation.</li> <li><b>⚠ QUALIFIED PERSON</b> If possible, adjust the generator voltage.</li> </ul> <p><b>Corrective measures for a utility grid:</b></p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> </ul>
W 336	ExtVtgRdtErrSlv1	1	The voltage at terminal <b>AC2</b> of slave 1 is outside the configured limiting values (redundant measurement).	
W 337	ExtVtgRdtErrSlv2	1	The voltage at terminal <b>AC2</b> of slave 2 is outside the configured limiting values (redundant measurement).	

No.	Name	Level	Cause	Corrective measures
W 339	ExtVtgIncPro	1	Voltage rise protection	<ul style="list-style-type: none"> <li>  <b>QUALIFIED PERSON</b>            Ensure that the conductor cross-section of the AC cables is correctly sized.         </li> </ul>
W 340	ExtVtgIncProSlv1	1		
W 341	ExtVtgIncProSlv2	1		
W 343	AcVtglim	1	The master disconnects from the external energy source because the voltage at terminal <b>AC2</b> is too high or the battery voltage too low.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> </ul>
W 344	AcVtglimSlv1	1	Slave 1 disconnects from the external energy source because the voltage at terminal <b>AC2</b> is too high or the battery voltage too low.	
W 345	AcVtglimSlv2	1	Slave 2 disconnects from the external energy source because the voltage at terminal <b>AC2</b> is too high or the battery voltage too low.	
W 347	ExtOverload	1	The master disconnects from the utility grid due to line conductor failure/overload at terminal <b>AC2</b> .	<ul style="list-style-type: none"> <li>Reduce the total power of the loads, e.g. by staggering their use over time.</li> <li>  <b>QUALIFIED PERSON</b>            Ensure that there is not a short circuit present at terminal <b>AC2</b>.         </li> </ul>
W 348	ExtOverloadSlv1	1	Slave 1 disconnects from the utility grid due to line conductor failure/overload at terminal <b>AC2</b> .	
W 349	ExtOverloadSlv2	1	Slave 2 disconnects from the utility grid due to line conductor failure/overload at terminal <b>AC2</b> .	
W 351	ExtScirDet	1	There is a short circuit present at terminal <b>AC2</b> of the master.	<ul style="list-style-type: none"> <li>  <b>QUALIFIED PERSON</b>            Eliminate the short circuit.         </li> </ul>
W 352	ExtScirDetSlv1	1	There is a short circuit present at terminal <b>AC2</b> of slave 1.	
W 353	ExtScirDetSlv2	1	There is a short circuit present at terminal <b>AC2</b> of slave 2.	
W 355	PhsAngErr	1	Assignment of the line conductors of the external energy source to the <b>AC2</b> terminals of the Sunny Island does not result in a right-rotating magnetic field.	<ul style="list-style-type: none"> <li>  <b>QUALIFIED PERSON</b>            Ensure that the master is connected to L1, slave 1 to L2, and slave 2 to L3.         </li> </ul>

No.	Name	Level	Cause	Corrective measures
F 365	VAcExtPhsFail	3	The line conductors of the measured AC voltage at terminals <b>VExt</b> and <b>AC2</b> do not match.	<p><b>⚠ QUALIFIED PERSON</b></p> <ul style="list-style-type: none"> <li>• Ensure that the neutral conductor and line conductor are correctly connected to the terminal <b>ExtVtg</b>.</li> <li>• Ensure that the neutral conductor and line conductor are correctly connected to terminal <b>AC2</b>.</li> <li>• Ensure that the terminals <b>ExtVtg</b> and <b>AC2</b> are connected to the same line conductor.</li> </ul>
F 366	HotAcBus	3	When the tie switch is open, AC voltage from an unknown source is present at terminal <b>AC2</b> .	<p><b>⚠ QUALIFIED PERSON</b></p> <ul style="list-style-type: none"> <li>• Ensure that the triggering of the tie switch is correct.</li> <li>• Ensure that the tie switch is correctly wired.</li> </ul>
F 367	ExtCtcNotOpen	3	Tie switch does not open.	<p><b>⚠ QUALIFIED PERSON</b></p> <ul style="list-style-type: none"> <li>• Ensure that the triggering of the tie switch is correct.</li> <li>• Ensure that the tie switch is correctly wired.</li> <li>• Ensure that the feedback contact is correctly connected.</li> </ul>
F 368	NRelNotOpen	3	Neutral conductor relay of the master does not open.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
W 369	NRelNotOpenSlv1	1	Neutral conductor relay of slave 1 does not open.	
W 370	NRelNotOpenSlv2	1	Neutral conductor relay of slave 2 does not open.	
W 372	VtgFrqRatio	1	Disconnection from the utility grid or generator due to noncompliance with the voltage-frequency ratio at the master.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line if required.</li> </ul>
W 373	VtgFrqRatioSlv1	1	Disconnection from the utility grid or generator due to noncompliance with the voltage-frequency ratio at slave 1.	
W 374	VtgFrqRatioSlv2	1	Disconnection from the utility grid or generator due to noncompliance with the voltage-frequency ratio at slave 2.	

No.	Name	Level	Cause	Corrective measures
W 380	VAcExtPhsFailS1	1	The line conductors of the measured AC voltage at terminals <b>VExt</b> and <b>AC2</b> do not match.	<p><b>⚠ QUALIFIED PERSON</b></p> <ul style="list-style-type: none"> <li>Ensure that the neutral conductor and line conductor are correctly connected to the terminal <b>ExtVtg</b>.</li> <li>Ensure that the neutral conductor and line conductor are correctly connected to terminal <b>AC2</b>.</li> <li>Ensure that the terminals <b>ExtVtg</b> and <b>AC2</b> are connected to the same line conductor.</li> </ul>
W 381	VAcExtPhsFailS2	1		
W 383	HotAcBusSlv1	1	When the tie switch is open, AC voltage from an unknown source is present at terminal <b>AC2</b> .	<p><b>⚠ QUALIFIED PERSON</b></p> <ul style="list-style-type: none"> <li>Ensure that the triggering of the tie switch is correct.</li> <li>Ensure that the tie switch is correctly wired.</li> </ul>
W 384	HotAcBusSlv2	1		

#### 9.4.4 Generator Category (4xx)

No.	Name	Level	Cause	Corrective measures
W 401	GnRevPwrProt	1	AC sources in the system are driving the generator. The reverse power in the generator has been exceeded for too long.	<ul style="list-style-type: none"> <li>Adjust the generator request to the properties of the AC sources in the system and the loads, e.g. for PV inverters preferably request the generator at night.</li> <li><b>⚠ QUALIFIED PERSON</b> If the generator can absorb reverse power, adjust the settings for reverse power (see installation manual of the Sunny Island).</li> </ul>
W 402	GnFailLock	1	Connection of the generator is locked as a result of too many interrupted start processes.	<p><b>⚠ QUALIFIED PERSON</b></p> <ul style="list-style-type: none"> <li>Ensure that the generator triggering is functioning, the generator starts, and there is constant and stable generator voltage present at terminal <b>AC2</b>.</li> <li>To re-enable connection of the generator, acknowledge the generator error (see Section 9.2 "Acknowledging Errors", page 41).</li> </ul> <p><b>⚠ QUALIFIED PERSON</b> A too short warm-up time <b>234.12 GnWarmTm</b> may have been configured and hence the generator is unable to supply valid voltage.</p> <ul style="list-style-type: none"> <li>Ensure that the generator warm-up time is configured appropriately (see the installation manual of the Sunny Island).</li> </ul>

### 9.4.5 Utility Grid Category (5xx)

No.	Name	Level	Cause	Corrective measures
W 505	GdCurNomExceed	1	The feed-in current of the master is greater than <b>232.04 GdCurNom</b> .	<ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> </ul>
W 506	GdCurNomExcSlv1	1	The feed-in current of slave 1 is greater than <b>232.04 GdCurNom</b> .	
W 507	GdCurNomExcSlv2	1	The feed-in current of slave 2 is greater than <b>232.04 GdCurNom</b> .	

### 9.4.6 Relay Category (6xx)

No.	Name	Level	Cause	Corrective measures
F 605	TransfNotOpn	4	Internal transfer relay in the master does not open.	A bypass switch may have bridged the internal transfer relay.
W 606	TransfNotOpnSL1	1	Internal transfer relay in slave 1 does not open.	<ul style="list-style-type: none"> <li>Ensure that the bypass switch is in the position for operation with the Sunny Island.</li> </ul>
W 607	TransfNotOpnSL2	1	Internal transfer relay in slave 2 does not open.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Ensure that the terminals <b>AC1</b> and <b>AC2</b> are not bridged.</li> </ul>

### 9.4.7 System Category (7xx)

No.	Name	Level	Cause	Corrective measures
F 702	RsDsp	5	Signal processor has performed a reset.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
F 703	TimeOut	2	Time for performing a particular task has been exceeded.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
F 704	Calib	4	The system has not calibrated.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 705	TimeOut	1	The watchdog of the signal processor of the master has tripped.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> </ul>
F 706	TimeOut	4	The watchdog of the signal processor of the master has tripped several times.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 707	TimeOutSlv1	1	The watchdog of the signal processor of slave 1 has tripped several times.	
W 708	TimeOutSlv2	1	The watchdog of the signal processor of slave 2 has tripped several times.	
F 710	AutoStrCnt	4	Autostart meter has expired several times in succession.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Read off the pending and logged warnings and errors and eliminate the causes.</li> <li>Ensure that the parameter <b>250.01 AutoStr</b> is set to <b>3</b>.</li> </ul>
W 713	TimeOut	1	The watchdog of the operation control unit has tripped.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line if required.</li> </ul>

No.	Name	Level	Cause	Corrective measures
F 716	VBATMIN	2	The measured battery voltage of the master is below the permissible measurement range.	<ul style="list-style-type: none"> <li>• Disconnect the DC loads and charge the battery.</li> </ul>
W 717	VBATMINSL1	1	The measured battery voltage of slave 1 is below the permissible measurement range.	<p>The usable battery capacity may be too small, e.g. due to aging. If a load with high power connects, the battery voltage collapses.</p>
W 718	VBATMINSL2	1	The measured battery voltage of slave 2 is below the permissible measurement range.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> If DC loads are installed in the system, install load shedding for DC loads.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that all battery cells are functional.</li> </ul>
F 720	InvTmpSns	4	The temperature sensor on the transformer of the master is defective.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
F 721	InvTmpSns	4	The temperature sensor on the heat sink of the master is defective.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
W 722	BatTmpSnsShort	1	Short circuit of the battery temperature sensor	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the battery temperature sensor is correctly connected (see installation manual of the Sunny Island).</li> </ul>
W 723	BatTmpSnsOpn	1	Cable break in battery temperature sensor	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
W 724	AutoStrCntSlv1	1	Maximum number of autostarts for slave 1 has been reached.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Read off the pending and logged warnings and errors and eliminate the causes.</li> </ul>
W 725	AutoStrCntSlv2	1	The maximum number of autostarts for slave 2 has been reached.	<ul style="list-style-type: none"> <li>• Ensure that the parameter <b>250.01 AutoStr</b> is set to <b>3</b>.</li> </ul>
F 731	ClstConfig	4	Configuration of the cluster is incorrect.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Change the addresses of the slaves in the cluster (see Section 9.7, page 71)</li> </ul>
F 732	ClstAdress	4	Error in the address assignment of the Sunny Island in the cluster.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the communication bus is equipped with a terminator at both ends.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Reset the address of the Sunny Island inverters in the cluster (see Section 9.7, page 71).</li> </ul>



No.	Name	Level	Cause	Corrective measures
F 733	MstrLoss	4	Communication to the master is interrupted.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.</li> </ul>
W 734	Slv1Loss	1	Communication from the master to slave 1 is interrupted.	
W 735	Slv2Loss	1	Communication from the master to slave 2 is interrupted.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the communication bus is equipped with a terminator at both ends.</li> </ul>
W 738	GnSynLoss	1	Synchronization with the generator or battery backup grid not successful.	<ul style="list-style-type: none"> <li>• Ensure that the generator can be started. It may be that the fuel level is too low.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that a constant and stable voltage is present at terminal <b>AC2</b>.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the limiting values for the voltage of the external energy sources are correctly configured.</li> </ul>
F 739	SPICom	3	Internal device communication of the master is disturbed.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
W 740	SPIComSlv1	1	Internal device communication of slave 1 is disturbed.	
W 741	SPIComSlv2	1	Internal device communication of slave 2 is disturbed.	
F 743	CANCom	3	Internal device CAN communication of the master is disturbed.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the terminators in the communication bus are attached.</li> </ul>
W 744	CANComSlv1	1	Internal device CAN communication of slave 1 is disturbed.	
W 745	CANComSlv2	1	Internal device CAN communication of slave 2 is disturbed.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.</li> <li>• Contact the SMA Service Line.</li> </ul>
W 747	InvTmpSnsSlv1	1	Temperature sensor on the transformer of slave 1 is defective.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
W 748	InvTmpSnsSlv2	1	Temperature sensor on the transformer of slave 2 is defective.	
W 750	InvTmpSnsSlv1	1	Temperature sensor on the heat sink of slave 1 is defective.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
W 751	InvTmpSnsSlv2	1	Temperature sensor on the heat sink of slave 2 is defective.	
W 753	DatInvalid	1	System time is invalid.	<ul style="list-style-type: none"> <li>• Select the parameter <b>250.02 Dt</b> and set the date. Select the parameter <b>250.03 Tm</b> and set the time.</li> </ul>

No.	Name	Level	Cause	Corrective measures
F 754	BoxCom	2	Communication with Multicluster Box is interrupted.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the communication bus is equipped with a terminator at both ends.</li> </ul>
W 755	LoBatMod1	1	Battery protection mode protects the battery. Level 1 is active.	<ul style="list-style-type: none"> <li>• Disconnect the loads, start the generator, start the Sunny Island and charge the battery.</li> </ul>
W 756	LoBatMod2	1	Battery protection mode protects the battery. Level 2 is active.	
W 757	LoBatMod3	1	Battery protection mode protects the battery. Level 3 is active.	
F 758	McNoVtg	2	Voltage of the main cluster cannot be measured at the master.	<ul style="list-style-type: none"> <li>• Ensure that all circuit breakers of the Sunny Island inverters in the Multicluster Box are closed.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the cabling at terminal <b>AC1</b> is correctly installed.</li> </ul>
W 759	McNoVtgSlv1	1	Voltage of the main cluster cannot be measured at slave 1.	
W 760	McNoVtgSlv2	1	Voltage of the main cluster cannot be measured at slave 2.	
F 781	SlvError	4	Error at a slave in the main cluster causing system shutdown.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Read off the pending and logged warnings and errors and eliminate the causes.</li> </ul>
F 782	AIVtgMonFail	4	Monitoring of the utility grid has failed.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
F 783	CANCom	2	Synchronization in the cluster is interrupted at the master.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the communication bus is equipped with a terminator at both ends.</li> </ul>
W 784	CANComSlv1	1	Synchronization in the cluster is interrupted at slave 1.	
W 785	CANComSlv2	1	Synchronization in the cluster is interrupted at slave 2.	
F 787	VcoreFail	3	Internal device voltage in the master is outside the tolerance limits.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
F 788	VcoreFailSlv1	3	Internal device voltage in slave 1 is outside the tolerance limits.	
F 789	VcoreFailSlv2	3	Internal device voltage in slave 2 is outside the tolerance limits.	
W 791	RsDspSlv1	1	Signal processor has performed a reset.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
W 792	RsDspSlv2	1		

No.	Name	Level	Cause	Corrective measures
W 793	TimeOutDspSlv1	1	Time for performing a particular task has been exceeded.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 794	TimeOutDspSlv2	1		
W 797	AiVtgMonFailSlv1	1	Monitoring of the utility grid has failed.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 798	AiVtgMonFailSlv2	1		

### 9.4.8 External Device and Component Category (8xx)

No.	Name	Level	Cause	Corrective measures
F 801	Box	4	Plausibility check of the contactors in the Multicluster Box has failed.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 805	BoxNoGn	1	Operation with the generator is not possible.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Reset the off-grid system. For this, disconnect all loads, AC sources, generator and DC sources. Open the load-break switch of the BatFuse. Wait ten minutes and restart the off-grid system. Wait until all AC sources are feeding into the stand-alone grid and all loads are connected before connecting the generator.</li> <li>Contact the SMA Service Line.</li> </ul>
F 806	BoxType	4	Configuration of the Sunny Island does not match the Multicluster Box.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Check whether the value of the parameter <b>250.23 Box</b> matches the Multicluster Box. If the value does not match, restart the QCG (see installation manual of the Sunny Island).</li> <li>Contact the SMA Service Line.</li> </ul>
W 807	BoxGdVtg	1	Voltage of the external energy source is not within the valid limiting values for connection.	<ul style="list-style-type: none"> <li>Acknowledge the error (see Section 9.2, page 41).</li> <li>Contact the SMA Service Line.</li> </ul>
F 809	BoxNoLod	4	Load-shedding contactor <b>Q5</b> in the Multicluster Box is not functioning correctly.	<ul style="list-style-type: none"> <li>Reset the off-grid system. For this, disconnect the off-grid system and restart. The configuration may be incorrect.</li> <li><b>⚠ QUALIFIED PERSON</b> Start the QCG and reconfigure multicluster operation (see installation manual of the Sunny Island).</li> <li>Contact the SMA Service Line.</li> </ul>
F 810	Box15V	4	15 V voltage supply in the Multicluster Box is defective.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
F 811	Box24V	4	24 V voltage supply in the Multicluster Box is defective.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>

No.	Name	Level	Cause	Corrective measures
W 815	BoxQ5	1	Contactors <b>Q5</b> in the Multicluster Box is not functioning correctly.	<ul style="list-style-type: none"> <li>Reset the off-grid system. For this, disconnect the off-grid system and restart.</li> </ul>
F 816	BoxQ7	2	Contactors <b>Q7</b> in the Multicluster Box is not functioning correctly.	<p>The configuration may be incorrect.</p> <ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Start the QCG and reconfigure multicluster operation (see installation manual of the Sunny Island).</li> <li>Contact the SMA Service Line.</li> </ul>
F 818	BoxPhsFail	4	One line conductor of a Sunny Island is missing.	<ul style="list-style-type: none"> <li>Ensure that all circuit breakers of the Sunny Island inverters in the Multicluster Box are closed.</li> <li>Reset the off-grid system. For this, disconnect the off-grid system and restart.</li> <li><b>⚠ QUALIFIED PERSON</b> Search for the missing line conductor and eliminate the error. For this, with loads connected, measure the AC voltage between each line conductor and between the line conductors and the neutral conductors. If an AC voltage deviates from the nominal voltage by <math>\pm 10\%</math>, the corresponding line conductor is missing.</li> </ul>
W 824	BoxQ4Overload	1	Multicluster Box signals an error at contactor Q4.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 840	eHZ1ComFail	1	Faulty communication between the Meter Box and the feed-in meter and purchased electricity meter.	<ul style="list-style-type: none"> <li>Ensure that the optical probe is correctly mounted.</li> <li>Ensure that the optical probe is correctly connected.</li> </ul>
W 841	eHZ2ComFail	1	Faulty communication between the Meter Box and the PV production meter.	
W 842	ComBoxFail	1	Faulty communication between the Sunny Island and the Meter Box.	<ul style="list-style-type: none"> <li><b>⚠ QUALIFIED PERSON</b> Ensure that the data cables are correctly installed.</li> </ul>
W 843	ComBoxWD	1	The Meter Box watchdog has triggered.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 844	eHZ1ProtFail	1	Data protocol of the feed-in and purchased electricity meter is unknown.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W 845	eHZ2ProtFail	1	Data protocol of the PV production meter is unknown.	
W 846	eHzInFail	1	Optical probes have been swapped.	<ul style="list-style-type: none"> <li>Swap the optical probe connections.</li> </ul>

No.	Name	Level	Cause	Corrective measures
W 847	ComHMFaill	1	Faulty communication between the Sunny Island and Sunny Home Manager.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that the data cables are correctly installed.         </li> <li>           Ensure that the parameter <b>250.06 ComBaud</b> is set to <b>115k Bd</b>.         </li> </ul>
W 851	Sic1BatShort	1	Connection of the battery to the Sunny Island Charger 1 is reverse poled or there is a short circuit.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that the battery is correctly connected to the <b>DC</b> terminal of the Sunny Island Charger.         </li> <li> <b>⚠ QUALIFIED PERSON</b>            Disconnect the PV array from the Sunny Island Charger and restart the system. This will ensure that the PV array is not short-circuited.         </li> </ul>
W 852	Sic1BatVtgHi	1	Battery voltage at the Sunny Island Charger 1 is too high.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.         </li> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that all DC sources and DC loads are correctly configured and connected.         </li> <li>           Reset the system. For this, switch off the system, wait ten minutes and restart.         </li> </ul>
W 853	Sic1PvVtgHi	1	PV voltage at the Sunny Island Charger 1 is too high.	<ul style="list-style-type: none"> <li>           Contact the SMA Service Line if required.         </li> </ul>
W 854	Sic1PvVtgLo	1	No PV voltage at the Sunny Island Charger 1 or there is a short circuit.	<ul style="list-style-type: none"> <li>           Contact the SMA Service Line if required.         </li> </ul>
W 855	Sic1TmpLo	1	Sunny Island Charger 1 reports a battery undertemperature.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Set the Sunny Island Charger to the operating mode "SMA operation" (see installation manual of the Sunny Island Charger).         </li> </ul>
W 856	Sic1TmpHI	1	Sunny Island Charger 1 reports a battery overtemperature.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Set the Sunny Island Charger to the operating mode "SMA operation" (see installation manual of the Sunny Island Charger).         </li> </ul>

No.	Name	Level	Cause	Corrective measures
W 857	Sic1ComLoss	1	Last communication with the Sunny Island Charger 1 was more than 24 hours ago.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.         </li> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.         </li> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that the communication interfaces are correctly inserted in the Sunny Island.         </li> </ul>
W 861	Sic2BatShort	1	Connection of the battery to the Sunny Island Charger 2 is reverse poled or there is a short circuit.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that the battery is correctly connected to the <b>DC</b> terminal of the Sunny Island Charger.         </li> <li> <b>⚠ QUALIFIED PERSON</b>            Disconnect the PV array from the Sunny Island Charger and restart the system. This will ensure that the PV array is not short-circuited.         </li> </ul>
W 862	Sic2BatVtgHi	1	Battery voltage at the Sunny Island Charger 2 is too high.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.         </li> <li> <b>⚠ QUALIFIED PERSON</b>            Ensure that all DC sources and DC loads are correctly configured and connected.         </li> <li>           Reset the system. For this, switch off the system, wait ten minutes and restart.         </li> </ul>
W 863	Sic2PvVtgHi	1	PV voltage at the Sunny Island Charger 2 is too high.	<ul style="list-style-type: none"> <li>           Contact the SMA Service Line if required.         </li> </ul>
W 864	Sic2PvVtgLo	1	No PV voltage at the Sunny Island Charger 2 or there is a short circuit.	<ul style="list-style-type: none"> <li>           Contact the SMA Service Line if required.         </li> </ul>
W 865	Sic2TmpLo	1	Sunny Island Charger 2 reports a battery undertemperature.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Set the Sunny Island Charger to the operating mode "SMA operation" (see installation manual of the Sunny Island Charger).         </li> </ul>
W 866	Sic2TmpHI	1	Sunny Island Charger 2 reports a battery overtemperature.	<ul style="list-style-type: none"> <li> <b>⚠ QUALIFIED PERSON</b>            Set the Sunny Island Charger to the operating mode "SMA operation" (see installation manual of the Sunny Island Charger).         </li> </ul>

No.	Name	Level	Cause	Corrective measures
W 867	Sic2ComLoss	1	Last communication with the Sunny Island Charger 2 was more than 24 hours ago.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the communication interfaces are correctly inserted in the Sunny Island.</li> </ul>
W 871	Sic2BatShort	1	Connection of the battery to the Sunny Island Charger 2 is reverse poled or there is a short circuit.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the battery is correctly connected to the <b>DC</b> terminal of the Sunny Island Charger.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Disconnect the PV array from the Sunny Island Charger and restart the system. This will ensure that the PV array is not short-circuited.</li> </ul>
W 872	Sic3BatVtgHi	1	Battery voltage at the Sunny Island Charger 3 is too high.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that all DC sources and DC loads are correctly configured and connected.</li> <li>• Reset the system. For this, switch off the system, wait ten minutes and restart.</li> </ul>
W 873	Sic3PvVtgHi	1	PV voltage at the Sunny Island Charger 3 is too high.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line if required.</li> </ul>
W 874	Sic3PvVtgLo	1	No PV voltage at the Sunny Island Charger 3 or there is a short circuit.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line if required.</li> </ul>
W 875	Sic3TmpLo	1	Sunny Island Charger 3 reports a battery undertemperature.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Set the Sunny Island Charger to the operating mode "SMA operation" (see installation manual of the Sunny Island Charger).</li> </ul>
W 876	Sic3TmpHI	1	Sunny Island Charger 3 reports a battery overtemperature.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Set the Sunny Island Charger to the operating mode "SMA operation" (see installation manual of the Sunny Island Charger).</li> </ul>

No.	Name	Level	Cause	Corrective measures
W 877	Sic3ComLoss	1	Last communication with the Sunny Island Charger 3 was more than 24 hours ago.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the communication interfaces are correctly inserted in the Sunny Island.</li> </ul>
W 881	Sic4BatShort	1	Connection of the battery to the Sunny Island Charger 4 is reverse poled or there is a short circuit.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the battery is correctly connected to the <b>DC</b> terminal of the Sunny Island Charger.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Disconnect the PV array from the Sunny Island Charger and restart the system. This will ensure that the PV array is not short-circuited.</li> </ul>
W 882	Sic4BatVtgHi	1	Battery voltage at the Sunny Island Charger 4 is too high.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>• <b>⚠ QUALIFIED PERSON</b> Ensure that all DC sources and DC loads are correctly configured and connected.</li> <li>• Reset the system. For this, switch off the system, wait ten minutes and restart.</li> </ul>
W 883	Sic4PvVtgHi	1	PV voltage at the Sunny Island Charger 4 is too high.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line if required.</li> </ul>
W 884	Sic4PvVtgLo	1	No PV voltage at the Sunny Island Charger 4 or there is a short circuit.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line if required.</li> </ul>
W 885	Sic4TmpLo	1	Sunny Island Charger 4 reports a battery undertemperature.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Set the Sunny Island Charger to the operating mode "SMA operation" (see installation manual of the Sunny Island Charger).</li> </ul>
W 886	Sic4TmpHI	1	Sunny Island Charger 4 reports a battery overtemperature.	<ul style="list-style-type: none"> <li>• <b>⚠ QUALIFIED PERSON</b> Set the Sunny Island Charger to the operating mode "SMA operation" (see installation manual of the Sunny Island Charger).</li> </ul>



No.	Name	Level	Cause	Corrective measures
W 887	Sic4ComLoss	1	Last communication with the Sunny Island Charger 4 was more than 24 hours ago.	<ul style="list-style-type: none"> <li>⚠ <b>QUALIFIED PERSON</b> Ensure that undamaged CAT5e cables are used for communication and that the cables are plugged in correctly.</li> <li>⚠ <b>QUALIFIED PERSON</b> Ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>⚠ <b>QUALIFIED PERSON</b> Ensure that the communication interfaces are correctly inserted in the Sunny Island.</li> </ul>
W 890	BoxMeas	2	Disturbance in voltage or current measurement at the measurement point of the Multicluster Box for the master.	<ul style="list-style-type: none"> <li>⚠ <b>QUALIFIED PERSON</b> Ensure that the control and measuring cable between the Multicluster Box and the corresponding Sunny Island of the main cluster is correctly inserted. When doing so, observe the correct sequence of the Multicluster Box terminals to the Sunny Island inverters (see installation manual of the Sunny Island and the Multicluster Box documentation).</li> </ul>
W 891	BoxMeasSlv1	2	Disturbance in voltage or current measurement at the measurement point of the Multicluster Box for slave 1.	
W 892	BoxMeasSlv2	2	Disturbance in voltage or current measurement at the measurement point of the Multicluster Box for slave 2.	

### 9.4.9 General Category (9xx)

No.	Name	Level	Cause
W 915	Timeout	1	An error has occurred in the program run sequence.
F 952	ExtBMSTimeout	3	Time for communication with the external battery management has been exceeded.
W 953	WrnExtBMSTmOut	1	Time for communication with the external battery management has been exceeded.

## 9.5 Frequently Asked Questions

### 9.5.1 Questions regarding the Sunny Island

#### The Sunny Island does not switch off even though you have opened the load-break switch of the BatFuse?

The Sunny Island may still be supplied from the AC side.

- ⚠ **QUALIFIED PERSON**  
Switch off all AC sources and disconnect them from the Sunny Island.

#### The Sunny Island does not switch to silent mode?

Another function might have a higher priority than silent mode, e.g. equalization charge or full charge.

## After automatic disconnection in battery protection mode, the Sunny Island can no longer be started?

- **⚠ QUALIFIED PERSON**  
Only charge the battery when the Sunny Island cannot be switched on (see Section 9.6 "Charging the Battery after Automatic Shutdown in Off-Grid Systems", page 69).
- Switch off all loads.
- If there is a generator in the system, start the generator manually. When doing so, observe the warm-up time of the generator. Five minutes without charging current may result in disconnection of the Sunny Island.
- If sufficient power is available from the generator or the AC sources in the stand-alone grid, e.g. sufficient solar irradiation for PV inverters, switch the Sunny Island on. AC sources in the stand-alone grid can only start feeding in electric current once the Sunny Island has been started and is in operation.

## 9.5.2 Questions regarding the Sunny Remote Control

### The display of the Sunny Remote Control is dark and nothing is displayed?

The Sunny Island might not be switched on.

- Switch the Sunny Island on (see Section 4.1, page 17).

#### ✘ The Sunny Island does not switch on?

- **⚠ QUALIFIED PERSON**  
Ensure that the fuse in the BatFuse is not defective.

The Sunny Remote Control might not be connected to the Sunny Island.

- **⚠ QUALIFIED PERSON**  
Ensure that the Sunny Remote Control is connected to the Sunny Island.

The RJ45 data cable might be damaged.

- **⚠ QUALIFIED PERSON**  
Replace the RJ45 data cable between the Sunny Remote Control and the Sunny Island.

### Parameters cannot be changed?

The parameter might only be displayed in expert mode.

- Switch to expert mode on the Sunny Remote Control (see Section 5.4.1, page 28).

The parameter might only be changeable in standby mode or in the QCG.

- Observe the messages in the display (see Section 5.4.6 "Setting the Parameters", page 30).

The parameter might be hidden as it is not required in the configuration set for the system.

- Ensure that the configuration does not deactivate any functions which are required.

### "MMC/SD operation failed !" is shown in the display?

An action with the SD memory card has failed.

- Use a computer to ensure that the SD memory card is free of errors.
- **⚠ QUALIFIED PERSON**  
Ensure that the data cable between the Sunny Remote Control and the Sunny Island is undamaged and that the plugs are firmly inserted into the pin connectors.

### The display shows "WRONG FILE SYSTEM"?

The SD memory card is not formatted with the FAT-12 or FAT-16 file system.

### 9.5.3 Questions regarding the Battery

#### A battery cell is defective?

- **⚠ QUALIFIED PERSON**  
Remove the defective battery cell from the battery system. This reduces the rated voltage of the battery by the voltage of the battery cell.
- **⚠ QUALIFIED PERSON**  
In the QCG, set the current rated voltage of the battery under **New Battery** (see Section 10.8 "Replacing the Battery", page 77).

#### The state of charge of the battery is not 100 percent after completion of a full charge?

The power requirements of the loads might have been so high before completion of the full charge that the battery could not be charged 100 percent.

- If necessary, select the parameter **222.03 AptTmFul** and set to a longer time period.

#### The battery discharges even though the generator is running?

The Sunny Island may not have connected to the generator.

- Eliminate the cause (see Section 9.5.4 "Questions regarding the Generator", page 67).

The power of the loads might exceed the power of the generator.

#### What do you need to do after replacing a battery current sensor?

- **⚠ QUALIFIED PERSON**  
Calibrate the battery current sensor (see the installation manual of the Sunny Island for commissioning instructions).

### 9.5.4 Questions regarding the Generator

#### The Sunny Island does not connect to the running generator?

A high output power of the Sunny Island when the battery state of charge is low may lead to the Sunny Island not being able to raise the AC voltage in the stand-alone grid to the AC voltage of the generator. The Sunny Island cancels the synchronization.

- To charge the battery, reduce the power of the loads.

The generator voltage might not be within the limiting values for voltage and frequency.

- Check whether the symbol "⚡" is displayed permanently in standard mode.

If the "⚡" symbol is not displayed, ensure that the fuse is not defective or the circuit breaker is activated.

If the "⚡" symbol is not displayed permanently, the generator voltage is sporadically outside the limiting values.

- **⚠ QUALIFIED PERSON**  
Set the limiting values for voltage and frequency of the generator voltage (see the installation manual of the Sunny Island).

If the "⚡" symbol is displayed permanently, the Sunny Island is in the warm-up period or is blocked for connection. Tip: Check whether the Sunny Remote Control displays the "!" warning symbol in standard mode.

#### The Sunny Island only connects to the generator for a short time?

The generator might be overloaded.

- Select the parameter **234.03 GnCurNom** and set it to 75 percent of the rated current of the generator.
- If possible, reduce the power of the loads.

The set maximum permissible generator voltage might be too low.

- **⚠ QUALIFIED PERSON**  
Select the parameter **234.02 GNVtgMax** and set to the maximum generator voltage.

The minimum frequency set for the generator voltage might be too high.

- **⚠ QUALIFIED PERSON**  
Select the parameter **234.05 GnFrqMin** and set to the minimum frequency of the generator voltage.

The permitted time **234.14 GnRvTm** for reverse power might have been exceeded.

- Check whether warning **W401** is registered in the menu **420# Error history**. Tip: If a warning was registered, the warning symbol "!" is shown in the standard mode of the Sunny Remote Control.
- Select the **540.02 GnAck** parameter and set to **Ackn**. This acknowledges the generator error.

### The Sunny Island does not reconnect to the generator after a disconnection from the generator due to noncompliance with the limiting values for voltage and frequency?

The Sunny Island is switched with a hysteresis, i.e. the limiting values for connection do not correspond to the limiting values for disconnection.

- To unload the generator, disconnect unnecessary loads.
- Wait until the voltage and frequency have reached the nominal values.

## 9.5.5 Questions regarding Cluster Systems and Multicluster Systems

### Extension clusters remain in standby mode even though the main cluster is in inverter mode?

The data cable between the masters of the individual clusters might not be connected. The master of the main cluster cannot forward the "Start" command to the masters of the extension clusters.

### The multicluster system is not supplying full power?

An extension cluster or individual Sunny Island inverters of an extension cluster might have failed.

### High levels of energy is transferred between the clusters in the multicluster system?

The state of charge of the batteries might differ temporarily. The off-grid system equalizes different states of charge automatically.

The nominal frequencies and nominal voltages might be defined differently.

- Set the frequencies and voltages in the **210# Inverter Settings** menu to the same values for all masters.

The battery capacities might differ significantly.

- **⚠ QUALIFIED PERSON**  
Distribute the battery capacities to the clusters as evenly as possible.

Individual battery cells of a battery might have failed.

- **⚠ QUALIFIED PERSON**  
Disconnect defective battery cells and set the new rated voltage and capacity (see Section 10.8 "Replacing the Battery", page 77).

## 9.6 Charging the Battery after Automatic Shutdown in Off-Grid Systems

### **⚠ QUALIFIED PERSON**

When a battery undergoes a deep discharge, the Sunny Island shuts down automatically and you cannot restart the Sunny Island. In order to start the Sunny Island again after an automatic shutdown, you must charge the battery in emergency charge mode.

In emergency charge mode, the Sunny Island does not form a separate stand-alone grid, and you can charge the battery using a generator. Battery management is active in emergency charge mode and the Sunny Island charges the battery in accordance with the parameter settings. In standby mode or in the QCG, you can adjust the parameters for the battery, e.g. the battery nominal voltage, if a battery cell fails.

### **i Restricted management functions in emergency charge mode**

In emergency charge mode, the generator management is not active. The limits for voltage, current and frequency are not monitored. Set the maximum current consumption of the Sunny Island for charging the battery in emergency charge mode. The Sunny Island does not record additional strain on the generator due to loads.

#### **Requirement:**

- The Sunny Remote Control must be connected to the master.
- The system must be an off-grid system.

#### **Procedure:**

- Connect the generator to terminal **AC1**.
- Charge the battery.
- Disconnect the generator from terminal **AC1**.
- Start the off-grid system.

### **Connecting the Generator to Terminal AC1**

#### 1. **⚠ WARNING**

##### **Danger to life from electric shock due to high voltages**

High voltages are present on the AC power cables and on the control cables. Touching live parts can result in death or serious injury due to electric shock.

- Disconnect the Sunny Island from voltage sources (see Section 8, page 39).
2. If a generator is installed permanently in the off-grid system, bridge the terminals **AC1** and **AC2**.
  3. If a mobile generator is used, connect the generator to terminal **AC1** (see the installation manual of the Sunny Island).
  4. Close the Sunny Island (see Commissioning in the installation manual of the Sunny Island).

### **Charging the Battery**

1. Switch off all loads.
2. Connect or close all circuit breakers and fuse switch-disconnectors for energy sources.
3. Quickly connect the load-break switch of the BatFuse and close the BatFuse (see the installation manual of the BatFuse).
4. Start the generator.
5. Switch the Sunny Island on (see Section 4.1, page 17).

6. If the Sunny Remote Control displays **<Init System>**, press and hold the button.

- The Sunny Remote Control displays the QCG.

```
Select option
001#01  [■■■■■■■■■■]
          StartMenu
          Start System↓
```

7. Select the menu **Emerg Charge** and press the button.

```
Select option
001#01  ■■■■■■■■■■]
          StartMenu
          Emerg Charge↓
```

8. Confirm with **Y**.

- The Sunny Remote Control shows the **ExtCurMax** parameter.

```
Emerg. Charg Mode
005#24          <Set>↓
                ExtCurMax
                0.0 [A]
```

9. Set the AC current of the connected generator and press the button.

10. Confirm the AC current with **Y**.

11. Turn the button to the right and confirm the message **Emerg.Confirm Charge Mode Start?**

```
Emerg. Charg Mode
Start? <accept Y/N>
```

### Interrupting the Emergency Charge Mode

You can interrupt the emergency charge mode, e.g. to add diesel to a generator.

- Press and hold the button.
  - Emergency charge mode is stopped.
- Press and hold the button.
  - Emergency charge mode is in operation.

## Disconnecting the Generator from Terminal AC1

1. Switch the Sunny Island off (see Section 4.4, page 18).

2. Ensure that the generator is stopped permanently.

### 3. **WARNING**

#### **Danger to life from electric shock due to high voltages**

High voltages are present on the AC power cables and on the control cables. Touching live parts can result in death or serious injury due to electric shock.

- Disconnect the Sunny Island from voltage sources (see Section 8, page 39).

4. If the terminals **AC1** and **AC2** are bridged, remove the bridge.

5. If a mobile generator is used, disconnect the generator from terminal **AC1**.

6. Close the Sunny Island (see Commissioning in the installation manual of the Sunny Island).

## Starting the Off-Grid System

1. Connect or close all circuit breakers and fuse switch-disconnectors.

2. Start the off-grid system (see Section 4.2, page 17).

## 9.7 Changing Slave Addresses in a Cluster

### ⚠ QUALIFIED PERSON

If you want to change slave addresses (e.g. after replacing a Sunny Island) you can assign the slaves a new address using the Quick Configuration Guide (QCG). Only the address is changed, all other configurations remain as they were, e.g. assignment of the clusters in a multicluster system. When replacing a master, you must reconfigure the cluster (see the Quick Reference Guide "Off-Grid Systems" for configuring single-cluster operation or multicluster operation).

**You can change the slave addresses in two ways:**

- Change the slave addresses with a Sunny Remote Control.
- Change the slave addresses without Sunny Remote Control.

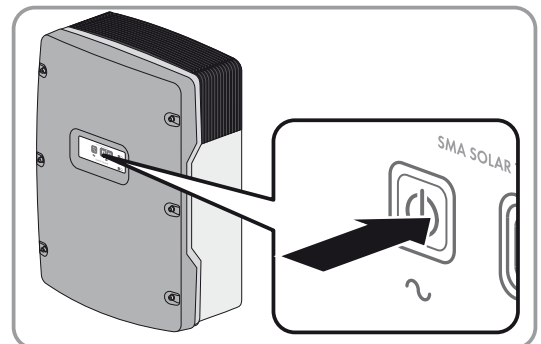
### Changing Slave Addresses with a Sunny Remote Control

#### Requirements:

- All Sunny Island inverters must be switched off.
- A Sunny Remote Control is connected to the master only.

#### Procedure:

1. Switch the slave on.
2. Turn on the master and then press and hold the button on the Sunny Remote Control.
  - An acoustic signal sounds three times and the QCG starts.
3. Select the **NewClstCfg** menu on the Sunny Remote Control and confirm with **Y**.
4. For a single-phase system, set **1Phs** and press the button.
5. For a three-phase system, set **3Phs** and press the button.
6. Confirm the question **Setup new cluster ?** with **Y**.
7. Wait until the inverter LED of slave 1 flashes and the Sunny Remote Control shows the message **To identify Slave 1 press Tss on the Slv**.
8. Press the start-stop button on slave 1.
  - The QCG configures slave 1.



9. To configure slave 2, wait until the inverter LED of slave 2 flashes and the Sunny Remote Control shows the message **To identify Slave2 press Tss on the Slv**.
10. Press the start-stop button on slave 2.
  - An acoustic signal sounds and the QCG configures slave 2.
11. Press the button on the Sunny Remote Control. This closes the QCG.
  - The Sunny Remote Control switches from display mode to standard mode.

## Changing the Slave Addresses Without a Sunny Remote Control

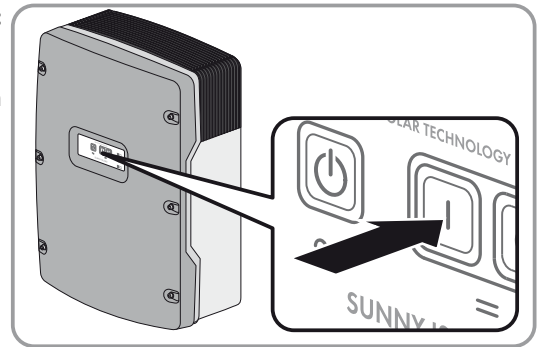
Only use this method if a Sunny Remote Control cannot be connected.

### Requirement:

- There is no Sunny Remote Control connected to the cluster.

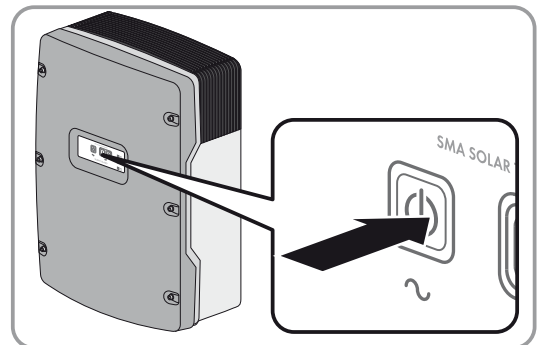
### Procedure:

1. Switch the system on.
  - The Sunny Island inverters are in standby mode.
2. Press and hold the activation button on the master until an acoustic signal sounds three times.
  - The cluster restarts and the LEDs on the Sunny Island inverters in the cluster are flashing.



3. In a single-phase system, press the activation button on the master repeatedly until one LED is flashing.
4. In a three-phase system, press the activation button on the master repeatedly until all three LEDs are flashing.
5. Wait until the LED/LEDs on all Sunny Island inverters are flashing.
6. Press the start-stop button on slave 1.

- The master configures slave 1.



7. In order to configure slave 2, press the start-stop button on slave 2.
  - The master configures slave 2.
8. Press the start-stop button on the master. This completes the configuration.



## 10 Cleaning and Maintenance

### 10.1 Cleaning and Checking the Sunny Island Enclosure

- If the enclosure is heavily soiled, use a soft brush to remove the soiling.
- If the enclosure is dusty, remove the dust with a dry soft cloth. Do not use any solvents, abrasives or corrosive liquids.

### 10.2 Cleaning the Sunny Remote Control

- Clean the Sunny Remote Control with a dry soft cloth. Do not use any solvents, abrasives or corrosive liquids.

### 10.3 Performing a Manual Equalization Charge in the Off-Grid System

After extended periods without charging (e.g. systems operated seasonally), perform a manual equalization charge at the end or start of the season.

#### Requirement:

- The Sunny Remote Control must be in standard mode or user mode.

#### Procedure:

1. Select the display page **Battery** on the Sunny Remote Control and press the button (see Section 5.3.1 "Displaying Parameters and Operating and Setting the System", page 26).
2. Select the parameter **Equalize** and set to **Start**.

### 10.4 Checking the Function

- For the first six months after installation of new systems, check every week whether error messages have been logged. This will reveal any hidden errors in the installation or configuration:
  - Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
  - Select the menu **420# Error history** and check whether any error messages have been logged.
  - If error messages have been logged, rectify the cause (see Section 9 "Troubleshooting", page 40).
- Check every six months whether error messages have been logged:
  - Switch to installer mode on the Sunny Remote Control (see Section 5.4.1, page 28).
  - Select the menu **420# Error history** and check whether any error messages have been logged.
  - If error messages have been logged, rectify the cause (see Section 9.4 "Logged Warning Messages and Error Messages", page 45).

### 10.5 Checking the Terminals

#### QUALIFIED PERSON

#### 1. WARNING

##### **Danger to life from electric shock due to live voltage**

High voltages are present inside the Sunny Island. When the enclosure lid is removed, live components can be touched which can result in death or serious injury due to electric shock.

- Disconnect the Sunny Island from voltage sources (see Section 8, page 39).
2. Ensure that the cables on the **DC+** and **DC-** terminals are securely fastened (torque: 12 Nm).
  3. Ensure that the terminals are free of corrosion.
  4. Ensure that the cables in the **AC1** and **AC2** terminals are securely fastened.
  5. Close the Sunny Island (see installation manual of the Sunny Island).
  6. Switch on all load-break switches and circuit breakers.

## 10.6 Checking and Maintaining the Battery

### ⚠ QUALIFIED PERSON

#### ⚠ WARNING

##### Chemical burns and poisoning caused by battery electrolytes

If handled inappropriately, battery electrolytes can cause chemical burns to eyes, respiratory system and skin, and be poisonous. This may result in blindness and 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 with clear water for a long time and 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 and eye injury 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.

#### Requirement:

- The Sunny Remote Control is in user mode.

#### Procedure:

1. Check whether the current state of the battery corresponds with the expected state:
  - Select the display page **Battery** on the Sunny Remote Control.
  - Select the parameter **Cycle** and compare the value with the expected nominal energy throughputs.
  - Select the parameter **Health (SOH)** and compare with the expected usable battery capacity.

If the current state of the battery does not correspond with the expected state, carry out the following steps:

- Ensure that the requirements for the ambient temperature of the battery are met (see documentation of the battery manufacturer).
  - Check and optimize the battery management settings.
  - If you cannot determine the cause for the deviation, contact the SMA Service Line.
2. Stop the system and switch off the Sunny Island (see Section 6, page 32).
  3. Open the load-break switch of the BatFuse and secure against reconnection.
  4. Check and maintain the battery (see documentation of the battery manufacturer).
  5. Quickly connect the load-break switch of the BatFuse and close the BatFuse (see the installation manual of the BatFuse).
  6. Start the system.

## 10.7 Cleaning the Fans

### ⚠ QUALIFIED PERSON

If the Sunny Remote Control shows the warning **W137 Derate** exceptionally often, one of the fans is probably defective or blocked.

#### Procedure:

#### 1. ⚠ WARNING

##### Danger to life from electric shock due to live voltage

High voltages are present inside the Sunny Island. When the enclosure lid is removed, live components can be touched which can result in death or serious injury due to electric shock.

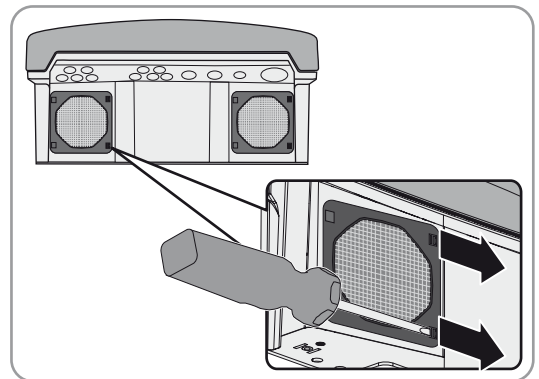
- Disconnect the Sunny Island from voltage sources (see Section 8, page 39).

2. Wait for the fans to stop rotating.
3. Check whether the fan guard is dusty or badly clogged.

If the fan guard is dusty, clean the fan guard with a vacuum cleaner or a soft brush.

If the fan guard is badly clogged, remove and clean the fan guard:

- Use a screwdriver to push the two locking tabs at the right-hand edge of the fan guard to the right and remove them from the retainer.

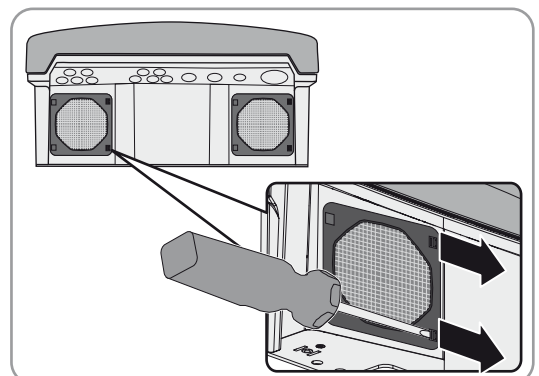


- Carefully remove the fan guard.
- Clean the fan guard with a soft brush, a paint brush, a cloth or compressed air.

4. Check whether the fan is soiled.

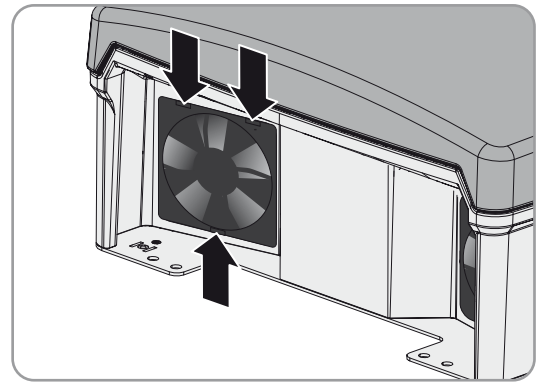
If the fan is soiled, remove the fan:

- Use a screwdriver to push the two locking tabs at the right-hand edge of the fan guard to the right and remove them from the retainer.

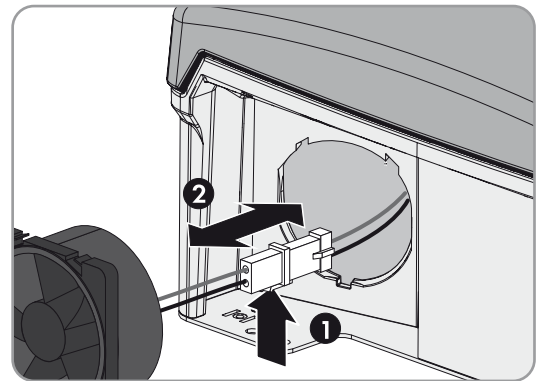


- Carefully remove the fan guard.

- Push the front locking tabs of the fan backwards and the rear locking tabs of the fan forwards.



- Slowly remove the fan from the Sunny Island.
- Release and remove the fan plug.



5. **NOTICE**

**Damage to the fan due to compressed air**

- Clean the fan with a soft brush, a paint brush, or a damp cloth.
6. Insert the fan plug into the pin connector until it snaps into place.
  7. Insert the fan into the Sunny Island until the fan audibly snaps into place.
  8. Press the fan guard into the bracket until it audibly snaps into place.

## 10.8 Replacing the Battery

### **⚠ QUALIFIED PERSON**

#### **⚠ WARNING**

##### **Risk of injury due to short-circuit currents**

Short-circuit currents in the battery can cause heat build-up and electric arcs. Burns and eye injury 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**

##### **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 the battery management will protect the battery.

- Ensure that the battery is from one of the following manufacturers and has been approved for Sunny Island by the manufacturer:
  - Akasol
  - Dispatch Energy
  - LG Chem
  - Leclanché
  - SAFT
  - Samsung
  - Sony

This list is updated regularly (see Planning Guidelines "SMA Smart Home" at [www.SMA-Solar.com](http://www.SMA-Solar.com)).

#### **⚠ WARNING**

##### **Chemical burns and poisoning caused by battery electrolytes**

If handled inappropriately, battery electrolytes can cause chemical burns to eyes, respiratory system and skin, and be poisonous. This may result in blindness and 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 with clear water for a long time and consult a doctor.
- Install, operate, maintain and dispose of the battery according to the manufacturer's specifications.


#### **NOTICE**

##### **Damage to the battery due to incorrect settings**

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

- Ensure that the values recommended by the battery manufacturer are set for the battery (refer to the technical data of the battery in the manufacturer documentation).

**Procedure:**

1. Stop the system and switch off the Sunny Island (see Section 6, page 32).
2. Open the load-break switch of the BatFuse and secure against reconnection.
3. Remove the battery to be replaced (see battery manufacturer's instructions).
4. Mount and connect the new battery (see manuals of the battery manufacturer). The battery must comply with the technical requirements of the Sunny Island (refer to the Sunny Island installation manual for technical data of the **DC** terminal).
5. Quickly connect the load-break switch of the BatFuse and close the BatFuse (see the installation manual of the BatFuse).
6. Switch the Sunny Island on (see Section 4.1, page 17).
7. If the Sunny Remote Control displays **<Init System>** , press and hold the button until the Sunny Remote Control displays the QCG.
8. Select the menu **New Battery** and press the button.
9. Confirm with **Y**.
10. Select the parameter **BatTyp**, set the battery type as follows and confirm with **Y**.

Value	Explanation
VRLA	Lead-acid battery with immobilized electrolyte in AGM (Absorbent Glass Mat Separator) or gel
FLA	Lead-acid battery with liquid electrolyte
Lilon_Ext-BMS	Lithium-ion battery

11. Make the following settings for lead-acid batteries.
  - Select the parameter **BatVtgLst**, set the battery voltage and confirm with **Y**.
  - Select the parameter **BatCpyNom**, set the C10 capacity of the battery (see the installation manual of the Sunny Island on how to calculate the battery capacity) and confirm the battery capacity with **Y**.
12. Make the following settings for lithium-ion batteries.
  - Select the parameter **BatCpyNom**, set the C10 capacity of the battery (see the installation manual of the Sunny Island on how to calculate the battery capacity) and confirm the battery capacity with **Y**.
13. Select the last page and confirm the question **Setup New Battery** with **Y**.

## 11 Decommissioning

### 11.1 Disassembling the Sunny Island

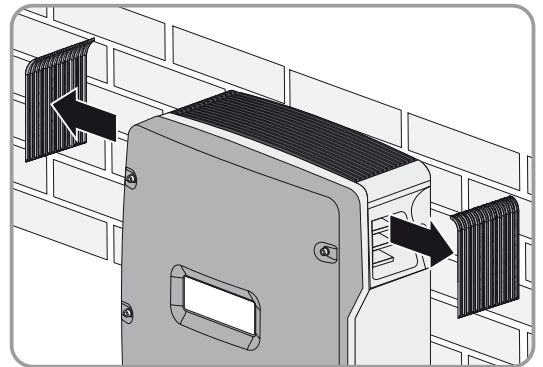
#### ⚠ QUALIFIED PERSON

#### 1. ⚠ WARNING

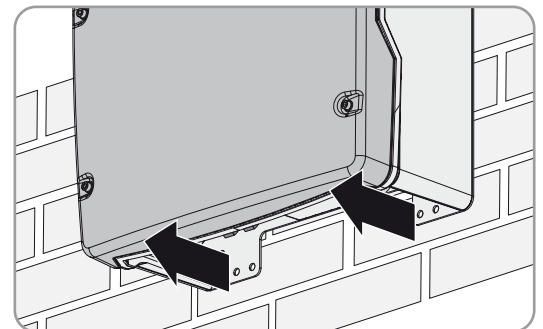
##### **Danger to life from electric shock due to live voltage**

High voltages are present inside the Sunny Island. When the enclosure lid is removed, live components can be touched which can result in death or serious injury due to electric shock.

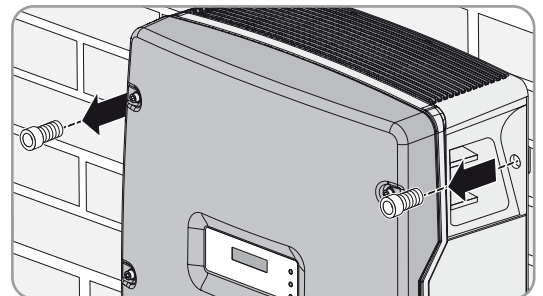
- Disconnect the Sunny Island from voltage sources (see Section 8, page 39).
2. Remove all cables from the Sunny Island.
  3. Close the Sunny Island.
  4. Remove the ventilation grids laterally.



5. If the Sunny Island is protected against theft, loosen the safety screws.

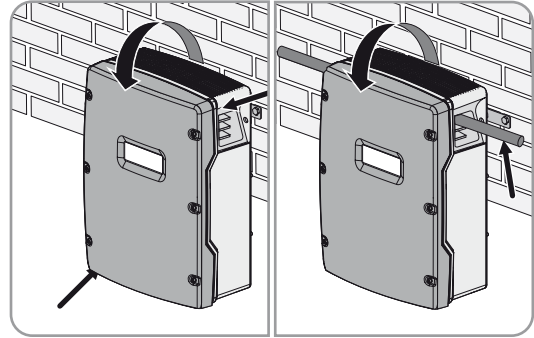


6. Loosen the screws on both sides between the Sunny Island and the wall mounting bracket using an Allen key (AF 5).



7. **⚠ CAUTION****Risk of injury due to the heavy weight of the Sunny Island**

- Remember that the Sunny Island weighs 63 kg.
- Remove the Sunny Island vertically upwards from the wall mounting bracket. To do this, use the side recess grips or a steel rod (diameter: maximum 30 mm). Keep the Sunny Island in a horizontal position when moving it.

**11.2 Packaging the Sunny Island**

1. Remove the cable glands from the Sunny Island.
2. Pack the Sunny Island and the cable glands. For this, use the original packaging or packaging that is suitable for the weight and dimensions of the Sunny Island (for the technical data, refer to the installation manual of the Sunny Island).

**11.3 Disposing of the Sunny Island**

- Dispose of the Sunny Island in accordance with the locally applicable disposal regulations for electronic waste.



## 12 Directory of the Parameters in User Mode

### 12.1 Inverter Category

#### Display Page

Name	Description	Value	Explanation
Tot.Power	Total active power of the Sunny Island inverters in kW This parameter is hidden in multicluster systems.	-	-
MC.Power	Total active power of the multicluster system in kW This parameter is hidden in single systems and single-cluster systems.	-	-
Timer mode	Time-controlled operation of the Sunny Island in off-grid systems This parameter is hidden in battery backup systems and systems for increased self-consumption.	Enable	The Sunny Island is in time-controlled operation.
		Disable	Time-controlled operation is disabled.

#### Setting pages

Name	Description	Value	Explanation
Restart	Restart of the Sunny Island	Yes	Initiate restart.
		No	Do not initiate a restart.
Str.Date	Start date for time-controlled operation of the Sunny Island in dd.mm.yy In time-controlled operation, the Sunny Island switches from standby mode to operation for the first time on the start date. This parameter is hidden in battery backup systems and systems for increased self-consumption.	-	-
Start time	Start time for time-controlled operation, in hh:mm:ss This parameter is hidden in battery backup systems and systems for increased self-consumption.	-	-
Run time	Run time for time-controlled operation The Sunny Island switches to operation from the start time for the configured run time. This parameter is hidden in battery backup systems and systems for increased self-consumption.	-	-
Repetition	Repetition cycle for time-controlled operation This parameter is hidden in battery backup systems and systems for increased self-consumption.	Single	Configures one-time operation on the start date.
		Daily	Configures daily operation from the start date.
		Weekly	Configures weekly operation from the start date. The start date determines the weekday.
Timed start	Time-controlled operation This parameter is hidden in battery backup systems and systems for increased self-consumption.	Disable	Disables time-controlled operation.
		Enable	Enables time-controlled operation.

## 12.2 Battery Category

### Display Pages

Name	Description	Value	Explanation
StateOfCharge	Current battery state of charge in %	-	-
Voltage	Battery voltage in V	-	-
PowerOut	Current discharge power of the battery in kW	-	If the value is positive, the battery is discharging. If the value is negative, the battery is charging.
Mode	Current charging process	Boost	Boost charge is enabled.
		Full	Full charge is enabled.
		Float	Float charge is enabled.
		Equalize	Equalization charge is enabled.
		Silent	In the silent mode, the Sunny Island switches to standby to save energy when the battery is fully charged.
Remain time	Remaining time of current charging process in hh:mm:ss	-	-
Next equal	Remaining time until next equalization charge in days	-	-
Health (SOH)	Ratio of currently usable capacity to nominal capacity, in %	-	-
Cycle	Nominal energy throughputs of the battery A nominal energy throughput is the calculated result of one full charge and discharge of the battery.	-	-

### Setting Page

Name	Description	Value	Explanation
Equalize	Manual equalization charge	Start	Starts the equalization charge.
		Stop	Stops the equalization charge.
		Idle	Remains idle until the requirements for an equalization charge are met.

## 12.3 Generator Category

### Display Pages

The Sunny Remote Control will display these pages whenever a generator is connected and configured.

Name	Description	Value	Explanation
Power	Active power of the generator in kW	-	-
Voltage	Generator voltage	-	-
Frequency	Frequency of generator voltage	-	-
Request by	Source of generator request	None	Generator has not been requested.
		Bat	Generator was requested due to state of charge.
		Lod	Generator was requested due to load.
		Tim	Generator requested due to time.
		Run 1 h	Generator manually requested for one hour.
		Start	Generator was started manually.
		ExtSrcReq	Generator was requested externally.
Run time	Current run time of the generator in hh:mm:ss	-	-
Energy	Energy supplied by the generator since the last start in kWh	-	-
No.OfStarts	Number of generator starts	-	-
Op.Hours	Total operating hours of the generator	-	-
Tot.Energy	Total energy supplied by the generator in kWh	-	-

### Setting Page

The Sunny Remote Control will display these pages whenever a generator is connected and configured.

Name	Description	Value	Explanation
Mode	Generator control	Autostart	Enable automatic generator operation.
		Stop	Stops the generator.
		Start	Start the generator.
		Run 1 h	Starts the generator for one hour.
Error	Error confirmation for generator fault	Ackn.	Acknowledges the error.

## 12.4 Grid Category

### Display Page

The Sunny Remote Control displays these pages in a battery backup system.

Name	Description
Power	Active power of the utility grid in kW
Voltage	Voltage of the utility grid in V
Frequency	Frequency of the utility grid, in Hz

## Setting Page

The Sunny Remote Control displays these pages in a battery backup system.

Name	Description	Value	Explanation
Mode	Manual connection to the utility grid	Auto	Enables automatic connection to the utility grid.
		Stop	Disconnects the Sunny Island from the utility grid.
		Start	Connects the Sunny Island to the utility grid.

## 12.5 SIC50 Category

### Display Page

The Sunny Remote Control only shows this page if at least one Sunny Island Charger is used in the off-grid system.

Name	Description
Tot.Power	Total active power of all Sunny Island Charger devices in kW
Tot.Energy	Total energy of all Sunny Island Charger devices in kWh
Day Energy	Current daily energy of all Sunny Island Charger devices in kWh

## 12.6 Self Cnsmptn Category

### Display Pages

The Sunny Remote Control displays these pages if the PV generation is captured in a system for increased self-consumption.

Name	Description
IncPower	Current increased self-consumption in kW
IncToday	Today's increased self-consumption in kWh
IncEnergy	Total increased self-consumption in kWh
Energy	Total self-consumption in kWh

## 12.7 Grid Cnsmptn Category

### Display Page

The Sunny Remote Control displays these pages in a system for increased self-consumption.

Name	Description
Power	Power currently consumed in kW
Energy	Energy drawn from the utility grid in kWh

## 12.8 Grid Feed Category

### Display Page

The Sunny Remote Control displays these pages in a system for increased self-consumption.

Name	Description
Power	Current feed-in power in kW
Energy	Energy fed in in kWh

## 12.9 Loads Category

### Display Page

The Sunny Remote Control displays these pages if the PV generation is captured in a system for increased self-consumption.

Name	Description
Power	Current power of the loads in kW
Energy	Power consumed by the loads in kWh
ConState	Reserved for future applications

## 12.10 PV System Category

### Display Page

The Sunny Remote Control displays these pages if the PV generation is captured in a system for increased self-consumption.

Name	Description
Power	Current power of the PV system in kW
Energy	Power fed in by the PV system in kWh
ConState	Reserved for future applications

## 12.11 System Category

### Display Page

Name	Description	Value	Explanation
Type	Configuration of the system	1Phase1	Single-phase system with 1 Sunny Island
		1Phase2	Single-phase system with 2 Sunny Island inverters
		1Phase3	Single-phase system with 3 Sunny Island inverters
		3Phase	Three-phase system
		MC-Box	Multicluster system
		Box Type	Type of connected Multicluster Box
Box Type	This parameter is only shown in multicluster systems.	MC-Box-12	Multicluster Box 12
		MC-Box-36	Multicluster Box 36

Name	Description	Value	Explanation
Device	Type of cluster This parameter is only shown in multicluster systems.	MainClst	Sunny Remote Control is connected to the main cluster.
		ExtnClst	The Sunny Remote Control is connected to the extension cluster.

## 12.12 Time Category

### Display Page

Name	Description
Date	Date in dd.mm.yyyy
Time	Time in hh:mm:ss

### Setting Page

Name	Description	Explanation
Date	Date in dd.mm.yyyy	Set the date.
Time	Time in hh:mm:ss	Set the time.

## 12.13 Identity Category

### Display Page

Name	Description
Serial No.	Serial number
Firmware	Firmware version

## 12.14 Password Category

### Display Page

Name	Description	Value	Explanation
Level	Current password level	User	Sunny Remote Control is in user mode.

### Setting Page

Name	Description
Set	Enter the installer password.
Runtime	Displays the operating hours

## 13 Directory of the Parameters in Installer Mode and Expert Mode

### 13.1 Display Values

#### 13.1.1 Inverter (110#)

##### 111# Total

No.	Name	Description
111.01	TotInvPwrAt	Total active power of the Sunny Island inverters in a cluster in kW
111.02	TotInvCur	Total current of the Sunny Island inverters in a cluster in A
111.03	TotInvPwrRt	Total reactive power of the Sunny Island inverters in a cluster in kvar (expert mode)
111.05	TotLodPwr	Total current active power of the loads in a cluster in kW
111.06	TotMccLodPwr	Total current active power of the loads in a multicluster system in kW

##### 112# Device

No.	Name	Description	Value (plain text no.)	Explanation
112.01	InvOpStt	Operating state of the Sunny Island	Init (1)	Initialization
			Startup (2)	Switch from standby to operation
			Standby (3)	Standby
			Run (4)	Operation
			I-Loop (5)	Current-controlled generator operation
			Error (6)	Error status
112.02	InvPwrAt	Active power of the Sunny Island in kW	-	-
112.03	InvVtg	Voltage of the Sunny Island in V	-	-
112.04	InvCur	Current of the Sunny Island in A	-	-
112.05	InvFrq	Voltage frequency of the Sunny Island in Hz	-	-
112.06	InvPwrRt	Reactive power of the Sunny Island in kvar (expert mode)	-	-
112.07	Rly1Stt	Status of multifunction relay 1	Off	Multifunction relay is deactivated.
			On	Multifunction relay is activated.
112.08	Rly2Stt	State of multifunction relay 2	Off	Multifunction relay is deactivated.
			On	Multifunction relay is activated.

No.	Name	Description	Value (plain text no.)	Explanation
112.12	TrfTmp	Temperature of the transformer in °C (expert mode) The temperature of the transformer is displayed in the master of a cluster.	-	-
112.13	HsTmp	Temperature of the heat sink in the Sunny Island in °C (expert mode) The temperature of the heat sink is displayed in the master of a cluster.	-	-

**113# Slave1**

No.	Name	Description	Value	Explanation
113.01	InvOpSttSlv1	Operating state of slave 1	Init (1)	Initialization
			Startup (2)	Switch from standby to operation
			Standby (3)	Standby
			Run (4)	Operation
			I-Loop (5)	Current-controlled generator operation
			Error (6)	Error status
113.02	InvPwrAtSlv1	Active power of slave 1 in kW	-	-
113.03	InvVtgSlv1	Voltage of slave 1 in V	-	-
113.04	InvCurSlv1	Current of slave 1 in A	-	-
113.05	InvPwrRtSlv1	Reactive power of slave 1 in kVAr (expert mode)	-	-
113.06	Rly1SttSlv1	State of multifunction relay 1 in slave 1	Off	Multifunction relay is deactivated.
			On	Multifunction relay is activated.
113.07	Rly2SttSlv1	State of multifunction relay 2 in slave 1	Off	Multifunction relay is deactivated.
			On	Multifunction relay is activated.
113.09	TrfTmpSlv1	Temperature of the transformer in slave 1 in °C (expert mode)	-	-
113.10	HsTmpSlv1	Temperature of the heat sink in slave 1 in °C (expert mode)	-	-



**114# Slave2**

No.	Name	Description	Value	Explanation
114.01	InvOpSttSlv2	Operating state of slave 2	Init (1)	Initialization
			Startup (2)	Switch from standby to operation
			Standby (3)	Standby
			Run (4)	Operation
			I-Loop (5)	Current-controlled generator operation
			Error (6)	Error status
114.02	InvPwrAtSlv2	Active power of slave 2 in kW	-	-
114.03	InvVtgSlv2	Voltage of slave 2 in V	-	-
114.04	InvCurSlv2	Current of slave 2 in A	-	-
114.05	InvPwrRtSlv2	Reactive power of slave 2 in kVAr (expert mode)	-	-
114.06	Rly1SttSlv2	State of multifunction relay 1 in slave 2	Off	Multifunction relay is deactivated.
			On	Multifunction relay is activated.
114.07	Rly2SttSlv2	State of multifunction relay 2 in slave 2	Off	Multifunction relay is deactivated.
			On	Multifunction relay is activated.
114.09	TrfTmpSlv2	Temperature of the transformer in slave 2 in °C (expert mode)	-	-
114.10	HsTmpSlv2	Temperature of the heat sink in slave 2 in °C (expert mode)	-	-

**13.1.2 Battery (120#)**

No.	Name	Description	Value (plain text no.)	Explanation
120.01	BatSoc	State of charge of the battery (SOC) based on the nominal battery capacity in %	0% to 100%	-
120.02	BatVtg	Battery voltage in V	-	-
120.03	BatChrgVtg	Charging voltage setpoint in V	-	-
120.04	AptTmRmg	Remaining absorption time upon completion of the active charging process <b>120.05 BatChrgOp</b> in hh:mm:ss	-	-
120.05	BatChrgOp	Active charging process	Boost (1)	Fast charge
			Full (2)	Full charge
			Float (3;7)	Float charge
			Equalize (4;5)	Equalization charge
			Silent (6;8)	Silent mode active
120.06	TotBatCur	Total battery current of the cluster in A	-	-
120.07	BatTmp	Battery temperature in °C	-	-

No.	Name	Description	Value (plain text no.)	Explanation
120.08	RmgTmFul	Remaining time until next full charge in days	-	-
120.09	RmgTmEqu	Remaining time until next equalization charge in days	-	-
120.10	AptPhs	Status of the absorption phase	Off (1)	Absorption phase not active
			On (2)	Absorption phase is active
120.11	BatSocErr	Estimated error of the state of charge (SOC) in % (expert mode)	-	-
120.12	BatCpyThrpCnt	Nominal energy throughputs of the battery A nominal energy throughput is the calculated result of one full charge and discharge of the battery.	-	-

### 13.1.3 External (130#)

#### 131# Total

No.	Name	Description
131.01	TotExtPwrAt	Total active power of external energy source in kW
131.02	TotExtCur	Total current of external energy source in A
131.03	TotExtPwrRt	Total reactive power of the external energy source in kvar

#### 132# Grid State

No.	Name	Description	Value (plain text no.)	Explanation
132.01	GdStt	Status of the management for the operation on the utility grid (expert mode)	Off (1)	Grid operation is disabled.
			Init (2)	Utility grid has been detected.
			Detect (3)	Grid monitoring started.
			Wait (4)	Waiting until the stand-alone grid is synchronized with the utility grid.
			RunVExt (5)	The stand-alone grid is synchronized with and connected to the utility grid.
			Feed (6)	Grid feed-in into the utility grid is possible.
			Silent (7)	Sunny Island is in silent mode.
			SiStr (8)	The Sunny Island is switching to silent mode.
			SiStp (9)	The Sunny Island is leaving silent mode.
			Error (10)	An error occurred when connecting.
			Reinit (11)	Utility grid has been re-detected.
132.02	GdRmgTm	Remaining time of grid monitoring in hh:mm:ss	-	-

**133# Gen State**

No.	Name	Description	Value (plain text no.)	Explanation
133.01	GnDmdSrc	Source of generator request	None (1)	No request
			Bat (2)	State-of-charge-dependent request
			Lod (3)	Load-dependent request
			Tim (4)	Time-controlled request
			Run1h (5)	Requested for 1 hour
			Start (6)	Manually started
			ExtSrcReq (7)	External generator request
133.02	GnStt	Status of the generator management	Off (1)	Deactivated generator operation
			Init (2)	Detecting generator
			Ready (3)	Waiting for request (ready)
			Warm (4)	Warming up
			Connect (5)	Connecting
			Run (6)	Operation
			Retry (7)	Restarting
			Disconnect (8)	Disconnecting
			Cool (9)	Cooling down
			Lock (10)	Locked after operation
			Fail (11)	Failure
			FailLock (12)	Locked after error
			Reinit (13)	Re-detection of the generator
133.03	GnRmgTm	Remaining minimum run time of the generator in hh:mm:ss	-	-
133.04	GnRnStt	Status of generator feedback (expert mode)	Off (1)	Off
			On (2)	On

**134# Device**

No.	Name	Description
134.01	ExtPwrAt	Active power of external energy source in kW
134.02	ExtVtg	Voltage of external energy source in V
134.03	ExtCur	Current of external energy source in A
134.04	ExtFrq	Frequency of external energy source in Hz
134.05	ExtPwrRt	Reactive power of external energy source in kVAr (expert mode)
134.07	ExtLkRmgTm	Minimum stop time in hh:mm:ss

**135# Slave1**

No.	Name	Description
135.01	ExtPwrAtSlv1	Active power of external energy source slave 1 in kW
135.02	ExtVtgSlv1	Voltage of external energy source slave 1 in V
135.03	ExtCurSlv1	Current of external energy source slave 1 in A
135.04	ExtPwrRtSlv1	Reactive power of external energy source slave 1 in kVAr (expert mode)

**136# Slave2**

No.	Name	Description
136.01	ExtPwrAtSlv2	Active power of external energy source slave 2 in kW
136.02	ExtVtgSlv2	Voltage of external energy source slave 2 in V
136.03	ExtCurSlv2	Current of external energy source slave 2 in A
136.04	ExtPwrRtSlv2	Reactive power of external energy source slave 2 in kVAr (expert mode)

**13.1.4 Charge Controller (140#)****141# SIC50 Total**

No.	Name	Description
141.01	TotSicEgyCntIn	Total energy of all Sunny Island Charger devices in kWh
141.02	TotSicDyEgyCntIn	Total daily energy of all Sunny Island Charger devices in kWh
141.03	TotSicPvPwr	Total PV power of all Sunny Island Charger devices in W
141.04	TotSicBatCur	Total battery current of all Sunny Island Charger devices in A

**142# SIC50 1**

No.	Name	Description
142.01	Sic1EgyCntIn	Total energy of Sunny Island Charger 1 in kWh
142.02	Sic1TdyEgyCntIn	Daily energy of Sunny Island Charger 1 in kWh
142.03	Sic1PvPwr	PV power of Sunny Island Charger 1 in W
142.04	Sic1PvVtg	PV voltage of Sunny Island Charger 1 in V
142.05	Sic1BatVtg	Battery voltage of Sunny Island Charger 1 in V (expert mode)
142.06	Sic1BatCur	Battery current of Sunny Island Charger 1 in A (expert mode)
142.07	Sic1HsTmp	Heat sink temperature of Sunny Island Charger 1 in °C (expert mode)

**143# SIC50 2**

No.	Name	Description
143.01	Sic2EgyCntIn	Total energy of Sunny Island Charger 2 in kWh
143.02	Sic2TdyEgyCntIn	Daily energy of Sunny Island Charger 2 in kWh
143.03	Sic2PvPwr	PV power of Sunny Island Charger 2 in W
143.04	Sic2PvVtg	PV voltage of Sunny Island Charger 2 in V

No.	Name	Description
143.05	Sic2BatVtg	Battery voltage of Sunny Island Charger 2 in V (expert mode)
143.06	Sic2BatCur	Battery current of Sunny Island Charger 2 in A (expert mode)
143.07	Sic2HsTmp	Heat sink temperature of Sunny Island Charger 2 in °C (expert mode)

### 144# SIC50 3

No.	Name	Description
144.01	Sic3EgyCntln	Total energy of Sunny Island Charger 3 in kWh
144.02	Sic3TdyEgyCntln	Daily energy of Sunny Island Charger 3 in kWh
144.03	Sic3PvPwr	PV power of Sunny Island Charger 3 in W
144.04	Sic3PvVtg	PV voltage of Sunny Island Charger 3 in V
144.05	Sic3BatVtg	Battery voltage of Sunny Island Charger 3 in V (expert mode)
144.06	Sic3BatCur	Battery current of Sunny Island Charger 3 in A (expert mode)
144.07	Sic3HsTmp	Heat sink temperature of Sunny Island Charger 3 in °C (expert mode)

### 145# SIC50 4

No.	Name	Description
145.01	Sic4EgyCntln	Total energy of Sunny Island Charger 4 in kWh
145.02	Sic4TdyEgyCntln	Daily energy of Sunny Island Charger 4 in kWh
145.03	Sic4PvPwr	PV power of Sunny Island Charger 4 in W
145.04	Sic4PvVtg	PV voltage of Sunny Island Charger 4 in V
145.05	Sic4BatVtg	Battery voltage of Sunny Island Charger 4 in V (expert mode)
145.06	Sic4BatCur	Battery current of Sunny Island Charger 4 in A (expert mode)
145.07	Sic4HsTmp	Heat sink temperature of Sunny Island Charger 4 in °C (expert mode)

## 13.1.5 Compact (150#)

The menu **150# Compact** displays multiple parameters from the following areas at a glance:

- Battery
- AC measured values of the Sunny Island
- Generator or battery backup grid
- Status of the Sunny Island

### Battery (Bat)

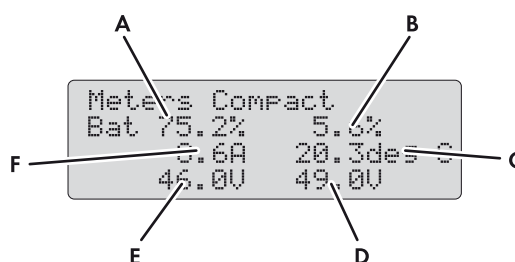


Figure 16: Overview of the menu **Meters Compact** for the battery

Position	Description	Parameter
A	State of charge of the battery (SOC) in %	120.01 BatSoc
B	Estimated error of the state of charge in %	120.11 BatSocErr
C	Battery temperature in °C	120.07 BatTmp
D	Setpoint of the charge voltage in V	120.03 BatChrgVtg
E	Battery voltage in V	120.02 BatVtg
F	Total battery current of the cluster in A	120.06 TotBatCur

### Measured AC Values of the Sunny Island (Inv)

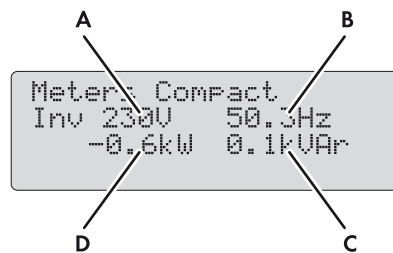


Figure 17: Overview of the menu **Meters Compact** for the AC measured values of the Sunny Island

Position	Description	Parameter
A	Voltage of the Sunny Island in V	112.03 InvVtg
B	Voltage frequency of the Sunny Island in Hz	112.05 InvFrq
C	Reactive power of the inverter in kvar	112.06 InvPwrRt
D	Active power of the inverter in kW	112.02 InvPwrAt

### Generator or Battery Backup Grid (Ext)

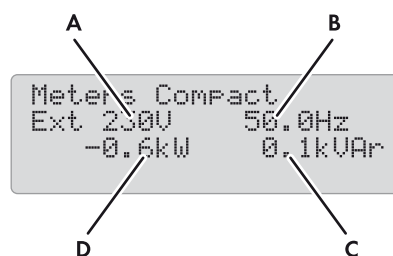


Figure 18: Overview of the menu **Meters Compact** for the generator or the battery backup grid

Position	Description	Parameter
A	Voltage of the generator or the battery backup grid in V	134.02 ExtVtg
B	Frequency of the generator or the battery backup grid in Hz	134.04 ExtFrq
C	Reactive power of the generator or the battery backup grid in kvar	134.05 ExtPwrRt
D	Active power of the generator or the battery backup grid in kW	134.01 ExtPwrAt

## Status of the Sunny Island (OpStt)

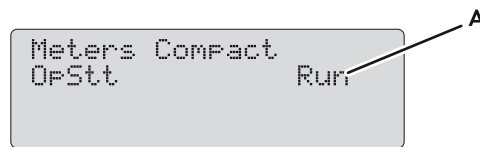


Figure 19: Overview of the menu **Meters Compact** for the status of the Sunny Island

Position	Description	Value	Explanation	Parameter
A	Operating state of the Sunny Island	Init	Initialization	112.01 InvOpStt
		Standby	Standby	
		Run	Operation	
		EmChargeMod	Emergency charge mode	
		Error	Error	

### 13.1.6 SlfCsmp (160#)

#### 161# Power

No.	Name	Description
161.01	TotPvPwrAt	Total PV power in kW
161.02	TotLodPwrAt	Total power consumption in kW
161.03	SlfCsmpPwrAt	Self-consumption in kW
161.04	SlfCsmpIncPwr	Increased self-consumption in kW
161.05	GdCsmpPwrAt	Power drawn from the utility grid in kW
161.06	GdFeedPwrAt	Feed-in power into the utility grid in kW

#### 162# Energy

No.	Name	Description
162.01	TotLodEgyCnt	Total consumption in kWh
162.02	SlfCsmpIncEgy	Total increased self-consumption in kWh
162.03	SlfCsmpIncTdy	Today's increased self-consumption in kWh
162.04	SlfCsmpEgy	Total self-consumption in kWh
162.05	GdCsmpEgyMtr	Meter reading purchased electricity in kWh
162.06	GdCsmpEgyTdy	Today's purchased electricity in kWh
162.07	GdFeedEgyMtr	Meter reading grid feed-in in kWh
162.08	PvEgyMtr	Meter reading PV production meter in kWh
162.09	GdFeedEgyTdy	Today's grid feed-in in kWh

**163# State**

No.	Name	Description	Value	Explanation
163.01	BatMntStt	Status of the full charge or equalization charge If full charge or equalization charge with PV energy has not ended after 24 hours, <b>163.01 BatMntStt</b> automatically switches to <b>On</b> .	On	Full charge or equalization charge active, energy is drawn from the utility grid
			Wait	If sufficient PV energy is available, full charge or equalization charge active
			Off	No full charge or equalization charge active
163.02	SlfCsmoSOCArea	Current range of the state of charge of the battery In systems for increased self-consumption and in backup systems, this parameter shows in which range the state of charge of the battery is currently in.	SlfCsmoSOC	Range for the increased self-consumption
			PVResSOC	Range for maintaining the state of charge of the battery
			BUResSOC	Range for battery backup function
			BatResSOC	Range for protection against deep discharge
			ProtResSOC	Range for protection in the event of deep discharge



## 13.2 Adjustable Parameters

### 13.2.1 Inverter (210#)

No.	Name	Description	Value	Explanation	Default value
210.01	InvVtgNom	Nominal voltage of the Sunny Island in V	172.5 V to 264.5 V	230 V / 50 Hz	230.0 V
				220 V / 60 Hz	220.0 V
210.02	InvFrqNom	Nominal frequency of the Sunny Island in Hz (expert mode)	40 Hz to 70 Hz	230 V / 50 Hz	50 Hz
				220 V / 60 Hz	60 Hz
210.03	InvChrgCurMax	Maximum AC charging current in A (expert mode)	0 A to 26.1 A	SI 8.0H	26.1 A
			0 A to 20.0 A	SI 6.0H	20.0 A

### 13.2.2 Battery (220#)

#### NOTICE

#### Damage to the battery due to incorrect settings

Settings of the parameters in the menu **220# Battery** influence the charging behavior of the Sunny Island. Incorrect settings lead to premature aging of the battery.

- Ensure that the values recommended by the battery manufacturer are set (refer to the technical data of the battery in the manufacturer documentation).

### 221# Property

No.	Name	Description	Value	Explanation	Default value
221.01	BatTyp	Battery type	VRLA	Valve-regulated lead-acid battery with immobilized electrolyte in gel or glass mat	-
			FLA	Valve-regulated lead-acid battery with liquid electrolyte	-
			Lilon	Lithium-ion battery	-
221.02	BatCpyNom	Nominal battery capacity C10 in Ah	100 Ah to 10,000 Ah	VRLA, FLA	166 Ah
			50 Ah to 10,000 Ah	Lithium-ion	
221.03	BatVtgNom	Battery nominal voltage in V	40.0 V to 48.0 V	-	-
221.04	BatTmpMax	Maximum battery temperature in °C (expert mode)	221.05 BatTmpStr to 50°C	-	40°C
221.05	BatTmpStr	Start temperature after exceeding the maximum battery temperature in °C (expert mode)	0°C to 221.04 BatTmpMax	-	35°C

No.	Name	Description	Value	Explanation	Default value
221.06	BatWirRes	Resistance of the battery cable in mΩ (expert mode)	0 m Ω to 100 m Ω	-	0 m Ω
221.07	BatFanTmpStr	Start temperature for the <b>BatFan</b> function of the multifunction relay in °C	20 °C to 221.04 BatTmpMax	-	40 °C

## 222# Chargemode

No.	Name	Description	Value	Explanation	Default value
222.01	BatChrgCurMax	Maximum battery charging current in A	10 A to 900 A	-	900 A
222.02	AptTmBoost	Absorption time of the boost charge in minutes (expert mode)	1 min to 600 min	For VRLA For FLA	180 min 90 min
222.03	AptTmFul	Absorption time for full charge in hours (expert mode)	1.0 h to 20.0 h	-	6.0 h
222.04	AptTmEqu	Absorption time for equalization charge in hours (expert mode)	1.0 h to 48.0 h	-	12.0 h
222.05	CycTmFul	Cycle time of full charge in days (expert mode)	1 d to 180 d	-	14 d
222.06	CycTmEqu	Cycle time of equalization charge in days (expert mode)	7 d to 365 d	-	90 d
222.07	ChrgVtgBoost	Setpoint of the cell voltage at boost charge in V (expert mode)	2.20 V to 2.70 V	VRLA FLA, Off-Grid FLA, On-Grid	2.40 V 2.40 V 2.55 V
222.08	ChrgVtgFul	Cell voltage setpoint for full charge in V (expert mode)	2.30 V to 2.70 V	Off-Grid On-Grid	2.45 V 2.50 V
222.09	ChrgVtgEqu	Cell voltage setpoint for equalization charge in V (expert mode)	2.30 V to 2.70 V	Off-Grid VRLA, On-Grid FLA, On-Grid	2.45 V 2.55 V 2.50 V
222.10	ChrgVtgFlo	Cell voltage setpoint for float charge in V (expert mode)	2.20 V to 2.40 V	-	2.25 V
222.11	BatTmpCps	Battery temperature compensation in mV/°C (expert mode)	0.0 mV/°C to 10.0 mV/°C	-	4.0 mV/°C
222.12	AutoEquChrgEna	Automatic equalization charge (expert mode)	Disable Enable	Disable Enable	Enable
222.13	BatChrgVtgMan	Manual setpoint of the battery charging voltage with disabled battery management in V (expert mode)	41.0 V to 63.0 V	-	54.0 V

**223# Protection**

No.	Name	Description	Value	Default value
223.01	BatPro1TmStr	Start time of the battery protection mode level 1 in hh:mm:ss (expert mode)	00:00:00 to 23:59:59	22:00:00
223.02	BatPro1TmStp	Stop time of the battery protection mode level 1 in hh:mm:ss (expert mode)	00:00:00 to 23:59:59	06:00:00
223.03	BatPro2TmStr	Start time of the battery protection mode level 2 in hh:mm:ss (expert mode)	00:00:00 to 23:59:59	17:00:00
223.04	BatPro2TmStp	Stop time of the battery protection mode level 2 in hh:mm:ss (expert mode)	00:00:00 to 23:59:59	09:00:00
223.05	BatPro1Soc	SOC for battery protection mode level 1 in % (expert mode)	0% to 70%	20%
223.06	BatPro2Soc	SOC for battery protection mode level 2 in % (expert mode)	0% to 70%	15%
223.07	BatPro3Soc	SOC for battery protection mode level 3 in % (expert mode)	0% to 70%	10%

**224# BatSilentmode**

No.	Name	Description	Value	Explanation	Default value
224.01	BatSilentEna	Silent mode on utility grid (expert mode)	Disable Enable	Disable Enable	Disable
224.02	BatSilentTmFlo	Maximum time for float charge until switch to silent mode in hours (expert mode)	1 h to 48 h	-	3 h
224.03	BatSilentTmMax	Maximum time for standby in silent mode until switch to float charge in hours (expert mode)	1 h to 168 h	-	12 h

**225# Current Sensor**

No.	Name	Description	Value	Explanation	Default value
225.01	BatCurSnsTyp	Type of battery current sensor	None 60 mV 50 mV	No sensor is connected 60 mV type 50 mV type	None
225.02	BatCurGain60	60 mV type in $A/_{60\text{ mV}}$	0 $A/_{60\text{ mV}}$ to 1,800 $A/_{60\text{ mV}}$	-	100 $A/_{60\text{ mV}}$
225.03	BatCurGain50	50 mV type in $A/_{50\text{ mV}}$	0 $A/_{50\text{ mV}}$ to 1,800 $A/_{50\text{ mV}}$	-	100 $A/_{50\text{ mV}}$
225.04	BatCurAutoCal	Automatic calibration of external battery current sensor	Start	Start automatic calibration	-

### 13.2.3 External/Backup (230#)

#### 231# General

No.	Name	Description	Value	Explanation	Default value
231.01	PvFeedTmStr	Start time for PV grid feed-in in hh:mm:ss (expert mode)	00:00:00 to 23:59:59	-	04:00:00
231.02	PvFeedTmStp	Stop time for PV grid feed-in in hh:mm:ss (expert mode)	00:00:00 to 23:59:59	-	22:00:00
231.03	ExtLkTm	Lock time after reverse power or relay protection in minutes (expert mode)	0 min to 60 min	-	20 min
231.06	ExtSrc	Generator and grid operating mode	PvOnly Gen Grid GenGrid	Only AC sources in the stand-alone grid, no generator in the off-grid system Generator Utility grid Generator or utility grid	-
231.14	AC2NSel	Terminal at which the neutral conductor is connected to <b>AC2</b> .	N NTT	The neutral conductor is connected to terminal <b>N</b> . The neutral conductor is connected to terminal <b>N<sub>TT</sub></b> .	-

#### 232# Grid Control

No.	Name	Description	Value	Explanation	Default value
232.01	Country	Country data set (protected by SMA Grid Guard)	Other VDE-AR-4105 AS4777	Individual setting Code of Practice VDE-AR-N 4105 Standard AS4777	- - -
232.02	GdVtgMin	Minimum line voltage in V (expert mode, protected by SMA Grid Guard)	172.50 V to 210.01 InvVtgNom	230 V / 50 Hz 220 V / 60 Hz	184.00 V 194.00 V
232.03	GdVtgMax	Maximum line voltage in V (expert mode, protected by SMA Grid Guard)	210.01 InvVtgNom to 264.50 V	230 V / 50 Hz 220 V / 60 Hz	264.50 V 242.00 V

No.	Name	Description	Value	Explanation	Default value
232.04	GdCurNom	Utility grid nominal current in A	0.0 A to 50.0 A	1 Sunny Island	16.0 A
			0.0 A to 100.0 A	2 Sunny Island inverters parallel	
			0.0 A to 150.0 A	3 Sunny Island inverters parallel	
			0.0 A to 50.0 A	Three-phase	
232.05	GdFrqNom	Utility grid nominal frequency in Hz (expert mode)	232.05 GdFrqMin to 232.06 GdFrqMax	230 V / 50 Hz 220 V / 60 Hz	50.00 Hz 60.00 Hz
232.06	GdFrqMin	Minimum power frequency in Hz (expert mode, protected by SMA Grid Guard)	40.00 Hz to 232.04 GdFrqNom	230 V / 50 Hz	47.50 Hz
				220 V / 60 Hz	59.30 Hz
232.07	GdFrqMax	Maximum power frequency in Hz (expert mode, protected by SMA Grid Guard)	232.05 GdFrqNom to 70.00 Hz	230 V / 50 Hz	51.50 Hz
				220 V / 60 Hz	60.50 Hz
232.08	GdVldTm	Minimum observation time for line voltage and frequency in the permissible range for connection in s (expert mode, protected by SMA Grid Guard)	5 s to 900 s	VDE-AR-N 4105 AS4777	60 s
				220 V / 60 Hz	300 s
232.09	GdMod	Grid interface (expert mode)	GridCharge	Charge on utility grid	GridCharge
			GridFeed	Charge and feedback on utility grid	
232.10	GdRvPwr	Permissible active power of grid reverse power in W (expert mode)	0 W to 5,000 W	1 Sunny Island or single-cluster system	100 W
			0 W to 20,000 W	Multicluster system	100 W
232.11	GdRvTm	Permissible time for grid reverse power in s (expert mode)	0 s to 60 s	-	5 s
232.16	GdAISns	Sensitivity of the anti-islanding detection (expert mode, protected by SMA Grid Guard)	Low	Low	Normal
			Medium	Medium	
			Normal	Normal	
			High	High	
232.38	GdVtgIncProEna	Voltage increase protection (protected by SMA Grid Guard)	Enable	Enable	-
			Disable	Disable	

No.	Name	Description	Value	Explanation	Default value
232.39	GdVtgIncPro	Limiting value for the ten minute average value of the voltage increase protection (protected by SMA Grid Guard)	253.0 V to 264.5 V	230 V / 50 Hz	253.0 V
			242.0 V to 253.0 V	220 V / 60 Hz	242.0 V
232.41	P-WCtHzMod	Frequency-dependent active power limitation (expert mode, protected by SMA Grid Guard)	Off	Disable	
			WCtHz	Enable	
232.42	P-HzStr	Start frequency of the active power limitation in Hz (expert mode, protected by SMA Grid Guard)	0.0 Hz to 5.0 Hz	This values defines how many Hz above <b>210.02 InvFrqNom</b> the active power limitation starts.	0.2 Hz
232.43	P-HzStop	End frequency of the active power limitation in Hz (expert mode, protected by SMA Grid Guard)	0.0 Hz to 5.0 Hz	This values defines how many Hz above <b>210.02 InvFrqNom</b> the active power limitation stops.	0.2 Hz
232.44	P-WGra	Increase of the active power limitation in %/Hz (expert mode, protected by SMA Grid Guard)	10%/Hz to 130%/Hz	-	40%/Hz
232.48	Q-VArMod	Setpoint of the displacement power factor $\cos \varphi$ (expert mode, protected by SMA Grid Guard)	Off	Disable	
			PFCnst	Constant displacement power factor $\cos \varphi$	
			PFCtIW	Automatic adjustment of the displacement power factor depending on the current active power	
232.49	PF-PF	Setpoint of the displacement power factor $\cos \varphi$ at <b>PFCnst</b> (expert mode, protected by SMA Grid Guard)	0.8 to 1	Code of Practice VDE-AR-N 4105	0.9
				Standard AS-4777	1
232.50	PF-PFExt	Type of excitation of the displacement power factor $\cos \varphi$ at <b>PFCnst</b> (expert mode, protected by SMA Grid Guard)	OvExt	Overexcited	UnExt
			UnExt	Underexcited	

No.	Name	Description	Value	Explanation	Default value
232.51	PF-PFStr	Displacement power factor $\cos \varphi$ at the start point at <b>PFctIW</b> (expert mode, protected by SMA Grid Guard)	0.8 to 1	-	1
232.52	PF-PFExtStr	Excitation type at the start point at <b>PFctIW</b> (expert mode, protected by SMA Grid Guard)	OvExt UnExt	Overexcited Underexcited	OvExt
232.53	PF-WNomStr	Proportion of the maximum active power at the start point in % at <b>PFctIW</b> (expert mode, protected by SMA Grid Guard)	0% to 232.56 PF-WNomStop	-	50%
232.54	PF-PFStop	Displacement power factor $\cos \varphi$ at the end point at <b>PFctIW</b> (expert mode, protected by SMA Grid Guard)	0.8 to 1.0	-	0.9
232.55	PF-PFExtStop	Excitation type at the end point at <b>PFctIW</b> (expert mode, protected by SMA Grid Guard)	OvExt UnExt	Overexcited Underexcited	UnExt
232.56	PF-WNomStop	Proportion of the maximum active power at the end point in % at <b>PFctIW</b> (expert mode, protected by SMA Grid Guard)	232.52 PF-WNomStr to 100%	-	100%

### 233# Grid Start

No.	Name	Description	Value	Explanation	Default value
233.01	GdSocEna	Enable grid request based on SOC (expert mode)	Disable Enable	Disable Enable	Disable
233.02	GdSocTm1Str	SOC limiting value for connection to the utility grid in interval 1 in % (expert mode)  Interval 1 begins at time <b>233.06 GdTm1Str</b> .	1% to 233.03 GdSocTm1Stp	-	40%

No.	Name	Description	Value	Explanation	Default value
233.03	GdSocTm1Stp	SOC limiting value for disconnection from the utility grid in interval 1 in % (expert mode)  Interval 1 begins at time <b>233.06 GdTm1Str.</b>	233.02 GdSocTm1Str to 95%	-	80%
233.04	GdSocTm2Str	SOC limiting value for connection to the utility grid in interval 2 in % (expert mode)  Interval 2 begins at time <b>233.07 GdTm2Str.</b>	1% to 233.05 GdSocTm2Str	-	40%
233.05	GdSocTm2Stp	SOC limiting value for disconnection from the utility grid in interval 2 in % (expert mode)  Interval 2 begins at time <b>233.07 GdTm2Str.</b>	233.04 GdSocTm2Str to 95%	-	80%
233.06	GdTm1Str	Start of interval 1 for grid request in hh:mm:ss (expert mode)	00:00:00 to 23:59:59	-	-
233.07	GdTm2Str	Start of interval 2 for grid request in hh:mm:ss (expert mode)	00:00:00 to 23:59:59	-	-
233.08	GdPwrEna	Grid request based on power (expert mode)	Disable Enable	Disable Enable	Disable
233.09	GdPwrStr	Grid request connection power limit in kW (expert mode)	233.10 GdPwrStp to 300 kW	-	4.0 kW
233.10	GdPwrStp	Grid request disconnection power limit in kW (expert mode)	0 kW to 233.09 GdPwrStr	-	2.0 kW
233.11	GdStrChrgMod	Connection to utility grid in configured charge mode (expert mode)	Off Full Equal Both	Off Full charge Equalization charge Full and equalization charge	Equal



**234# Gen Control**

No.	Name	Description	Value	Explanation	Default value
234.01	GnVtgMin	Minimum generator voltage in V (expert mode)	172.5 V to 210.01 InvVtgNom	-	172.50 V
234.02	GnVtgMax	Maximum generator voltage in V (expert mode)	210.01 InvVtgNom to 264.5 V	-	250.0 V
234.03	GnCurNom	Nominal generator current in A	0.0 A to 50.0 A	1 Sunny Island	16.0 A
			0.0 A to 100.0 A	2 Sunny Island inverters parallel	16.0 A
			0.0 A to 150.0 A	3 Sunny Island inverters parallel	16.0 A
			0.0 A to 50.0 A	Three-phase	16.0 A
			0.0 A to 80.0 A	Multicluster Box 6	60.0 A
			0.0 A to 160.0 A	Multicluster Box 12	160.0 A
			0.0 A to 500.0 A	Multicluster Box 36	435.0 A
234.04	GnFrqNom	Nominal generator frequency under nominal load in Hz (expert mode)	234.05 GnFrqMin to 234.06 GnFrqMax	230 V / 50 Hz	50.00 Hz
				220 V / 60 Hz	60.00 Hz
234.05	GnFrqMin	Minimum generator frequency in Hz (expert mode)	40.00 Hz to 234.04 GnFrqNom	230 V / 50 Hz	44.64 Hz
			50.00 Hz to 234.04 GnFrqNom	220 V / 60 Hz	50.00 Hz
234.06	GnFrqMax	Maximum generator frequency in Hz (expert mode)	234.04 GnFrqNom to 70.00 Hz	230 V / 50 Hz	60.00 Hz
				220 V / 60 Hz	70.00 Hz
234.07	GnStrMod	Generator interface	Manual	Manual	Autostart
			Autostart	Automatic	
234.08	GnOpTmMin	Minimum run time of generator in minutes	0 min to 360 min	-	15 min
234.09	GnStpTmMin	Minimum stop time of the generator in minutes	0 min to 360 min	-	15 min
234.10	GnCoolTm	Cooling time of the generator in minutes	0 min to 60 min	-	5 min
234.11	GnErrStpTm	Stop time of the generator in the event of an error in hours (expert mode)	0 h to 24 h	-	1 h
234.12	GnWarmTm	Warm-up time in seconds	5 s to 900 s	-	60 s
234.13	GnRvPwr	Active power of the generator reverse power in W (expert mode)	0 W to 5,000 W	1 Sunny Island or single-cluster system	100 W
			0 W to 20,000 W	Multicluster system	100 W

No.	Name	Description	Value	Explanation	Default value
234.14	GnRvTm	Permissible time for reverse power or reverse current, in s (expert mode)	0 s to 900 s	-	30 s
234.15	GnCtlMod	Generator control (expert mode) The generator control limits the consumption of generator current.	Cur	Fixed limiting value for current limitation	Cur
			CurFrq	Frequency-dependent current limitation	
234.20	GnAlSns	Anti-islanding sensitivity (expert mode)	Low	Low	Normal
			Medium	Medium	
			Normal	Normal	
			High	High	
234.41	GnCurCtlMod	Enable I-Loop in generator mode (expert mode) I-Loop enables generators with inadequate voltage regulation to be used in the system.	Droop	Standard generator operation without I-Loop	Droop
			CurCtl	Current-controlled generator operation with I-Loop	

### 235# Gen Start

No.	Name	Description	Value	Explanation	Default value
235.01	GnAutoEna	Automatic restart of generator in the event of disturbance	Off	Disable	On
			On	Enable	
235.02	GnAutoStr	Number of attempts to carry out automatic restart of generator (expert mode)	0 to 10	-	3
235.03	GnSocTm1Str	SOC limiting value for generator request in interval 1 in % Interval 1 begins at time 235.07 GnTm1Str	1% to 235.04 GnSocTm1Stp	-	40%
235.04	GnSocTm1Stp	SOC limiting value for end of generator request in interval 1 in % Interval 1 begins at time <b>235.07 GnTm1Str.</b>	235.03 GnSocTm1Str to 95%	-	80%
235.05	GnSocTm2Str	SOC limiting value for generator request in interval 2 in % Interval 2 begins at time <b>235.08 GnTm2Str.</b>	1% to 235.06 GnSocTm2Stp	-	40%

No.	Name	Description	Value	Explanation	Default value
235.06	GnSocTm2Stp	SOC limiting value for end of generator request in interval 2 in %  Interval 2 begins at time <b>235.08 GnTm2Str.</b>	235.05 GnSocTm2 Str to 95%	-	80%
235.07	GnTm1Str	Start of interval 1 for grid request in hh:mm:ss	00:00:00 to 23:59:59	-	00:00:00
235.08	GnTm2Str	Start of interval 2 for grid request in hh:mm:ss	00:00:00 to 23:59:59	-	00:00:00
235.09	GnPwrEna	Load-dependent generator request (expert mode)	Disable Enable	Disable Enable	Enable
235.10	GnPwrStr	Limiting value for load-dependent generator request in kW (expert mode)	235.11 GnPwrStp to 300.0 kW	-	4.0 kW
235.11	GnPwrStp	Limiting value for end of load-dependent generator request, in kW (expert mode)	0.0 kW to 235.10 GnPwrStr	-	2.0 kW
235.12	GnPwrAvgTm	Averaging time for load-dependent generator request in s (expert mode)	1 s to 900 s	-	60 s
235.13	GnTmOpEna	Time-controlled generator operation	Disable Enable	Disable Enable	Disable
235.14	GnTmOpStrDt	Start date for time-controlled generator operation in dd.mm.yyyy	-	-	01.01.2011
235.15	GnTmOpStrTm	Time at the start of time-controlled generator mode in hh:mm:ss	00:00:00 to 23:59:59	-	00:00:00
235.16	GnTmOpRnDur	Run time for time-controlled generator operation in hh:mm:ss	00:00:00 to 99:59:00	-	00:00:00
235.17	GnTmOpCyc	Repeat cycle for time-controlled generator operation	Single Daily Weekly	Once Daily Weekly	Single
235.18	GnStrChrgMod	Generator request in configured charge mode (expert mode)	Off Full Equal Both	Off Full charge Equalization charge Full and equalization charge	Both
235.19	GnStrDigIn	Generator request in response to signal on activated digital input (expert mode)	Disable Enable	Disable Enable	Disable

## 13.2.4 Relay (240#)

### 241# General

No.	Name	Description	Value	Explanation	Default value
241.01	Rly1Op	Multifunction relay 1 function	Off	The multifunction relay is always in non-operative mode.	AutoGn
			On	The multifunction relay is permanently activated.	
			AutoGn	The Sunny Island automatically requests the generator. In case of a generator request, the multifunction relay is activated.	
			AutoLodExt	1-level load shedding When connecting the generator the Sunny Island stops the load shedding. When the loads are shed, the multifunction relay is deactivated.	
			AutoLod1Soc	1-level load shedding or first level of 2-level load shedding When the upper SOC limiting value is reached, the Sunny Island ends load shedding. When the loads are shed, the multifunction relay is deactivated.	
			AutoLod2Soc	Second level of 2-level load shedding When the upper SOC limiting value is reached, the Sunny Island ends load shedding. When the loads are shed, the multifunction relay is deactivated.	
			Tm1	Timer 1 The Sunny Island controls external processes time-dependently. When the set time <b>#243 Timer</b> is reached, the multifunction relay is activated.	
			Tm2	Timer 2 The Sunny Island controls external processes time-dependently. When the set time <b>#243 Timer</b> is reached, the multifunction relay is activated.	
ExtPwrDer	The Sunny Island controls additional loads in order to put excess energy to practical use. When excessive energy can be used, the multifunction relay is activated.				

No.	Name	Description	Value	Explanation	Default value
241.01	Rly1Op	Function of multifunction relay 1 function (continued)	GnRn	When the generator is running and connected, the multifunction relay activates.	AutoGn
			ExtVfOk	When the voltage and frequency of the external energy source are within the valid range for the connection, the multifunction relay activates.	
			GdOn	When the utility grid is connected, the multifunction relay activates.	
			Error	When an error message is pending, the multifunction relay deactivates.	
			Warn	When a warning is pending, the multifunction relay activates.	
			Run	When the Sunny Island or the cluster is in operation, the multifunction relay is activated.	
			BatFan	The Sunny Island controls the battery room fan. When the battery room is to be ventilated, the multifunction relay is activated.	
			AcdCir	The Sunny Island controls the electrolyte pump of the battery. When the electrolyte is to be circulated, the multifunction relay is activated.	
			MccBatFan	The Sunny Island controls the battery room fan for all clusters together. When the battery room is to be ventilated, the multifunction relay is activated.	
			MccAutoLod	1-level load shedding When all batteries have reached the upper SOC limiting value, the Sunny Island ends load shedding. When the loads are shed, the multifunction relay is deactivated.	
			CHPReq	No function	
			CHPAdd	No function	
			SiComRemote	Multifunction relay is controlled via <b>ComSync</b> .	
			Overload	When the Sunny Island limits its power, the multifunction relay is deactivated.	
GriSwT	Triggering of contactors for grid disconnection in the battery backup system				

No.	Name	Description	Value	Explanation	Default value
241.01	Rly1Op	Function of multifunction relay 1 (continued)	GndSwT	Triggering of the grounding in the battery backup system	AutoGn
241.02	Rly2Op	Multifunction relay 2 function	See <b>241.01 Rly1Op</b> , page 108 for value and explanation		AutoLodExt

No.	Name	Description	Value	Default value
241.07	ExtPwrDerMinTm	Minimum time for the <b>ExtPwrDer</b> function of the multifunction relay in minutes	0 min to 600 min	10 min
241.08	ExtPwrDerDltVtg	Voltage difference for the <b>ExtPwrDer</b> function of the multifunction relay in V  The voltage difference corresponds to the cell voltage of the battery.	0 V to 0.40 V	0.15 V

## 242# Load

No.	Name	Description	Value	Default value
242.01	Lod1SocTm1Str	SOC limiting value for starting load shedding 1 in interval 1 in %  Interval 1 begins at time <b>242.05 Lod1Tm1Str</b> .	1% to 242.02 Lod1SocTm1Stp	30%
242.02	Lod1SocTm1Stp	SOC limiting value for stopping load shedding 1 in interval 1 in %  Interval 1 begins at time <b>242.05 Lod1Tm1Str</b> .	242.01 Lod1SocTm1Str to 90%	50%
242.03	Lod1SocTm2Str	SOC limiting value for starting load shedding 1 in interval 2 in %  Interval 2 begins at time <b>242.06 Lod1Tm2Str</b> .	1% to 242.04 Lod1SocTm2Stp	30%
242.04	Lod1SocTm2Stp	SOC limiting value for stopping load shedding 1 in interval 2 in %  Interval 2 begins at time <b>242.06 Lod1Tm2Str</b> .	242.03 Lod1SocTm2Str to 90%	50%
242.05	Lod1Tm1Str	Start of interval 1 for load shedding 1, in hh:mm:ss	00:00:00 to 23:59:59	-
242.06	Lod1Tm2Str	Start of interval 2 for load shedding 1, in hh:mm:ss	00:00:00 to 23:59:59	-
242.07	Lod2SocTm1Str	SOC limiting value for starting load shedding 2 in interval 1 in %  Interval 1 begins at time <b>242.11 Lod2Tm1Str</b> .	1% to 242.08 Lod2SocTm1Stp	30%

No.	Name	Description	Value	Default value
242.08	Lod2SocTm1Stp	SOC limiting value for stopping load shedding 2 in interval 1 in % Interval 1 begins at time <b>242.11 Lod2Tm1Str.</b>	242.07 Lod2SocTm1Str to 90%	50%
242.09	Lod2SocTm2Str	SOC limiting value for starting load shedding 2 in interval 2 in % Interval 2 begins at time <b>242.12 Lod2Tm2Str.</b>	1% to 242.10 Lod2SocTm2Stp	30%
242.10	Lod2SocTm2Stp	SOC limiting value for stopping load shedding 2 in interval 2 in % Interval 2 begins at time <b>242.12 Lod2Tm2Str.</b>	242.09 Lod2SocTm2Str to 90 %	50%
242.11	Lod2Tm1Str	Start of interval 1 for load shedding 2 in hh:mm:ss	00:00:00 to 23:59:59	00:00:00
242.12	Lod2Tm2Str	Start of interval 2 for load shedding 2 in hh:mm:ss	00:00:00 to 23:59:59	00:00:00

### 243# Timer

No.	Name	Description	Value	Explanation	Default value
243.01	RlyTmr1StrDt	Start date for timer 1 in dd.mm.yyyy	-	-	01.01.2011
243.02	RlyTmr1StrTm	Start time at which the multifunction relay activates for timer 1 in hh:mm:ss	00:00:00 to 23:59:59	-	-
243.03	RlyTmr1Dur	Duration for which the multifunction relay remains activated for timer 1 in hh:mm:ss	00:00:00 to 99:59:00	-	-
243.04	RlyTmr1Cyc	Repetition cycle time for timer 1	Single Daily Weekly	Once Daily Weekly	Single
243.05	RlyTmr2StrDt	Start date for timer 2 in dd.mm.yyyy	-	-	01.01.2011
243.06	RlyTmr2StrTm	Start time at which the multifunction relay activates for timer 2 in hh:mm:ss	00:00:00 to 23:59:59	-	-
243.07	RlyTmr2Dur	Duration for which the multifunction relay remains activated for timer 2 in hh:mm:ss	00:00:00 to 99:59:00	-	-
243.08	RlyTmr2Cyc	Repetition cycle time for timer 2	Single Daily Weekly	Once Daily Weekly	Single

**244# Slave1**

No.	Name	Description	Value	Explanation	Default value
244.01	Rly1OpSlv1	Multifunction relay 1 of slave 1 function	See <b>241.01 Rly1Op</b> , page 108 for value and explanation		Off
244.02	Rly2OpSlv1	Multifunction relay 1 of slave 1 function	See <b>241.01 Rly1Op</b> , page 108 for value and explanation		Off

**245# Slave2**

No.	Name	Description	Value	Explanation	Default value
245.01	Rly1OpSlv2	Multifunction relay 1 of slave 2 function	See <b>241.01 Rly1Op</b> , page 108 for value and explanation		Off
245.02	Rly2OpSlv2	Multifunction relay 2 of slave 2 function	See <b>241.01 Rly1Op</b> , page 108 for value and explanation		Off

**13.2.5 System (250#)**

No.	Name	Description	Value	Explanation	Default value
250.01	AutoStr	Number of autostarts	0 to 10	<b>0</b> indicates that autostart is disabled.	3
250.02	Dt	Date in dd.mm.yyyy	-	-	-
250.03	Tm	Time in hh:mm:ss	-	-	-
250.04	BeepEna	Button sound	Off On	Disable Enable	On
250.06	ComBaud	Baud rate in Bd This value cannot be used with Speedwire.	1,200 4,800 9,600 19,200 115 k	Default value for RS485 communication. - - - Default value for Speedwire communication.	-
250.09	ComAdr	Communication address (non-adjustable)	0 to 65 535	-	1
250.11	AfraEna	Automatic frequency synchronization (AFRA) (expert mode)	Disable Enable	Disable Enable	-
250.23	Box	Type of Multicluster Box used	None MC-Box-6 MC-Box-9 MC-Box-12 MC-Box-36	None Multicluster Box 6.3 Multicluster Box 9.3 Multicluster Box 12.3 Multicluster Box 36.3	-



No.	Name	Description	Value	Explanation	Default value
250.24	ClstMod	Cluster type (adjustable in QCG)	SingleClst	Single cluster	-
			MainClst	Main cluster	-
			ExtnClst	Extension cluster	-
250.26	MtrDatSel	Readout device for energy meters	MtrBox	Meter Box for Sunny Backup	-
			HomeMngr	Sunny Home Manager	-
250.29	ChrgCtlOp	Types of energy sources in the system (expert mode)	Auto	AC sources and DC charge controllers	Auto
			NoFrq	DC charge controllers only The DC charge controllers are not Sunny Island Charger devices and there are no AC sources in the system.	
			SMA	Sunny Island Charger devices only No AC sources in the system.	
250.31	RnMod	Run Mode Behavior under fault conditions	RunAlways	In the event of a slave device error, the cluster remains in operation	RunAlways
			StopAlways	In the event of a device error, the cluster stops operation	
250.32	ChLstSel	Selection of short or normal channel list (expert mode) The length must be compatible with the communication device.	Short	Short	Normal
			Normal	Normal	
250.33	UpdMode	Type of firmware update	Manual	Update must be confirmed on the Sunny Remote Control.	Manual
			Auto	Update will be performed automatically at the set time <b>250.34 UpdAutoTime</b> .	
			Never	Deactivation of all updates	
250.34	UpdAutoTime	Point in time for performing the automatic firmware update in hh:mm:ss	00:00:00 to 23:59:59	-	05:00:00

## 13.2.6 SlfCsmBackup (#260)

### 261# General

No.	Name	Description	Value (plain text no.)	Explanation	Default value
261.01	SlfCsmplncEna	Increased self-consumption	Disable	Disable	–
			Enable	Enable	
261.02	SlfCsmPosSel	System location (expert mode)	North	Northern hemisphere	–
			South	Southern hemisphere	
261.03	Saisonenable	Automatic alignment of the battery depth of discharge (expert mode)  In seasons with fewer hours of sunlight the battery will undergo deep electric discharges less.	No	Disable	Yes
			Yes	Enable	

### 262# BatUsage

No.	Name	Description	Value (plain text no.)	Explanation	Default value
262.01	ProtResSOC	Range for protection in the event of deep discharge as a percentage of the battery capacity (expert mode)	10% to 20%	Lead-acid batteries	10%
			3% to 20%	Lithium-ion batteries	3%
262.02	BatResSOC	Range for protection against deep discharge as a percentage of the battery capacity (expert mode)	2% to 50%	Lithium-ion battery, self-consumption only	2%
				Lithium-ion battery battery backup system	10%
				Lead-acid battery, self-consumption only	30%
				Lead-acid battery, battery backup system	5%
262.03	BUResSOC	Range for the battery backup function on the longest day of the year as a percentage of the battery capacity (expert mode)	0% to 100%	–	0%
262.04	PVResSOC	Range for maintaining the state of charge of the battery as a percentage of the nominal capacity (expert mode)	4% to 20%	–	5%
262.05	MinSlfCsmSOC	Range for increased self-consumption on the shortest day of the year as a percentage of the battery capacity (expert mode)	0% to 100%	Lithium-ion battery	70%
				Lead-acid battery	35%

### 13.2.7 Authent (270#)

No.	Name	Description
270.01	Auth.Code	Entry of the SMA Grid Guard code

## 13.3 Information (300#)

### 13.3.1 Inverter (310#)

#### 311# Total

No.	Name	Description
311.01	EgyCntIn	Energy consumed by the Sunny Island in kWh
311.02	EgyCntOut	Energy supplied by the Sunny Island in kWh
311.03	EgyCntTm	Run time of energy metering in hours

#### 312# Device

No.	Name	Description	Value (plain text no.)	Explanation
312.01	Adr	Device address	Master (1)	Address
			Slave 1 (2)	Address
			Slave2 (3)	Address
312.03	AppSel	Operating mode of the Sunny Island (expert mode)	Offgrid	Sunny Island is operating in the stand-alone grid.
			OnGrid	Sunny Island is connected to the utility grid.
312.05	SysFncSel	Selection of the on-grid system	SelfConsOnly	Increased self-consumption only
			BackupOnly	Battery backup only
			SelfConsBackup	Battery backup with increased self-consumption
312.06	FwVer	Firmware version of master	-	-
312.07	SN	Serial number of master	-	-
312.08	OnTmh	Operating hours	-	-
312.09	ClstCfgAt	Set configuration of cluster	1Phase1	Single-phase, 1 Sunny Island
			1Phase2	Single-phase, 2 Sunny Island inverters
			1Phase3	Single-phase, 3 Sunny Island inverters
			3Phase	Three-phase, 3 Sunny Island inverters

No.	Name	Description	Value (plain text no.)	Explanation
312.10	OpStt	Operating state of the Sunny Island	Operating (1)	Operation
			Warning (2)	Warning
			Failure (3)	Failure
312.11	CardStt	SD memory card status message	Off (1)	No SD memory card inserted
			Operational (2)	Ready for operation
			Mount (3)	Initialization
			OutOfSpace (4)	No storage space available
			BadFileSys (5)	No file system detected
			Incomp (6)	File system incompatible
			Parameter (7)	Parameter set write access
			ParamFailed (8)	Parameter set write access failed
			WriteLogData (9)	Log data write access
312.12	FwVer2	Firmware version of the digital signal processor	-	-
312.13	FwVer3	Boot loader of the operation control unit	-	-
312.14	FwVer4	Boot loader of the digital signal processor	-	-
312.18	ComMod1	Type of interface in the interface slot <b>SiSysCan</b>	---	No interface inserted
			SI-SysCan	SI-SYSCAN.BGx inserted (multicluster system)
312.19	ComMod2	Type of interface in the interface slot <b>SiComSma</b>	---	No interface inserted
			SI-ComSma	SI-COM SMA.BGx inserted (RS485)
			SI-SW-DM	SWDMSI-NR inserted (Speedwire)

### 313# Slave1

No.	Name	Description	Value	Explanation
313.01	FwVerSlv1	Firmware version of slave 1	-	-
313.02	SNSlv1	Serial number of slave 1	-	-
313.03	OnTmhSlv1	Operating hours of slave 1 in hours	-	-
313.04	PhSlv1	Line conductor assignment of slave 1	L1	Line conductor L1
			L2	Line conductor L2
			L3	Line conductor L3

No.	Name	Description	Value	Explanation
313.05	OpSttSlv1	Operating state of slave 1	Operating	Operation
			Warning	Warning
			Failure	Failure
313.06	FwVer2Slv1	DSP firmware version of slave 1	-	-
313.07	FwVer3Slv1	OCU boot loader of slave 1	-	-
313.08	FwVer4Slv1	DSP boot loader of slave 1	-	-

### 314# Slave2

No.	Name	Description	Value	Explanation
314.01	FwVerSlv2	Firmware version of slave 2	-	-
314.02	SNSlv2	Serial number of slave 2	-	-
314.03	OnTmhSlv2	Operating hours of slave 2 in hours	-	-
314.04	PhSlv2	Line conductor assignment of slave 2	L1	Line conductor L1
			L2	Line conductor L2
			L3	Line conductor L3
314.05	OpSttSlv2	Operating state of slave 2	Operating	Operation
			Warning	Warning
			Failure	Failure
314.06	FwVer2Slv2	Firmware version of the digital signal processor of slave 2	-	-
314.07	FwVer3Slv2	Boot loader of the operation control unit of slave 2	-	-
314.08	FwVer4Slv2	Boot loader of the digital signal processor of slave 2	-	-

### 13.3.2 Battery (320#)

No.	Name	Description
320.01	Soh	State of charge (SOH) in % Ratio of currently usable capacity to the rated value of the battery
320.02	StatTm	Run time of statistics counter in days
320.03	ChrgFact	Charge factor
320.04	BatEgyCntIn	Energy meter for battery charging in kWh
320.05	BatEgyCntOut	Energy meter for battery discharging in kWh
320.06	AhCntIn	Battery charging counter in Ah
320.07	AhCntOut	Battery discharging counter in Ah
320.08	BatTmpPkMin	Minimum battery temperature in °C
320.09	BatTmpPkMax	Maximum battery temperature in °C
320.10	EquChrgCnt	Equalization charge meter

No.	Name	Description
320.11	FulChrgCnt	Full charge counter
320.12	BatCurOfsErr	Estimated offset error of battery current in A (expert mode)
320.13	OcvPointCnt	Counter for open-circuit voltage points (expert mode)
320.15	AhCntFul	Ampere-hour meter for battery discharging since the last full charge in $\text{Ah}/100 \text{ Ah}$
320.16	AhCntEqu	Ampere-hour meter for battery discharging since the last equalization charge in $\text{Ah}/100 \text{ Ah}$
320.17	BatVtgPk	Maximum battery voltage reached since the last start in V
320.18	BatCurPkIn	Maximum battery current reached since the last start in charge direction in A
320.19	BatCurPkOut	Maximum battery current reached since the last start in discharge direction in A
320.20	SocHgm100	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 100% to and including 90%, based on time in % (expert mode)
320.21	SocHgm090	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 90% to and including 80%, based on time in % (expert mode)
320.22	SocHgm080	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 80% to and including 70%, based on time in % (expert mode)
320.23	SocHgm070	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 70% to and including 60%, based on time in % (expert mode)
320.24	SocHgm060	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 60% to and including 50%, based on time in % (expert mode)
320.25	SocHgm050	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 50% to and including 40%, based on time in % (expert mode)
320.26	SocHgm040	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 40% to and including 30%, based on time in % (expert mode)
320.27	SocHgm030	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 30% to and including 20%, based on time in % (expert mode)
320.28	SocHgm020	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 20% to and including 10%, based on time in % (expert mode)
320.29	SocHgm010	Percentage frequency distribution of state of charge (SOC) when SOC is in the range of 10 % to and including 0 %, based on time in % (expert mode)
320.30	SocHgm000	Frequency distribution of SOC in relation to time, when SOC is equal to 0% in % (expert mode)
320.31	SocVtgCal	Recalibration of SOC based on open-circuit voltage only in % (expert mode)
320.32	ErrSocVtgCal	Estimated error of the voltage-calibrated state of charge in % (expert mode)
320.33	SocChrgCal	Recalibration of SOC based on full charge only in % (expert mode)
320.34	ErrSocChrgCal	Estimated error of the full-charge-calibrated state of charge in % (expert mode)
320.35	OcvGra	Gradient of the open-circuit voltage characteristic curve in $\text{Ah}/\text{V}$ (expert mode)
320.36	OcvMax	Maximum open-circuit voltage in V (expert mode)

### 13.3.3 External (330#)

#### 331# Grid

No.	Name	Description
331.01	GdEgyCntIn	Energy meter for grid feed-in in kWh
331.02	GdEgyCntOut	Energy meter for purchased electricity in kWh
331.03	GdEgyTmh	Duration in which an energy exchange is possible with the utility grid in hours
331.04	GdOpTmh	Operating hours counter for grid operation in hours
331.05	GdCtcCnt	Number of grid connections
331.06	TotTmh	Feed-in hours
331.07	GdFailTms	Duration of the grid failure in s

#### 332# Generator

No.	Name	Description
332.01	GnEgyCnt	Energy meter for generator in kWh
332.02	GnEgyTm	Duration of the energy measuring for the generator in hours
332.03	GnOpTmh	Operating hours counter for generator in hours
332.04	GnStrCnt	Number of generator starts

## 13.4 Report (400#)

#### 410# Error active

Display of currently pending warnings and errors (see Section 9 "Troubleshooting", page 40).

#### 420# Error history

History of warnings and errors (see Section 9 "Troubleshooting", page 40).

#### 430# Event history

History of events (see Section 9 "Troubleshooting", page 40).

#### 440# Error Grid

History of the last five grid errors (see Section 9 "Troubleshooting", page 40).

## 13.5 Operation (500#)

### 13.5.1 Inverter (510#)

No.	Name	Description	Value	Explanation	Default value
510.01	InvRs	Trips a restart of the Sunny Island	No	Do not restart	-
			Yes	Restart	
510.02	InvTmOpEna	Time-controlled operation	Disable	Disable	Disable
			Enable	Enable	
510.03	InvTmOpStrDt	Start date for time-controlled operation in dd.mm.yyyy	-	-	-
510.04	InvTmOpStrTm	Time for the start of time-controlled operation in hh:mm:ss	00:00:00 to 23:59:59	-	-
510.05	InvTmOpRnDur	Run time for time-controlled operation in hh:mm:ss	00:00:00 to 99:59:00	-	-
510.06	InvTmOpCyc	Repetition cycle for time-controlled operation	Single	Once	Single
			Daily	Daily	
			Weekly	Weekly	
510.07	CntRs	Delete energy meter The value indicates which energy meter is to be deleted.	Inv	Sunny Island	-
			Bat	Battery	
			Gn	Generator	
			Gd	Utility grid	
			All	All energy meters	
			Sic1	Sunny Island Charger 1	
			Sic2	Sunny Island Charger 2	
			Sic3	Sunny Island Charger 3	
Sic4	Sunny Island Charger 4				
SicAll	All Sunny Island Charger devices				
510.08	TstClstCom	Activation of communication test between individual clusters (expert mode)	Off	Off	-
			Transmit	Enable	
510.09	ClstComStt	Status of communication test (expert mode)	Wait	Wait	-
			OK	Completed	



### 13.5.2 Battery (520#)

No.	Name	Description	Value	Explanation	Default value
520.01	ChrgSelMan	Manual equalization charge	Idle	Waiting until conditions are met	Idle
			Start	Start	
			Stop	Stop	

### 13.5.3 Generator (540#)

No.	Name	Description	Value	Explanation	Default value
540.01	GnManStr	Manual generator start	Auto	Automatic	Auto
			Stop	Stop	
			Start	Start	
			Run1h	Start for 1 hour	
540.02	GnAck	Acknowledgement of generator errors	Ackn	Acknowledge	-

### 13.5.4 MMC-Card (550#)

No.	Name	Description	Value	Explanation
550.01	ParaSto	Save parameter settings	Set1	Parameter set 1
			Set2	Parameter set 2
550.02	ParaLod	Load parameter settings (expert mode)	Set1	Parameter set 1
			Set2	Parameter set 2
			Factory	Load default settings
550.03	CardFunc	Functions of the SD memory card	ForcedWrite	Forced write
			StoEvtHis	Storing event memory
			StoFailHis	Storing fault memory
			StoHis	Storing event and fault memory

### 13.5.5 Grid (560#)

No.	Name	Description	Value	Explanation	Default value
560.01	GdManStr	Manual connection to the utility grid	Auto	Automatic	Auto
			Stop	Stop	
			Start	Start	

# 14 Menu Structure

## 14.1 User Mode

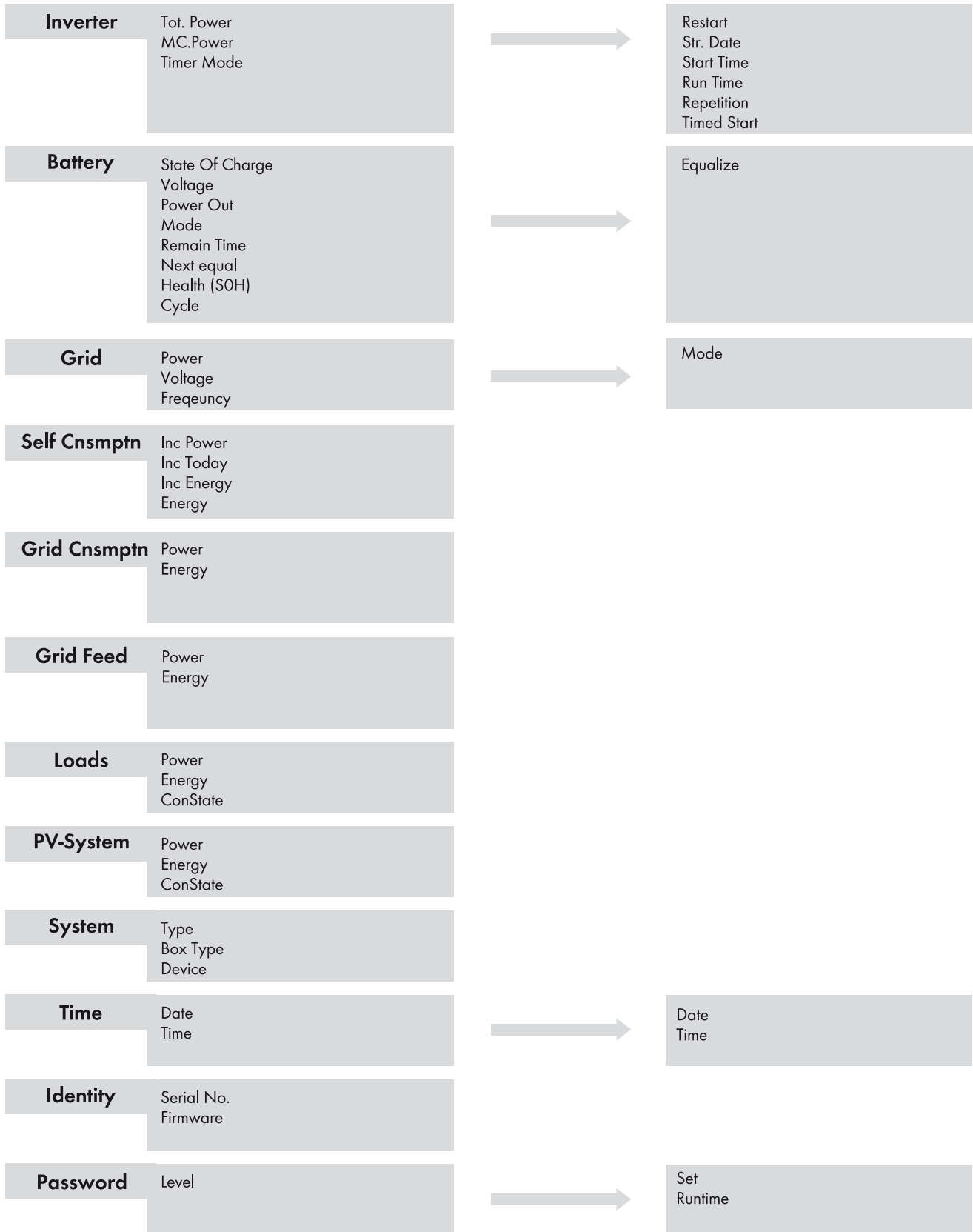


Figure 20: Menu structure: user mode

## 14.2 Installer Mode and Expert Mode

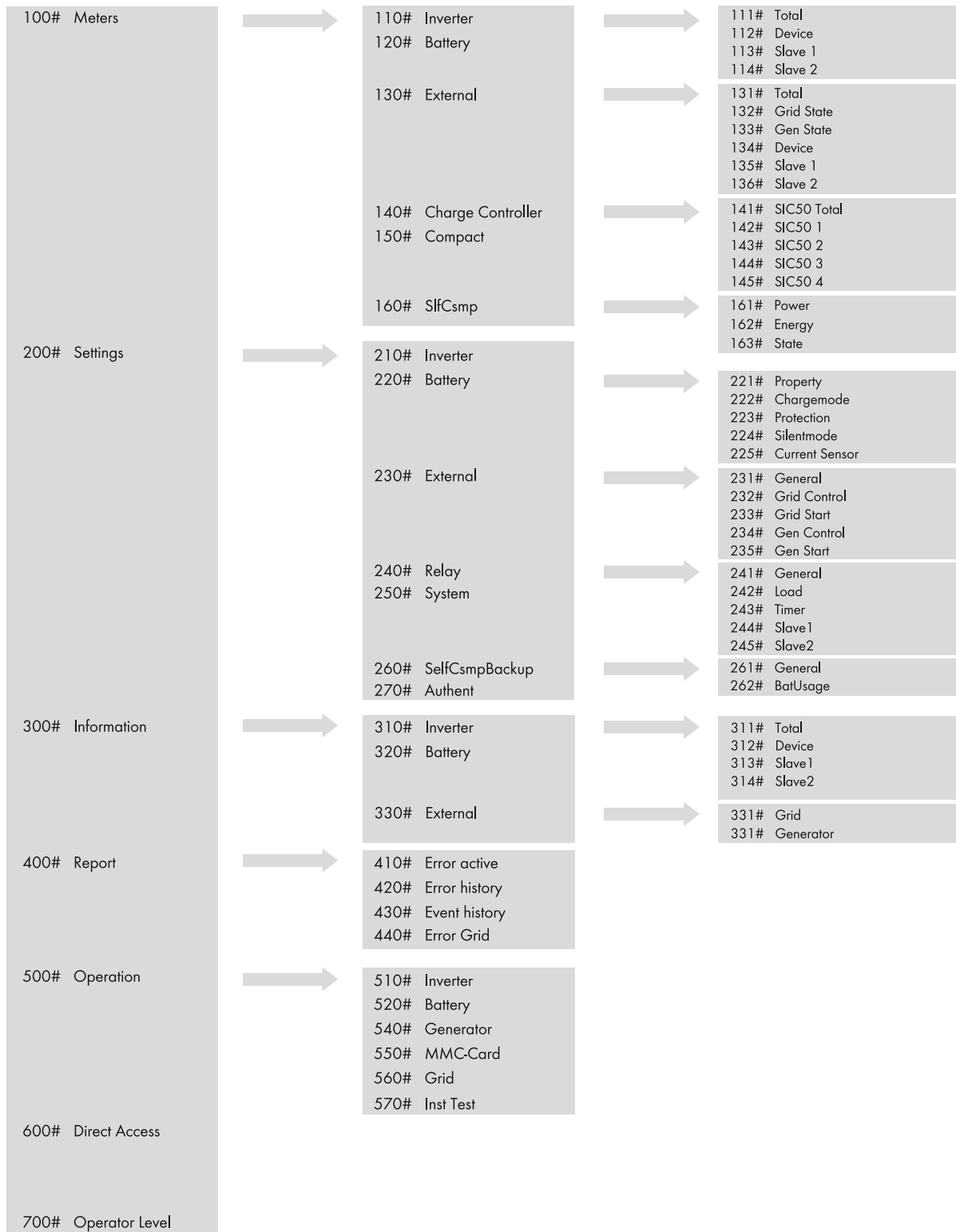


Figure 21: Menu structure: installer mode and expert mode

## 15 Contact

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

- Type of Sunny Island
- Serial number of the Sunny Island
- Firmware version of the Sunny Island
- Displayed error message
- Type of battery connected
- Nominal battery capacity
- Nominal battery voltage
- Type of the communication products connected
- Type and size of additional energy sources

Australia	SMA Australia Pty Ltd. Sydney	Toll free for Australia:	1800 SMA AUS (1800 762 287)
		International:	+61 2 9491 4200
Belgien/ Belgique/ België	SMA Benelux BVBA/SPRL Mechelen	+32 15 286 730	
Brasil	Vide España (Espanha)		
Česko	SMA Central & Eastern Europe s.r.o. Praha	+420 235 010 417	
Chile	Ver España		
Danmark	Se Deutschland (Tyskland)		
Deutschland	SMA Solar Technology AG Niestetal	Medium Power Solutions Wechselrichter: Kommunikation: SMA Online Service Center:	+49 561 9522-1499 +49 561 9522-2499 <a href="http://www.SMA.de/Service">www.SMA.de/Service</a>
		Hybrid Energy Solutions Sunny Island:	+49 561 9522-399
		Power Plant Solutions Sunny Central:	+49 561 9522-299
España	SMA Ibérica Tecnología Solar, S.L.U. Barcelona	Llamada gratuita en España: Internacional:	900 14 22 22 +34 902 14 24 24
France	SMA France S.A.S. Lyon	Medium Power Solutions Onduleurs : Communication :	+33 472 09 04 40 +33 472 09 04 41
		Hybrid Energy Solutions Sunny Island :	+33 472 09 04 42
		Power Plant Solutions Sunny Central :	+33 472 09 04 43
India	SMA Solar India Pvt. Ltd. Mumbai	+91 22 61713888	

Italia	SMA Italia S.r.l. Milano	+39 02 8934-7299	
Κύπρος/ Kıbrıs	Βλέπε Ελλάδα/ Bkz. Ελλάδα (Yunanistan)		
Luxemburg/ Luxembourg	Siehe Belgien/ Voir Belgien (Belgique)		
Magyarország	lásd Česko (Csehország)		
Nederland	zie Belgien (België)		
Österreich	Siehe Deutschland		
Perú	Ver España		
Polska	Patrz Česko (Czechy)		
Portugal	SMA Solar Technology Portugal, Unipessoal Lda Lisboa	Isento de taxas em Portugal: 800 20 89 87 Internacional: +351 2 12 37 78 60	
România	Vezi Česko (Cehia)		
Schweiz	Siehe Deutschland		
Slovensko	pozri Česko (Česká republika)		
South Africa	SMA Solar Technology South Africa Pty Ltd. Centurion (Pretoria)	08600 SUNNY (08600 78669) International: +27 (12) 643 1785	
United Kingdom	SMA Solar UK Ltd. Milton Keynes	+44 1908 304899	
Ελλάδα	SMA Hellas AE Αθήνα	801 222 9 222 International: +30 212 222 9 222	
България	Вижте Ελλάδα (Гърция)		
ไทย	SMA Solar (Thailand) Co., Ltd. ประเทศไทย	+66 2 670 6999	
대한민국	SMA Technology Korea Co., Ltd. 서울	+82 2 508-8599	
中国	SMA Beijing Commercial Company Ltd. 北京	+86 10 5670 1350	
日本	SMA Japan K.K. 東京	+81 3 3451 9530	
+971 2 698-5080	SMA Middle East LLC أبو ظبي		الإمارات العربية المتحدة
Other countries	International SMA Service Line Niestetal	Toll free worldwide: 00800 SMA SERVICE (+800 762 7378423)	





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