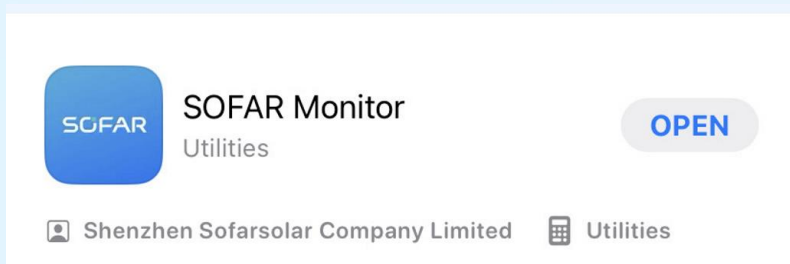







SOFAR


# SOFAR Monitor App

## Local Control



 SOFAR Monitor  
Utilities [OPEN](#)

 Shenzhen Sofarsolar Company Limited  Utilities



Version: V1.2  
Date: 02.05.2024

- App for iOS and Android for the initial setup and advanced settings of inverters.
- Connection with integrated Bluetooth interface for all G3 and G4 inverters
- List of events
- Grid code configurations
- Storage system configurations



iOS



Version 1.9.3

[https://play.google.com/store/apps/details?id=com.sofarsolar.sofarsolar&pcampaignid=web\\_share](https://play.google.com/store/apps/details?id=com.sofarsolar.sofarsolar&pcampaignid=web_share)

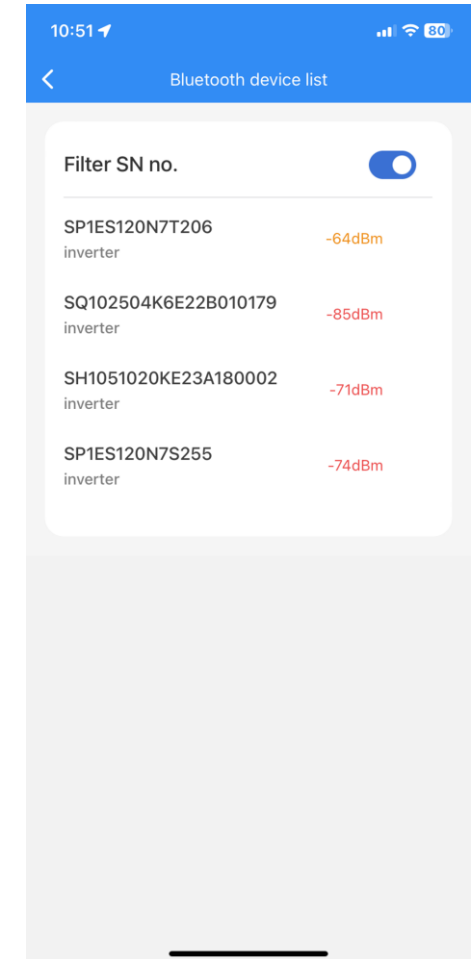
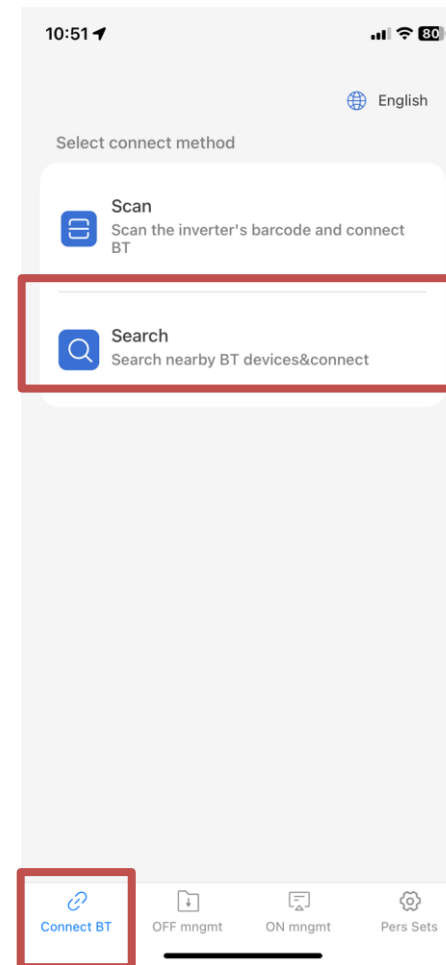
<https://apps.apple.com/us/app/sofar-monitor/id1628763002>

# Starting the App

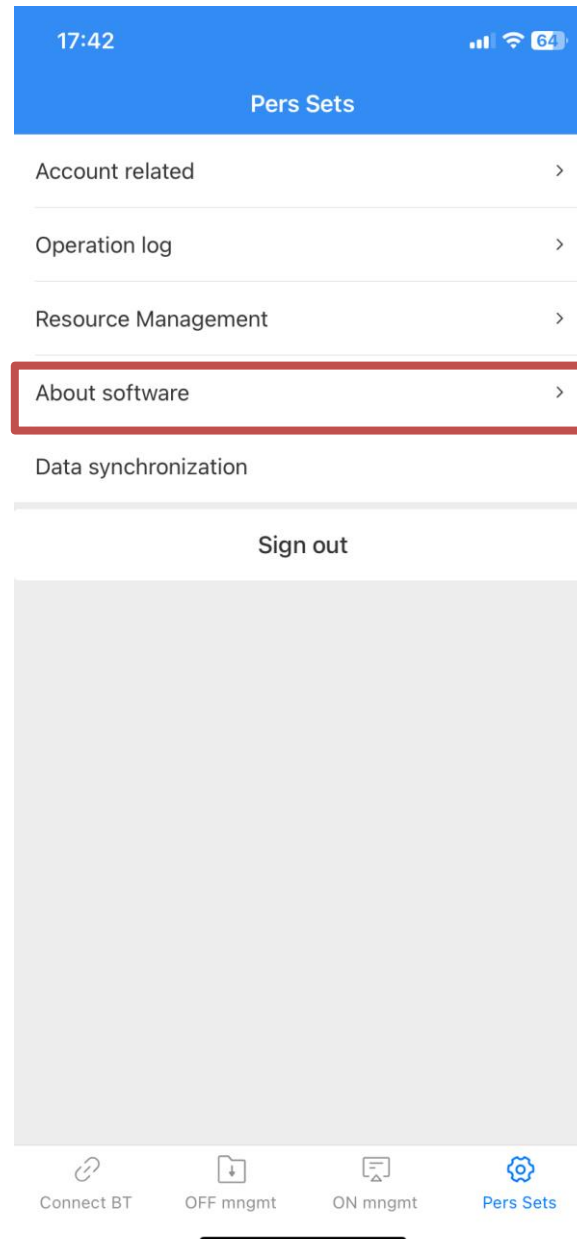
1. Activate Bluetooth on your cell phone
2. Start the app on your phone.
3. Go to "Application" in the app menu and search for the device.
4. Connect to your inverter identified by the serial number

\* if the inverter is not found straight away:

1. Go to the "Advanced settings" LCD menu on the inverter (password 0001)
2. Select the "Advanced Settings" -> "Bluetooth Reset" menu



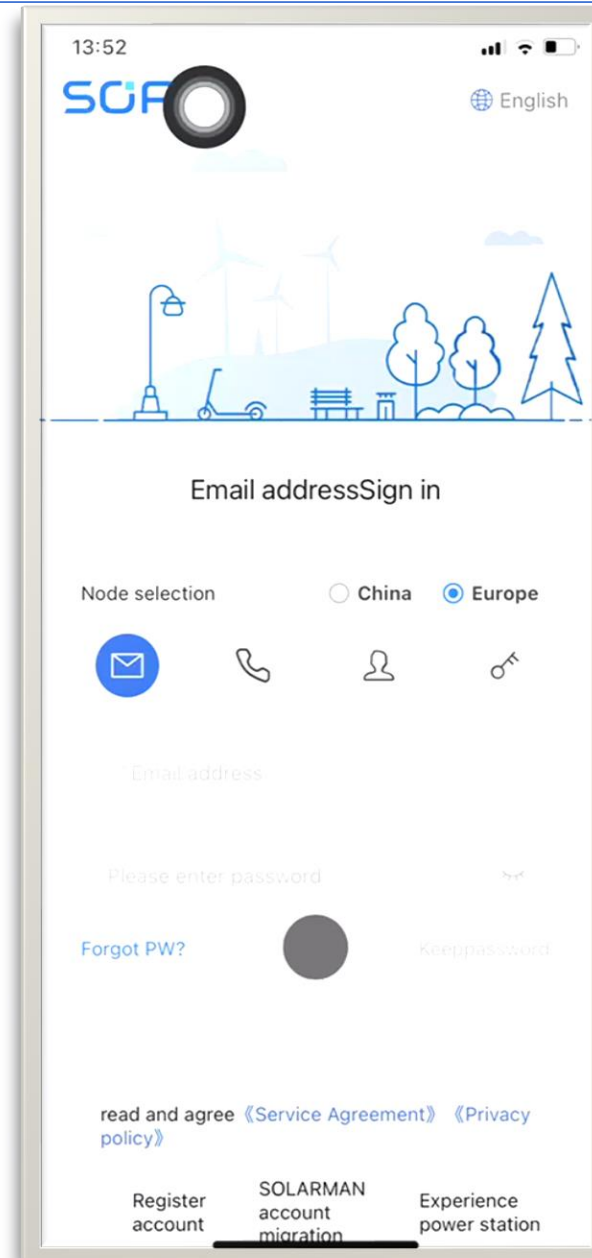
Further information on the app can be found in the user guide, which is available in the app itself.



Please watch the short video in this link to learn how to create a SOFAR-Monitor account:

[https://sofarsolargmbh.sharepoint.com/:v:/s/service/EbzBR58J4IxBk\\_yROo6R3Z0BPDw1A3fyfSPp8Oi6T3L-jQ?e=QNt4do](https://sofarsolargmbh.sharepoint.com/:v:/s/service/EbzBR58J4IxBk_yROo6R3Z0BPDw1A3fyfSPp8Oi6T3L-jQ?e=QNt4do)

Please note that registration now only works with an email address to receive the verification code. Your username/email address is case-sensitive, so please ensure that you always enter your email address in lowercase letters.



# APP overview

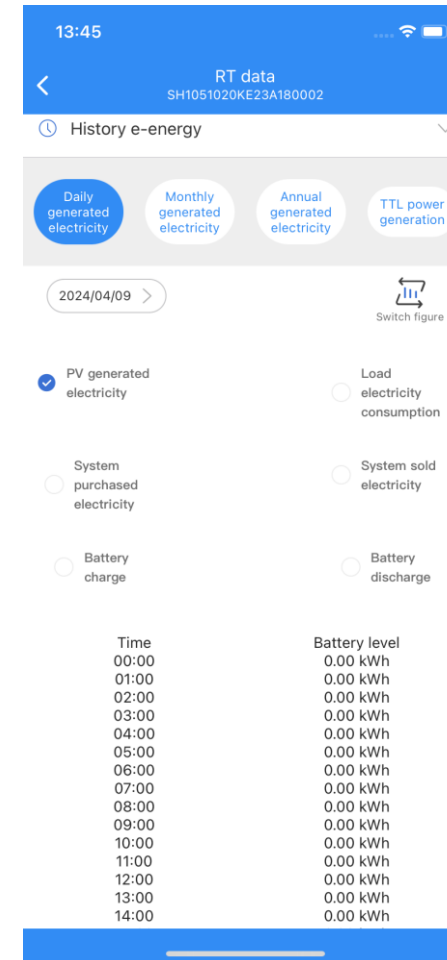
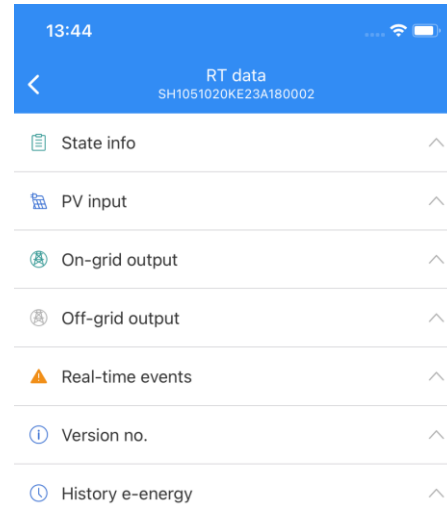
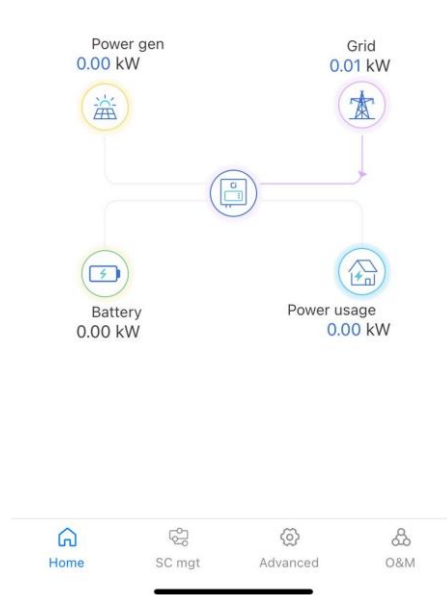
- **Overview**

Daily and total energy production and consumption



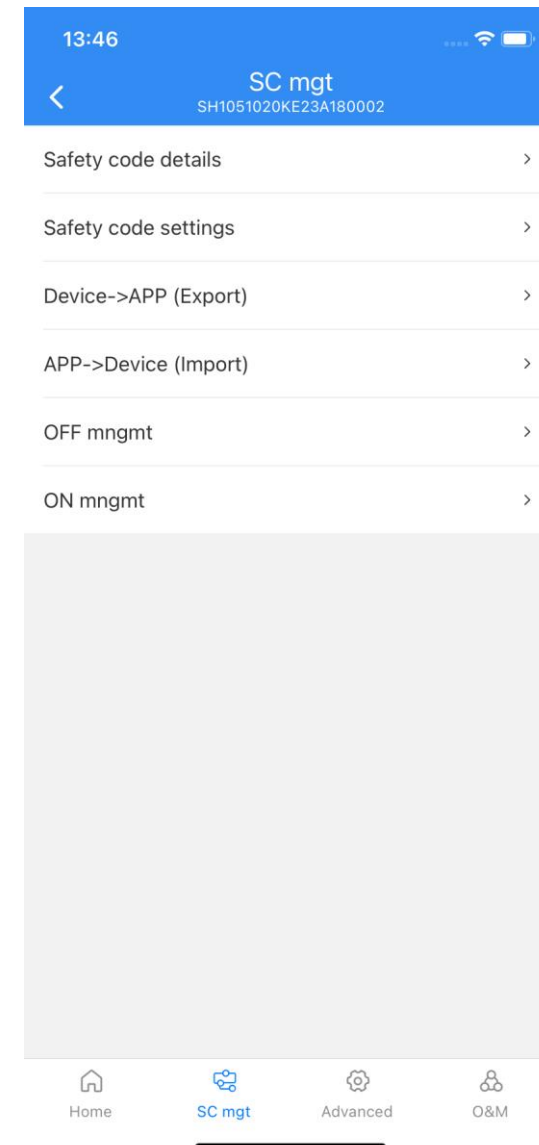
- **Real time data**

Real-time data and events

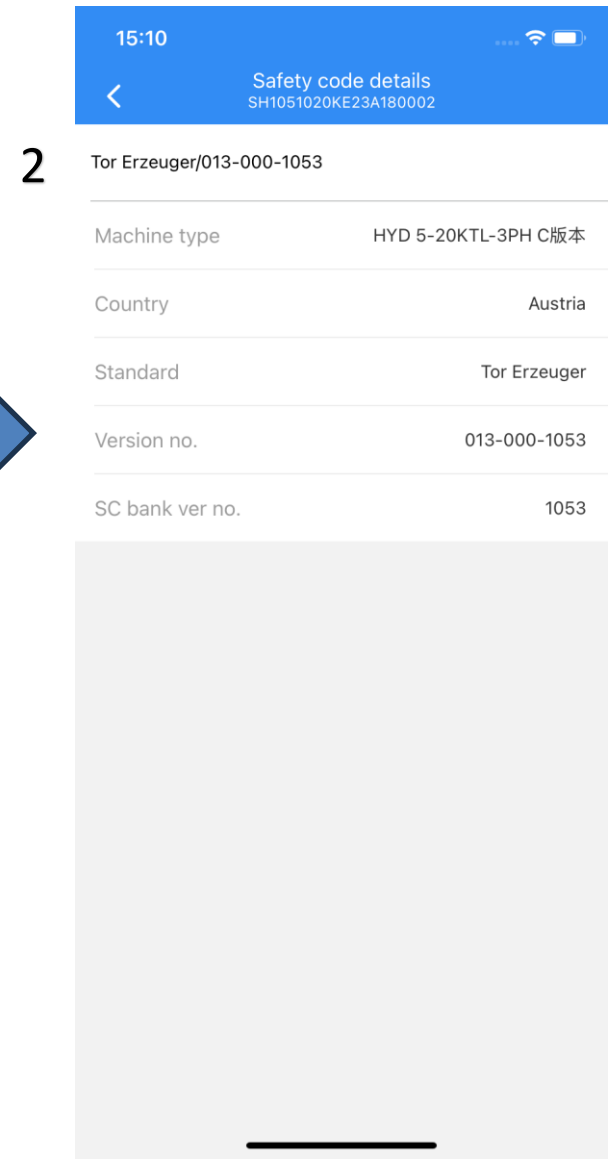
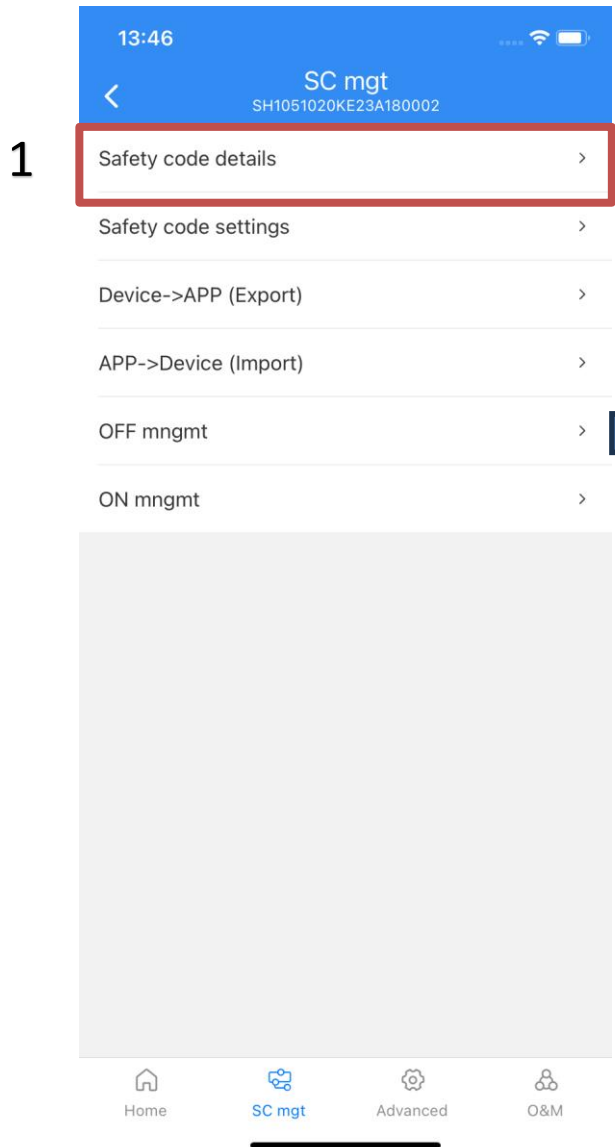


No.	ID	Event	Time
1	2	GridUVP	2024-04-08 17:48:04
2	3	GridOFF	2024-04-08 17:04:27
3	3	GridOFF	2024-04-08 09:41:57
4	3	GridOFF	2024-04-07 17:05:35
5	3	GridOFF	2024-04-07 09:57:32
6	3	GridOFF	2024-04-07 09:55:55
7	152	SafetyVerFault	2024-04-05 10:57:26
8	157	BMS1CommFault	2024-04-05 10:49:33
9	157	BMS1CommFault	2024-04-03 16:36:31
10	2	GridUVP	2024-04-03 16:04:09
11	1	GridOVP	2024-04-03 15:50:21
12	1	GridOVP	2024-04-03 15:50:09
13	1	GridOVP	2024-04-03 15:49:57
14	1	GridOVP	2024-04-03 15:49:46

- **Security details**  
Provision of information about the installed security code
- **Security settings**  
Provision of information and control for setting the grid code
- **Device-> App (export)**  
Export security file from the device to the app
- **APP -> Device (Import)**  
Importing / Setting a security file from the app to the devices
- **Offline management**  
Downloaded security file
- **Online administration**  
Download the security file from the online library



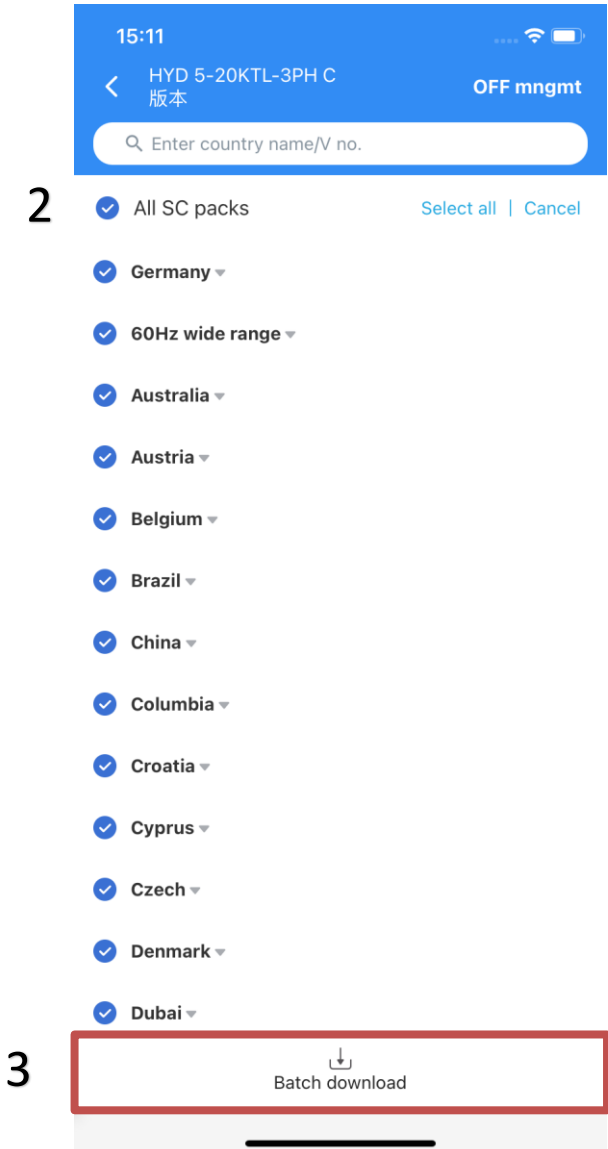
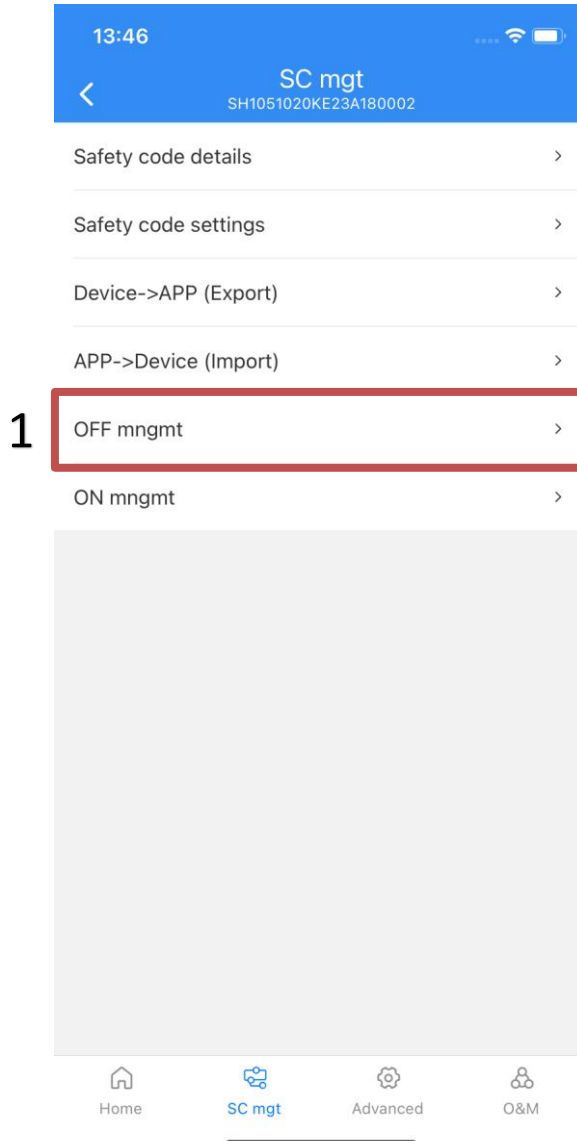
# Checking the country code



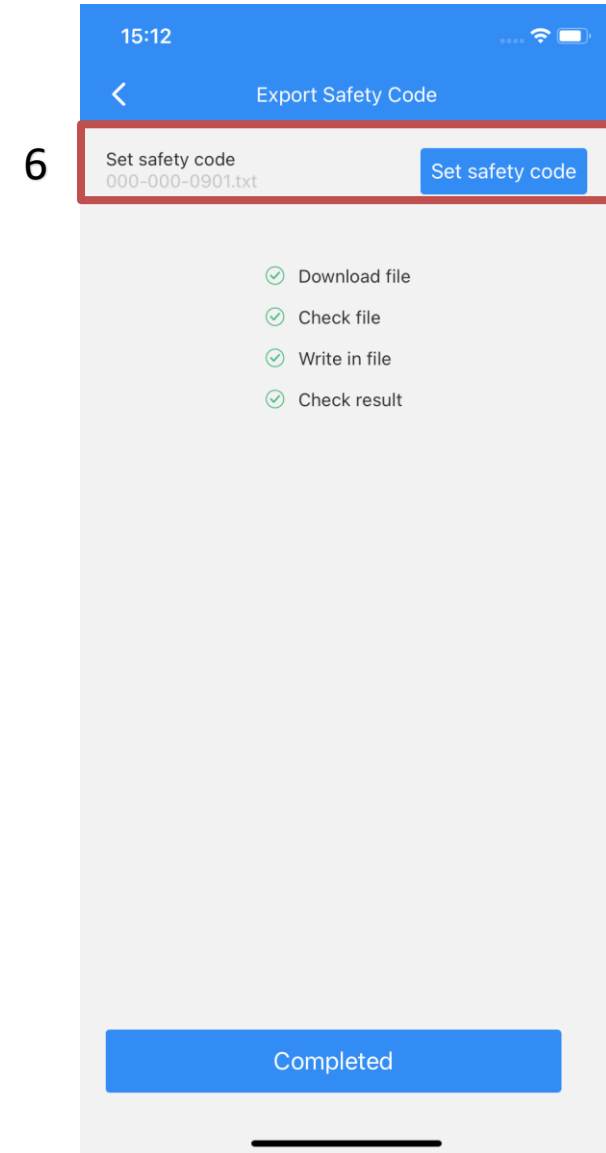
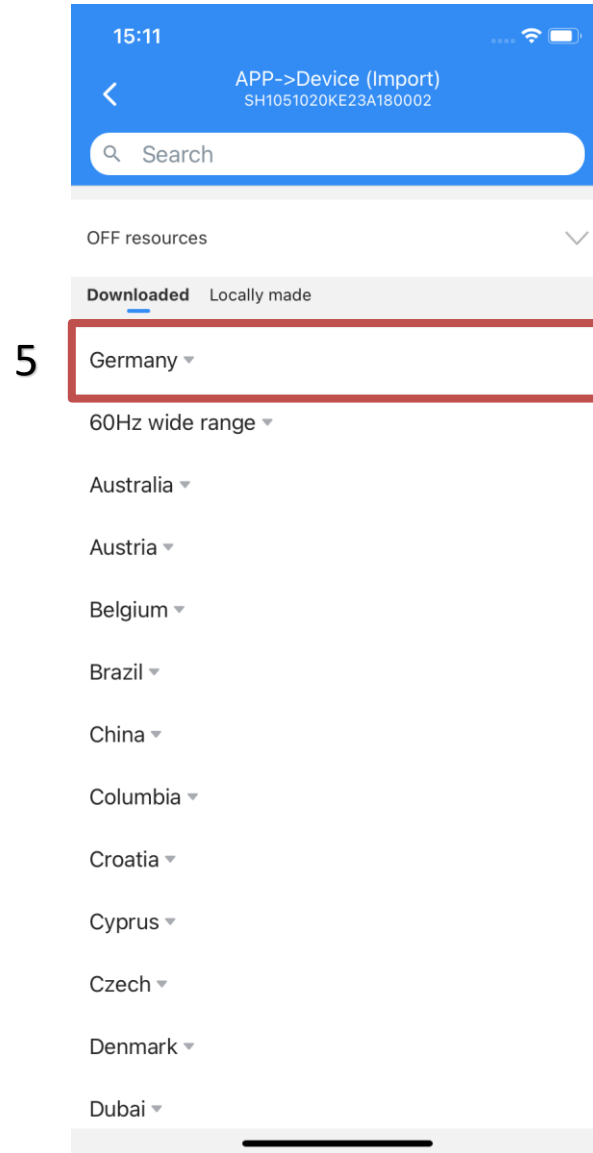
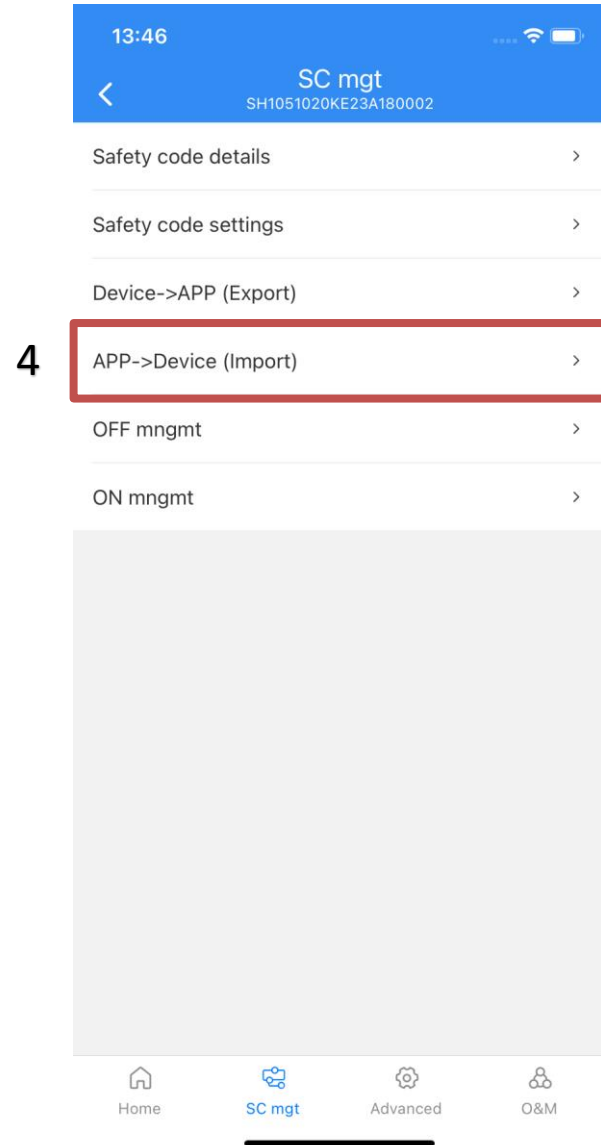
# Setting the country code

Steps to set the country code:

1. Navigate to "OFF Mngmt."
2. Select "All Packages."
3. Download the latest Safety Code library.
4. Go to APP -> Device (import).
5. Select the country code (for example, VDE 4105).
6. Press "Set Safety Code."
7. Verify if the country code has changed as described in the last slide.

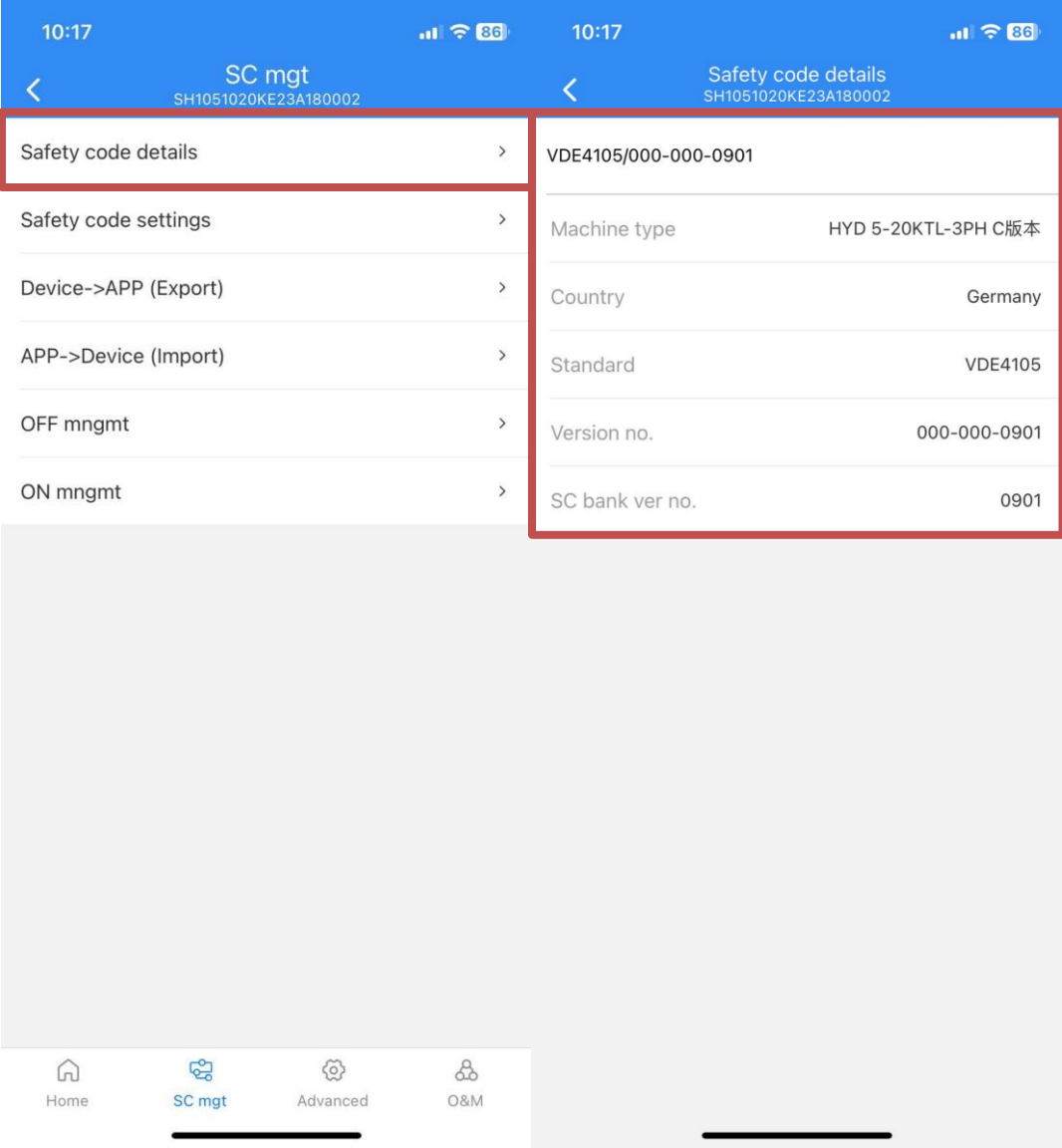


# Setting the country code



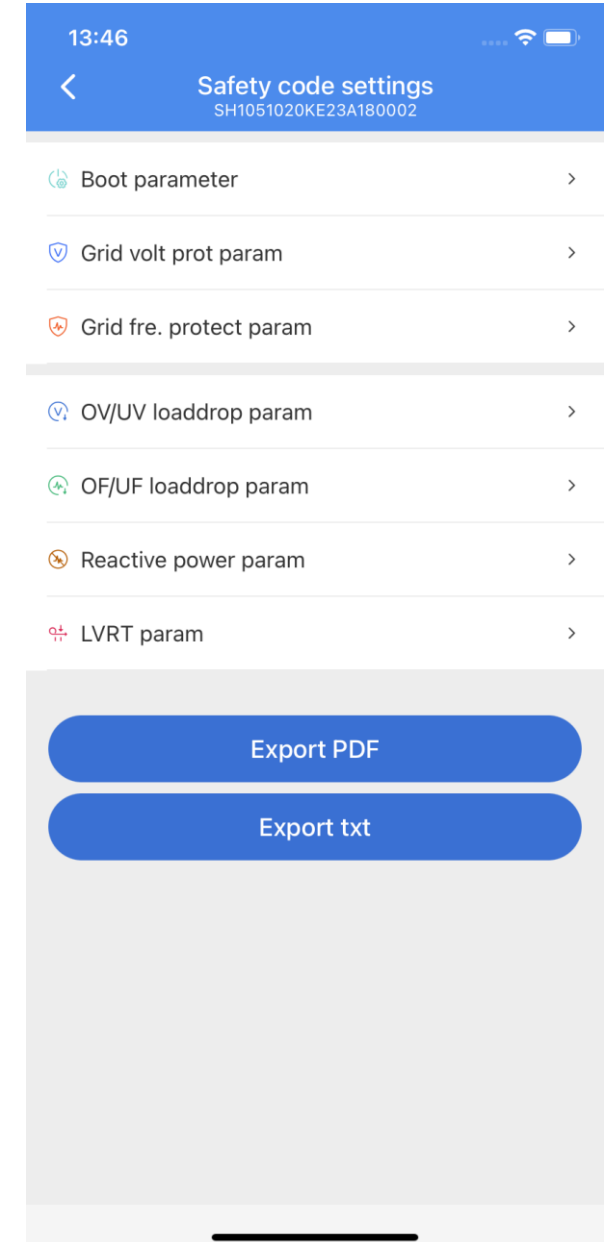
# Setting the country code

7



# Safety code settings

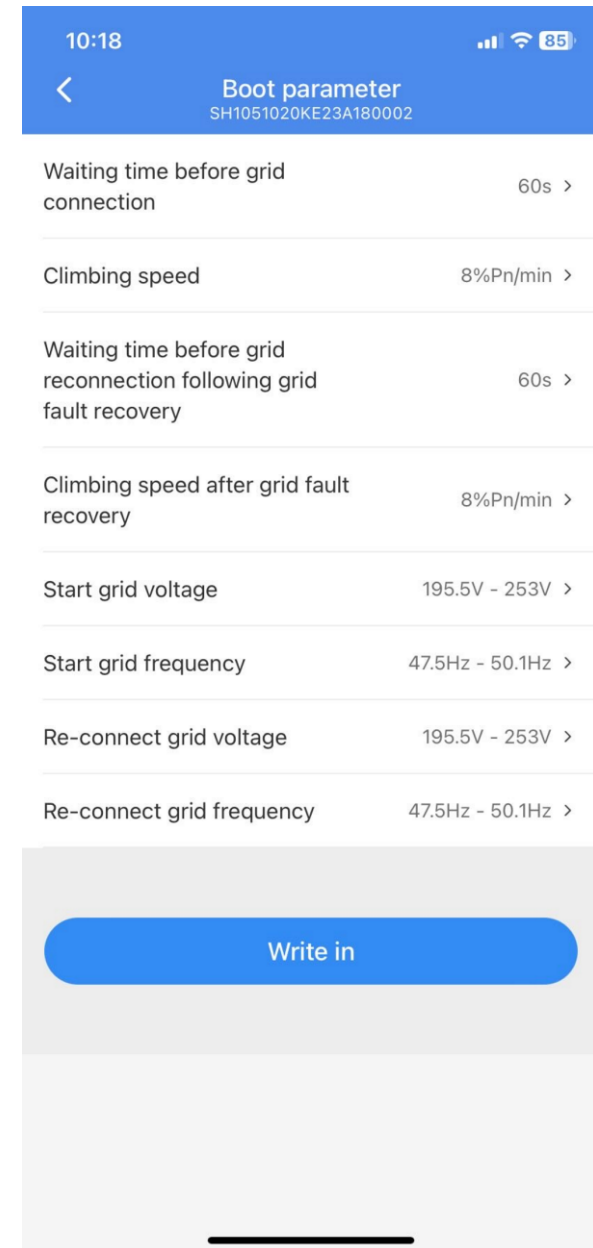
Setting Name	Functions
Boot parameter	Connection and re-connection conditions
Grid voltage Protection parameter	Voltage monitoring
Grid frequency protection parameter	Frequency monitoring
Overvoltage /Undervoltage load drop parameter	Power reduction via voltage - P(U) DRM 0, DRM 0-8 Zero export limit
Overfrequency/Underfrequency Loaddrop Parameter	Power reduction via frequency - P(f)
Reactive power parameter	Reactive power modes
LVRT/ HVRT parameter	Fault ride-through



# Connection and Reconnection conditions

The following parameters can be set:

- Grid connection waiting time
- Power ramp after grid connection
- Waiting time for reconnection
- Power ramp after reconnection
- Min. and max. Mains voltage before connecting to the mains
- Min. and max. Mains frequency before the mains connection
- Min. and max. Mains voltage before switching on again
- Min. and max. Mains frequency before switching on again



# Voltage Monitoring

Setting the overvoltage and undervoltage protection values for levels 1, 2 and 3

10:18 📶 📶 85%

< Grid volt prot param  
SH1051020KE23A180002

Rated grid voltage 230.0V >

---

OV L1protect ENBbit

L1 overvoltage protection value(0~6553.5V) 264.5

---

L1 overvoltage protection time(10~655350ms) 60

---

UV L1protect ENBbit

L1 undervoltage protection value(0~6553.5V) 184

---

L1 undervoltage protection time(10~655350ms) 3000

---

OV L2protect ENBbit

L2 overvoltage protection value(0~6553.5V) 287.5

---

L2 overvoltage protection time(10~655350ms) 60

---

UV L2protect ENBbit

L2 undervoltage protection value(0~6553.5V) 103.5

10:18 📶 📶 85%

< Grid volt prot param  
SH1051020KE23A180002

L2 undervoltage protection value(0~6553.5V) 103.5

---

L2 undervoltage protection time(10~655350ms) 300

---

OV L3protect ENBbit

L3 overvoltage protection value(0~6553.5V) 0

---

L3 overvoltage protection time(10~655350ms) 10

---

UV L3protect ENBbit

L3 undervoltage protection value(0~6553.5V) 0

---

L3 undervoltage protection time(10~655350ms) 10

---

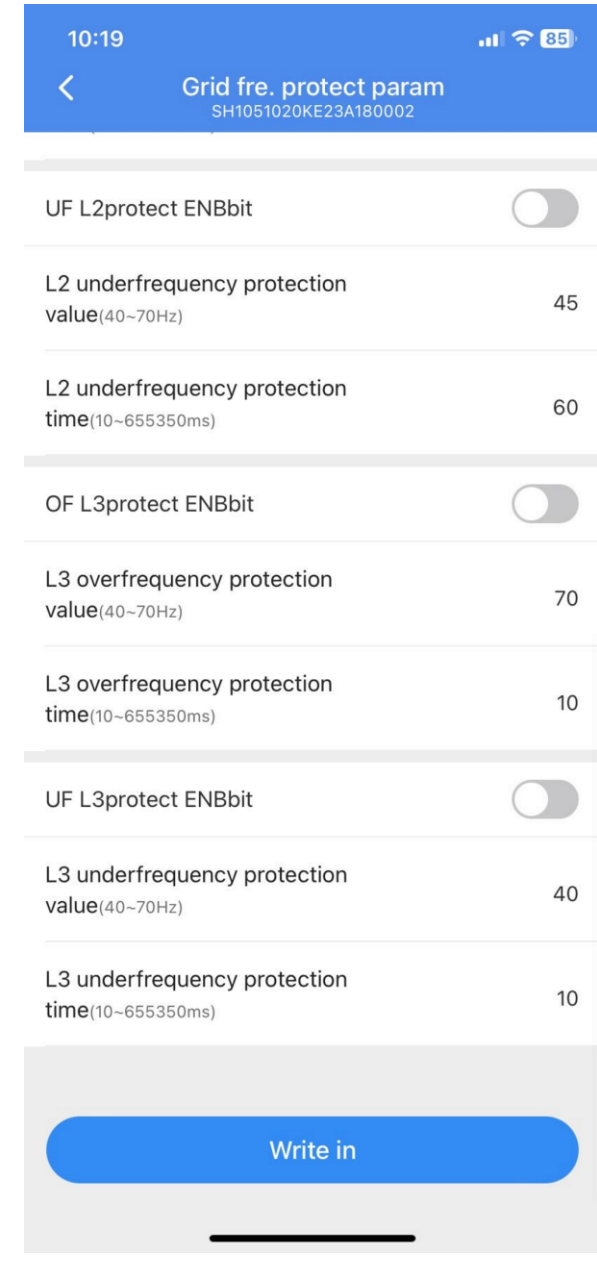
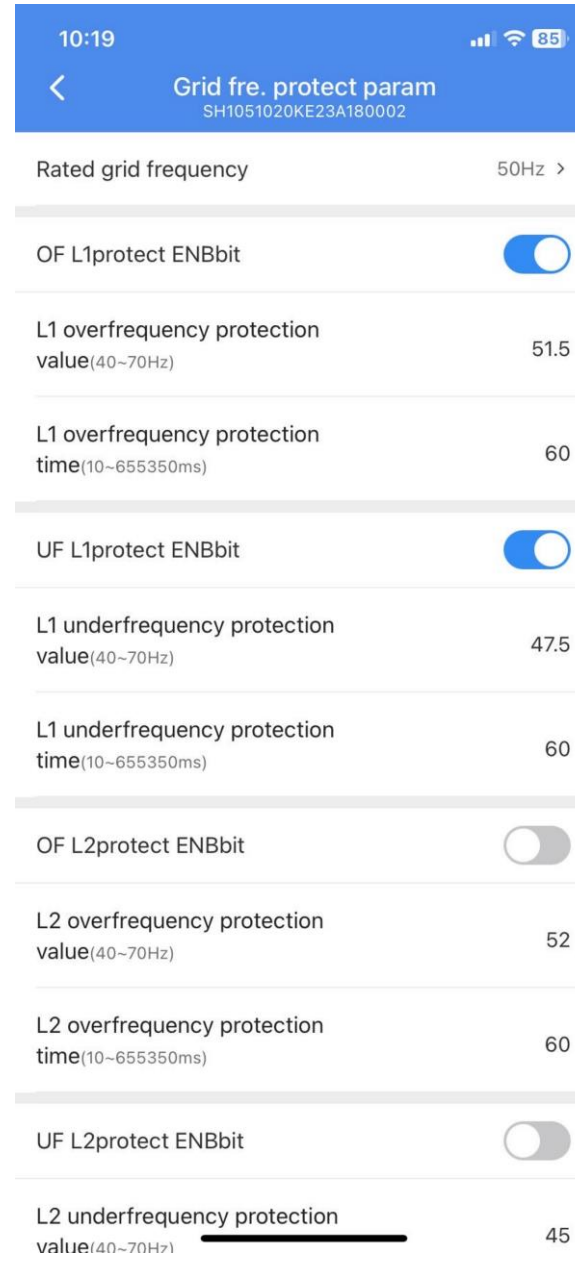
10minOV prot ENBbit

Grid 10min-overvoltage protection value(0~6553.5V) 253

Write in

# Frequency Monitoring

Setting the overfrequency and underfrequency protection values for levels 1, 2 and 3



# Active power control

- Remote ON & Off
- Fixed active power limit with power reduction Ramp.
- Feed-in P(U)
- Charging P(U)
- DRM 0
- Logical interface (DRM)
- Feed-in limit
- Active power Time constant set

16:36  
OV/UV loaddrop param  
SH1051020KE23A180002

Remote on/off enable bit	<input checked="" type="checkbox"/>
Active power load drop ENBbit	<input type="checkbox"/>
Percentage of active power output(0~100%)	100
Active power load shed rate(1~300%Pn/min)	100
OV charge load drop enable bit	<input type="checkbox"/>
Overvoltage load shed enable bit	<input type="checkbox"/>
Grid overvoltage load shed start point(0~6553.5V)	253
Grid overvoltage load shed end point(0~6553.5V)	260
Grid overvoltage load shed cut-off power(-100~100%)	20
Overvoltage load shed rate(1~300%Pn/min)	600
Undervoltage charge protection enable bit	<input type="checkbox"/>
Grid undervoltage load shed start point(0~6553.5V)	210

10:19  
OV/UV loaddrop param  
SH1051020KE23A180002

Undervoltage charge protection enable bit	<input type="checkbox"/>
Grid undervoltage load shed start point(0~6553.5V)	210
Grid undervoltage load shed end point(0~6553.5V)	205
Grid undervoltage load shed cut-off power(-100~100%)	-20
DRM0 enable bit	<input type="checkbox"/>
Logic interface (DRM1-8) enable bit	<input checked="" type="checkbox"/>
Logint1cor. Power(-100~100%)	0
Logint2cor. Power(-100~100%)	100
Logint3cor. Power(-100~100%)	100
Logint4cor. Power(-100~100%)	100
Logint5cor. Power(-100~100%)	0
Logint6cor. Power(-100~100%)	30
Logint7cor. Power(-100~100%)	60
Logint8cor. Power(-100~100%)	100

10:19  
OV/UV loaddrop param  
SH1051020KE23A180002

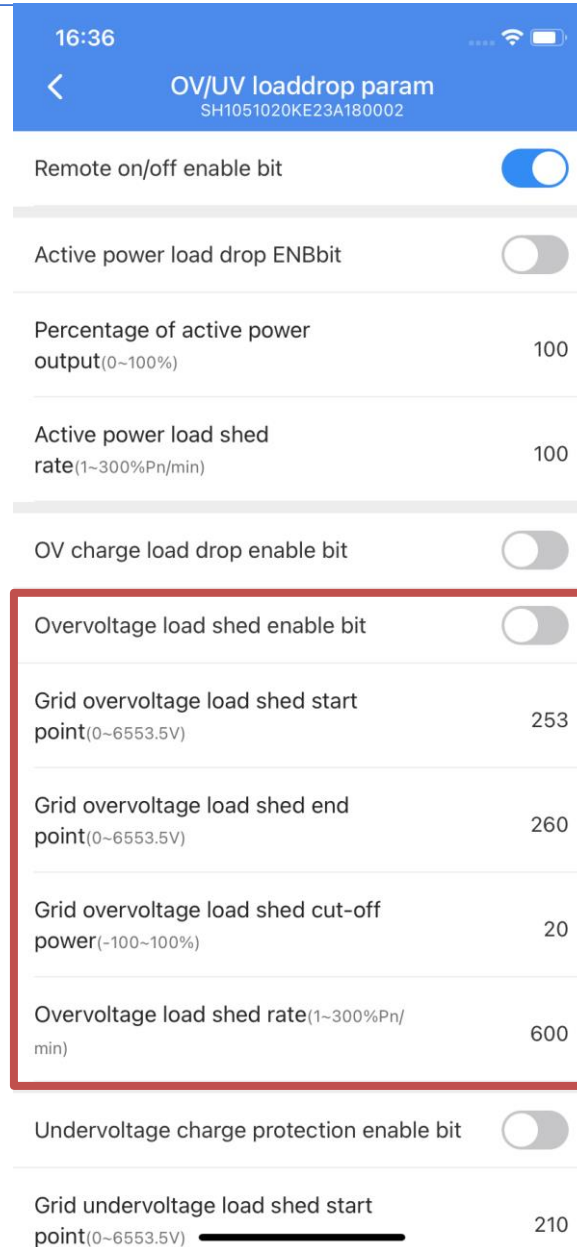
Logint4cor. Power(-100~100%)	100
Logint5cor. Power(-100~100%)	0
Logint6cor. Power(-100~100%)	30
Logint7cor. Power(-100~100%)	60
Logint8cor. Power(-100~100%)	100
Feed-in Limit overload enable bit	<input type="checkbox"/>
Feed-in Limit power(0~100%)	100
Feed-in Limit overload time(0~655350ms)	3000
LI load shed rate(1~65535%Pn/min)	3000
LI reload rate(1~65535%Pn/min)	3000
Load PT curve enable bit	<input type="checkbox"/>
Voltage drop time(0~65535s)	10

Write in

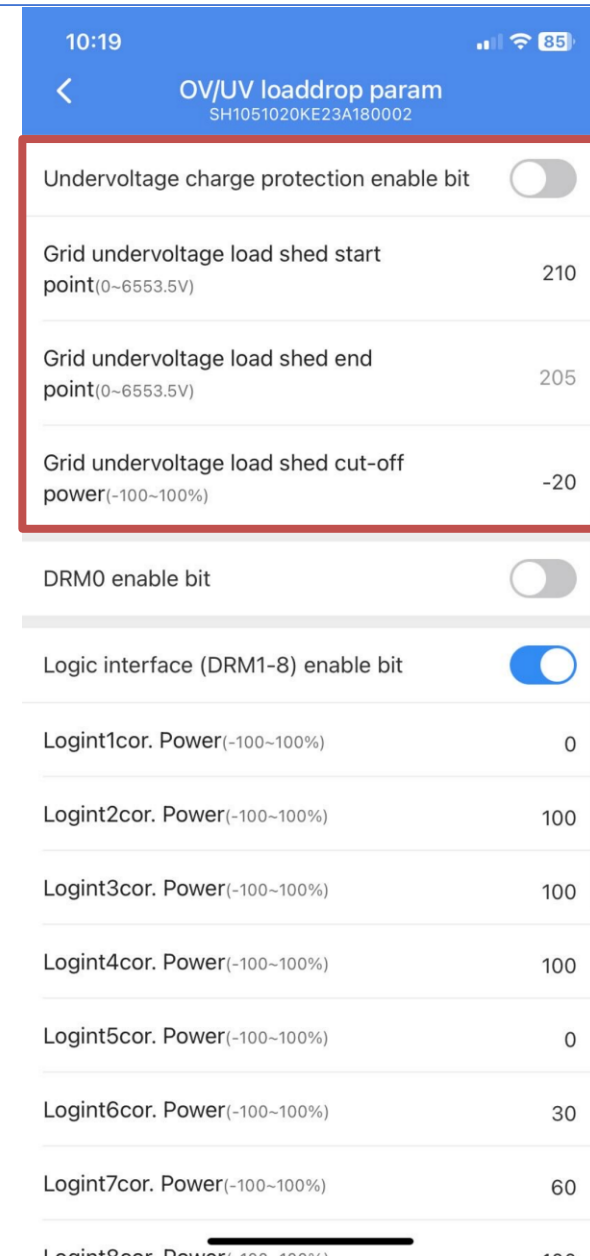
# P(U) control

1. Feed-in P(U) → Power derating with increased Grid Voltage

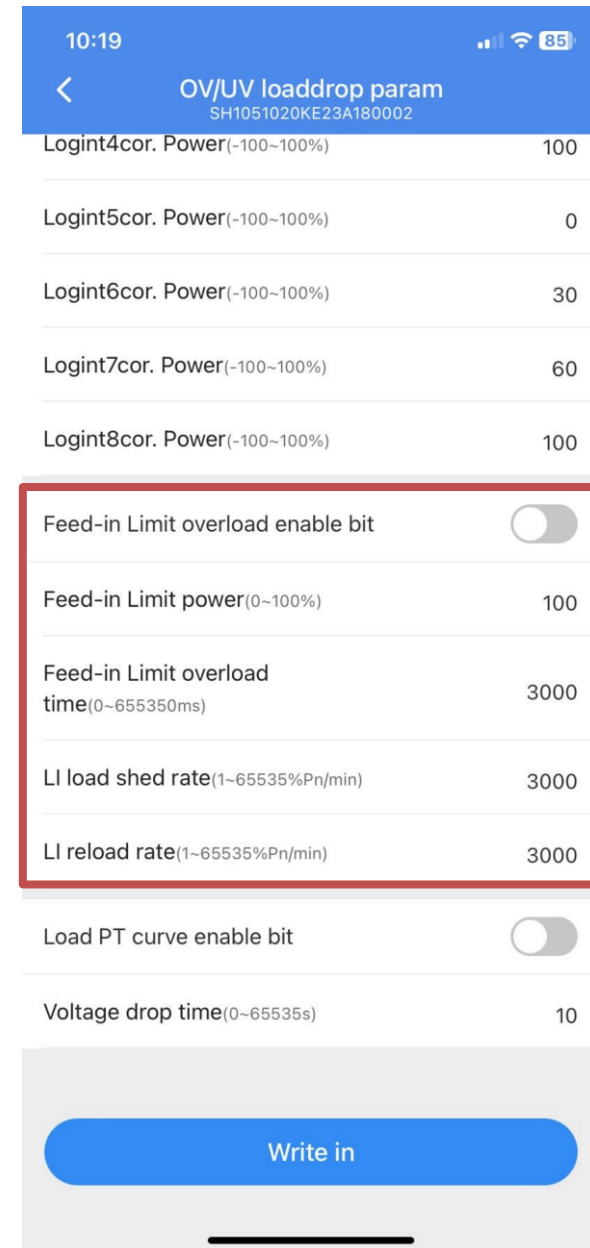
2. Reduction in battery charging power at low Grid voltage (Storage Systems only)



2

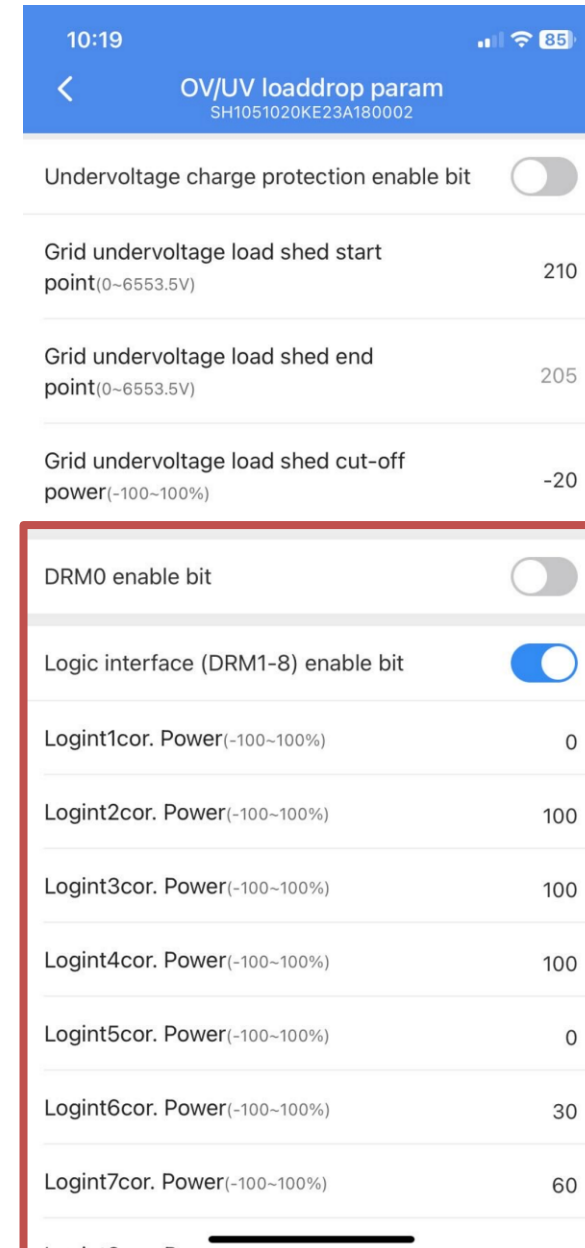


- Limitation:
  - Deactivated as default.
  - Standard: no grid phase can feed in power above the active power setting
  - Average power: Calculation of the average power (sum of all phases, netting measurement)
  - Power limit in percent



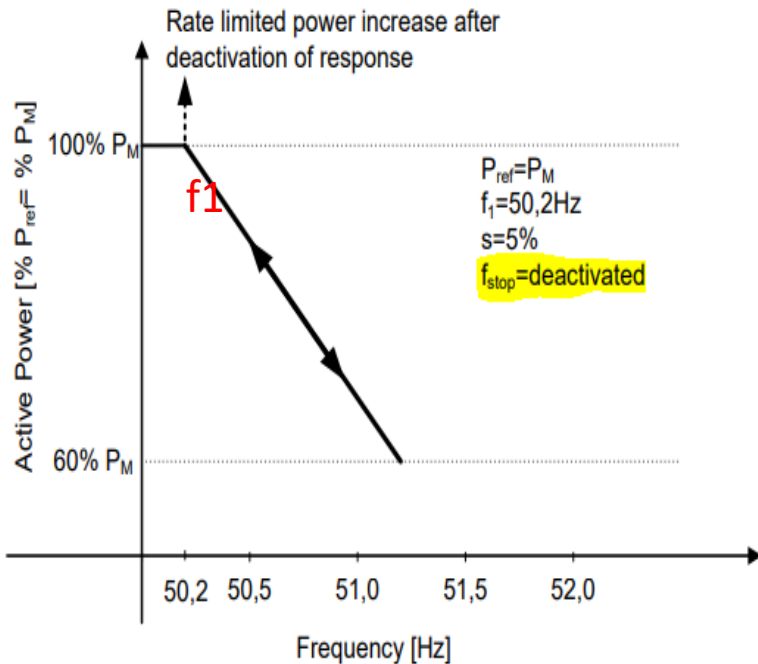
# Demand Response Modes (DRMs)

- Remote disconnection of the generation output to the grid via (DRM 0)
- Remote configuration of the output power via 1-8 DRMs



# Power reduction via frequency P(f)

- Overfrequency: "Slope" or "Slope range" mode
- Underfrequency: Reduction of the memory charge
- Reference power when an event occurs: instantaneous power or rated power



10:22 📶 84

< OF/UF loaddrop param  
SH1051020KE23A180002

Overfrequency discharge load shed enable bit

Load shed mode

Slope mode  F range mode

**f1** Overfrequency load shed start frequency(40~70Hz) 50.2

**S** Overfrequency load shed slope percentage(1~300%Pn/Hz) 40

Wait time of overfrequency load shed start(0~655350ms) 0

Underfrequency charge load shed enable bit

Underfrequency load shed start frequency(40~70Hz) 49.8

Underfrequency load shed slope percentage(1~300%Pn/Hz) 40

Wait time of underfrequency load shed start(0~655350ms) 0

Overfrequency return load shed enable

Wait time before overfrequency reload(0~655350ms) 610000

10:22 📶 84

< OF/UF loaddrop param  
SH1051020KE23A180002

Wait time before overfrequency reload(0~655350ms) 610000

Overfrequency load shed and reload frequency(40~70Hz) 50.2

Percentage of overfrequency reload rate(1~300%Pn/min) 9

Underfrequency return load shed enable

Wait time before underfrequency load return(0~655350ms) 30000

Underfrequency load shed and reload frequency(40~70Hz) 49.85

Percentage of underfrequency reload rate(1~300%Pn/min) 9

Maximum frequency of load shed exit(40~70Hz) 50.2

Minimum frequency of load shed exit(40~70Hz) 49.85

Enable start load shed from rated power

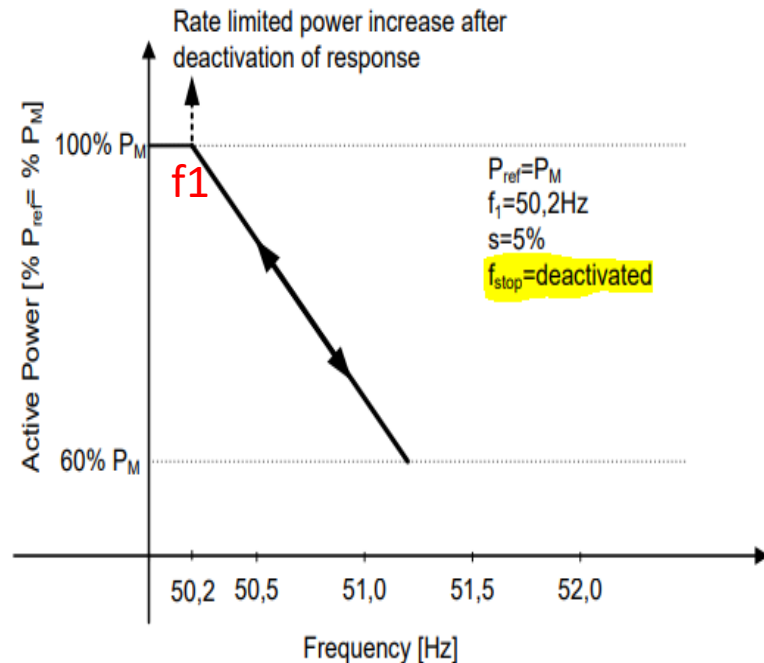
Calculation of load shed slope enable based on current power

# Power reduction via frequency P(f)

- We enter the Slope in %Pn/Hz, sometimes the utility asks the slope in %.
- The droop in % is defined as  $(\Delta f / f_{nom}) / (\Delta P / P_n)$ , So for the current setting it calculates accordingly as  $1 / 40 \%P_n/Hz / 50Hz = 5\%$
- **for example:**

Droop = 4%, Start frequency = 50.5 Hz

The slope in %Pn/Hz would then calculate as  $1 / 4\% / 50 = 0.5 = 50\% P_n/ Hz$ .



10:22 📶 84%

< OF/UF loaddrop param  
SH1051020KE23A180002

Overfrequency discharge load shed enable bit

Load shed mode

Slope mode  F range mode

Overfrequency load shed start frequency(40~70Hz) 50.2

Overfrequency load shed slope percentage(1~300%Pn/Hz) 40

Wait time of overfrequency load shed start(0~655350ms) 0

---

Underfrequency charge load shed enable bit

Underfrequency load shed start frequency(40~70Hz) 49.8

Underfrequency load shed slope percentage(1~300%Pn/Hz) 40

Wait time of underfrequency load shed start(0~655350ms) 0

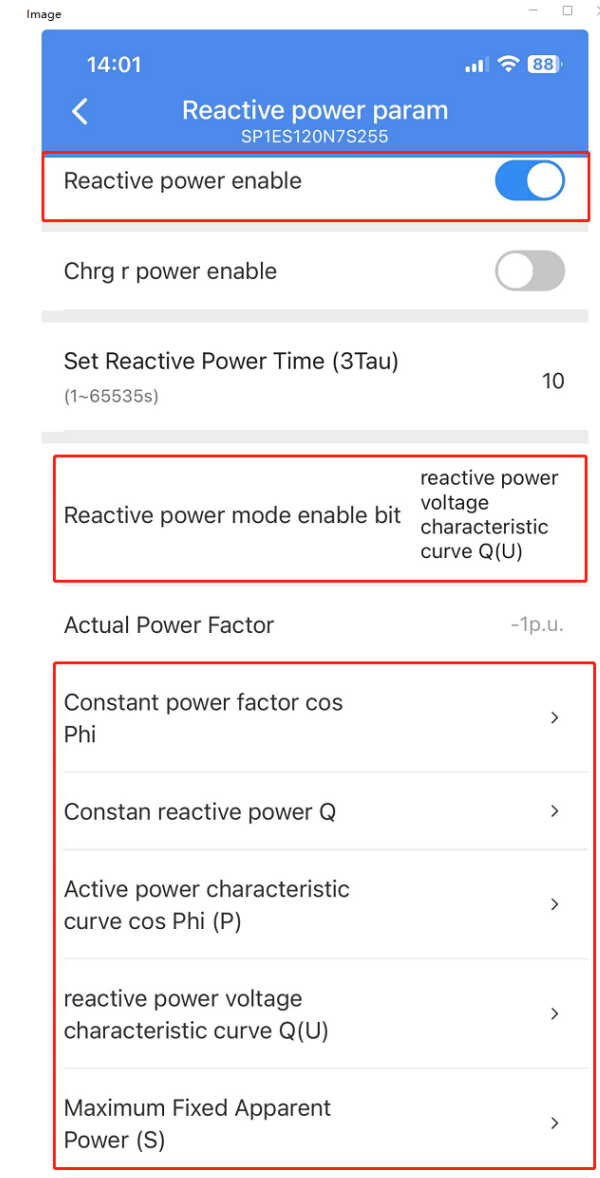
---

Overfrequency return load shed enable

Wait time before overfrequency reload(0~655350ms) 610000

# Reactive power modes

- Mode 1: Constant power factor control ( $\text{Cos } \Phi = P/S$ )
- Mode 2: Constant reactive power control ( $Q/S$ )
- Mode 3: Dynamic  $\text{Cos } \Phi$  (P) control
- Mode 4: Dynamic  $Q(U)$  control
- Mode 5: Constant apparent power control (S)



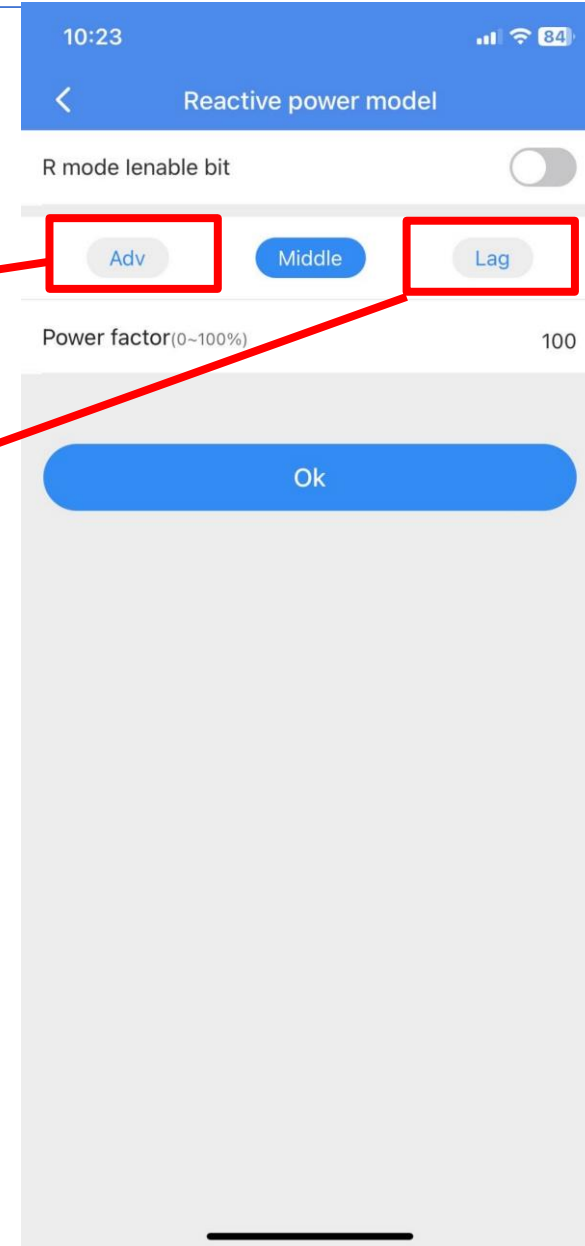
To activate: Activate the reactive power and - Select one of the modes, only one mode can be activated at a time.

# Reactive power mode 1

Mode 1: (constant power factor or CosPhi value)

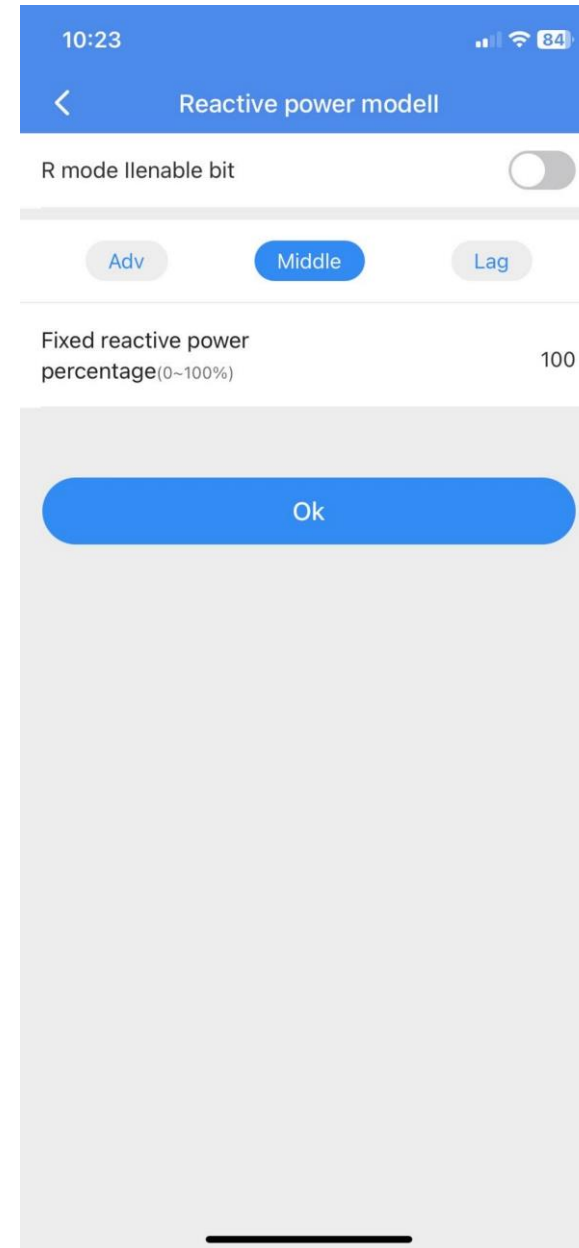
Leading

Lagging



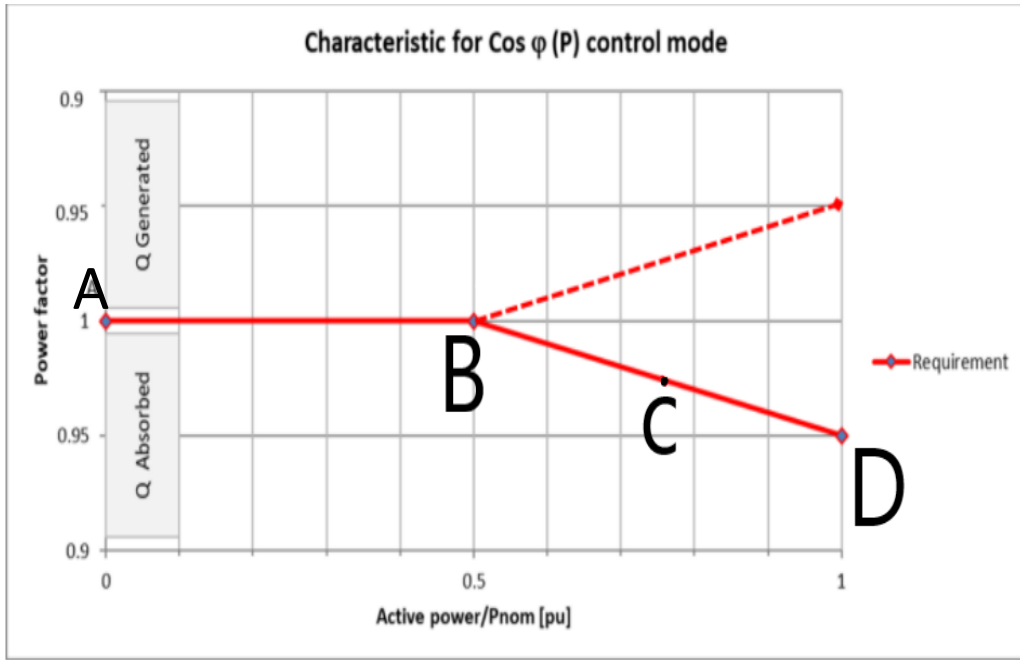
# Reactive power mode 2

Mode 2: (constant ratio reactive power / apparent power)



# Reactive power mode 3 CosPhi (P)

Functional description: The power factor changes according to the set gradient when the power changes.



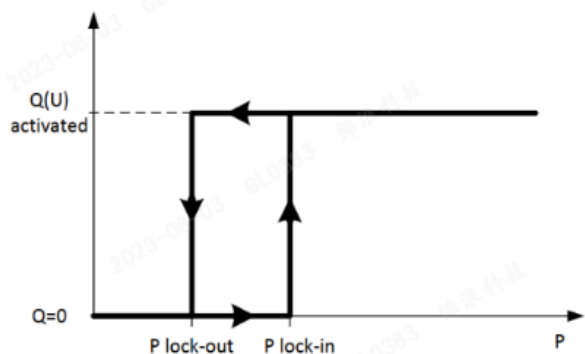
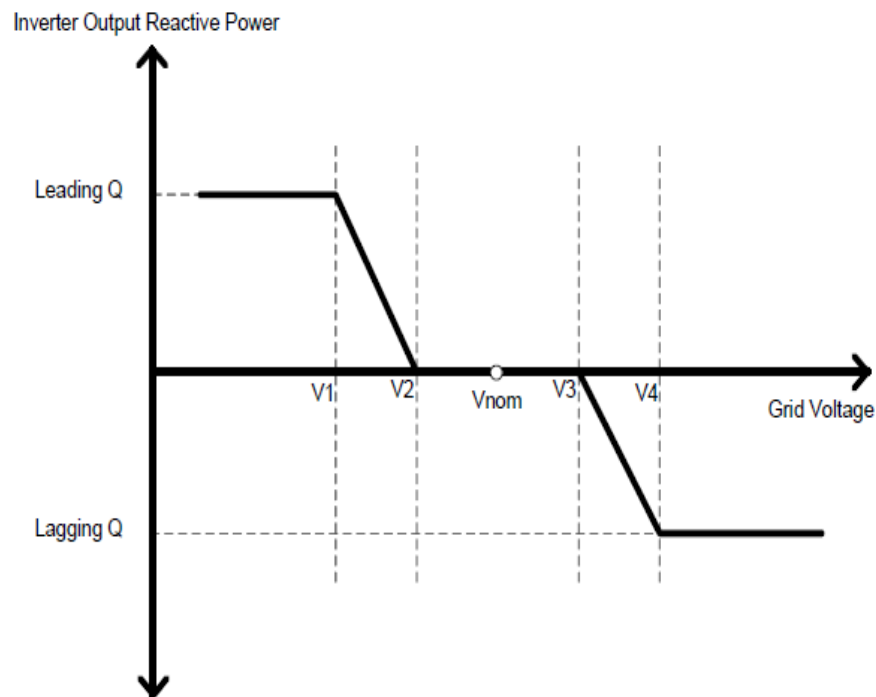
Lockin / Lockout voltage

Reactive power mode III configuration settings:

- Second point power percentage(-100~100%): 50
- Third point power factor value(0~100%): 100
- Third point power percentage(-100~100%): 50
- Fourth point power factor value(0~100%): 90
- Fourth point power percentage(-100~100%): 100
- LockinV Voltage value percentage(0~200%): 0
- LockoutV Voltage value percentage(0~200%): 0
- R mode III enable bit:
- Volt entry enable bit:
- First point power factor value(0~100%): 100
- First point power percentage(-100~100%): 50
- Second point power factor value(0~100%): 100
- Second point power percentage(-100~100%): 50
- Third point power factor value(0~100%): 100
- Third point power percentage(-100~100%): 50

# Reactive power mode 4

## Reactive power voltage characteristic curve Q(U)



Q offset

V3

V4

V2

V1

P Lock-In

10:23 📶 📶 🔋 84%
<
Reactive power mode IV

R mode IVenable bit

---

Max.3PH voltage control&Limit  
cos $\phi$ >=0.4

---

Adv
Middle
Lag

Reactive power offset(0~100%Qmax) 0

---

High voltage start voltage  
percentage(0~200%) 103

---

High voltage end voltage  
percentage(0~200%) 107

---

Low voltage start voltage  
percentage(0~200%) 97

---

Low voltage end voltage  
percentage(0~200%) 93

---

Percentage of reactive power of high  
voltage start voltage  
point(-100~100%Sn) 0

---

Maximum lag reactive power  
percentage(0~100%Sn) 48.43

---

Lockin Power value  
percentage(0~100%) 0

Lockout Power value  
percentage(0~100%) **P Lock-out** 0

---

Maximum percentage of advanced  
reactive power(0~100%Sn) 48.43

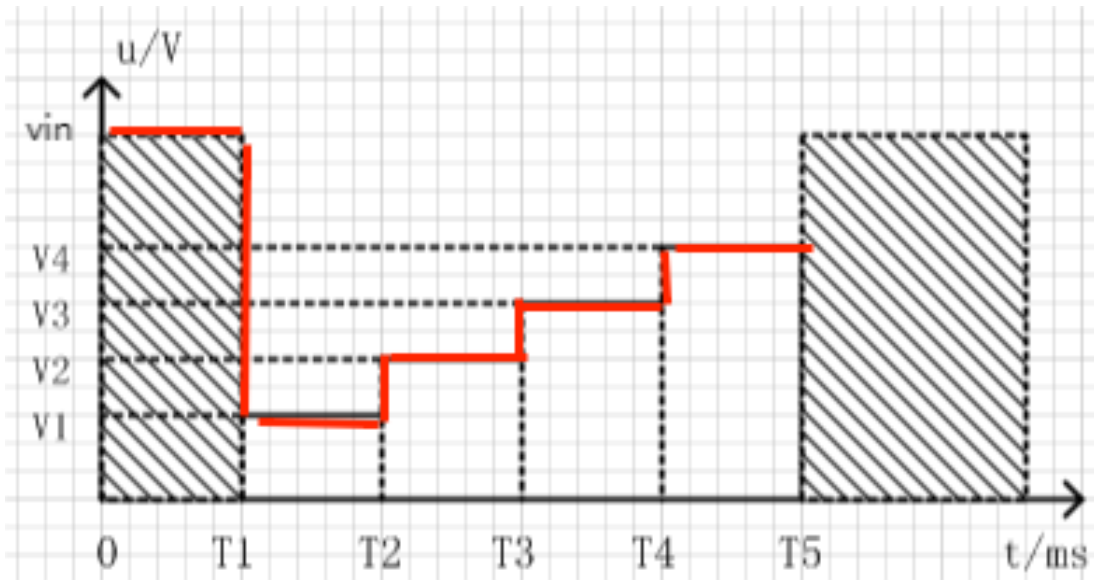
---

Reactive response waiting  
time(0~655350ms) 0

Ok

# Voltage Ride Through - FRT

Configurable behavior in the event of a voltage dip  
 LVRT : Low Voltage ride through  
 HVRT: High Voltage ride through



Vin  
 V1  
 T1  
 V2  
 T2  
 ⋮  
 ⋮

Vin: LVRT trigger threshold  
 V1: LVRT curve node 1 U  
 T1: LVRT curve node 1 t

10:24 LVRT param SH1051020KE23A180002		10:24 LVRT param SH1051020KE23A180002	
LVRT enable bit	<input checked="" type="checkbox"/>	LVRT power return rate(1~300%Pn/min)	30000
%of v value inLVRT(0~65535%)	80	OVRT enable bit	<input checked="" type="checkbox"/>
% of first LVRT point voltage(0~65535%)	15	%of v value inOVRT(0~65535%)	115
First LVRT point time(0~65535ms)	220	% of first HVRT point voltage(0~65535%)	125
% of second LVRT point voltage(0~65535%)	25	First HVRT point time(0~655350ms)	160
Second LVRT point time(0~65535ms)	640	% of second HVRT point voltage(0~65535%)	120
% of third LVRT point voltage(0~65535%)	50	Second HVRT point time(0~655350ms)	5100
Yhird LVRT point time(0~65535ms)	1640	% of third HVRT point voltage(0~65535%)	115
% of fourth LVRT point voltage(0~65535%)	80	Third HVRT point time(0~655350ms)	60100
Fourth LVRT point time(0~65535ms)	60100	% of fourth HVRT point voltage(0~65535%)	115
LVRT reactive current coefficient K(0~6553.5p.u)	0	Fourth HVRT point time(0~655350ms)	60100
Wait time after LVRT recovery(0~65535ms)	0	HVRT reactive current coefficient K(0~6553.5p.u)	0
LVRT power return rate(1~300%Pn/min)	30000	Wait time after HVRT	n

# Voltage Ride Through - FRT

10:25 📶 📶 83

< **LVRT param**  
SH1051020KE23A180002

HVRT reactive current coefficient  
K(0~6553.5p.u) 0

Wait time after HVRT  
recovery(0~65535ms) 0

HVRT power return rate(1~300%Pn/min) 30000

---

Zero current enable bit

Percentage of zero current mode  
entering low voltage(0~65535%) 50

Percentage of zero current mode  
entering high voltage(0~65535%) 120

---

Reactive current prior to RT

LVRT exit voltage value  
percentage(0~65535%) 81

Computation of percentage of start  
voltage value based on LVRT  
reactive current(0~65535%) 80

% of HVRT exit voltage  
value(0~65535%) 114

Computation of percentage of start  
voltage value based on HVRT  
reactive current(0~65535%) 115

10:25 📶 📶 83

< **LVRT param**  
SH1051020KE23A180002

Zero current enable bit

Percentage of zero current mode  
entering low voltage(0~65535%) 50

Percentage of zero current mode  
entering high voltage(0~65535%) 120

---

Reactive current prior to RT

LVRT exit voltage value  
percentage(0~65535%) 81

Computation of percentage of start  
voltage value based on LVRT  
reactive current(0~65535%) 80

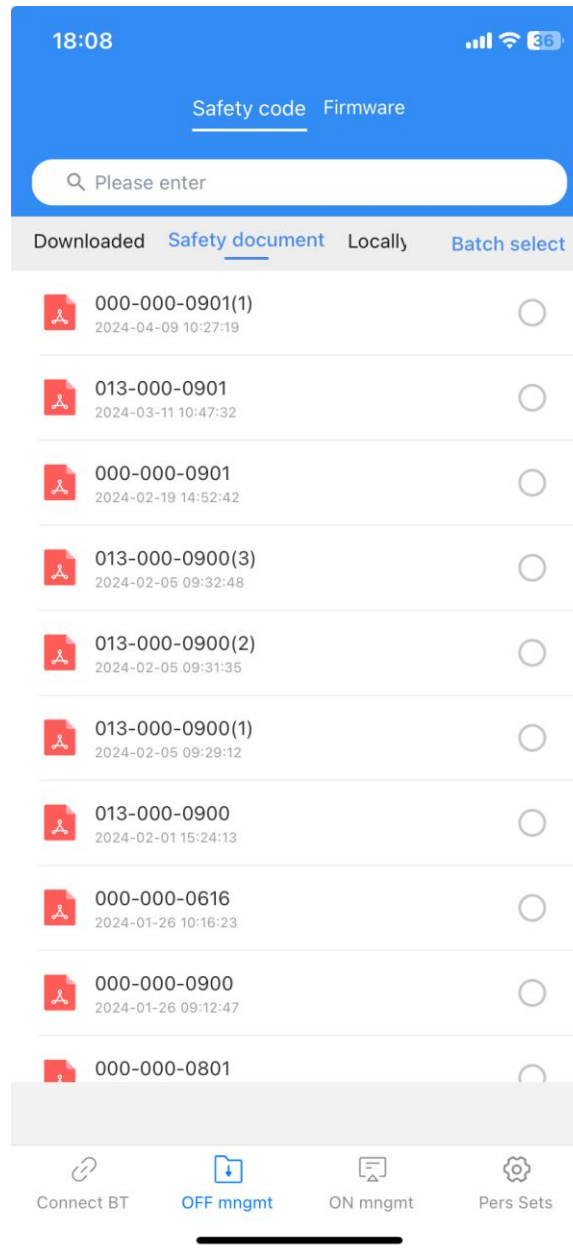
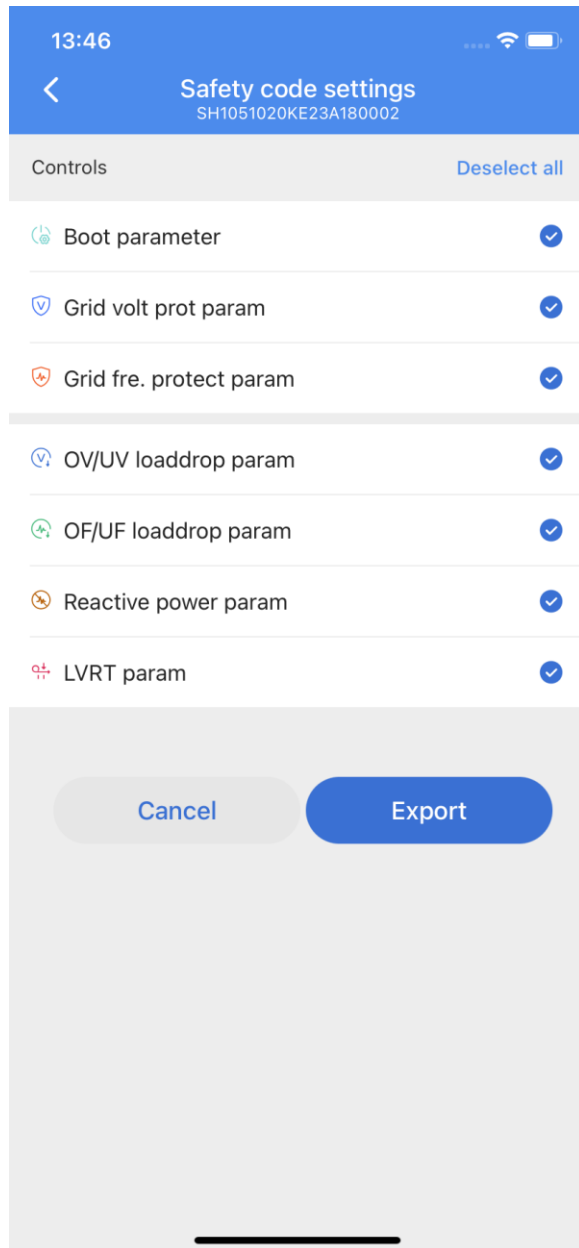
% of HVRT exit voltage  
value(0~65535%) 114

Computation of percentage of start  
voltage value based on HVRT  
reactive current(0~65535%) 115

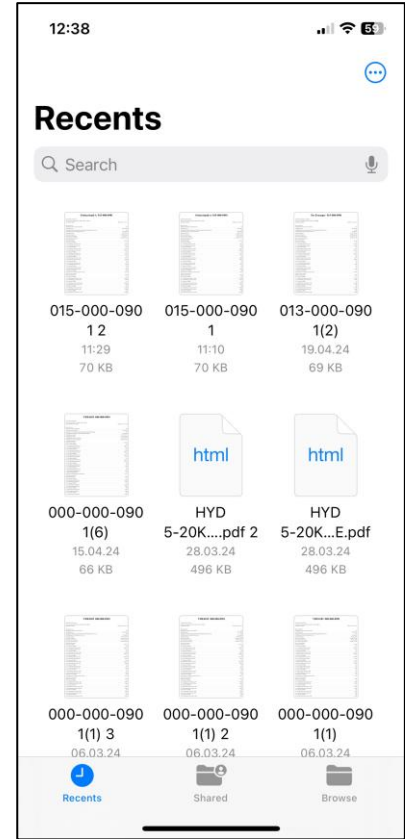
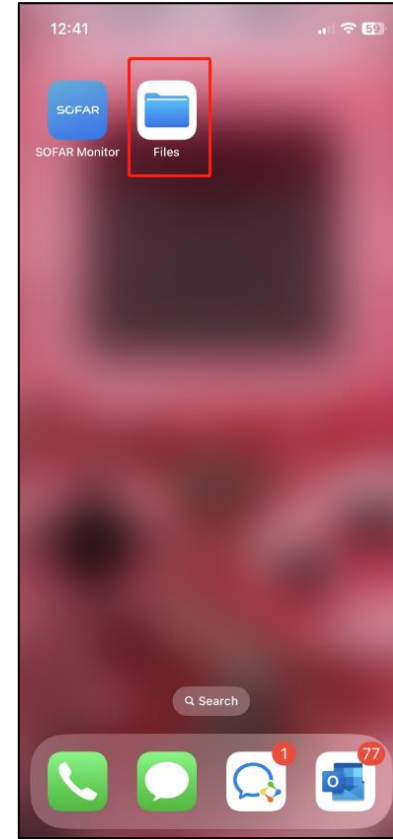
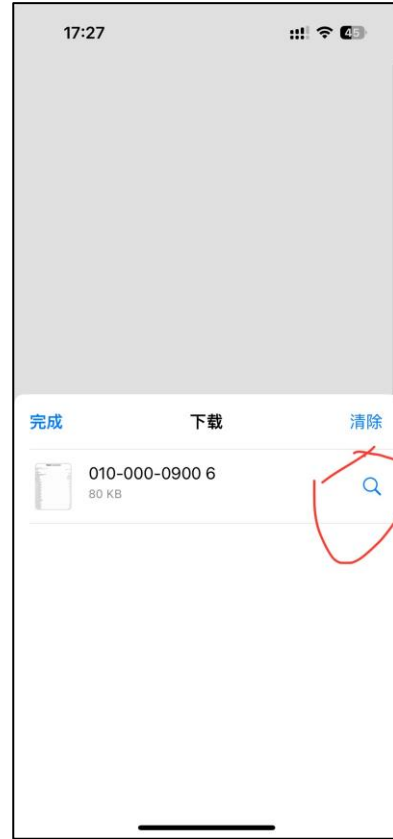
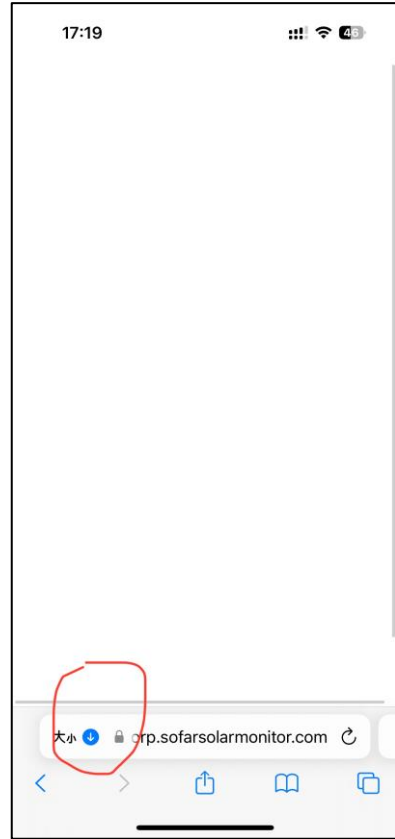
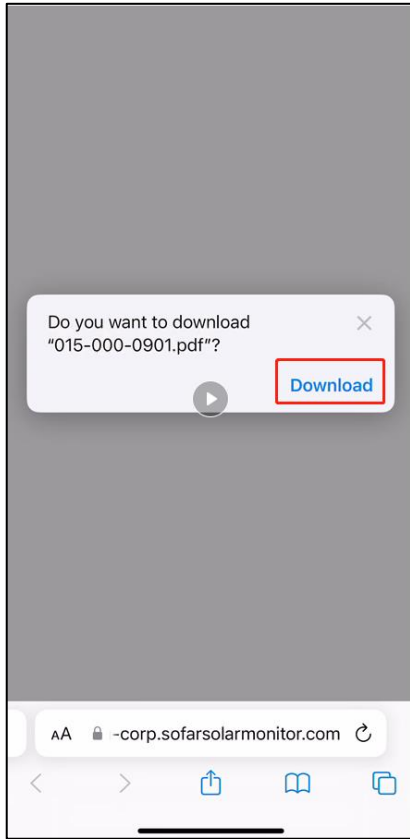
% of maximal reactive  
current(0~65535%) 100

Write in

# Exporting the Parameters as PDF



# Exporting the Parameters as PDF



## Note for IOS:

- After download please press the down arrow
- The downloaded PDF files are saved in this IOS folder.

# Other settings

10:28 📶 📶 83%

< **Advanced**  
SH1051020KE23A180002

- Automatic battery activation
- Logic interface
- Feed-in Limit
- Inverter menu lang English >
- Emerg p enable control
- Hard Feed-in Limit
- Input channel >
- Battery param >
- IV scan >
- Forced BTY activate
- CT calibration
- CT ratio setting >
- Unbalanced support
- ES work mode set Self-use mode >

Home SC mgt **Advanced** O&M

10:28 📶 📶 83%

< **O&M**  
SH1051020KE23A180002

- Remote power on/off >
- Factorysetting reset >
- Firmware upgrade >
- System Time >
- Mailing address >
- Fault recording >

Home SC mgt Advanced **O&M**

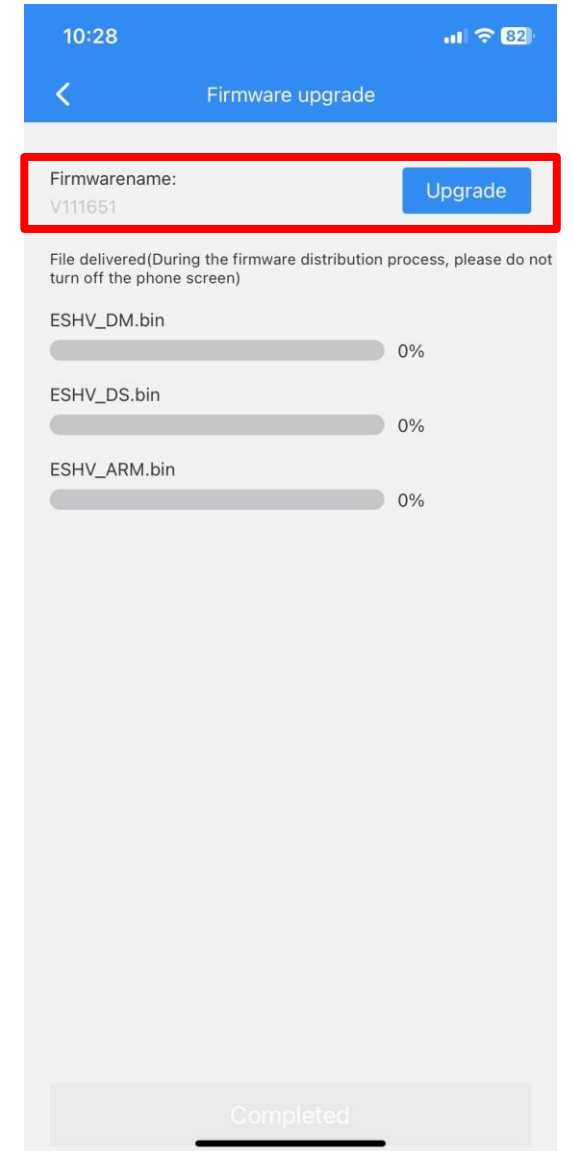
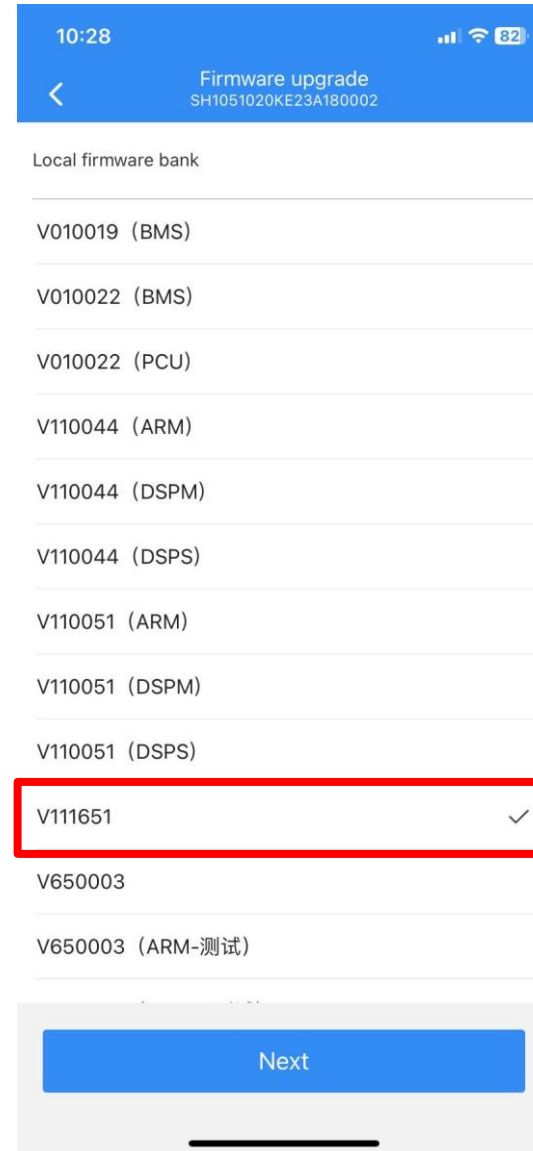
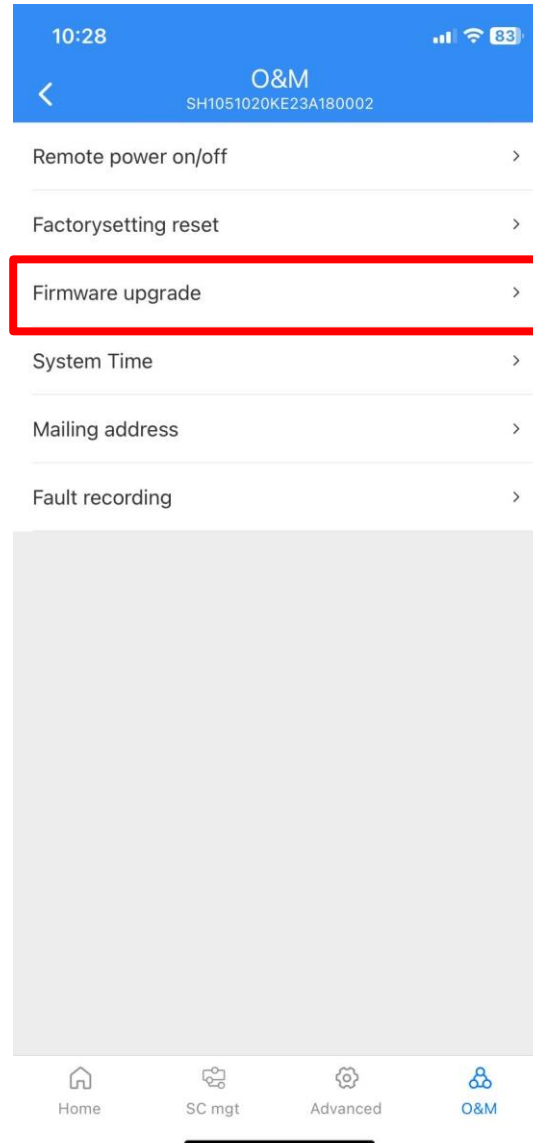
All SOFAR inverters have 3 processors:

- ARM - For LCD screen, interfaces, Modbus, etc.
- DSP Master - Digital Signal Processor (main processor)
- DSP Slave - Digital Signal Processor Slave (for redundancy)

# Firmware Update

In addition to the ability to perform firmware updates via USB stick or the Solarman Portal, the SOFAR Monitor App offers the ability to perform local updates using Bluetooth in three simple steps:

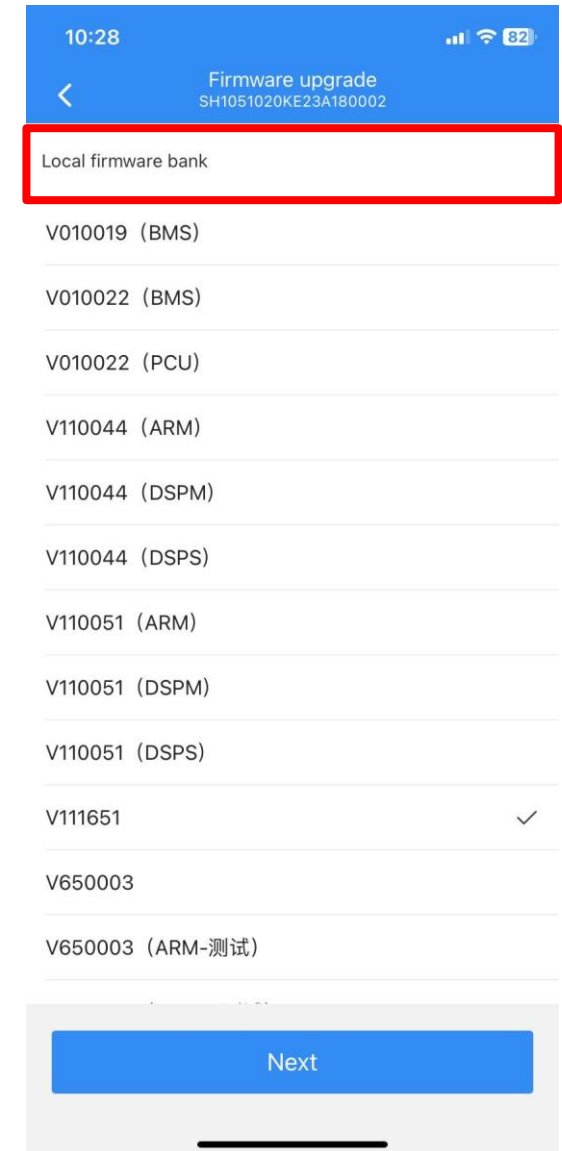
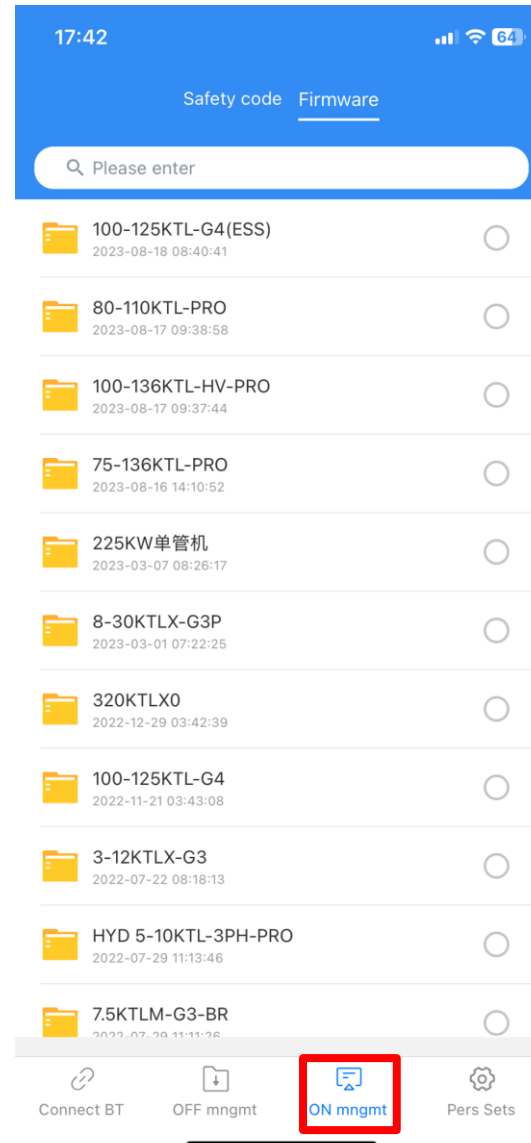
1. **Navigate to O&M**
2. **Chose FW Package**
3. **Press Upgrade**



# Firmware Update

If you are not connected to the internet, you can download the firmware file when the internet is available and then proceed with the following steps to upgrade the firmware:

1. **Open online Management.**
2. **Download the firmware file.**
3. **Navigate to O&M.**
4. **Navigate to the local firmware bank.**
5. **Choose the firmware file.**
6. **Press „Upgrade.“**



# Firmware Update

## Special Cases for String Inverters:

- For these inverter types in the table, which have different software versions due to different hardware, Please check your inverter if is a special case first!
- For example: 3-6KLTM-G3 have two ARMs with G and V, two DSPMs with U and V, two DSPSs with P and V.
- Please pay attention to the first letter of the software version number.

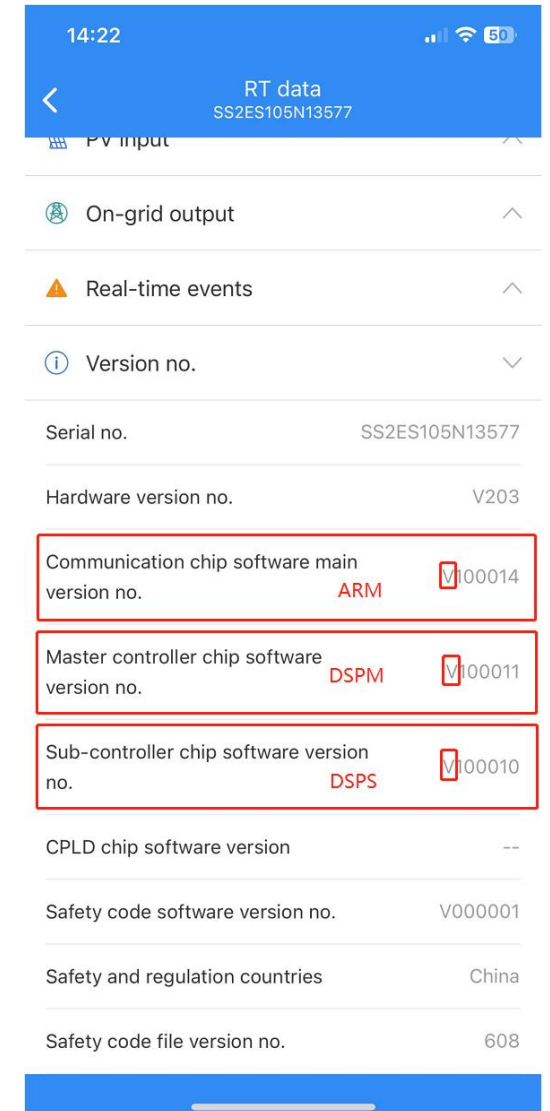
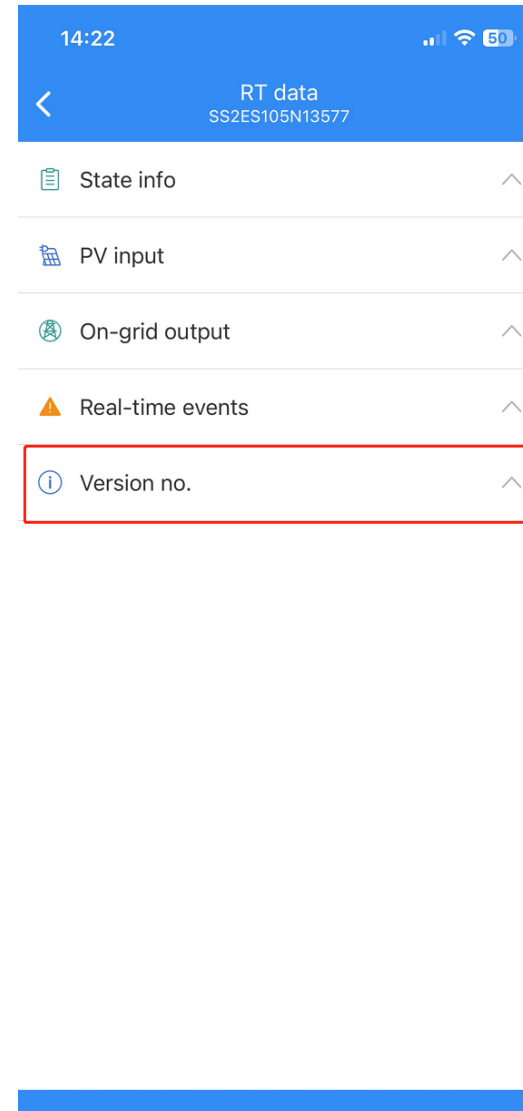
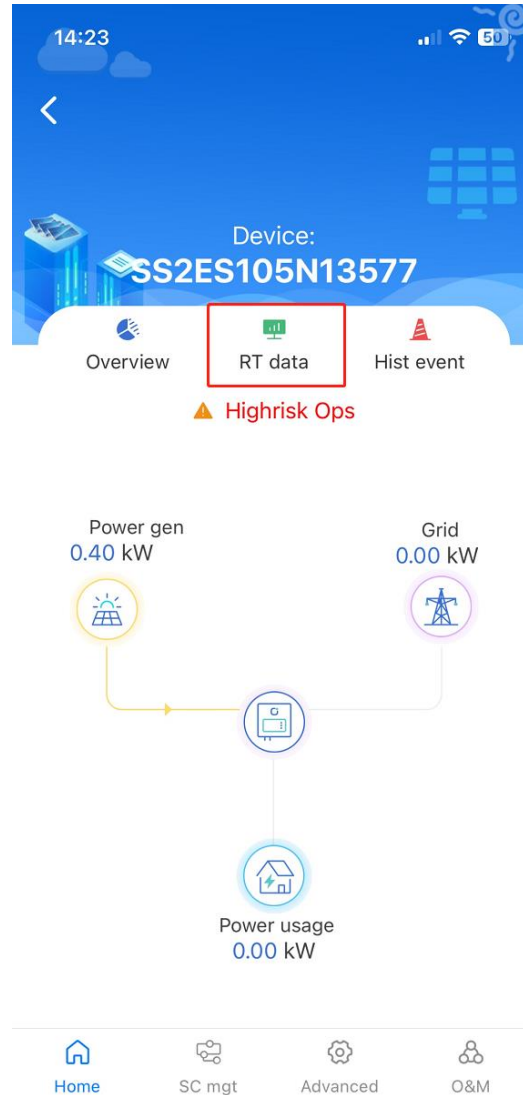
Inverter Type	ARM	DSPM	DSPS
3-12KTLX-G3	V-	V-	V-
	G-	V-	V-
	I-	V-	L-
3-15KTL G3 PRO	V-	V-	L-
	G-	V-	L-
15-24KTLX G3	V-	V-	V-
	G-	V-	V-
7-10.5KTLM G3	V-	V-	V-
	G-	V-	V-
3-6KTLM G3	V-	V-	V-
	G-	U-	P-
25-50KTL G3	I-	V-	L-

# Firmware Update

## Example for Special Cases:

### 3-12KTLX-G3

- Connect to the internet
- Follow the pictures to find the inverter's software version number.
- This inverter has ARM with V, DSPM with V and DSPS with V.



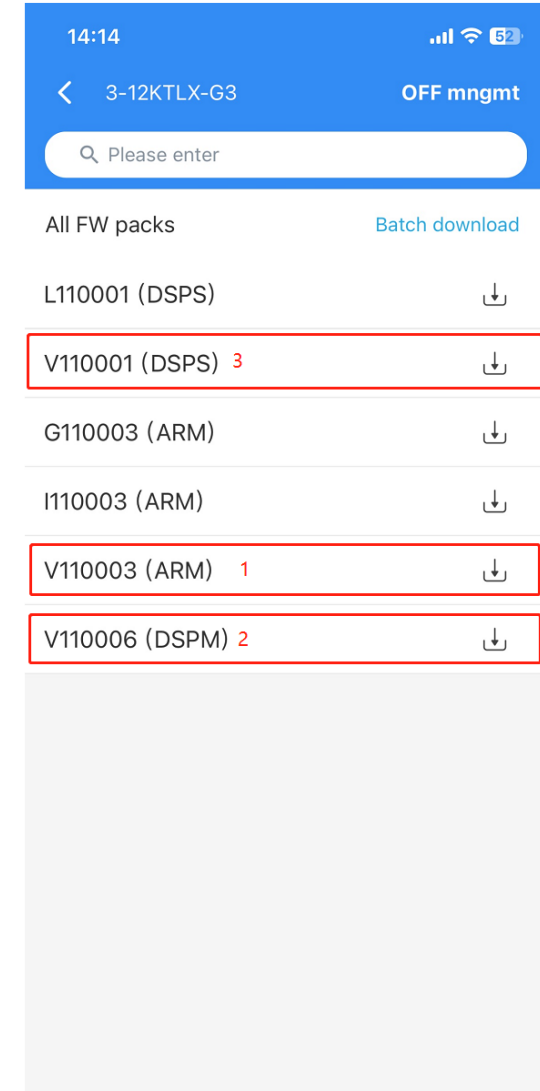
# Firmware Update

## Example for Special Cases:

### 3-12KTLX-G3

- Select the correct software version with the first letter V.
- in the order of ARM, DSPM, DSPS to upgrade

Inverter Type	ARM	DSPM	DSPS
3-12KTLX-G3	V-	V-	V-
	G-	V-	V-
	I-	V-	L-
3-15KTL G3 PRO	V-	V-	L-
	G-	V-	L-
15-24KTLX G3	V-	V-	V-
	G-	V-	V-
7-10.5KTLM G3	V-	V-	V-
	G-	V-	V-
3-6KTLM G3	V-	V-	V-
	G-	U-	P-
25-50KTL G3	I-	V-	L-



ASOFAR BTS batteries have 3 processors:

- BMS - Battery Management Systems
- PCU - Power-Control-Unit
- BDU - battery disconnect unit

**Note:** GTX batteries do not support wireless and remote upgrades

# Firmware Update

In addition to the ability to perform firmware updates via USB stick or the Solarman Portal, the SOFAR Monitor App offers the ability to perform local updates using Bluetooth in three simple steps:

1. **Navigate to O&M**
2. **Select in the order "BMS->PCU->BDU" to upgrade FW.**

