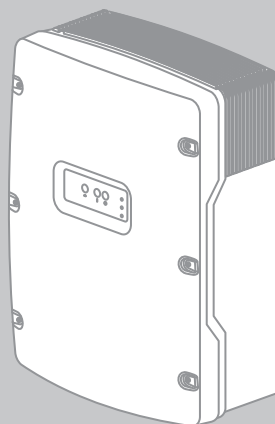


Off-Grid Inverters

## SUNNY ISLAND 8.0H / 6.0H

Technical Description





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# 1 Information on this Document

## Validity





This document is valid for the following device types:

- SI8.0H-10
- SI8.0H-11
- SI6.0H-10
- SI6.0H-11

## Target Group

This document is intended for operators and skilled persons. Only personnel with the corresponding qualifications are allowed to perform the tasks set forth in this document (see Section 2 "Target Group Qualifications", page 9).

## Symbols

Symbol	Explanation
 <b>DANGER</b>	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
 <b>WARNING</b>	Indicates a hazardous situation which, if not avoided, could result in death or serious injury
 <b>CAUTION</b>	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury
<b>NOTICE</b>	Indicates a situation which, if not avoided, could result in property damage
	Information that is important for a specific topic or goal, but is not safety-relevant
<input type="checkbox"/>	Indicates an essential requirement for achieving a specific goal
<input checked="" type="checkbox"/>	Desired result
<b>x</b>	A problem that might occur

## Nomenclature

This document refers to the Sunny Island as an off-grid inverter.



## 2 Target Group Qualifications

### Operators

Operators must be instructed in the following areas by a skilled person:

- Training in the dangers when handling electrical devices
- Training in the operation of an off-grid system
- Training in the safe handling of batteries
- Training in the safe deactivation and disconnection of the off-grid system in the event of an error
- Training in how an off-grid system is secured against reactivation
- Training in the maintenance and cleaning of the off-grid inverter
- Knowledge of and adherence to this manual and all the specified safety precautions

### Skilled persons

Skilled persons must have the following qualifications:

- Training in off-grid systems from SMA Solar Technology AG
- Training in how to deal with the dangers and risks associated with installing and using electrical devices and batteries
- Training in the installation and commissioning of electrical devices
- Knowledge and observance of the local standards and guidelines
- Knowledge of and adherence to this manual and all the specified safety precautions

## 3 Parameters in User Mode

### 3.1 Inverter

#### Display page

Name	Description	Value	Explanation
Tot.Power	Total active power of the off-grid inverter in kW This parameter is hidden for multicluster systems.	-	-
MC.Power	Total active power of the multicluster system in kW This parameter is hidden for single systems and single-cluster systems.	-	-
Timer Mode	Time-controlled inverter mode	Enable	Off-grid inverter is in time-controlled mode.
		Disable	Time-controlled mode is disabled.

## Setting Pages

Name	Description	Value	Explanation
Restart	Restart of the off-grid inverter	Yes	Trip restart.
		No	Do not trip restart.
Str.Date	Start date for time-controlled inverter mode in dd.mm.yy On the start date, the off-grid inverter in time-controlled mode switches for the first time from standby to inverter mode.	-	-
Start Time	Start time for time-controlled inverter mode in hh:mm:ss	-	-
Run Time	Run time for time-controlled inverter mode The off-grid inverter switches to inverter mode from the start time for the configured run time.	-	-
Repetition	Repetition cycle for time-controlled inverter mode	Single	Configure one-time inverter operation on the start date.
		Daily	Configure daily inverter operation from the start date.
		Weekly	Configure weekly inverter operation from the start date. The start date specifies the weekday.
Timed Start	Time-controlled inverter mode	Disable	Disable time-controlled mode.
		Enable	Enable time-controlled mode.

## 3.2 Battery

### Display Pages

Name	Description	Value	Explanation
StateOfCharge	Current battery state of charge in %	-	-
Voltage	Battery voltage in V	-	-
Power	Current discharge power of the battery in kW	-	At positive values, the battery will be discharged. At negative values, the battery will be charged.
Charge Mode	Current charging process	Boost	Boost charge is enabled.
		Full	Full charge is enabled.
		Float	Float charge is enabled.
		Equalize	Equalisation charge is enabled.
Silent	The off-grid inverter switches to standby in silent mode.		
Remain Time	Remaining time of the current charging process in hh:mm:ss	-	-
Next equal	Remaining time until next equalisation charge in days	-	-
Health (SOH)	Ratio of currently usable capacity to nominal capacity in %	-	-
Cycle	Battery cycle	-	-
	A battery cycle is the calculated result for the full charge and discharge of the battery.		

**Setting Page**

<b>Name</b>	<b>Description</b>	<b>Value</b>	<b>Explanation</b>
Equalize	Manual equalisation charge	Start	Starts the equalisation charge.
		Stop	Stops the equalisation charge.
		Idle	Waits until the conditions for an equalisation charge are met.

## 3.3 Generator

### Display Pages

The pages are only displayed if a generator was configured during commissioning. If a generator and the electricity grid are used in an off-grid system, only the component that is currently connected will be displayed.

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

## Setting Page

The page is only displayed if a generator was configured during commissioning. If a generator and the electricity grid are used in an off-grid system, only the component that is currently connected will be displayed.

<b>Name</b>	<b>Description</b>	<b>Value</b>	<b>Explanation</b>
Mode	Generator control	Autostart	Enables automatic generator mode.
		Stop	Stops the generator.
		Start	Starts the generator.
		Run 1h	Starts the generator for one hour.
Error	Error acknowledgement for generator fault	Ackn.	Acknowledges the error.

## 3.4 Grid

### Display Page

The page is only displayed if an electricity grid was configured during commissioning. If a generator and the electricity grid are used in an off-grid system, only the component that is currently connected will be displayed.

Name	Description
Power	Active power of the electricity grid in kW
Voltage	Voltage of the electricity grid in V
Frequency	Frequency of the voltage in Hz

### Setting Page

The page is only displayed if an electricity grid was configured during commissioning. If a generator and the electricity grid are used in an off-grid system, only the component that is currently connected will be displayed.

Name	Description	Value	Explanation
Mode	Manual grid start	Auto	Enables automatic connection to the electricity grid.
		Stop	Disconnects the off-grid inverter from the electricity grid.
		Start	Connects the off-grid inverter to the electricity grid.



## 3.5 SIC50

### Display Page

The page is only displayed if at least 1 Sunny Island Charger is used in the off-grid system.

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

## 3.6 System

### Display Page

Name	Description	Value	Explanation
Type	Configuration of the off-grid system	1Phase1	One-phase system with one off-grid inverter.
		1Phase2	One-phase system with two off-grid inverters.
		1Phase3	One-phase system with three off-grid inverters.
		3Phase	Three-phase system.
		MC-Box	Multicluster system.
Box Type	Type of Multicluster Box connected This parameter is hidden for single systems and single-cluster systems.	MC-Box-6	Multicluster Box 6.
		MC-Box-12	Multicluster Box 12.
		MC-Box-36	Multicluster Box 36.
Device	Type of cluster This parameter is hidden for single systems and single-cluster systems.	MainClst	Sunny Remote Control is connected to the main cluster.
		ExtnClst	Sunny Remote Control is connected to the extension cluster.

## 3.7 Time

### 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	Sets the date.
Time	Time in hh:mm:ss	Sets the time.

## 3.8 Identity

### Display Page

Name	Description
Serial No.	Serial number
Firmware	Firmware version

## 3.9 Password

### 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	Display of operating hours

## 4 Parameters in Installer Mode and Expert Mode

### 4.1 Display of Parameters and Menus

- Parameters in installer mode and expert mode are protected by an installer password (for information on switching to installer mode, see the operating manual of the off-grid inverter).
- The system design that was configured during the commissioning in QCG determines the scope of the visible menus and parameters. Menus and parameters that are not required are hidden.
- Parameters for additional functions are only displayed in expert mode (for information on expert mode, see the operating manual of the off-grid inverter).
- If you disable functions in installer mode or expert mode, the associated parameters will be hidden.

### 4.2 Changing Parameters

Parameters influence the behaviour of off-grid inverters. Some parameters may only be changed by skilled persons.



#### **Help in case of malfunctions due to incorrect settings**

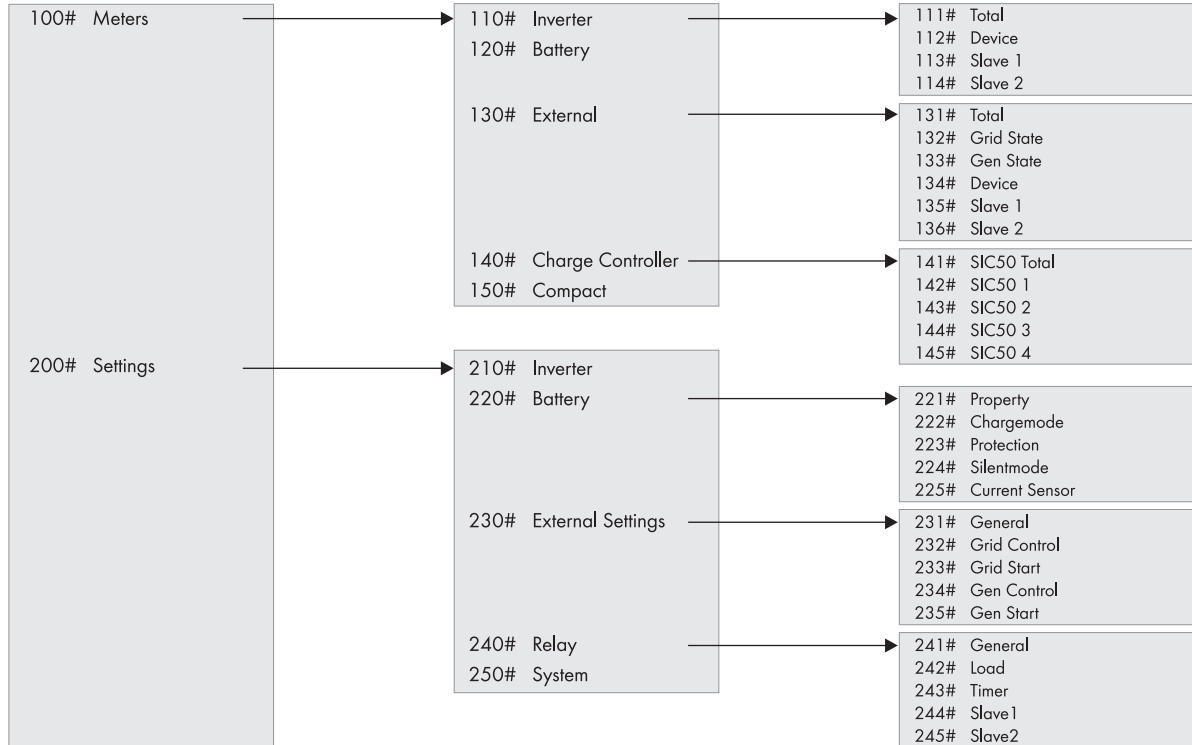
In order to replace incorrect settings with the original setting, proceed as follows:

- Note the value prior to changing the parameter.

**or**

Save the parameter set (for information on saving and loading parameters, refer to the operating manual of the off-grid inverter).

### 4.3 Menu Structure



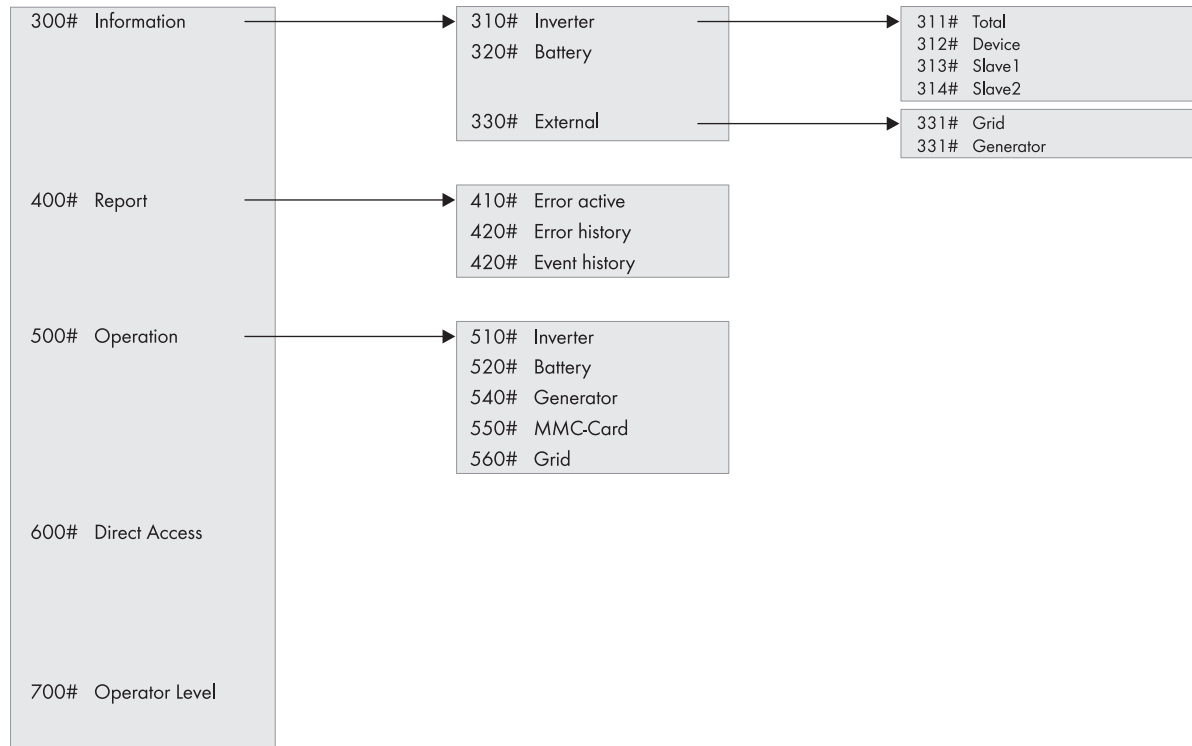


Figure 1: Menu Structure

## 4.4 Display Values

### 4.4.1 Inverter (110#)

#### 111# Total

No.	Name	Description
111.01	TotInvPwrAt	Total active power of the off-grid inverters in a cluster in kW
111.02	TotInvCur	Total current of the off-grid inverters in a cluster in A
111.03	TotInvPwrRt	Total reactive power of the off-grid inverters in a cluster in kvar (expert mode)
111.05	TotLodPwr	Total, instantaneous reactive power of the loads in a cluster in kW
111.06	TotMcLodPwr	Total, instantaneous reactive 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 off-grid inverter	Init (1)	Initialisation
			Standby (2)	Standby
			Run (3)	Operation
			EmChargeMod (4)	Emergency charge mode
			Error (5)	Error status
			Startup (7)	Transfer from standby to operation
112.02	InvPwrAt	Active power of the off-grid inverter in kW	-	-



No.	Name	Description	Value (plain text no.)	Explanation
112.03	InvVtg	Voltage of the off-grid inverter in V	-	-
112.04	InvCur	Current of the off-grid inverter in A	-	-
112.05	InvFrq	Frequency of the voltage of the off-grid inverter in Hz	-	-
112.06	InvPwrRt	Reactive power of the off-grid inverter in kvar (expert mode)	-	-
112.07	Rly1Stt	State of multi-function relay 1	Off	Multi-function relay open
			On	Multi-function relay closed
112.08	Rly2Stt	State of multi-function relay 2	Off	Multi-function relay open
			On	Multi-function relay closed
112.12	TrfTmp	Temperature of the transformer in °C (expert mode) In a cluster, the temperature of the transformer is displayed in the master.	-	-
112.13	HsTmp	Temperature of the heat sink in the off-grid inverter in °C (expert mode) In a cluster, the temperature of the heat sink is displayed in the master.	-	-

**113# Slave1**

No.	Name	Description	Value	Explanation
113.01	InvOpSttSlv1	Operating state of slave 1	Standby	Standby
			Run	Operation
			EmChargeMod	Emergency charge mode
			Error	Error status
			Startup	Transfer from standby to operation
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 the multi-function relay 1 in slave 1	Off	Multi-function relay open
			On	Multi-function relay closed
113.07	Rly2SttSlv1	State of the multi-function relay 2 in slave 1	Off	Multi-function relay open
			On	Multi-function relay closed
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	Standby	Standby
			Run	Operation
			EmChargeMod	Emergency charge mode
			Error	Error status
			Startup	Transfer from standby to operation
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 multi-function relay 1 in slave 2	Off	Multi-function relay open
			On	Multi-function relay closed
114.07	Rly2SttSlv2	State of multi-function relay 2 in slave 2	Off	Multi-function relay open
			On	Multi-function relay closed
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)	-	-

## 4.4.2 Battery (120#)

No.	Name	Description	Value (plain text no.)	Explanation
120.01	BatSoc	State of charge of the battery (SOC) in %	-	-
120.02	BatVtg	Battery voltage in V	-	-
120.03	BatChrgVtg	Target value of charge voltage in V	-	-
120.04	AptImRmg	Remaining absorption time in hh:mm:ss	-	-
120.05	BatChrgOp	Active charging process	Boost (1)	Boost charge
			Full (2)	Full charge
			Float (3;7)	Float charge
			Equalize (4;5)	Equalisation charge
			Silent (6;8)	Silent mode
120.06	TotBatCur	Total battery current of the cluster in A	-	-
120.07	BatTmp	Battery temperature in °C	-	-
120.08	RmgTmFul	Remaining time until next full charge in days	-	-
120.09	RmgTmEqu	Remaining time until next equalisation charge in days	-	-
120.10	AptPhs	Status of absorption phase	Off (1)	Absorption phase not active
			On (2)	Absorption phase active
120.11	BatSocErr	Estimated error of state of charge in % (expert mode)	-	-
120.12	BatCpyThrpCnt	Battery cycle	-	-

### 4.4.3 External (130#)

#### 131# Total

No.	Name	Description
131.01	TotExtPwrAt	Total active power of the external energy source in kW
131.02	TotExtCur	Total current of the 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	State of the electricity grid (expert mode)	Detect	Electricity grid detected
			Wait	Time until grid monitoring
			RunVExt	The stand-alone grid is synchronised with and connected to the electricity grid.
			Silent	The off-grid inverter is in silent mode.
			Error	Error upon connection
132.02	GdRmgTm	Remaining run time of the grid monitoring in hh:mm:ss	-	-

**133# Gen State**

No.	Name	Description	Value (plain text no.)	Explanation
133.01	GnDmdSrc	Source for generator request	None (1)	No request
			Bat (2)	State-of-charge-dependent
			Lod (3)	Load-dependent
			Tim (4)	Time-controlled
			Run1h (5)	Requested for one hour
			Start (6)	Manually started
			ExtSrcReq (7)	External generator request
			Cycle (8)	
133.02	GnStt	Generator state	Off (1)	Off
			Init (2)	Init
			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 failure

No.	Name	Description	Value (plain text no.)	Explanation
133.03	GnRmgTm	Remaining run time of the generator in hh:mm:ss	-	-
133.04	GnRnStt	State of generator feedback on master (expert mode)	Off (1)	Off
			On (2)	On

### 134# Device

No.	Name	Description
134.01	ExtPwrAt	Active power of the external energy source in kW
134.02	ExtVtg	Voltage of the external energy source in V
134.03	ExtCur	Current of the external energy source in A
134.04	ExtFrq	Frequency of the external energy source in Hz
134.05	ExtPwrRt	Reactive power of the 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 the external energy source slave 1 in kW
135.02	ExtVtgSlv1	Voltage of the external energy source slave 1 in V
135.03	ExtCurSlv1	Current of the external energy source slave 1 in A
135.04	ExtPwrRtSlv1	Reactive power of the external energy source slave 1 in kvar (expert mode)

**136# Slave2**

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

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

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

**142# SIC50 1**

No.	Name	Description
142.01	Sic1EgyCntIn	Energy of the Sunny Island Charger 1 in kWh
142.02	Sic1TdyEgyCntIn	Daily energy of the Sunny Island Charger 1 in kWh
142.03	Sic1PvPwr	PV power of the Sunny Island Charger 1 in W
142.04	Sic1PvVtg	PV voltage of the Sunny Island Charger 1 in V
142.05	Sic1BatVtg	Battery voltage of the Sunny Island Charger 1 in V (expert mode)



No.	Name	Description
142.06	Sic1BatCur	Battery current of the Sunny Island Charger 1 in A (expert mode)
142.07	Sic1HsTmp	Heat sink temperature of the Sunny Island Charger 1 in °C (expert mode)

### 143# SIC50 2

No.	Name	Description
143.01	Sic2EgyCntIn	Energy of the Sunny Island Charger 2 in kWh
143.02	Sic2TdyEgyCntIn	Daily energy of the Sunny Island Charger 2 in kWh
143.03	Sic2PvPwr	PV power of the Sunny Island Charger 2 in W
143.04	Sic2PvVtg	PV voltage of the Sunny Island Charger 2 in V
143.05	Sic2BatVtg	Battery voltage of the Sunny Island Charger 2 in V (expert mode)
143.06	Sic2BatCur	Battery current of the Sunny Island Charger 2 in A (expert mode)
143.07	Sic2HsTmp	Heat sink temperature of the Sunny Island Charger 2 in °C (expert mode)

### 144# SIC50 3

No.	Name	Description
144.01	Sic3EgyCntIn	Energy of the Sunny Island Charger 3 in kWh
144.02	Sic3TdyEgyCntIn	Daily energy of the Sunny Island Charger 3 in kWh
144.03	Sic3PvPwr	PV power of the Sunny Island Charger 3 in W
144.04	Sic3PvVtg	PV voltage of the Sunny Island Charger 3 in V
144.05	Sic3BatVtg	Battery voltage of the Sunny Island Charger 3 in V (expert mode)
144.06	Sic3BatCur	Battery current of the Sunny Island Charger 3 in A (expert mode)
144.07	Sic3HsTmp	Heat sink temperature of the Sunny Island Charger 3 in °C (expert mode)

**145# SIC50 4**

No.	Name	Description
145.01	Sic4EgyCntIn	Energy of the Sunny Island Charger 4 in kWh
145.02	Sic4TdyEgyCntIn	Daily energy of the Sunny Island Charger 4 in kWh
145.03	Sic4PvPwr	PV power of the Sunny Island Charger 4 in W
145.04	Sic4PvVtg	PV voltage of the Sunny Island Charger 4 in V
145.05	Sic4BatVtg	Battery voltage of the Sunny Island Charger 4 in V (expert mode)
145.06	Sic4BatCur	Battery current of the Sunny Island Charger 4 in A (expert mode)
145.07	Sic4HsTmp	Heat sink temperature of the Sunny Island Charger 4 in °C (expert mode)

**4.4.5 Compact (150#)**

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

- Battery
- AC measured values of the off-grid inverter
- External energy source
- Status of the off-grid inverter

## Battery (Bat)

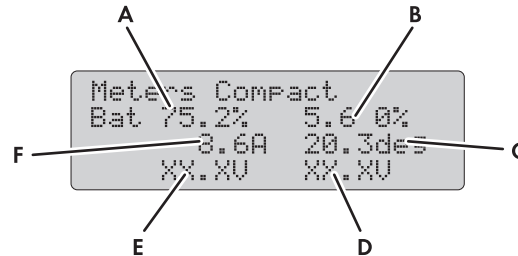


Figure 2: Overview of the Meters Compact for the battery

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	Target value 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

## AC Measured Values of the Off-Grid Inverter (Inv)

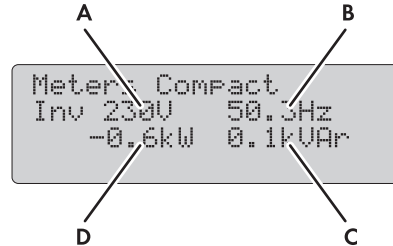


Figure 3: Overview of the Meters Compact for the AC measured values of the off-grid inverter

Position	Description	Parameter
A	Voltage of the off-grid inverter in V	112.03 InvVtg
B	Frequency of the voltage of the off-grid inverter 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

## External Energy Source (Ext)

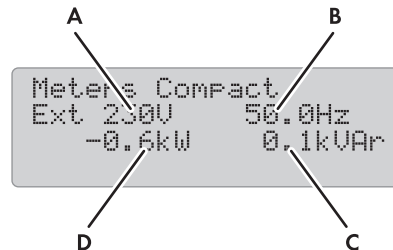


Figure 4: Overview of the Meters Compact for the external energy source

Position	Description	Parameter
A	Voltage of the external energy source in V	134.02 ExtVtg
B	Frequency of the external energy source in Hz	134.04 ExtFrq
C	Reactive power of the external energy source in kvar	134.05 ExtPwrRt
D	Active power of the external energy source in kW	134.01 ExtPwrAt

## Status of the Off-Grid Inverter (OpStt)

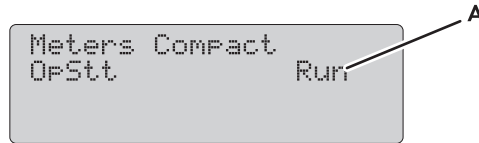


Figure 5: Overview of the Meters Compact for the status of the off-grid inverter

Position	Description	Value	Explanation	Parameter
A	Operating state of the off-grid inverter	Init	Initialisation	112.01 InvOpStt
		Standby	Standby	
		Run	Operation	
		EmChargeMod	Emergency charge operation	
		Error	Failure	

## 4.5 Adjustable Parameters

### 4.5.1 Inverter (210#)

No.	Name	Description	Value	Explanation	Default value
210.01	InvVtgNom	Nominal voltage of the off-grid inverter in V	172.5 V ... 264.5 V	230 V/50 Hz	230.0 V
				220 V/60 Hz	220.0 V
210.02	InvFrgNom	Nominal frequency of the off-grid inverter in Hz (expert mode)	40 Hz ... 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 ... 26.1 A	SI 8.0H	26.1 A
			0 A ... 20.0 A	SI 6.0H	20.0 A

### 4.5.2 Battery (220#)

#### 221# Property

No.	Name	Description	Value	Explanation	Default value
221.01	BatTyp	Battery type	VRLA	Valve-regulated lead acid battery with electrolyte fixed in gel or glass mat	-
			FLA	Valve-regulated lead-acid battery with liquid electrolyte	

No.	Name	Description	Value	Explanation	Default value
221.02	BatCpyNom	Nominal battery capacity C10 in Ah	100 Ah ... 10,000 Ah		100 Ah
221.03	BatVtgNom	Nominal battery voltage in V	42.0 V ... 48.0 V	-	-
221.04	BatTmpMax	Maximum battery temperature in °C (expert mode)	221.05 BatTmpStr ... 50°C	-	40°C
221.05	BatTmpStr	Temperature for start after stop due to overtemperature in °C (expert mode)	0°C ... 221.04 BatTmpMax	-	35°C
221.06	BatWirRes	Cable resistance of the battery connection in m Ω (expert mode)	0 m Ω ... 100 m Ω	-	0 m Ω
221.07	BatFanTmpStr	Start temperature for the <b>BatFan</b> function of the multi-function relay in °C	20°C ... 221.04 BatTmpMax	-	40°C

## 222# Chargemode

No.	Name	Description	Value	Explanation	Default value
222.01	BatChrgCurMax	Maximum charge current of battery in A	10 A ... 900 A	-	900 A
222.02	AptImBoost	Absorption time of the boost charge in minutes (expert mode)	1 min ... 600 min	VRLA	120 min
				FLA	90 min
222.03	AptImFul	Absorption time of the full charge in hours (expert mode)	1.0 h ... 20.0 h	-	5.0 h
222.04	AptImEqu	Absorption time of the equalisation charge in hours (expert mode)	1.0 h ... 48.0 h	-	10.0 h
222.05	CycTmFul	Cycle time of the full charge in days (expert mode)	1 d ... 180 d	-	14 d
222.06	CycTmEqu	Cycle time of the equalisation charge in days (expert mode)	7 d ... 365 d	-	180 d



No.	Name	Description	Value	Explanation	Default value
222.07	ChrgVtgBoost	Target value of the cell voltage for boost charge in V (expert mode)	2.20 V ... 2.70 V	VRLA	2.40 V
				FLA	2.55 V
222.08	ChrgVtgFul	Target value of the cell voltage for full charge in V (expert mode)	2.30 V ... 2.70 V	VRLA	2.40 V
				FLA	2.50 V
222.09	ChrgVtgEqu	Target value of the cell voltage for equalisation charge in V (expert mode)	2.30 V ... 2.70 V	VRLA	2.40 V
				FLA	2.50 V
222.10	ChrgVtgFlo	Target value of the cell voltage for float charge in V (expert mode)	2.20 V ... 2.40 V	-	2.25 V
222.11	BatTmpCps	Battery temperature compensation in mV/°C (expert mode)	0 mV/°C ... 10 mV/°C	-	4.0 mV/°C
222.12	AutoEquChrgEna	Automatic equalisation charge (expert mode)	Disable	Disable	Enable
			Enable	Enable	
222.13	BatChrgVtgMan	Manual target value of the battery charge voltage for disabled battery management in V (expert mode)	41.0 V ... 63.0 V	-	54.0 V

## 223# Protection

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

**224# Silentmode**

No.	Name	Description	Value	Explanation	Default value
224.01	SilentEna	Silent mode on the electricity grid (expert mode)	Disable	Disable	Disable
			Enable	Enable	
224.02	SilentTmFlo	Maximum time for float charge until transfer to silent mode in hours (expert mode)	1 h ... 48 h	-	3 h
224.03	SilentTmMax	Maximum time for standby in silent mode until transfer to float charge in h (expert mode)	1 h ... 168 h	-	12 h

**225# Current Sensor**

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

### 4.5.3 External (230#)

#### 231# General

No.	Name	Description	Value	Explanation	Default value
231.01	PvFeedTmStr	Start time for PV feed-in in hh:mm:ss (expert mode)	00:00:00 ... 23:59:59	-	04:00:00
231.02	PvFeedTmStp	Stop time for PV feed-in in hh:mm:ss (expert mode)	00:00:00 ... 23:59:59	-	22:00:00
231.03	ExtLkTm	Lock time after reverse power or relay protection in minutes (expert mode)	0 min ... 60 min	-	20 min
231.06	ExtSrc	Generator and grid operating mode	PvOnly	Only AC sources in stand-alone grid, no external energy source at terminal AC2	-
			Gen	Generator	
			Grid	Electricity grid	
			GenGrid	Generator or electricity grid	

#### 232# Grid Control

No.	Name	Description	Value	Explanation	Default value
232.01	GdVtgMin	Minimum line voltage in V (expert mode)	172.50 V ...	230 V/50 Hz	184.00 V
			210.01 InvVtgNom	220 V/60 Hz	194.00 V
232.02	GdVtgMax	Maximum line voltage in V (expert mode)	210.01 InvVtgNom ...	230 V/50 Hz	264.50 V
			264.50 V	220 V/60 Hz	242.00 V

No.	Name	Description	Value	Explanation	Default value
232.03	GdCurNom	Nominal grid current in A	0.0 A ... 50.0 A	1 off-grid inverter	16.0 A
			0.0 A ... 100.0 A	2 off-grid inverters connected in parallel	
			0.0 A ... 150.0 A	3 off-grid inverters connected in parallel	
			0.0 A ... 50.0 A	Three-phase	
232.04	GdFrqNom	Nominal grid frequency in Hz (expert mode)	232.05 GdFrqMin ...	230 V/50 Hz	50.00 Hz
			232.06 GdFrqMax	220 V/60 Hz	60.00 Hz
232.05	GdFrqMin	Minimum power frequency in Hz (expert mode)	40.00 Hz ...	230 V/50 Hz	47.50 Hz
			232.04 GdFrqNom	220 V/60 Hz	59.30 Hz
232.06	GdFrqMax	Maximum power frequency in Hz (expert mode)	232.4 GdFrqNom ...	230 V/50 Hz	50.20 Hz
			70.00 Hz	220 V/60 Hz	60.50 Hz
232.07	GdVldTm	Minimum observation time for line voltage and frequency in the permissible range for connection in seconds (expert mode)	5 s ... 900 s	230 V/50 Hz	30 s
				220 V/60 Hz	300 s
232.08	GdMod	Grid interface	GridCharge	Charging on the electricity grid	GridCharge
			GridFeed	Charging and backfeeding on the electricity grid	
232.09	GdRvPwr	Permissible active power of the grid backfeed in W (expert mode)	0 W ... 5,000 W	1 off-grid inverter or single-cluster system	100 W
			0 W ... 20,000 W	Multicenter system	100 W
232.10	GdRvTm	Permissible time for grid reverse power in seconds (expert mode)	0 s ... 60 s	-	5 s

No.	Name	Description	Value	Explanation	Default value
232.15	GdAlSns	Sensitivity of the anti-islanding detection (expert mode)	Low	Low	Normal
			Medium	Medium	
			Normal	Normal	
			High	High	

### 233# Grid Start

No.	Name	Description	Value	Explanation	Default value
233.01	GdSocEna	Enable grid request based on SOC (expert mode)	Disable	Disable	Disable
			Enable	Enable	
233.02	GdSocTm1Str	Switch on SOC limit for electricity grid for time 1 in % (expert mode)	1% ... 233.03 GdSocTm1Stp	-	40%
233.03	GdSocTm1Stp	Switch off SOC limit for electricity grid for time 1 in % (expert mode)	233.02 GdSocTm1Str ... 95%	-	80%
233.04	GdSocTm2Str	Switch on SOC limit for electricity grid for time 2 in % (expert mode)	1% ... 233.05 GdSocTm2Stp	-	40%
233.05	GdSocTm2Stp	Switch off SOC limit for electricity grid for time 2 in % (expert mode)	233.04 GdSocTm2Str ... 95%	-	80%
233.06	GdTm1Str	Time 1 for grid request in hh:mm:ss (expert mode) Start of time 1, end of time 2	00:00:00 ... 23:59:59	-	-
233.07	GdTm2Str	Time 2 for grid request in hh:mm:ss (expert mode) Start of time 2, end of time 1	00:00:00 ... 23:59:59	-	-
233.08	GdPwrEna	Grid request based on power (expert mode)	Disable	Disable	Disable
			Enable	Enable	

No.	Name	Description	Value	Explanation	Default value
233.09	GdPwrStr	Grid request based on connection power limit in kW (expert mode)	233.10 GdPwrStp ... 300 kW	-	4.0 kW
233.10	GdPwrStp	Grid request based on disconnection power limit in kW (expert mode)	0 kW ... 233.09 GdPwrStr	-	2.0 kW
233.11	GdStrChrgMod	Charge type when connecting to the grid (expert mode)	Off	Off	Equal
			Full	Full charge	
			Equal	Equalisation charge	
			Both	Full and equalisation charge	

### 234# Gen Control

No.	Name	Description	Value	Explanation	Default value
234.01	GnVtgMin	Minimum generator voltage in V (expert mode)	172.5 V ... 210.01 InvVtgNom	-	172.50 V
234.02	GnVtgMax	Maximum generator voltage in V (expert mode)	210.01 InvVtgNom ... 264.5 V	-	250.0 V

No.	Name	Description	Value	Explanation	Default value
234.03	GnCurNom	Nominal generator current in A	0.0 A ... 50.0 A	1 off-grid inverter	16.0 A
			0.0 A ... 100.0 A	2 off-grid inverters connected in parallel	16.0 A
			0.0 A ... 150.0 A	3 off-grid inverters connected in parallel	16.0 A
			0.0 A ... 50.0 A	Three-phase	16.0 A
			0.0 A ... 80.0 A	Multicluster Box 6	60.0 A
			0.0 A ... 160.0 A	Multicluster Box 12	160.0 A
			0.0 A ... 500.0 A	Multicluster Box 36	435.0 A
234.04	GnFrqNom	Nominal generator frequency at nominal load in Hz (expert mode)	234.05 GnFrqMin ...	230 V/50 Hz	50.00 Hz
			234.06 GnFrqMax	220 V/60 Hz	60.00 Hz
234.05	GnFrqMin	Minimum generator frequency in Hz (expert mode)	40.00 Hz ...	230 V/50 Hz	44.64 Hz
			234.04 GnFrqNom	220 V/60 Hz	50.00 Hz
234.06	GnFrqMax	Maximum generator frequency in Hz (expert mode)	234.04 GnFrqNom ...	230 V/50 Hz	60.00 Hz
			70.00 Hz	220 V/60 Hz	70.00 Hz
234.07	GnStrMod	Generator interface	Manual	Manual	Autostart
			Autostart	Automatic	
			GenMan	SMA generator management box	
234.08	GnOpTmMin	Minimum run time of the generator in minutes	0 min ... 360 min	-	15 min
234.09	GnStpTmMin	Minimum stop time of the generator in minutes	0 min ... 360 min	-	15 min

No.	Name	Description	Value	Explanation	Default value
234.10	GnCoolTm	Cooling time of the generator in minutes	0 min ... 60 min	-	5 min
234.11	GnErrStpTm	Stop time of the generator in the event of an error in hours (expert mode)	0 h ... 24 h	-	1 h
234.12	GnWarmTm	Warm-up time in seconds	5 s ... 900 s	-	60 s
234.13	GnRvPwr	Active power of the generator reverse power in W (expert mode)	0 W ... 5,000 W	1 off-grid inverter or single-cluster system	100 W
			0 W ... 20,000 W	Multicluster system	100 W
234.14	GnRvTm	Permissible time for reverse power/reverse current in seconds (expert mode)	0 s ... 900 s	-	30 s
234.15	GnCtlMod	Generator regulation (expert mode) The generator control limits the consumption of the 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 the use of generators with insufficient voltage regulation in the off-grid 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	Generator autostart	Off	Disable	On
			On	Enable	
235.02	GnAutoStr	Number of autostarts (expert mode)	0 ... 10	-	3
235.03	GnSocTm1Str	Switching on SOC limit for generator for time 1 in %	1% ... 235.04 GnSocTm1Stp	-	40%
235.04	GnSocTm1Stp	Switching off SOC limit for generator for time 1 in %	235.03 GnSocTm1Str ... 95%	-	80%
235.05	GnSocTm2Str	Switching on SOC limit for generator for time 2 in %	1% ... 235.06 GnSocTm2Stp	-	40%
235.06	GnSocTm2Stp	Switching off SOC limit for generator for time 2 in %	235.05 GnSocTm2Str ... 95%	-	80%
235.07	GnTm1Str	Time 1 for generator request in hh:mm:ss Start: time 1, end: time 2	00:00:00 ... 23:59:59	-	00:00:00
235.08	GnTm2Str	Time 2 for generator request in hh:mm:ss Start: time 2, end: time 1	00:00:00 ... 23:59:59	-	00:00:00
235.09	GnPwrEna	Generator request based on power (expert mode)	Disable	Disable	Enable
			Enable	Enable	
235.10	GnPwrStr	Generator request based on connection power limit in kW (expert mode)	235.11 GnPwrStp ... 300.0 kW	-	4.0 kW
235.11	GnPwrStp	Generator request for disconnection power limit in kW (expert mode)	0.0 kW ... 235.10 GnPwrStr	-	2.0 kW

No.	Name	Description	Value	Explanation	Default value
235.12	GnPwrAvgTm	Average time for power-related generator start in seconds (expert mode)	1 s ... 900 s	-	60 s
235.13	GnTmOpEna	Time-controlled generator mode	Disable	Disable	Disable
			Enable	Enable	
235.14	GnTmOpStrDt	Start date for time-controlled generator mode in dd:mm:yyyy	-	-	01.01.2011
235.15	GnTmOpStrTm	Start time for time-controlled generator mode in hh:mm:ss	00:00:00 ... 23:59:59	-	00:00:00
235.16	GnTmOpRnDur	Run time for time-controlled generator mode in hh:mm:ss	00:00:00 ... 99:59:00	-	00:00:00
235.17	GnTmOpCyc	Repetition cycle for time-controlled generator mode	Single	Once	Single
			Daily	Daily	
			Weekly	Weekly	
235.18	GnStrChrgMod	Generator start for charge type (expert mode)	Off	Off	Both
			Full	Full charge	
			Equal	Equalisation charge	
			Both	Full and equalisation charge	
235.19	GnStrDigIn	Generator start upon signal on activated digital input (expert mode)	Disable	Disable	Disable
			Enable	Enable	

## 4.5.4 Relay (240#)

### 241# General

No.	Name	Description	Value	Explanation	Default value
241.01	Rly1Op	Function of multi-function relay 1	Off	The multi-function relay is permanently in the NC position.	AutoGn
			On	The multi-function relay is permanently in the NO position.	
			AutoGn	The off-grid inverter automatically requests the generator.	
			AutoLodExt	1-level load shedding When connecting an external energy source or in case of sufficient battery charge, the off-grid inverter ends the load shedding.	
			AutoLod1 Soc	1-level load shedding or first level of 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			AutoLod2Soc	Second level for 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			Tm1	Timer 1 The off-grid inverter controls external processes depending on time.	

No.	Name	Description	Value	Explanation	Default value
241.01	Rly1Op	Function of multi-function relay 1 (continued)	Tm2	Timer 2 The off-grid inverter controls external processes depending on time.	AutoGn
			ExtPwrDer	The off-grid inverter controls additional loads in order to put excess energy to practical use.	
			GnRn	When the generator is running and connected, the off-grid inverter closes the multi-function relay.	
			ExtVfOk	When the voltage and frequency of the external energy source are within the valid range for the connection, the off-grid inverter closes the multi-function relay.	
			GdOn	When the electricity grid is connected, the off-grid inverter closes the multi-function relay.	
			Error	When an error message is pending, the off-grid inverter opens the multi-function relay.	
			Warn	When a warning is pending, the off-grid inverter closes the multi-function relay.	
			Run	When the off-grid inverter/the cluster is in operation, the off-grid inverter/master closes the multi-function relay.	

No.	Name	Description	Value	Explanation	Default value
241.01	Rly1Op	Function of multi-function relay 1 (continued)	BatFan	The off-grid inverter controls the battery chamber fan.	AutoGn
			AcdCir	The off-grid inverter controls the electrolyte pump of the battery.	
			MccBatFan	The off-grid inverter controls the battery chamber fan for all clusters.	
			MccAutoLod	1-level load shedding When all batteries have reached the upper SOC limit, the off-grid inverter ends the load shedding.	
			CHPreq	Without function	
			CHPAdd	Without function	
			SiComRemote	Multi-function relay is controlled via ComSync.	
			Overload	When the off-grid inverter limits its power, the off-grid inverter closes the multi-function relay.	

No.	Name	Description	Value	Explanation	Default value
241.02	Rly2Op	Function of multi-function relay 2	Off	The multi-function relay is permanently off.	AutoLodExt
			On	The multi-function relay is permanently on.	
			AutoGn	The off-grid inverter automatically requests the generator.	
			AutoLodExt	1-level load shedding When connecting an external energy source or in case of sufficient battery charge, the off-grid inverter ends the load shedding.	
			AutoLod1Soc	1-level load shedding or first level of 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			AutoLod2Soc	Second level for 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			Tm1	Timer 1 The off-grid inverter controls external processes depending on time.	
			Tm2	Timer 2 The off-grid inverter controls external processes depending on time.	

No.	Name	Description	Value	Explanation	Default value
241.02	Rly2Op	Function of multi-function relay 2 (continued)	ExtPwrDer	The off-grid inverter controls additional loads in order to put excess energy to practical use.	AutoLodExt
			GnRn	When the generator is running and connected, the off-grid inverter closes the multi-function relay.	
			ExtVfOk	When the voltage and frequency of the external energy source are within the valid range for the connection, the off-grid inverter closes the multi-function relay.	
			GdOn	When the electricity grid is connected, the off-grid inverter closes the multi-function relay.	
			Error	When an error message is pending, the off-grid inverter opens the multi-function relay.	
			Warn	When a warning is pending, the off-grid inverter closes the multi-function relay.	
			Run	When the off-grid inverter/the cluster is in operation, the off-grid inverter/master closes the multi-function relay.	
			BatFan	The off-grid inverter controls the battery chamber fan.	
			AcdCir	The off-grid inverter controls the electrolyte pump of the battery.	

No.	Name	Description	Value	Explanation	Default value
241.02	Rly2Op	Function of multi-function relay 2n (continued)	MccBatFan	The off-grid inverter controls the battery chamber fan for all clusters together.	AutoLodExt
			MccAutoLod	1-level load shedding When all batteries have reached the upper SOC limit, the off-grid inverter ends the load shedding.	
			CHPreq	Without function	
			CHPAdd	Without function	
			SiComRemote	Multi-function relay is controlled via ComSync.	
			Overload	When the off-grid inverter limits its power, the off-grid inverter closes the multi-function relay.	
241.07	ExtPwrDerMinTm	Minimum time for the <b>ExtPwrDer</b> function of the multi-function relay in minutes	0 min ... 600 min	-	10 min
241.08	ExtPwrDerDltVtg	Voltage difference for the <b>ExtPwrDer</b> function of the multi-function relay in V	0 V ... 0.40 V	-	0.15 V



**242# Load**

No.	Name	Description	Value	Default value
242.01	Lod1SocTm1Str	SOC limit for starting load shedding 1 for t1 in %	1% ... 242.02 Lod1SocTm1Stp	30%
242.02	Lod1SocTm1Stp	SOC limit for stopping load shedding 1 for t1 in %	242.01 Lod1SocTm1Str ... 90%	50%
242.03	Lod1SocTm2Str	SOC limit for starting load shedding 1 for t2 in %	1% ... 242.04 Lod1SocTm2Stp	30%
242.04	Lod1SocTm2Stp	SOC limit for stopping load shedding 1 for t2 in %	242.03 Lod1SocTm2Str ... 90%	50%
242.05	Lod1Tm1Str	Time 1 for load shedding 1 in hh:mm:ss Start: time 1, end: time 2	00:00:00 ... 23:59:59	-
242.06	Lod1Tm2Str	Time 2 for load shedding 1 in hh:mm:ss Start: time 2, end: time 1	00:00:00 ... 23:59:59	-
242.07	Lod2SocTm1Str	SOC limit for starting load shedding 2 for t1 in %	1% ... 242.08 Lod2SocTm1Stp	30%
242.08	Lod2SocTm1Stp	SOC limit for stopping load shedding 2 for t1 in %	242.07 Lod2SocTm1Str ... 90%	50%
242.09	Lod2SocTm2Str	SOC limit for starting load shedding 2 for t2 in %	1% ... 242.10 Lod2SocTm2Stp	30%
242.10	Lod2SocTm2Stp	SOC limit for stopping load shedding 2 for t2 in %	242.09 Lod2SocTm2Str ... 90%	50%
242.11	Lod2Tm1Str	Time 1 for load shedding 2 in hh:mm:ss Start: time 1, end: time 2	00:00:00 ... 23:59:59	00:00:00
242.12	Lod2Tm2Str	Time 2 for load shedding 2 in hh:mm:ss Start: time 2, end: time 1	00:00:00 ... 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 for relay control timer 1 in hh:mm:ss	00:00:00 ... 23:59:59	-	-
243.03	RlyTmr1Dur	Run time for relay control timer 1 in hh:mm:ss	00:00:00 ... 99:59:00	-	-
243.04	RlyTmr1Cyc	Repetition cycle time for timer 1	Single	Once	Single
			Daily	Daily	
			Weekly	Weekly	
243.05	RlyTmr2StrDt	Start date timer 2	-	-	01.01.2011
243.06	RlyTmr2StrTm	Start time for relay control timer 2 in hh:mm:ss	00:00:00 ... 23:59:59	-	-
243.07	RlyTmr2Dur	Run time for relay control timer 2 in hh:mm:ss	00:00:00 ... 99:59:00	-	-
243.08	RlyTmr2Cyc	Repetition cycle time for timer 2	Single	Once	Single
			Daily	Daily	
			Weekly	Weekly	

**244# Slave1**

No.	Name	Description	Value	Explanation	Default value
244.01	Rly1OpSlv1	Function of multi-function relay 1 of slave 1	Off	The multi-function relay is permanently off.	Off
			On	The multi-function relay is permanently on.	
			AutoGn	The off-grid inverter automatically requests the generator.	
			AutoLodExt	1-level load shedding When connecting an external energy source or in case of sufficient battery charge, the off-grid inverter ends the load shedding.	
			AutoLod1Soc	1-level load shedding or first level of 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			AutoLod2Soc	Second level for 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			Tm1	Timer 1 The off-grid inverter controls external processes depending on time.	
			Tm2	Timer 2 The off-grid inverter controls external processes depending on time.	
			ExtPwrDer	The off-grid inverter controls additional loads in order to put excess energy to practical use.	
GnRn	When the generator is running and connected, the off-grid inverter closes the multi-function relay.				

No.	Name	Description	Value	Explanation	Default value
244.01	Rly1OpSlv1	Function of multi-function relay 1 of slave 1 (continued)	ExtVfOk	When the voltage and frequency of the external energy source are within the valid range for the connection, the off-grid inverter closes the multi-function relay.	
			GdOn	When the electricity grid is connected, the off-grid inverter closes the multi-function relay.	
			Error	When an error message is pending, the off-grid inverter opens the multi-function relay.	
			Warn	When a warning is pending, the off-grid inverter closes the multi-function relay.	
			Run	When the cluster is in operation, the off-grid inverter closes the multi-function relay.	
			BatFan	The off-grid inverter controls the battery chamber fan.	
			AcdCir	The off-grid inverter controls the electrolyte pump of the battery.	
			MccBatFan	The off-grid inverter controls the battery chamber fan for all clusters.	
			MccAutoLod	1-level load shedding When all batteries have reached the upper SOC limit, the off-grid inverter ends the load shedding.	
			CHPreq	Without function	
			CHPAdd	Without function	
			SiComRemote	Multi-function relay is controlled via ComSync.	
			Overload	When the off-grid inverter limits its power, the off-grid inverter closes the multi-function relay.	

No.	Name	Description	Value	Explanation	Default value
244.02	Rly2OpSlv1	Function of multi-function relay 2 of slave 1	Off	The multi-function relay is permanently off.	Off
			On	The multi-function relay is permanently on.	
			AutoGn	The off-grid inverter automatically requests the generator.	
			AutoLodExt	1-level load shedding When connecting an external energy source or in case of sufficient battery charge, the off-grid inverter ends the load shedding.	
			AutoLod1Soc	1-level load shedding or first level of 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			AutoLod2Soc	Second level for 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			Tm1	Timer 1 The off-grid inverter controls external processes depending on time.	
			Tm2	Timer 2 The off-grid inverter controls external processes depending on time.	
			ExtPwrDer	The off-grid inverter controls additional loads in order to put excess energy to practical use.	

No.	Name	Description	Value	Explanation	Default value
244.02	Rly2OpSlv1	Function of multi-function relay 2 of slave 1 (continued)	GnRn	When the generator is running and connected, the off-grid inverter closes the multi-function relay.	Off
			ExtVfOk	When the voltage and frequency of the external energy source are within the valid range for the connection, the off-grid inverter closes the multi-function relay.	
			GdOn	When the electricity grid is connected, the off-grid inverter closes the multi-function relay.	
			Error	When an error message is pending, the off-grid inverter opens the multi-function relay.	
			Warn	When a warning is pending, the off-grid inverter closes the multi-function relay.	
			Run	When the cluster is in operation, the off-grid inverter closes the multi-function relay.	
			BatFan	The off-grid inverter controls the battery chamber fan.	
			AcdCir	The off-grid inverter controls the electrolyte pump of the battery.	
			MccBatFan	The off-grid inverter controls the battery chamber fan for all clusters.	
			MccAutoLod	1-level load shedding When all batteries have reached the upper SOC limit, the off-grid inverter ends the load shedding.	
			CHPreq	Without function	
			CHPAdd	Without function	

No.	Name	Description	Value	Explanation	Default value
244.02	Rly2OpSlv1	Function of multi-function relay 2 of slave 1 (continued)	SiComRemote	Multi-function relay is controlled via ComSync.	
			Overload	When the off-grid inverter limits its power, the off-grid inverter closes the multi-function relay.	

### 245# Slave2

No.	Name	Description	Value	Explanation	Default value
245.01	Rly1OpSlv2	Function of multi-function relay 1 of slave 2	Off	The multi-function relay is permanently off.	Off
			On	The multi-function relay is permanently on.	
			AutoGn	The off-grid inverter automatically requests the generator.	
			AutoLodExt	1-level load shedding When connecting an external energy source or in case of sufficient battery charge, the off-grid inverter ends the load shedding.	
			AutoLod1Soc	1-level load shedding or first level of 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			AutoLod2Soc	Second level for 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			Tm1	Timer 1 The off-grid inverter controls external processes depending on time.	

No.	Name	Description	Value	Explanation	Default value
245.01	Rly1OpSlv2	Function of multi-function relay 1 of slave 2 (continued)	Tm2	Timer 2 The off-grid inverter controls external processes depending on time.	Off
			ExtPwrDer	The off-grid inverter controls additional loads in order to put excess energy to practical use.	
			GnRn	When the generator is running and connected, the off-grid inverter closes the multi-function relay.	
			ExtVfOk	When the voltage and frequency of the external energy source are within the valid range for the connection, the off-grid inverter closes the multi-function relay.	
			GdOn	When the electricity grid is connected, the off-grid inverter closes the multi-function relay.	
			Error	When an error message is pending, the off-grid inverter opens the multi-function relay.	
			Warn	When a warning is pending, the off-grid inverter closes the multi-function relay.	
			Run	When the cluster is in operation, the off-grid inverter closes the multi-function relay.	
			BatFan	The off-grid inverter controls the battery chamber fan.	
			AcdCir	The off-grid inverter controls the electrolyte pump of the battery.	
			MccBatFan	The off-grid inverter controls the battery chamber fan for all clusters.	



No.	Name	Description	Value	Explanation	Default value
245.01	Rly1OpSlv2	Function of multi-function relay 1 of slave 2 (continued)	MccAutoLod	1-level load shedding When all batteries have reached the upper SOC limit, the off-grid inverter ends the load shedding.	Off
			CHPreq	Without function	
			CHPAdd	Without function	
			SiComRemote	Multi-function relay is controlled via ComSync.	
			Overload	When the off-grid inverter limits its power, the off-grid inverter closes the multi-function relay.	
245.02	Rly2OpSlv2	Function of multi-function relay 2 of slave 2	Off	The multi-function relay is permanently off.	Off
			On	The multi-function relay is permanently on.	
			AutoGn	The off-grid inverter automatically requests the generator.	
			AutoLodExt	1-level load shedding When connecting an external energy source or in case of sufficient battery charge, the off-grid inverter ends the load shedding.	
			AutoLod1Soc	1-level load shedding or first level of 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	
			AutoLod2Soc	Second level for 2-level load shedding When the upper SOC limit has been reached, the off-grid inverter ends the load shedding.	

No.	Name	Description	Value	Explanation	Default value
245.02	Rly2OpSlv2	Function of multi-function relay 2 of slave 2 (continued)	Tm1	Timer 1 The off-grid inverter controls external processes depending on time.	Off
			Tm2	Timer 2 The off-grid inverter controls external processes depending on time.	
			ExtPwrDer	The off-grid inverter controls additional loads in order to put excess energy to practical use.	
			GnRn	When the generator is running and connected, the off-grid inverter closes the multi-function relay.	
			ExtVfOk	When the voltage and frequency of the external energy source are within the valid range for the connection, the off-grid inverter closes the multi-function relay.	
			GdOn	When the electricity grid is connected, the off-grid inverter closes the multi-function relay.	
			Error	When an error message is pending, the off-grid inverter opens the multi-function relay.	
			Warn	When a warning is pending, the off-grid inverter closes the multi-function relay.	
			Run	When the cluster is in operation, the off-grid inverter closes the multi-function relay.	
			BatFan	The off-grid inverter controls the battery chamber fan.	
			AccCir	The off-grid inverter controls the electrolyte pump of the battery.	
			MccBatFan	The off-grid inverter controls the battery chamber fan for all clusters.	

No.	Name	Description	Value	Explanation	Default value
245.02	Rly2OpSlv2	Function of multi-function relay 1 of slave 2 (continued)	MccAutoLod	1-level load shedding When all batteries have reached the upper SOC limit, the off-grid inverter ends the load shedding.	Off
			CHPreq	Without function	
			CHPAdd	Without function	
			SiComRemote	Multi-function relay is controlled via ComSync.	
			Overload	When the off-grid inverter limits its power, the off-grid inverter closes the multi-function relay.	

#### 4.5.5 System (250#)

No.	Name	Description	Value	Explanation	Default value
250.01	AutoStr	Autostart 0 indicates autostart is disabled.	0 ... 10	-	3
250.02	Dt	Date in dd.mm.yyyy	-	-	-
250.03	Tm	Time in hh:mm:ss	-	-	-
250.04	BeepEna	Key clicks	Off	Disable	On
			On	Enable	
250.06	ComBaud	Baud rate 1,200 baud is the default value for communication with SMA inverters.	1,200	-	1,200
			4,800	-	
			9,600	-	
			19,200	-	

No.	Name	Description	Value	Explanation	Default value
250.09	ComAdr	Communication address (non-adjustable)	0 ... 65,535	-	1
250.10	SleepEna	Sleep mode	Disable	Disable	Enable
			Enable	Enable	
250.11	AfraEna	Automatic frequency synchronisation (expert mode)	Disable	Disable	Enable
			Enable	Enable	
250.13	SleepAtNight	Time-controlled sleep mode	Disable	Disable	Disable
			Enable	Enable	
250.14	SlpStrTm	Start time for time-controlled sleep mode	00:00:00 ... 23:59:59	-	20:00:00
250.15	SlpStpTm	Stop time for time-controlled sleep mode	00:00:00 ... 23:59:59	-	05:00:00
250.23	Box	Type of Multicluster Box used	None	None	-
			MC-Box-6	Multicluster Box 6.3	
			MC-Box-9	Multicluster Box 9.3	
			MC-Box-12	Multicluster Box 12.3	
			MC-Box-36	Multicluster Box 36.3	
250.24	ClstMod	Cluster type (configurable in QCG)	SingleClst	Single cluster	-
			MainClst	Main cluster	-
			ExtnClst	Extension cluster	-
250.28	ChrgCltOp	Type of DC charging device (expert mode)	Auto	Automatic	Auto
			DCOnly	Only battery charger	
			SMA	Sunny Island Charger	

No.	Name	Description	Value	Explanation	Default value
250.30	RnMod	Run mode Behaviour when error occurs	RunAlways	In the event of a device error of a slave, the cluster remains in operation	RunAlways
			StopAlways	In the event of a device error, the cluster stops operation	
250.31	SearchMod	Enable search mode	Disable	Disable	Disable
			Enable	Enable	
			Timed	Time-controlled	
250.32	SearchModSns	Sensitivity for the detection of the loads (expert mode)	Very High	Highest sensitivity	Middle
			High	High sensitivity, $P < 15 \text{ W}$	
			Middle	Middle sensitivity, $P < 20 \text{ W}$	
			Low	Low sensitivity, $P < 30 \text{ W}$	
			Very Low	Lowest sensitivity, $P < 50 \text{ W}$	
250.33	SearchModStr	Start time of time-controlled search mode in hh:mm:ss (expert mode)	00:00:00 ... 23:59:59	-	22:00:00
250.34	SearchModStp	Stop time of time-controlled search mode in hh:mm:ss (expert mode)	00:00:00 ... 23:59:59	-	06:00:00
250.35	ChLstSel	Selection of short or normal channel list (expert mode)  The length must be suitable for the communication device.	Short	Short	Normal
			Normal	Normal	

## 4.6 Information (300#)

### 4.6.1 Inverter (310#)

#### 311# Total

No.	Name	Description
311.01	EgyCntIn	Absorbed energy of the off-grid inverter in kWh
311.02	EgyCntOut	Output energy of the off-grid inverter 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
			Slave1 (2)	Address
			Slave2 (3)	Address
312.03	FW	Firmware version of the master	-	-
312.04	SN	Serial number of the master	-	-
312.05	OnTmh	Operating hours	-	-
312.06	ClstCfgAt	Set configuration of the cluster	1Phase1	One-phase, one off-grid inverter
			1Phase2	One-phase, two off-grid inverters
			1Phase3	One-phase, three off-grid inverters
			3Phase	Three-phase, three off-grid inverters

No.	Name	Description	Value (plain text no.)	Explanation
312.07	OpStt	Operating state of the off-grid inverter	Operating (1)	Operation
			Warning (2)	Warning
			Failure (3)	Failure
312.08	CardStt	SD card status message	Off (1)	None
			Operational (2)	Ready for operation
			Mount (3)	Initialisation
			OutOfSpace (4)	No memory 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 set write access
312.09	FwVer2	DSP firmware version	-	-
312.10	FwVer3	OCU boot loader	-	-
312.11	FwVer4	DSP boot loader	-	-
312.15	ComMod1	Type of interface in the interface slot <b>SiSysCan</b>	---	No interface inserted
			SI-SysCan	SI-SYSCAN.BGx inserted
312.16	ComMod2	Type of interface in the interface slot <b>SiComSma</b>	---	No interface inserted
			SI-ComSma	SI-COMSMA.BGx inserted

**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 position of slave 1	L1	Line conductor L1
			L2	Line conductor L2
			L3	Line conductor L3
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 bootloader of slave 1	-	-
313.08	FwVer4Slv1	DSP bootloader 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 position of slave 2	L1	Line conductor L1
			L2	Line conductor L2
			L3	Line conductor L3



No.	Name	Description	Value	Explanation
314.05	OpSttSlv2	Operating state of slave 2	Operating	Operation
			Warning	Warning
			Failure	Failure
314.06	FwVer2Slv2	DSP firmware version of slave 2	-	-
314.07	FwVer3Slv2	OCU bootloader of slave 2	-	-
314.08	FwVer4Slv2	DSP bootloader of slave 2	-	-

## 4.6.2 Battery (320#)

No.	Name	Description
320.01	Soh	State of health (SOH) in % Ratio of current usable capacity to the rated value of the battery
320.02	StatTm	Run time of statistics meter in days
320.03	ChrgFact	Charge factor
320.04	BatEgyCntIn	Energy meter for battery charge in kWh
320.05	BatEgyCntOut	Energy meter for battery discharge in kWh
320.06	AhCntIn	Meter for battery charge in Ah
320.07	AhCntOut	Meter for battery discharge in Ah
320.08	BatTmpPkMin	Minimum battery temperature in °C
320.09	BatTmpPkMax	Maximum battery temperature in °C
320.10	EquChrgCnt	Meter for equalisation charge
320.11	FulChrgCnt	Meter for full charge
320.12	BatCurOfsErr	Current offset error of the battery current in A (expert mode)

<b>No.</b>	<b>Name</b>	<b>Description</b>
320.13	OcvPointCnt	Meter for open-circuit voltage points (expert mode)
320.15	AhCntFul	Ampere-hour meter for battery discharge since the last full charge in Ah/100 Ah
320.16	AhCntEqu	Ampere-hour meter for battery discharge since last equalisation charge in Ah/100 Ah
320.17	BatVtgPk	Maximum battery voltage measured in V
320.18	BatCurPkIn	Maximum battery current measured in charge direction in A
320.19	BatCurPkOut	Maximum battery current measured in discharge direction in A
320.20	SocHgm100	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 100% to 90% inclusive (expert mode)
320.21	SocHgm090	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 90% to 80% inclusive (expert mode)
320.22	SocHgm080	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 80% to 70% inclusive (expert mode)
320.23	SocHgm070	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 70% to 60% inclusive (expert mode)
320.24	SocHgm060	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 60% to 50% inclusive (expert mode)
320.25	SocHgm050	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 50% to 40% inclusive (expert mode)
320.26	SocHgm040	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 40% to 30% inclusive (expert mode)
320.27	SocHgm030	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 30% to 20% inclusive (expert mode)
320.28	SocHgm020	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 20% to 10% inclusive (expert mode)

No.	Name	Description
320.29	SocHgm010	Percentage frequency distribution of state of charge (SOC) when SOC ranges from 10% to 0% inclusive (expert mode)
320.30	SocHgm000	Percentage frequency distribution of state of charge (SOC) when SOC is exactly 0% (expert mode)
320.31	SocVtgCal	Recalibration of the SOC only on the basis of the open-circuit voltage in % (expert mode)
320.32	ErrSocVtgCal	Estimated error of the voltage-calibrated state of charge in % (expert mode)
320.33	SocChrgCal	Recalibration of SOC only on the basis of full charge in % (expert mode)
320.34	ErrSocChrgCal	Estimated error of the full-charge-calibrated state of charge in % (expert mode)
320.35	OcvGra	Slope of the open-circuit voltage curve in Ah/V (expert mode)
320.36	OcvMax	Maximum open-circuit voltage in V (expert mode)

### 4.6.3 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	Run time of energy meter for electricity grid in hours
331.04	GdOpTmh	Operating hours meter for grid operation in hours
331.05	GdCtcCnt	Meter for grid connections
331.06	TotTmh	Feed-in hours

### 332# Generator

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

## 4.7 Report (400#)

### 410# Error active

Display of currently pending warnings and errors (see Section 5).

### 420# Error history

History of warnings and errors (see Section 5).

### 430# Event history

History of events (see Section 5).

## 4.8 Operation (500#)

### 4.8.1 Inverter (510#)

No.	Name	Description	Value	Explanation	Default value
510.01	InvRs	Trip restart of the off-grid inverter	No	Do not restart	-
			Yes	Restart	
510.02	InvTmOpEna	Time-controlled inverter mode	Disable	Disable	Disable
			Enable	Enable	
510.03	InvTmOpStrDt	Start date for time-controlled inverter mode in dd.mm.yyyy	-	-	-
510.04	InvTmOpStrTm	Start time for time-controlled inverter mode in hh:mm:ss	00:00:00 ... 23:59:59	-	-
510.05	InvTmOpRnDur	Run time for time-controlled inverter mode in hh:mm:ss	00:00:00 ... 99:59:00	-	-
510.06	InvTmOpCyc	Repetition cycle for time-controlled inverter mode (Tm1)	Single	Once	Single
			Daily	Daily	
			Weekly	Weekly	

No.	Name	Description	Value	Explanation	Default value
510.07	CntRs	Delete energy meter The value states which energy meter is to be deleted.	Inv	Off-grid inverter	-
			Bat	Battery	
			Gn	Generator	
			Gd	Electricity 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 Chargers	
510.08	TstClstCom	Activation of the communication test between the individual clusters (expert mode)	Off	Off	-
			Transmit	Enable	
510.09	ClstComStt	Status of communication test (expert mode)	Wait	Waiting	-
			OK	Completed	

## 4.8.2 Battery (520#)

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

## 4.8.3 Generator (540#)

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

#### 4.8.4 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 card	ForcedWrite	Forced writing
			StoEvtHis	Storing event memory
			StoFailHis	Storing fault memory
			StoHis	Storing event and fault memory

#### 4.8.5 Grid (560#)

No.	Name	Description	Value	Explanation	Default value
560.01	GdManStr	Manual grid start	Auto	Automatic	Auto
			Stop	Stopping	
			Start	Starting	



## 5 Events and Errors

### 5.1 Structure of the Display Numbers

Every error and every event has a unique three-digit display number that is created corresponding to the parameters or measured value assignment. Events and errors use the same number range:

- 1xx - Off-grid inverter
- 2xx - Battery
- 3xx - External energy source
- 4xx - Generator
- 5xx - Electricity grid
- 6xx - Relay
- 7xx - System
- 8xx - External devices and components
- 9xx - General

#### Meaning of abbreviations

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

In the event of a fault, the display shows whether the fault has come or gone using **I** for "Set" and **C** for "Clear".

## 5.2 Events

### 5.2.1 Off-Grid Inverter Category (1xx)

No.	Name	Description
E101	Standby	Wait status
E102	Startup	Startup process
E103	Run	Operation
E104	RunExtGn	Operation on the generator
E105	RunExtGd	Operation on the electricity grid
E106	RunGdFeed	Feed-in grid operation
E107	Sleep	Sleep mode
E108	Silent	Silent mode
E110	ErrShutdown	Shutting down due to error
E115	EmgCharge	Emergency charge
E118	AutoStart	Automatic start
E119	ManStart	Manual start
E120	ManStop	Manual stop
E121	PwrSaveStart	Start of off-grid inverter disconnection in sleep mode
E122	PwrSaveStop	Stop of off-grid inverter disconnection in sleep mode
E129	Ext.Start	Start with external generator request
E130	Ext.Stop	Stop with external generator request
E131	AfraStart	Automatic frequency synchronisation engages
E132	AfraStop	Automatic frequency synchronisation stops

## 5.2.2 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	Operating state switches to silent mode
E207	BmsEqual	Battery charge algorithm switches to equalisation charge

## 5.2.3 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	GnManStop	Manual error acknowledgement of generator fault
E406	GnDmdSrc	Generator request
E407	GnCurCtlStr	Current-regulated generator operation started
E408	GnCurCtlStp	Current-controlled generator operation stopped

## 5.2.4 Electricity Grid Category (5xx)

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

## 5.2.5 Relay Category (6xx)

No.	Name	Description
E601	Rly1Off	Multi-function relay 1 open
E602	Rly1On	Multi-function relay 1 closed
E603	Rly1Slv1Off	Multi-function relay 1 on slave 1 open
E604	Rly1Slv1On	Multi-function relay 1 on slave 1 closed
E605	Rly1Slv2Off	Multi-function relay 1 on slave 2 open
E606	Rly1Slv2On	Multi-function relay 1 on slave 2 closed
E609	TransferOff	Internal transfer relay open
E610	TransferOn	Internal transfer relay closed
E611	TransferSlv1Off	Internal transfer relay on slave 1 open
E612	TransferSlv1On	Internal transfer relay on slave 1 closed
E613	TransferSlv2Off	Internal transfer relay on slave 2 open
E614	TransferSlv2On	Internal transfer relay on slave 2 closed

No.	Name	Description
E617	Rly2Off	Multi-function relay 2 open
E618	Rly2On	Multi-function relay 2 closed
E619	Rly2Slv1Off	Multi-function relay 2 on slave 1 open
E620	Rly2Slv1On	Multi-function relay 2 on slave 1 closed
E621	Rly2Slv2Off	Multi-function relay 2 on slave 2 open
E622	Rly2Slv2On	Multi-function relay 2 on slave 2 closed
E625	DigInOff	Digital input OFF (Low)
E626	DigInOn	Digital input ON (High)
E627	DigInSlv1Off	Digital input slave 1 OFF (Low)
E628	DigInSlv1On	Digital input slave 1 ON (High)
E629	DigInSlv2Off	Digital input slave 2 OFF (Low)
E630	DigInSlv2On	Digital input slave 2 ON (High)

### 5.2.6 System Category (7xx)

No.	Name	Description
E705	PwrOn	Device start
E706	DateSet	Date/time changed
E707	NewSys	New system configured in QCG
E708	Fw1Update	Part 1 of firmware updated
E709	Fw2Update	Part 2 of firmware updated
E710	ClstUpdate	Cluster firmware updated
E711	CardInsert	SD card inserted

<b>No.</b>	<b>Name</b>	<b>Description</b>
E712	ParaUpdate	SD card parameter set loaded
E715	SRCOOn	Sunny Remote Control activated
E718	NoComMod1	Communication interface 1 is incorrectly inserted or missing
E719	NoComMod2	Communication interface 2 is incorrectly inserted or missing

### 5.2.7 External Devices and Components Category (8xx)

<b>No.</b>	<b>Name</b>	<b>Description</b>
E807	StartBox	Multicluster Box ready for operation
E808	StopBox	Multicluster Box deactivated
E851	Sic1Detect	Sunny Island Charger 1 detected
E852	Sic2Detect	Sunny Island Charger 2 detected
E853	Sic3Detect	Sunny Island Charger 3 detected
E854	Sic4Detect	Sunny Island Charger 4 detected

## 5.3 Warnings and Error Messages

### 5.3.1 Safety During Troubleshooting

#### Electric shock

High voltages are present in the off-grid system and in the off-grid inverter. The off-grid inverter can start automatically from standby. Work on the electrical connections of the off-grid inverter must be performed by a skilled person. Note the following safety rules prior to performing any work on the electrical connections.

- Switch off or disconnect the following components in the order specified:
  - Off-grid inverter
  - All loads, AC sources, external energy sources, and DC sources
  - Miniature circuit-breaker for AC sources and the external energy source in the sub-distributions
  - BatFuse switch-disconnector
- Ensure that the device cannot be reconnected.
- Open the enclosure lid and ensure that no voltage is present.
- Earth and short circuit the AC conductors.
- Cover or shield any adjacent live components.

#### Explosion

Explosive gases can escape from the battery.

- Do not allow open flames, embers, or sparks in the vicinity of the battery.
- Maintain and operate the battery according to the manufacturer specifications.
- Do not throw batteries into fire.

## Burns and poisoning

If handled inappropriately, the electrolyte of the battery can cause burns to the skin and eyes and/or poisoning.

- Protect the battery enclosure against destruction.
- Do not open or deform the battery.
- Wear rubber gloves, rubber boots, and goggles when performing any work on the battery.
- Rinse off acid splashes with clear water and consult a doctor.
- Maintain and operate the battery according to the manufacturer specifications.

## Crushing

Moving parts on the generator can crush or sever body parts. A generator can be started automatically by the off-grid inverter.

- Only operate the generator using the safety devices.
- Maintain and operate the generator according to the manufacturer specifications.

## Burn hazards

Some parts of the off-grid inverter can become hot during operation.

- During operation, touch the inverter on the enclosure lid only.

Short-circuit currents of the battery can cause heat generation and electric arcs. Note the following safety rules prior to performing any work on the battery.

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



## 5.3.2 Error Levels

The off-grid inverter distinguishes between five different error levels and behaves differently in the event of each level.

Level	Description	Display on off-grid inverter	Meaning
1	Warning	Warning	Warning, off-grid inverter continues to run. Information in standard mode that a warning has been recorded.
2	Malfunction 1	Malfunction	Disturbance that can only be detected in operation. The off-grid inverter switches off. Restart is possible immediately, e.g. via autostart.
3	Malfunction 2	Malfunction	Disturbance that can also be detected in standby. The off-grid inverter switches off. Restart only possible once malfunction is recognised as gone.
4	Failure	Failure	Device error, the off-grid inverter switches off. Error rectification, acknowledgement, and manual restart required.
5	Device defect	Defect	Off-grid inverter is defective and switches off. Off-grid inverter must be replaced.

### 5.3.3 Off-Grid Inverter Category (1xx)

No.	Name	Level	Cause	Corrective measures
F 109	InvTmpHi	3	Temperature of the transformer in the off-grid inverter/master is too high due to overload or ambient temperature.	<ul style="list-style-type: none"> <li>Ensure that the off-grid inverter is functional. Wait until the off-grid inverter has cooled down and restart the off-grid inverter.</li> </ul>
W110	InvTmpHiSlv1	1	Temperature of the transformer in slave 1 is too high due to overload or ambient temperature.	<ul style="list-style-type: none"> <li>Clean the fan (see the operating manual of the off-grid inverter).</li> </ul>
W111	InvTmpHiSlv2	1	Temperature of the transformer in slave 2 is too high due to overload or ambient temperature.	<ul style="list-style-type: none"> <li>Reduce the total power of the loads, e.g. through chronologically staggered use.</li> <li>If you are a skilled person, increase power by replacing the off-grid inverter with an inverter of a higher power class or by means of additional off-grid inverters.</li> </ul>
F 113	InvTmpHi	3	Temperature of the heat sink in the off-grid inverter/master is too high due to overload or ambient temperature.	<ul style="list-style-type: none"> <li>Ensure that the off-grid inverter is functional. Wait until the off-grid inverter has cooled down and restart the off-grid inverter.</li> </ul>
W114	InvTmpHiSlv1	1	Temperature of the heat sink in slave 1 is too high due to overload or ambient temperature.	<ul style="list-style-type: none"> <li>Reduce the total power of the loads, e.g. through chronologically staggered use.</li> </ul>
W115	InvTmpHiSlv2	1	Temperature of the heat sink in slave 2 is too high due to overload or ambient temperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, increase power by replacing the off-grid inverter with an inverter of a higher power class or by means of additional off-grid inverters.</li> </ul>

No.	Name	Level	Cause	Corrective measures
F 117	AcCurlim	2	The power of the loads is too high for the off-grid inverter/master.	<ul style="list-style-type: none"> <li>• Ensure that the off-grid inverter is functional. Clean the fans and restart the off-grid inverter (see operating manual of the off-grid inverter).</li> <li>• If you are a skilled person, ensure that there is no short circuit present in the stand-alone grid and that the power of the loads is not greater than the power of the off-grid inverter.</li> <li>• If you are a skilled person, connect the loads with very high power directly to the generator, if possible. Be sure not to overload the generator.</li> <li>• If you are a skilled person, connect three-phase loads with a high electricity requirement during startup (e.g. engines) to a star delta circuit.</li> </ul>
W118	AcCurlimSlv1	1	The power of the loads is too high for slave 1.	
W119	AcCurlimSlv2	1	The power of the loads is too high for slave 2.	
F 121	InvVtgHi	3	An overvoltage has occurred at terminal AC1 of the off-grid inverter/master.	<ul style="list-style-type: none"> <li>• An overvoltage has occurred at terminal AC1 of the off-grid inverter/master.</li> <li>• If you are a skilled person, find the cause of the overvoltage through measurement and step-by-step connection of the AC sources and loads.</li> </ul>
W122	InvVtgHiSlv1	1	An overvoltage has occurred at terminal AC1 of slave 1.	
W123	InvVtgHiSlv2	1	An overvoltage has occurred at terminal AC1 of slave 2.	

No.	Name	Level	Cause	Corrective measures
F 129	InvFrqHi	3	The frequency is too high at terminal AC1 of the off-grid inverter/master.	<ul style="list-style-type: none"> <li>Ensure that the off-grid inverter is functional. If you are a skilled person, disconnect all AC sources and loads from the off-grid inverter and restart the off-grid inverter.</li> <li>If you are a skilled person, find the cause of the overfrequency through measurement and step-by-step connection of the AC sources and loads.</li> </ul>
W130	InvFrqHiSlv1	1	An overfrequency has occurred at terminal AC1 of slave 1.	
W131	InvFrqHiSlv2	1	An overfrequency has occurred at terminal AC1 of slave 2.	
F 133	InvFrqLo	3	An underfrequency has occurred at terminal AC1 of the off-grid inverter/master.	<ul style="list-style-type: none"> <li>Ensure that the off-grid inverter is functional. If you are a skilled person, disconnect all AC sources and loads from the off-grid inverter and restart the off-grid inverter.</li> <li>If you are a skilled person, find the cause of the underfrequency through measurement and step-by-step connection of the AC sources and loads.</li> </ul>
W134	InvFrqLoSlv1	1	An underfrequency has occurred at terminal AC1 of slave 1.	
W135	InvFrqLoSlv2	1	An underfrequency has occurred at terminal AC1 of slave 2.	
W137	Derate	1	The off-grid inverter/master reduces the charge current of the battery due to overtemperature in the off-grid inverter.	<ul style="list-style-type: none"> <li>Clean the fan (see the operating manual of the off-grid inverter).</li> <li>Reduce the total power of the loads, e.g. through chronologically staggered use.</li> <li>If the off-grid inverter frequently goes into derating and you are a skilled person, increase the power by replacing the off-grid inverter with an inverter of a higher power class or by means of additional off-grid inverters.</li> </ul>
W138	DerateSlv1	1	Slave 1 reduces the charge current of the battery due to overtemperature in the off-grid inverter.	
W139	DerateSlv2	1	Slave 2 reduces the charge current of the battery due to overtemperature in the off-grid inverter.	

No.	Name	Level	Cause	Corrective measures
F 141	InvVtgLo	2	Voltage at terminal AC1 of the off-grid inverter/master is too low due to AC sources in the stand-alone grid.	<ul style="list-style-type: none"> <li>Ensure that the off-grid inverter is functional. If you are a skilled person, disconnect all AC sources and loads from the off-grid inverter and restart the off-grid inverter.</li> <li>If you are a skilled person, find the cause of the undervoltage through measurement and step-by-step connection of the AC sources and loads.</li> </ul>
W142	InvVtgLoSlv1	1	Voltage at terminal AC1 of slave 1 is too low due to AC sources in the stand-alone grid.	
W143	InvVtgLoSlv2	1	Voltage at terminal AC1 of slave 2 is too low due to AC sources in the stand-alone grid.	
F 158	VtgOnAC1Det	2	The off-grid inverter/master has measured an undesired voltage at terminal AC1.	<ul style="list-style-type: none"> <li>A bypass switch may have bridged the internal transfer relay. Ensure that the bypass switch is in the position for operation with the off-grid inverter.</li> <li>Ensure that the off-grid inverter is functional. If you are a skilled person, disconnect all AC sources and loads from the off-grid inverter and restart the off-grid inverter.</li> <li>A voltage source (e.g. generator) may be connected to terminal AC1. If you are a skilled person, disconnect the voltage source from terminal AC1 and connect to terminal AC2 (see installation manual of the off-grid inverter).</li> </ul>
W159	VtgOnAC1DetSlv1	1	Slave 1 has measured an undesired voltage at terminal AC1.	
W160	VtgOnAC1DetSlv2	1	Slave 2 has measured an undesired voltage at terminal AC1.	
F 162	OvrCurDet	2	Too much current is flowing through the DC terminal of the off-grid inverter/master.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W163	OvrCurDetSlv1	1	Too much current is flowing through the DC terminal of slave 1.	
W164	OvrCurDetSlv2	1	Too much current is flowing through the DC terminal of slave 2.	

### 5.3.4 Battery Category (2xx)

No.	Name	Level	Cause	Corrective measures
F 201	VBATMAX	2	Battery voltage of the off-grid inverter/master is above the permissible measurement range.	<ul style="list-style-type: none"> <li>• Check whether the value of the parameter "120.02 BatVtg" 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 DC terminal (see installation manual of the off-grid inverter).</li> <li>• If you are a skilled person, ensure that DC sources are correctly connected and configured.</li> </ul>
W202	VBATMAXSL1	1	Battery voltage of slave 1 is above the permissible measurement range.	
W203	VBATMAXSL2	1	Battery voltage of slave 2 is above the permissible measurement range.	
F 206	BatTmpHi	3	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 quick aging of the battery.</li> <li>• If you are a skilled person, check whether the battery temperature sensor has a resistance of 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	Battery voltage is greater than the target charge voltage.	<ul style="list-style-type: none"> <li>• If you are a skilled person, ensure that all DC sources are correctly configured.</li> <li>• If you are a skilled person, 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
W209	BatVtgWrnHi	1	Battery voltage is too high and has not been generated by the off-grid inverter.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that all DC sources are correctly configured.</li> <li>If you are a skilled person, ensure that all SMA inverters are configured to the country data set for stand-alone grid operation.</li> </ul>
W210	BatVtgHiWarn	1	Battery voltage is temporarily too high.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that all DC sources are correctly configured.</li> <li>If you are a skilled person, ensure that all SMA inverters are configured to the country data set for stand-alone grid operation.</li> </ul>
W211	BatTmpLoWarn	1	Battery temperature is too low.	<ul style="list-style-type: none"> <li>Ensure that the battery chamber is sufficiently warm.</li> </ul>
W212	BatTmpHiWarn	1	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 quick aging of the battery.</li> </ul>
F 213	BatVtgLow	3	Battery voltage is too low.	<ul style="list-style-type: none"> <li>If you are a skilled person, charge the battery in emergency charge operation or with an external battery charger (see the operating manual of the off-grid inverter).</li> <li>If you are a skilled person, ensure that the DC loads are shed using a load-shedding contactor when the battery is at a low state of charge.</li> </ul>
W220	BatSOH70Warn	1	Available battery capacity is below 70%.	<ul style="list-style-type: none"> <li>If you are a skilled person, verify the error message and replace the battery if required.</li> </ul>

### 5.3.5 External Energy Source Category (3xx)

No.	Name	Level	Cause	Corrective measures
W309	RlyProtect	1	Excessive current has been applied to the internal transfer relay of the off-grid inverter.	<ul style="list-style-type: none"> <li>Reduce the total power of the loads, e.g. through chronologically staggered use.</li> <li>If you are a skilled person, connect the load with very high power directly to the external energy source, if possible. In doing so, ensure that the external energy source is not overloaded.</li> <li>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).</li> </ul>
W310	RlyProtectSlv1	1	Excessive current has been applied to the internal transfer relay of slave 1.	
W311	RlyProtectSlv2	1	Excessive current has been applied to the internal transfer relay of slave 2.	
F 314	ExtVtgLoss	2	Voltage and/or frequency of the external energy source is outside of the configured range.	<p>Remedy in case of a generator as an external energy source:</p> <ul style="list-style-type: none"> <li>If you are a skilled person, adjust the limiting values for frequency and/or voltage of the generator on the off-grid inverter (see the installation manual of the off-grid inverter). Observe and evaluate the measured values <b>134.02 ExtVtg</b> and <b>134.04 ExtFrq</b> during operation.</li> <li>If you are a skilled person, adjust the generator voltage and/or generator frequency.</li> </ul> <p>Remedy if a generator is the external energy source:</p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>



No.	Name	Level	Cause	Corrective measures
W315	ExtVtgLo	1	Voltage at terminal AC2 of the off-grid inverter/master is too low.	Remedy in case of a generator as an external energy source: <ul style="list-style-type: none"> <li>If you are a skilled person, adjust the limiting values for generator voltage on the off-grid inverter (see the installation manual of the off-grid inverter). Observe and evaluate the measured values <b>134.02 ExtVtg</b> during operation.</li> </ul>
W316	ExtVtgLoSlv1	1	Voltage at terminal AC2 of slave 1 is too low.	
W317	ExtVtgLoSlv2	1	Voltage at terminal AC2 of slave 2 is too low.	
W319	ExtVtgHi	1	Voltage at terminal AC2 of the off-grid inverter/master is too high.	<ul style="list-style-type: none"> <li>If possible and if you are a skilled person, adjust the generator voltage.</li> </ul>
W320	ExtVtgHiSlv1	1	Voltage at terminal AC2 of slave 1 is too high.	
W321	ExtVtgHiSlv2	1	Voltage at terminal AC2 of slave 2 is too high.	Remedy if a generator is the external energy source: <ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W323	ExtFrqLo	1	Frequency at terminal AC2 of the off-grid inverter/master is too low.	Remedy in case of a generator as an external energy source: <ul style="list-style-type: none"> <li>If you are a skilled person, adjust the limiting values for generator frequency on the off-grid inverter (see the installation manual of the off-grid inverter). Observe and evaluate the measured values <b>134.04 ExtFrq</b> during operation.</li> <li>If you are a skilled person, adjust the frequency of the external energy source.</li> <li>The generator may be overloaded. Reduce the total power of the loads through chronologically staggered use.</li> </ul>
W324	ExtFrqLoSlv1	1	Frequency at terminal AC2 of slave 1 is too low.	
W325	ExtFrqLoSlv2	1	Frequency at terminal AC2 of slave 2 is too low.	
W327	ExtFrqHi	1	Frequency at terminal AC2 of the off-grid inverter/master is too high.	
W328	ExtFrqHiSlv1	1	Frequency at terminal AC2 of slave 1 is too high.	
W329	ExtFrqHiSlv2	1	Frequency at terminal AC2 of slave 2 is too high.	
				Remedy if a generator is the external energy source: <ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>

No.	Name	Level	Cause	Corrective measures
W331	Antils	1	Undesired stand-alone grid is present at terminal AC2 of the off-grid inverter/master.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the insulated conductors at terminal AC2 are securely connected and that the conductors in the terminals are free from insulation.</li> </ul> <p>Remedy in case of a generator as an external energy source:</p> <ul style="list-style-type: none"> <li>The cause may be a contactor between the generator and the off-grid inverter. If you are a skilled person, control the contactor using a multi-function relay of an off-grid inverter. Set the parameter of the multi-function relay, e.g. <b>241.01 Rly1Op</b>, to AutoGn.</li> <li>If you are a skilled person, set the parameter <b>234.20 GdAiSns</b> to a lower sensitivity.</li> </ul> <p>Remedy if a generator is the external energy source:</p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W332	AntilsSlv1	1	Undesired stand-alone grid is present at terminal AC2 of slave 1.	
W333	AntilsSlv2	1	Undesired stand-alone grid is present at terminal AC2 of slave 2.	
W335	ExtVtgRdtErr	1	Voltage at terminal AC2 of the off-grid inverter/master is outside the set limiting values (redundant measurement).	<p>Remedy in case of a generator as an external energy source:</p> <ul style="list-style-type: none"> <li>If you are a skilled person, adjust the limiting values for generator voltage on the off-grid inverter (see the installation manual of the off-grid inverter). Observe and evaluate the measured values <b>134.02 ExtVtg</b> during operation.</li> <li>If possible and if you are a skilled person, adjust the generator voltage.</li> </ul> <p>Remedy if a generator is the external energy source:</p> <ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W336	ExtVtgRdtErrSlv1	1	Voltage at terminal AC2 of slave 1 is outside the set limiting values (redundant measurement).	
W337	ExtVtgRdtErrSlv2	1	Voltage at terminal AC2 of slave 2 is outside the set limiting values (redundant measurement).	

No.	Name	Level	Cause	Corrective measures
W343	AcVtglim	1	Off-grid inverter/master disconnects from the external energy source because the voltage at terminal AC2 is too high in relation to the battery voltage.	-
W344	AcVtglimSlv1	1	Slave 1 disconnects from the external energy source because the ratio between the voltage at terminal AC2 and the battery voltage is too high.	
W345	AcVtglimSlv2	1	Slave 2 disconnects from the external energy source because the ratio between the voltage at terminal AC2 and the battery voltage is too high.	
W347	ExtOverload	1	The off-grid inverter/master disconnects from the electricity grid due to line conductor failure/overload at terminal AC2.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that there is no short circuit at terminal AC2.</li> </ul>
W348	ExtOverloadSlv1	1	Slave 1 disconnects from the electricity grid due to line conductor failure/overload at terminal AC2.	
W349	ExtOverloadSlv2	1	Slave 2 disconnects from the electricity grid due to line conductor failure/overload at terminal AC2.	
W351	ExtScirDet	1	Short circuit at terminal AC2 of the off-grid inverter/master.	<ul style="list-style-type: none"> <li>If you are a skilled person, eliminate the short circuit.</li> </ul>
W352	ExtScirDetSlv1	1	Short circuit at terminal AC2 of slave 1.	
W353	ExtScirDetSlv2	1	Short circuit at terminal AC2 of slave 2.	

No.	Name	Level	Cause	Corrective measures
W355	PhsAngErr	1	Assignment of the line conductors of the external energy source to the AC2 terminals of the off-grid inverters does not result in a right rotating magnetic field.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the master is connected to L1, slave 1 is connected to L2, and slave 2 is connected to L3.</li> </ul>

### 5.3.6 Generator Category (4xx)

No.	Name	Level	Cause	Corrective measures
W401	GnRevPwrProt	1	AC sources in the off-grid system are driving the generator. The reverse power to 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 stand-alone grid and to the properties of the loads, e.g. for PV inverters, preferably request the generator at night.</li> <li>If you are a skilled person and the generator can record reverse power, adjust the settings for reverse power (see the installation manual of the off-grid inverter)</li> </ul>
W402	GnFailLock	1	The connection of the generator is locked as a result of too many interrupted start processes.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the control of the generator is functioning, the generator starts, and there is constant and stable generator voltage at terminal AC2. To re-enable the connection of the generator, acknowledge the generator error (see the operating manual of the off-grid inverter).</li> <li>The configuration of the warm-up time <b>234.12 GnWarmTm</b> may be too short and the generator may be unable to supply valid voltage. Ensure that the warm-up time for the generator is suitably configured (see the installation manual of the off-grid inverter).</li> </ul>

### 5.3.7 Electricity Grid Category (5xx)

No.	Name	Level	Cause	Corrective measures
W501	GdRevPwrProt	1	AC sources in the stand-alone grid are performing undesired feed-in to the electricity grid.	-
W502	GdRevPwrProtSL1	1	The reverse power to the electricity grid has been exceeded for too long.	
W503	GdRevPwrProtSL2	1		

### 5.3.8 Relay Category (6xx)

No.	Name	Level	Cause	Corrective measures
F 605	TransfNotOpn	4	Internal transfer relay in the off-grid inverter/master does not open.	<ul style="list-style-type: none"> <li>A bypass switch may have bridged the internal transfer relay. Ensure that the bypass switch is in the position for operation with the off-grid inverter.</li> <li>If you are a skilled person, ensure that the terminals AC1 and AC2 are not bridged.</li> </ul>
W606	TransfNotOpnSL1	1	Internal transfer relay in slave 1 does not open.	
W607	TransfNotOpnSL2	1	Internal transfer relay in slave 2 does not open.	

### 5.3.9 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 was exceeded when performing a task.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
F 704	Calib	4	System has not calibrated itself.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W705	TimeOut	1	Watchdog of the signal processor of the off-grid inverter/master has tripped.	-

No.	Name	Level	Cause	Corrective measures
F 706	TimeOut	4	Watchdog of the signal processor of the off-grid inverter/master has tripped multiple times.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W707	TimeOutSlv1	1	Watchdog of the signal processor of slave 1 has tripped multiple times.	
W708	TimeOutSlv2	1	Watchdog of the signal processor of slave 2 has tripped multiple times.	
F 710	AutoStrCnt	4	Autostart meter has elapsed multiple times in succession.	<ul style="list-style-type: none"> <li>If you are a skilled person, read off the pending and entered 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>
W713	TimeOut	1	Watchdog of the OCU has tripped.	-
F 716	VBATMIN	2	Measured battery voltage of the off-grid inverter/master is below the permissible measurement range.	<ul style="list-style-type: none"> <li>Disconnect the DC loads and charge the battery.</li> <li>The usable battery capacity may be too small, e.g. due to aging. If a load with high power connects, the battery voltage is interrupted.</li> <li>If you are a skilled person and DC loads are installed in the off-grid system, install load shedding for DC loads.</li> <li>If you are a skilled person, ensure that all battery cells are functional.</li> </ul>
W717	VBATMINSL1	1	Measured battery voltage of slave 1 is below the permissible measurement range.	
W718	VBATMINSL2	1	Measured battery voltage of slave 2 is below the permissible measurement range.	
F 720	InvTmpSns	4	Temperature sensor on the transformer of the off-grid inverter/master is defective.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>

No.	Name	Level	Cause	Corrective measures
F 721	InvTmpSns	4	Temperature sensor at the heat sink of the off-grid inverter/master is defective.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
W722	BatTmpSnsShort	1	Short circuit in battery temperature sensor	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the battery temperature sensor is correctly connected (see the installation manual of the off-grid inverter).</li> <li>Contact the SMA Service Line.</li> </ul>
W723	BatTmpSnsOpn	1	Cable break in battery temperature sensor	
W724	AutoStrCntSlv1	1	Maximum number of autostarts of slave 1 has been reached.	<ul style="list-style-type: none"> <li>If you are a skilled person, read off the pending and entered 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>
W725	AutoStrCntSlv2	1	Maximum number of autostarts of slave 2 has been reached.	
F 731	ClstConfig	4	Configuration of the cluster is incorrect.	<ul style="list-style-type: none"> <li>If you are a skilled person, change the address assignment of the slaves in the cluster (see the operating manual of the off-grid inverter).</li> </ul>
F 732	ClstAdress	4	Multiple off-grid inverters have been assigned the same address, e.g. two off-grid inverters are configured as slave 1.	
F 733	MstrLoss	4	Communication to the master is interrupted.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that undamaged CAT5e cables are used for communication and that the cables are inserted correctly.</li> <li>If you are a skilled person, ensure that the communication bus is equipped with a terminating resistor at both ends.</li> </ul>
W734	Slv1Loss	1	Communication from master to slave 1 is interrupted.	
W735	Slv2Loss	1	Communication from master to slave 2 is interrupted.	

No.	Name	Level	Cause	Corrective measures
W738	GnSynLoss	1	Synchronisation with external energy sources has not occurred.	<ul style="list-style-type: none"> <li>• Ensure that the generator can be started. It is possible that insufficient fuel is available.</li> <li>• If you are a skilled person, ensure that there is constant and stable voltage at terminal AC2.</li> <li>• If you are a skilled person, ensure that the limiting values for the voltage of the external energy sources are correctly configured.</li> </ul>
F 739	SPICom	3	Device-internal communication of off-grid inverter/master is disturbed.	<ul style="list-style-type: none"> <li>• Contact the SMA Service Line.</li> </ul>
W740	SPIComSlv1	1	Device-internal communication of slave 1 is disturbed.	
W741	SPIComSlv2	1	Device-internal communication of slave 2 is disturbed.	
F 743	CANCom	3	Device-internal CAN communication of off-grid inverter/master is disturbed.	<ul style="list-style-type: none"> <li>• If you are a skilled person, ensure that the terminators are inserted.</li> <li>• If you are a skilled person, ensure that undamaged CAT5e cables are used for communication and that the cables are inserted correctly.</li> <li>• Contact the SMA Service Line.</li> </ul>
W744	CANComSlv1	1	Device-internal CAN communication of slave 1 is disturbed.	
W745	CANComSlv2	1	Device-internal CAN communication of slave 2 is disturbed.	
W747	InvTmpSnsSlv1	1	Temperature sensor on the transformer of slave 1 is defective.	
W748	InvTmpSnsSlv2	1	Temperature sensor on the transformer of slave 2 is defective.	
W753	DateInvalid	1	System time is invalid.	<ul style="list-style-type: none"> <li>• Select the parameter <b>250.02 D<sub>tr</sub></b> and set the date. Select the parameter <b>250.03 T<sub>m</sub></b> and set the time.</li> </ul>



No.	Name	Level	Cause	Corrective measures
F 754	BoxCom	2	Communication with the Multicluster Box is interrupted.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that undamaged CAT5e cables are used for communication and that the cables are inserted correctly.</li> <li>If you are a skilled person, ensure that the communication bus is equipped with a terminating resistor at both ends.</li> </ul>
W755	LoBatMod1	1	Battery protection mode protects the battery. Level 1 is active.	<ul style="list-style-type: none"> <li>Disconnect the loads, start or connect the external energy source, start the off-grid inverter, and charge the battery.</li> </ul>
W756	LoBatMod2	1	Battery protection mode protects the battery. Level 2 is active.	
W757	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 miniature circuit-breakers of the off-grid inverters in the Multicluster Box are closed.</li> <li>If you are a skilled person, ensure that the cabling at terminal AC1 is correctly installed.</li> </ul>
W759	McNoVtgSv1	1	Voltage of the main cluster cannot be measured at slave 1.	
W760	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>If you are a skilled person, read off the pending and entered warnings and errors and eliminate the causes.</li> </ul>
F 782	AlVtgMonFail	4	Monitoring of the electricity grid has failed.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>

No.	Name	Level	Cause	Corrective measures
F 783	CANCom	2	Synchronisation in the cluster is disturbed at the master.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that undamaged CAT5e cables are used for communication and that the cables are inserted correctly.</li> <li>If you are a skilled person, ensure that the communication bus is equipped with a terminating resistor at both ends.</li> </ul>
W784	CANComSlv1	1	Synchronisation in the cluster is disturbed at slave 1.	
W785	CANComSlv2	1	Synchronisation in the cluster is disturbed at slave 2.	
F 787	VcoreFail	3	Device-internal voltage in the off-grid inverter/master is outside of the tolerance limits.	<ul style="list-style-type: none"> <li>Contact the SMA Service Line.</li> </ul>
F 788	VcoreFailSlv1	3	Device-internal voltage in slave 1 is outside of the tolerance limits.	
F 789	VcoreFailSlv2	3	Device-internal voltage in slave 2 is outside of the tolerance limits.	

### 5.3.10 External Devices and Components 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>
W805	BoxNoGn	1	Operation with the generator is not possible.	<ul style="list-style-type: none"> <li>If you are a skilled person, reset the off-grid system. Disconnect all loads, AC sources, external energy sources, and DC sources. Open the switch-disconnectors of the BatFuse. Wait ten minutes and commission the off-grid system. Wait until all AC sources are feeding into the stand-alone grid and all loads are connected before connecting the external energy source.</li> <li>Contact the SMA Service Line.</li> </ul>
F 806	BoxType	4	Configuration of the off-grid inverter does not match the Multicluster Box.	<ul style="list-style-type: none"> <li>If you are a skilled person, check whether the value of the parameter <b>250.23 Box</b> matches the Multicluster Box. If the value does not match, restart QCG (see the installation manual of the off-grid inverter).</li> <li>Contact the SMA Service Line.</li> </ul>
W807	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 the operating manual of the off-grid inverter).</li> <li>Contact the SMA Service Line.</li> </ul>

No.	Name	Level	Cause	Corrective measures
F 809	BoxNoLod	4	Load-shedding contactor Q5 in the Multicluster Box is not functioning correctly.	<ul style="list-style-type: none"> <li>If you are a skilled person, reset the off-grid system. Disconnect the off-grid system and restart.</li> <li>The configuration may be incorrect. If you are a skilled person, start QCG and reconfigure multicluster operation (see the installation manual of the off-grid inverter).</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>
W815	BoxQ5	1	Contactor Q5 in the Multicluster Box is not functioning correctly.	<ul style="list-style-type: none"> <li>Reset the off-grid system. Disconnect the off-grid system and restart.</li> </ul>
F 816	BoxQ7	2	Contactor Q7 in the Multicluster Box is not functioning correctly.	<ul style="list-style-type: none"> <li>The configuration may be incorrect. If you are a skilled person, start QCG and reconfigure multicluster operation (see the installation manual of the off-grid inverter).</li> <li>Contact the SMA Service Line.</li> </ul>

No.	Name	Level	Cause	Corrective measures
F 818	BoxPhsFail	4	A line conductor of an off-grid inverter is missing.	<ul style="list-style-type: none"> <li>• Ensure that all miniature circuit-breakers of the off-grid inverters in the Multiclustervox are closed.</li> <li>• Reset the off-grid system. Disconnect the off-grid system and restart.</li> <li>• If you are a skilled person, search for the missing line conductor and eliminate the error. Measure the AC voltage between the respective line conductors and between the line conductors and the neutral conductors for the connected loads. If an AC voltage deviates from the nominal voltage by <math>\pm 10\%</math>, the corresponding line conductor is missing.</li> </ul>
W851	Sic1BatShort	1	Connection of the battery to Sunny Island Charger 1 is reverse connected or there is a short circuit.	<ul style="list-style-type: none"> <li>• If you are a skilled person, ensure that the battery is correctly connected to the DC terminal of the Sunny Island Charger.</li> <li>• If you are a skilled person, disconnect the PV array from the Sunny Island Charger and restart the off-grid system. Thus you will ensure that the PV array is not short-circuited.</li> </ul>
W852	Sic1BatVtgHi	1	Battery voltage of the Sunny Island Charger 1 is too high.	<ul style="list-style-type: none"> <li>• If you are a skilled person, ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>• If you are a skilled person, ensure that all DC sources and DC loads are correctly configured and connected.</li> <li>• Reset the off-grid system. Disconnect the off-grid system, wait ten minutes and restart.</li> </ul>
W853	Sic1PvVtgHi	1	PV voltage of the Sunny Island Charger 1 is too high.	-
W854	Sic1PvVtgLo	1	There is no PV voltage at Sunny Island Charger 1 or there is a short circuit.	-

No.	Name	Level	Cause	Corrective measures
W855	Sic1TmpLo	1	Sunny Island Charger 1 reports battery undertemperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, set the Sunny Island Charger to the "SMA operation" operating mode (see the installation manual of the Sunny Island Charger).</li> </ul>
W856	Sic1TmpHI	1	Sunny Island Charger 1 reports battery overtemperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, set the Sunny Island Charger to the "SMA operation" operating mode (see the installation manual of the Sunny Island Charger).</li> </ul>
W857	Sic1ComLoss	1	Last communication with the Sunny Island Charger 1 was more than 24 h ago.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that undamaged CAT5e cables are used for communication and that the cables are inserted correctly.</li> <li>If you are a skilled person, ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>If you are a skilled person, ensure that the communication interfaces in the off-grid inverter are correctly inserted.</li> </ul>
W861	Sic2BatShort	1	Connection of the battery to Sunny Island Charger 2 is reverse connected or there is a short circuit.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the battery is correctly connected to the DC terminal of the Sunny Island Charger.</li> <li>If you are a skilled person, disconnect the PV array from the Sunny Island Charger and restart the off-grid system. By doing so, you ensure that the PV array is not short-circuited.</li> </ul>
W862	Sic2BatVtgHi	1	Battery voltage of the Sunny Island Charger 2 is too high.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>If you are a skilled person, ensure that all DC sources and DC loads are correctly configured and connected.</li> <li>Reset the off-grid system. Disconnect the off-grid system, wait ten minutes and restart.</li> </ul>

No.	Name	Level	Cause	Corrective measures
W863	Sic2PvVtgHi	1	PV voltage of the Sunny Island Charger 2 is too high.	-
W864	Sic2PvVtgLo	1	There is no PV voltage at Sunny Island Charger 2 or there is a short circuit.	-
W865	Sic2TmpLo	1	Sunny Island Charger 2 reports battery undertemperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, set the Sunny Island Charger to the "SMA operation" operating mode (see the installation manual of the Sunny Island Charger).</li> </ul>
W866	Sic2TmpHI	1	Sunny Island Charger 2 reports battery overtemperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, set the Sunny Island Charger to the "SMA operation" operating mode (see the installation manual of the Sunny Island Charger).</li> </ul>
W867	Sic2ComLoss	1	Last communication with the Sunny Island Charger 2 was more than 24 h ago.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that undamaged CAT5e cables are used for communication and that the cables are inserted correctly.</li> <li>If you are a skilled person, ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>If you are a skilled person, ensure that the communication interfaces in the off-grid inverter are correctly inserted.</li> </ul>
W871	Sic2BatShort	1	Connection of the battery to Sunny Island Charger 2 is reverse connected or there is a short circuit.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the battery is correctly connected to the DC terminal of the Sunny Island Charger.</li> <li>If you are a skilled person, disconnect the PV array from the Sunny Island Charger and restart the off-grid system. By doing so, you ensure that the PV array is not short-circuited.</li> </ul>

No.	Name	Level	Cause	Corrective measures
W872	Sic3BatVtgHi	1	Battery voltage of the Sunny Island Charger 3 is too high.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>If you are a skilled person, ensure that all DC sources and DC loads are correctly configured and connected.</li> <li>Reset the off-grid system. Disconnect the off-grid system, wait ten minutes and restart.</li> </ul>
W873	Sic3PvVtgHi	1	PV voltage of the Sunny Island Charger 3 is too high.	-
W874	Sic3PvVtgLo	1	There is no PV voltage at Sunny Island Charger 3 or there is a short circuit.	-
W875	Sic3TmpLo	1	Sunny Island Charger 3 reports battery undertemperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, set the Sunny Island Charger to the "SMA operation" operating mode (see the installation manual of the Sunny Island Charger).</li> </ul>
W876	Sic3TmpHI	1	Sunny Island Charger 3 reports battery overtemperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, set the Sunny Island Charger to the "SMA operation" operating mode (see the installation manual of the Sunny Island Charger).</li> </ul>
W877	Sic3ComLoss	1	Last communication with the Sunny Island Charger 3 was more than 24 h ago.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that undamaged CAT5e cables are used for communication and that the cables are inserted correctly.</li> <li>If you are a skilled person, ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>If you are a skilled person, ensure that the communication interfaces in the off-grid inverter are correctly inserted.</li> </ul>



No.	Name	Level	Cause	Corrective measures
W881	Sic4BatShort	1	Connection of the battery to Sunny Island Charger 4 is reverse connected or there is a short circuit.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the battery is correctly connected to the DC terminal of the Sunny Island Charger.</li> <li>If you are a skilled person, disconnect the PV array from the Sunny Island Charger and restart the off-grid system. Thus you will ensure that the PV array is not short-circuited.</li> </ul>
W882	Sic4BatVtgHi	1	Battery voltage of the Sunny Island Charger 4 is too high.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>If you are a skilled person, ensure that all DC sources and DC loads are correctly configured and connected.</li> <li>Reset the off-grid system. Disconnect the off-grid system, wait ten minutes and restart.</li> </ul>
W883	Sic4PvVtgHi	1	PV voltage of the Sunny Island Charger 4 is too high.	-
W884	Sic4PvVtgLo	1	There is no PV voltage at Sunny Island Charger 4 or there is a short circuit.	-
W885	Sic4TmpLo	1	Sunny Island Charger 4 reports battery undertemperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, set the Sunny Island Charger to the "SMA operation" operating mode (see the installation manual of the Sunny Island Charger).</li> </ul>
W886	Sic4TmpHI	1	Sunny Island Charger 4 reports battery overtemperature.	<ul style="list-style-type: none"> <li>If you are a skilled person, set the Sunny Island Charger to the "SMA operation" operating mode (see the installation manual of the Sunny Island Charger).</li> </ul>

No.	Name	Level	Cause	Corrective measures
W887	Sic4ComLoss	1	Last communication with the Sunny Island Charger 4 was more than 24 h ago.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that undamaged CAT5e cables are used for communication and that the cables are inserted correctly.</li> <li>If you are a skilled person, ensure that the configuration of the Sunny Island Charger with the DIL switches is correct.</li> <li>If you are a skilled person, ensure that the communication interfaces in the off-grid inverter are correctly inserted.</li> </ul>
W890	BoxMeas	2	Disturbance of voltage measurement/current measurement at the measurement point of the Multicluster Box for the master.	<ul style="list-style-type: none"> <li>If you are a skilled person, ensure that the control and measuring cable between the Multicluster Box and the corresponding off-grid inverter of the main cluster is correctly inserted. Be sure to observe the correct connection sequence of the Multicluster Box to the off-grid inverters (see the installation manual of the off-grid inverter and the installation manual of the Multicluster Box)</li> </ul>
W891	BoxMeasSlv1	2	Disturbance of voltage measurement/current measurement at the measurement point of the Multicluster Box for slave 1.	
W892	BoxMeasSlv2	2	Disturbance of voltage measurement/current measurement at the measurement point of the Multicluster Box for slave 2.	

### 5.3.11 General Category (9xx)

No.	Name	Level	Cause	Corrective measures
W915	Timeout	1	An error has occurred in the program sequence.	-

## 6 Contact

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

- Type of off-grid inverter
- Serial number of the off-grid inverter
- Firmware version of the off-grid inverter
- Indicated error message
- Type of battery connected
- Nominal capacity of the battery
- Nominal voltage of the battery
- Type of communication products connected
- Type and size of additional energy sources
- If a generator is connected:
  - Type
  - Power
  - Maximum current

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