

# Single Phase Hybrid Inverter

# CPS ECH7.6/9.6/12KTL-US

# Installation and Operation Manual - Rev 1.5



## CHINT POWER SYSTEMS AMERICA CO.

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Acronym Key					
Acronym Meaning A		Acronym	Meaning		
AHJ Authority having jurisdiction		OCPD	Overcurrent protection device		
DSP	Digital signal processor	P&O	Perturb and observe		
EGC	Equipment grounding conductor	PCB	Printed circuit board		
FIT Feed-in tariff		PF	Power factor		
GFCI	Ground-fault circuit interrupter	PLC	Powerline communication		
HVRT	High voltage ride through	POI	Point of interconnection		
IEEE	Institute of Electrical and Electronics Engineers	PV	Photovoltaic		
LVRT	Low voltage ride through	PVRSS	PV rapid shutdown system		
MLPE	Module-level power electronics	RSD	Rapid shutdown		
MPPT	Maximum power point tracker	SCADA	Supervisory control and data acquisition		
NEC	National Electric Code	SPD	Surge protective device		
NFPA	National Fire Protection Association				



# 0 Before You Start...



#### Scope

This Installation Manual contains important information, safety guidelines, detailed planning, and setup information for installation, as well as information about configuring, operating, and troubleshooting for the CPS Single-Phase Hybrid Inverter (hereafter referred to as the "inverter") developed by Chint Power Systems America Co., Ltd. (hereafter referred to as "CPS").

#### Audience

The information in Sections 2 Overview, 6 App Local Control, 8 MatriCloud Platform, 10 Troubleshooting, 11 Technical Data, 12 Limited Warranty, and 13 Recycling is intended for the owner and operator of the inverter and does not require any special training or qualifications. The information in Sections 3 Mechanical Installation, 4 Electrical Connection, 5 Commissioning, 7 App Remote Control, and 9 Operation and Maintenance is intended for qualified personnel only. Qualified personnel have training, knowledge, and experience in:

- Installing electrical equipment and PV power systems.
- Appling all local installation codes.
- Analyzing and eliminating the hazards involved in performing electrical work.
- Selecting and using personal protective equipment (PPE).

Installation, commissioning, troubleshooting, and maintenance of the inverter must be done only by qualified personnel.

Thank you for choosing a CPS single-phase hybrid inverter. These inverters are high performance and highly reliable products specifically designed for the North American solar market.

The instructions in this user manual will help you solve most installation and operation difficulties. Installation, commissioning, troubleshooting, and maintenance of this inverter must be performed by qualified personnel. If you encounter any problems during installation or operation of this unit, first check the user manual before contacting CPS Customer Service.

#### Please keep this user manual on hand for quick reference.

The manual will be periodically updated or revised due to product development or improvement. The latest version of this manual can be acquired via our website: <u>www.chintpowersystems.com</u>.



# **1** Important Safety Instructions

# (SAVE THESE INSTRUCTIONS)

Please read this user manual carefully before installing the inverter. CPS reserves the right to refuse warranty claims for equipment damage if the user fails to install the product according to the instructions in this manual.

Failure to follow these instructions and other relevant safety procedures may result in the voiding of the product warranty and/or damage to the inverter or other property.

Warnings and symbols in this document include:

$\mathbf{\Lambda}$	DANGER:
	DANGER indicates a hazardous situation which, if not avoided, will result in death or injury.
	WARNING:
	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
Λ	CAUTION:
	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
^	NOTICE:
<u>/!\</u>	NOTICE indicates a hazardous situation which, if not avoided, could result in the inverter working abnormally or property loss.
0	INSTRUCTION:
(i)	INSTRUCTION indicates important supplementary information or provides skills or tips that can be used to help you solve a problem or save you time.



Warnings and markings on the product include:

Symbol	Meaning
4	<b>HIGH VOLTAGE!</b> There is high voltage inside the machine; the instructions in this manual <i>must</i> be followed for the
	operation of this product.
	HIGH ENERGY!
$\mathbb{A}$	Risk of electric shock from energy stored in capacitor. Do NOT remove cover until five (5) minutes <u>after</u> disconnecting all sources of power supply.
$\bigwedge$	HOT SURFACES!
	To reduce the risk of burns, do NOT touch.
	INFORMATION:
I	For more details please see the user manual.
٨	WARNING:
	For continued protection against risk of fire, replace ONLY with the same type and ratings of fuse. Refer to instruction manual for details.
	EARTH GROUND:
	This symbol marks the location of a grounding lug, which must be securely connected to the earth through the PE (protective earthing) cable to ensure operational safety.
$\frown$	RoHS Symbol:
RoHS	In accordance with 2011/65/EU regulations, the inverter imposes restrictions on the use of specific hazardous substances in electrical and electronic equipment.
"	Certification Marking
	This product complies with the provisions of the CE Directive.
(SA)	CSA
cus	The safety and quality of the inverter have been certified by the CSA.



# 1.1 Safety Precautions of Operating the Inverter



### WARNING:

All operations and connections must be performed by professional engineering and technical personnel!



#### WARNING:

To prevent the risk of electric shock during equipment maintenance or installation, ensure that all DC and AC power has been separated from the equipment, and ensure that the equipment is reliably grounded.

#### DANGER:



- Before opening the inverter enclosure for maintenance, you MUST first disconnect the grid-side AC power supply and PV-side DC power supply and ensure that the high-voltage energy inside the equipment has been completely released.
- All connections to the inverter MUST be cut off for at least five (5) minutes before maintaining and operating the equipment.



#### NOTICE:

The inverter is specially designed to integrate the generated AC power into the public grid. Do NOT directly connect the AC output terminal of the device to private AC power equipment. The inverter does not support battery panel grounding. If grounding is necessary, a transformer must be added to the AC side.



# NOTICE:

After unpacking the inverter, keep all its interfaces sealed before and after connecting wires.



#### CAUTION:

Check the wall bracket before hanging the machine to ensure that the wall bracket is firmly fixed onto the supporting surface.



#### CAUTION:

For continued protection against the risk of fire, replace ONLY with the same type and ratings of fuse. Disconnect supply before charging the fuse.



#### **INSTRUCTION:**

Before choosing a power grid code, contact your local power supply company. If the inverter is set to work under the wrong grid regulations, the power supply company can cancel the operation permit of the equipment.



#### **INSTRUCTION:**

Ensure that the entire system complies with national and local standards and applicable safety regulations before running the inverter.



# 2 Overview

2.1 Model Number



Figure 2-1 Product Model Number

No.	Letter Combination	Meaning
1	ECH	Hybrid, energy storage capable inverter
2	12K	Rated power 12 kW
3	TL	Transformerless
4	US	United States



## 2.2 Dimensions and Appearance



Figure 2-2 Inverter Dimensions





Figure 2-3 Product Appearance

No.	Name	Function
1	Main inverter module	-
2	Wire box	-
3	External protection earthing	Grounding connection
4	GEN knockout	GEN wiring
5	Grid knockout	Grid AC wiring
6	Vent valve	Vent air
7	Backup load knockout	Backup load wiring
8	COM port	Communication wiring (for BMS / EMS communication, if applicable)
9	PV knockout	PV wiring
10	Battery knockout	Battery wiring
11	Wi-Fi communication port	Wi-Fi communication
12	RSD button	RSD emergency shutdown
13	PV switch	Cuts off PV power supply safely
14	Fan	Cooling
15	LED indicator	Indicates the running status





Figure 2-4 Wire Box

Table	2-2	Wire	Box	Components
-------	-----	------	-----	------------

No.	Name	Function	
1	Battery circuit breaker	Disconnects battery circuit	
2	Battery terminal	Connects to battery	
3	PV terminal	Connects to PV panels	
4	Grounding copper bar 1	Grounding point of PV	
5	Generator circuit breaker	Disconnects generator circuit	
6	Neutral copper bar	Connects neutral cables	
7	Grounding copper bar 2	Grounding point of backup load and grid cable	
8	Grid terminal	Connects to grid cables	
9	Load terminal	Connects to backup load cables	
10	Load circuit breaker	Disconnects backup load circuit	
11	Communication board	Connects communication cables	
		(For further details, see Section 4 Electrical Connection.)	



## 2.3 LED Indicator

The LED display on the ECH7.6-12KTL-US inverter is shown in the image below:



LED indicators and their indications are shown in the table below:

LED	Name	Indication	Status
	Backup / grid indicator	On (green)	Grid connection is normal and in on-grid mode.
		Flashing (green)	Grid connection is normal and in off-grid mode.
		Off	Grid connection is abnormal.
	System indicator	On (green)	Running
		Flashing (green)	Pre-inspection
C		On (yellow)	Standby
		Off	Not running
		On (red)	System failure
	COM indicator	On (green)	Communication is normal.
(( <mark>†</mark> ))		On (red)	BMS communication is abnormal.
		Flashing (red)	Wi-Fi module communication is abnormal.
		Off	All communications are abnormal.

#### Table 2-3 LED Indicators



# 2.4 System Schematic Diagram



Figure 2-5 ECH Residential Hybrid System

No.	Name			
1	Low voltage battery			
2	PV array			
3	Backup loads			
4	Grid			
5	Generator (optional)			
6	Monitoring			



#### **NOTICE:**

- If connecting a generator to the inverter, the maximum allowable generator power is 24 kW.
- The solar inverter is connected either to the load panel or the generator circuit breaker.
- The maximum power of an AC coupled PV inverter is 12 kW.
- The generator and AC coupled inverter cannot be connected to the system at the same time.
- In off-grid scenarios, the generator must be connected. The wiring diagram refers to the off-grid applications Single Unit – 120/240 V – Off-grid – Hybrid and 3 Parallel – 120/240 V – Off-Grid – Hybrid.



### 2.5 System Working Modes

The system has five (5) working modes and a time of use (TOU) function.

#### Pure PV mode:

- The hybrid inverter functions like a normal PV inverter without battery.
- o Suitable for systems without batteries and extending battery life in the winter.

#### • Self-powered mode:

- When the PV power is high enough, it will first power the loads, then charge the battery. Excess PV power will be exported to the grid if the anti-backflow function is disabled.
- If the battery SOC is lower than the backup SOC and there is no more PV power, the battery can be charged by the grid if enabled.
- When PV power is sufficient, the battery and the grid (if allowed) will power the load together.
- Generators will function during a grid outage.

#### • Fully fed mode:

o The PV powers the loads and exports to the grid as much as possible. Excess PV power charges the battery.

When PV power is less than the hybrid inverter AC output power (loads + grid), the battery will discharge to increase the AC output power to maximum.

o Suitable for very high electricity rates such as feed-in tariffs (FIT).

#### • Emergency charging mode:

- When the grid is available, the inverter will force charge the battery with PV and grid until it reaches 100% SOC.
- o The load is powered by PV first; the grid will power the load if PV power is insufficient.
- The battery can be charged by the grid if enabled.
- The battery can only discharge to power the loads if there is a grid outage.

#### • Forced off-grid mode:

- Off-grid mode can be entered, even if the grid is functioning properly, to test off-grid function and estimated backup time.
- $\circ$   $\;$  In off-grid mode, there is no more energy flow between the system and the grid.
- When the off-grid load capacity of the system is low—such as low battery SOC or low PV power—the PCS will automatically switch to the on-grid mode that was running previously.



#### • Time of use (TOU) function:

- In addition to the above five basic running modes, you can also make use of the TOU function to select different running mores for each day and hour of the year.
- By customizing these basic running modes, the inverter can meet the diversified demands of various applications and the economic benefits of time use can be improved.

For example:

Season Name	Season Dates	Weekday Name	Weekday Setting	Time Slot	Basic Modes
Summor	June 1 to	ember 1 Weekday Monday-Friday Weekend Saturday-Sunday	5:01-18:00	Fully fed	
Summer	August 31	Weekend	Saturday-Sunday	18:01-5:00	Self-powered
Other	September 1 to May 31	Weekday	Monday-Sunday 0:00-24:00		Self-powered
Appual lague	lube 5 to Jube 7			10:01-12:00	Fully fed
Annuarieave	July 5 to July 7	-	-	12:01-10:00	Self-powered

For further information, see Figure 6-8 in Section 6.1 App Quick Connection and Configuration.



### 2.6 Optional Generator

When the system is running in off-grid scenarios or the battery SOC is less than the set value, if an optional generator is connected, it will start and supply power to the backup loads. After startup, there are two control strategies integrated into the generator system: quiet mode and economy mode. The battery running status and shutdown conditions of the two strategies are different, as described below.

#### 2.6.1 Quiet Mode

In this mode, the battery gets energy from a diesel generator. After charging the battery as quickly as possible, the generator will shut down and enter the off-grid phase.

- **Battery and PV**: The diesel generator and PV supply power to the backup loads and charge the battery at the same time. You can set the charging end SOC.
- **Diesel generator shutting down**: When the grid recovers or the battery is charged to the set end SOC, the generator will shut down.

#### 2.6.2 Economy Mode

In this mode, the battery will not take energy from the generator to avoid energy loss during charging and discharging.

- **Battery and PV**: As the diesel generator and PV supply power to the backup loads, the excess power will charge the battery to avoid damaging the generator.
- Diesel generator shutting down: When the grid recovers or the battery is full, the generator will shut down.

For further information, see Section 6.3.20 GEN Parameters.



## 2.7 Electrical Schematic Diagram and Single Line Diagram



The electrical schematic diagram of the inverter is as shown in Figure 2-6:



The single line diagram is as shown in Figure 2-7:



Figure 2-7 Single Line Diagram



2.8 Rapid Shutdown

#### 2.8.1 Single Hybrid Inverter

The ECH7.6/9.6/12kW inverters are PVRSS certified to perform module-level rapid shutdown when used with APS RSD-S-PLC/RSD-D products. For a single hybrid inverter, rapid shutdown can be initiated by pressing the RSD button on the left side of the inverter. When the RSD button is pressed, the inverter will disconnect the power supply to the internal RSD transmitter, turn off the power input on the battery side, and shut down the inverter.

With one inverter, pins 13 and 14 need to be connected:





The RSD transmitter is integrated in the inverter wire box, and the installation of the receiver on the PV panel is shown in the following schematic diagram below (Figure 2-8). Please refer to the APS RSD-S-PLC/RSD-D product user manual for installation and operation requirements.



Figure 2-9 Module-Level RSD Device Connection



#### 2.8.2 Multiple Hybrid Inverters in Parallel

For multiple hybrid inverters in parallel, the connecting wires between pins 13 and 14 of ALL the hybrid inverters can be removed and connected to an external RSD initiation device. The external RSD initiation device is then able to initiate the rapid shutdown of all the hybrid inverters simultaneously.

Note that the external RSD initiation device must be a normally closed contact. Pin 13 of all the hybrid inverters must be combined and connected to one end of the external RSD initiation device; pin 14 of all the hybrid inverters must be combined and connected to the other end of the external RSD initiation device. The recommended wire size is 16 AWG.



Figure 2-10 RSD Connection

The external RSD initiation device can shut down all hybrid inverters simultaneously if pins 13 and 14 of the inverters are connected.



#### NOTICE:

Do NOT connect pin 13 of one inverter to pin 14 of another inverter to avoid interference.



### 2.9 PCS Operating Mode

This system is equipped with a power control system (PCS). All PCS-controlled busbars or conductors must be protected with suitably rated overcurrent devices that are appropriately sized for the busbar rating or conductor ampacity.

There are multiple PCS operating modes:

- **Export Only mode**: The ESS can export active power to the area EPS during discharging but will not import active power from the area EPS for ESS charging purposes.
- **Import Only mode**: The ESS can import active power from the area EPS for charging purposes but will not export active power from the ESS to the area EPS.



#### NOTICE:

The PCS operating mode can only be configured by CPS contacting your local dealer or supplier to change the PCS operating mode.



#### NOTICE:

For Import Only mode, the longest measured open loop response time is 1.325 seconds and the longest steady state time is 1.585 seconds. For Export Only mode, the longest measured open loop response time is 1.9 seconds and the longest steady state time is 4.98 seconds.



#### WARNING:

The PCS must be programmed such that the system does not exceed the limitations of the overcurrent devices in the panelboard and connected circuit. The PCS must be coordinated within the limits defined by NEC 210.20, 705.12 or NFPA 70 2020 Ed., Section 705.13.



# **3** Mechanical Installation

## 3.1 Unpacking

Before installation, check the product for any visible damage and verify that all items on the delivery list (see Tables 3-1 and 3-2) are present. Contact CPS customer service if there are any issues.



Figure 3-1 Main Components

No.	Item	Qty.	Purpose
А	Main inverter module	1	-
В	Wire box	1	-
С	Upper mounting bracket	1	Hangs the inverter.
D	Lower mounting bracket	1	Hangs the wire box.





#### Table 3-1 Accessories in Accessory Bag

No.	Accessory name	Qty.	Purpose
Е	M6x18 cross hexagon head combined screw	7	One (1) for grounding terminal, six (6) for attaching the inverter and wire box onto the mounting bracket.
F	M6x20 hexagon socket head combined screw	4	Attaches the inverter and wire box.
G	Power connector for the line end	1	Connects the external communication line.
Н	M10 cap nut	6	AC terminal and battery terminal.
Ι	M10x25 screw	2	Neutral busbar.
J	M8x25 screw	1	Neutral busbar.
к	M4x10 cross hexagon head combined screw	2	Attaches the upper and lower mounting brackets.
L	M6 nut with flange	1	External grounding.
М	M8 expansion nut	9	Attaches the mounting bracket.
Ν	Wi-Fi module	1	Wi-Fi communication.
0	RJ45 cable (length: 78.74 in / 2000 mm)	1	Parallel network cable.
Р	Battery temperature sampling cable	-	N/A
Q	EMC magnetic ring	1	Attaches the battery cables.
R	Ball head hexagonal screwdriver head (length: 5.9 in / 150 mm)	1	Tool for attaching the inverter and wire box.
S	Cable tie	1	Ties the EMC magnetic ring and battery cables.
Т	Documents	2	Quick guide and warranty card.



## 3.2 Installation Tools

Use	Tools and Instruments Required for Installation				
	Impact drill (Ф10 mm drill bit)	Torque socket wrench	Multimeter		
	طر Marker / pen	Measuring tape	Level ruler		
Installation	© Control of the second	Diagonal pliers	Rubber hammer		
	(Type: PV-CZM-22100/19100)	Wire stripper	Hot air gun		
Personal protection	Safety gloves	Protective glasses	Safety shoes		



#### 3.3 Installation Precautions

- Check that the product's environmental specifications (i.e., protection degree, operating temperature range, humidity and altitude, etc.) meet the requirements of the project location.
- Ensure that the power grid voltage is within the normal range of the selected grid standard.
- Ensure that you have been authorized by the local electricity supply authority to connect to the grid.
- Installation personnel MUST be qualified electricians or those who have received professional training.
- Wear and use proper PPE during installation.
- Sufficient space must be provided to allow the inverter cooling system to operate normally.
- Install the inverter away from flammable and explosive substances.
- To prevent unwanted power loss, ensure that the installation conditions do not exceed the temperature limits specified for the inverter.
- Do NOT install the inverter near an electromagnetic source, as this can compromise the normal operation of the electronic equipment.
- Check that the PV array is not grounded.
- Ensure the conduit entries meet the following requirements:
  - ALL conduit entries must use watertight fittings.
  - o ALL conduit entries must use sealant around wires inside the wire box to avoid moisture ingress.
  - Metallic conduit is recommended to prevent propagation.



### 3.4 Installation Requirements

#### 3.4.1 Environment

The installation site of the inverter must meet the following environmental requirements:



Figure 3-2 Environmental Requirements

If the installation environment allows, avoiding direct sunlight, rain, and snow can reduce power derating and extend the life of the inverter. It is recommended that the inverter is installed under a roof or sunshade. (**Note**: Installing the inverter outdoors with direct sunlight, rain, and snow does not impact the warranty.) Ensure that the inverter is installed away from flammable and explosive substances.

#### 3.4.2 Installation Methods

The inverter must be installed according to the following requirements:



Figure 3-3 Installation Requirements



# NOTICE:

Ensure that the mounting structure (bearing wall, rack, etc.) is capable of bearing the weight of the inverter.



#### 3.4.3 Space Requirements

The distance between the inverter and the surrounding objects must meet the following conditions



Figure 3-4 Installation Space Requirements for Inverter Racks

# $\bigwedge$

#### NOTICE:

- The distance from the inverter to any objects to its left or right must be greater than 19.7 in (500 mm).
- The distance from the inverter to any objects above, below, or in front of it must be longer than 19.7 in (500 mm).
- If multiple inverters are being used simultaneously, objects that inhibit heat dissipation must NOT be placed between the inverters.



#### 3.5 Installation Procedure

1. Tighten the two M4x10 screws to affix the upper mounting bracket and lower mounting bracket; torque to 13.9 lbf-in (16 kgf-cm).



Figure 3-5 Affix the Mounting Brackets

2. Mark the positions of the mounting holes on the installation structure:



Figure 3-6 Mark the Mounting Holes of the Mounting Bracket

3. Use a percussion drill (Φ12 mm bit) to drill a hole 2.75 in (70 mm) deep, then use the rubber hammer to knock in the four expansion tubes.



4. Remove the nuts from the expansion tubes, then place the mounting bracket on the wall and ensure that the expansion tubes thread the holes of the mounting bracket. Tighten the nuts with an adjustable wrench and torque to 108.4 lbf-in (124.9 kgf-cm).



Figure 3-7 Fasten the Mounting Bracket

5. Remove the cover plates of the inverter and the wire box and set the two plates aside; these plates will be reaffixed as indicated in Step 10.



Figure 3-8 Remove the Cover Plates

6. Use the ball head hexagonal screwdriver with a combined handle to preload (but do not tighten) the four M6x18 screws to install the wire box onto the mounting bracket.



Figure 3-9 Install the Wire Box



- 7. Hang the inverter onto the mounting bracket as shown in Figure 3-9:
  - a. Lift mounting: Two M10 lifting eye nuts may be installed on the sides of the inverter. Use sling rope or bar, inserted through both lifting eye nuts, to lift the inverter onto the bracket. (Note that the M10 lifting eye nuts are not included with the inverter.)
  - b. **Manual mounting**: At least two (2) people are required to safely lift the inverter by the four arrow positions shown below.



Figure 3-10 Lift or Manually Hang the Inverter



#### **CAUTION:**

The weight of the inverter is approximately 139 lb (63 kg). If you want to manually lift the inverter, it is recommended to have AT LEAST two (2) people to lift it.



8. Use the ball head hexagonal screwdriver with a combined handle to tighten the four M6x20 combined screws on both sides to ensure close contact between the inverter handle and the wire box handle; torque to 52.1 lbf-in (60.0 kgf-cm).



Figure 3-11 Affix Inverter onto Mounting Bracket

- 9. Tighten the six M6x18 screws to affix the inverter and wire box onto the mounting bracket and torque to 52.0 lbf-in (59.9 kgf-cm).
  - **OPTIONAL**: Install an anti-theft padlock to prevent the inverter from being stolen if installed outdoors.



Figure 3-12 Attach the Inverter and Wire Box



10. Tighten the screws to secure the two cover plates on top of the inverter.



Figure 3-13 Affix the Cover Plates



# **4** Electrical Connection

CAUTION:

All cables must be connected in accordance with the NEC and all other applicable local codes or jurisdictions.

## 4.1 Cable Specification

All cables must be connected in accordance with the following specifications:

Table 4-1 Cable Specifications for the Single Phase Hybrid Inverter					
Туре	Conductor AWG				
		Recommended			
Multi-core cables specialized for outdoor use (use 90°C copper wire ONLY)	Grid & load cable	#1/0-4/0 AWG (3/8 in lugs)	#4/0 AWG (3/8 in lugs)		
	Generator L1/L2 cable	#1/0-2/0 AWG	#1/0 AWG		
	Generator neutral	#1/0-2/0 AWG (5/16 in lugs)	#1/0 AWG (5/16 in lugs)		
	Grounding cable	#4-14 AWG	#4 AWG		
Industry common PV tables (type: PV1-F, use 90°C copper wire ONLY)	#12-8 AWG		#10 AWG		
Multi-core cables specialized for outdoor use (use 90°C copper wire ONLY)	#2/0-4/0 AWG (3/8 in lugs)		#4/0 AWG (3/8 in lugs)		
Cables specialized for outdoor use (use 90°C copper wire ONLY)	#6-4 A	#4 AWG			
Cables specialized for outdoor use (use 90°C copper wire ONLY)	UTP Cat5e or #22-18 AWG communication cable (e.g., Belden 3106A)				
	Type   Multi-core cables specialized   for outdoor use (use 90°C   copper wire ONLY)   Industry common PV tables   (type: PV1-F, use 90°C   copper wire ONLY)   Multi-core cables specialized   for outdoor use (use 90°C   copper wire ONLY)   Multi-core cables specialized   for outdoor use (use 90°C   copper wire ONLY)   Cables specialized for   outdoor use (use 90°C   copper wire ONLY)   Cables specialized for   outdoor use (use 90°C   copper wire ONLY)	Type Grid & load cable   Multi-core cables specialized for outdoor use (use 90°C copper wire ONLY) Generator L1/L2 cable   Industry common PV tables (type: PV1-F, use 90°C copper wire ONLY) Grounding cable   Multi-core cables specialized for outdoor use (use 90°C copper wire ONLY) #12   Multi-core cables specialized for outdoor use (use 90°C copper wire ONLY) #12   Multi-core cables specialized for outdoor use (use 90°C copper wire ONLY) #2/0-4/0 A   Cables specialized for outdoor use (use 90°C copper wire ONLY) #6-4 A   Cables specialized for outdoor use (use 90°C copper wire ONLY) UTP Cat5e or #22   Cables specialized for outdoor use (use 90°C copper wire ONLY) UTP Cat5e or #22	Type   Conductor AWG     Type     Grid & load cable   #1/0-4/0 AWG (3/8 in lugs)     Multi-core cables specialized for outdoor use (use 90°C copper wire ONLY)   Generator L1/L2 cable   #1/0-2/0 AWG     Industry common PV tables (type: PV1-F, use 90°C copper wire ONLY)   Grounding cable   #1/2-8 AWG     Multi-core cables specialized for outdoor use (use 90°C copper wire ONLY)   #12-8 AWG (3/8 in lugs)   #12-8 AWG (3/8 in lugs)     Cables specialized for outdoor use (use 90°C copper wire ONLY)   #2/0-4/0 AWG (3/8 in lugs)   #12-8 AWG (copper)     Cables specialized for outdoor use (use 90°C copper wire ONLY)   #6-4 AWG (copper)   #6-4 AWG (copper)     Cables specialized for outdoor use (use 90°C copper wire ONLY)   UTP Cat5e or #22-18 AWG communication cable   UTP Cat5e or #22-18 AWG communication cable		



## 4.2 Tools Required and Torque Values



### NOTICE:

Cable sizing must be processed by a licensed electrical engineer according to the electrical code and cable OEM recommendation.

#### Tool Usage Torque Attaching battery cables, AC (Load L1 and L2, Grid L1 and L2) live cables, and AC 200 in-lb (22.5 N·m) No. 16 hex socket wrench 1 neutral cables (Load and Grid) Attaching generator neutral cable 110 in-lb (12.5 N·m) 2 No. 13 hex socket wrench 3 No. 10 hex socket wrench Attaching external grounding cable 53 in-lb (6 N·m) DC internal grounding bar 26 in-lb (3 N·m) 4 5 mm flat screwdriver AC internal grounding bar Attaching screws of generator terminal 32 in-lb (3.5 N·m) block (generator L1 and L2) 5 No. 2 Phillips screwdriver Attaching screws of PV terminal 26 in-lb (3 N·m) (PV1-3+ and PV1-3-) Preparing cables -6 **Diagonal pliers** 7 Preparing cables \_ Wire stripper Preparing cables -8 Crimping tool

#### Table 4-2 Required Tools and Torque Values


# 4.3 Electrical Cable Connection



# NOTICE:

Ensure watertight seals during installation.

Read these instructions carefully and refer to Section 11 Technical Data before wiring.



#### Figure 4-1 Conduit Knockout Locations and Trade Size

Connection Knockout	Trade Size (inches)
BATTERY (CPS battery)	2
PV (photovoltaic)	2
LOAD (backup loads)	2
GRID (power grid)	2
GEN (generator)	1.25
COMM PORT (EMS / BMS communication)	0.75



## 4.3.1 Ground Cable Connection

Crimp the compression lug and tighten an M6x18 screw to attach the grounding lug to the grounding hole.



Figure 4-2 Connect the Ground Wire

## 4.3.2 AC Wiring

1. Use the key ① to unlock the two buckle locks, pull part ② first, then pull part ③ to open the front cover.



Figure 4-3 Open the Front Cover



2. Use the supporting rod to hold the front cover open.



Figure 4-4 Hold the Front Cover

3. Loosen the two screws and remove the transparent cover.



Figure 4-5 Remove Transparent Cover



4. Remove the watertight hole plugs and insert the corresponding conduits and conduit fittings through the battery, COMM PORT, PV, LOAD, GEN, and GRID knockouts.

NOTE: Customer needs to prepare the steel conduits and conduit fittings according to the size of the knockout.



Figure 4-6 Insert the Steel Pipes

5. When the LOAD, GRID, and GEN cables are ready to use, thread them through the conduit, then remove an appropriate length of the insulation layer from the cable (see Figure 4-7):



Figure 4-7 Remove Jacket and Insulation Layer



- 6. Insert the exposed wire core into the crimped area of the compression lugs, then crimp the compression lugs.
- 7. After crimping, wrap the wire crimp area with heat shrink tubing and use the hot air gun to seal the tubes.



Figure 4-8 Crimp and Seal the Lugs

8. Connect the AC GRID cables and backup LOAD cables (if applicable).

NOTE: For grid-tied PV only applications, the AC cables must be connected to the GRID terminals.



Figure 4-9 Connect the AC GRID Cables and Backup LOAD Cables (if applicable)



9. Connect the GEN cable (if applicable).



Figure 4-10 Connect GEN Cables



# NOTICE:

Ground cables, N phase, and L phases must correspond to the PE, N, and L1/L2 terminal. If they are connected incorrectly, the inverter may not work properly.



## NOTICE:

The connection of a secondary protection ground wire cannot be replaced by that of the PE wire—both must be grounded correctly. CPS will not take any responsibility for the possible consequences caused by such an omission.

The L1/L2/N output cables of the inverter must be connected to the power grid via an independent 4-pole AC circuit breaker to ensure that the inverter can be disconnected safely from the power grid.



# 4.3.3 PV Wiring



## NOTICE:

It is important to use a multimeter to check the polarity of the DC input cables to avoid reverse polarity.

For PV cable connection, check the polarity <u>before</u> terminating the DC cables of the PV strings according to the following steps (shown in Figure 4-11):

- 1. Use a multi-meter to measure the PV strings' cable ends to check the polarity.
- 2. The positive (+) lug of the cable must match the positive (+) terminal of the inverter's DC input.
- 3. The negative (-) lug of the cable must match the negative (-) terminal of the inverter's DC input.



Figure 4-11 Polarity Check

Connect the cables:



1. Remove an appropriate length (see Figure 4-12) of the jacket and insulation layer from the PV input cable of the PV strings.



Figure 4-12 Wire Stripping



2. Insert the PV wires into the PV terminals and tighten the screws.



Figure 4-13 Connect the PV Cables



#### NOTICE:

To maximize production, reduce clipping losses, and optimize thermal performance, distribute the PV input power across all MPPTs as evenly as possible (e.g., the difference in the number of strings per MPPT is not larger than 1).



## 4.3.4 Battery Wiring



#### NOTICE:

Before connecting the battery cables, use a multimeter to ensure that the polarities are correct.

It is recommended that the rated current of the fuse is equal to the battery maximum discharge current × 1.25 (fuse safety factor). The specific value is subject to the battery manufacturer's requirements.

1. Remove an appropriate length (see Figure 4-14) of the jacket and insulation layer from the cable.





- 2. Insert the exposed wire core into the crimped area of the compression lugs, using crimping pliers to crimp the lugs.
- 3. After crimping, wrap the wire crimp area with heat shrinkable tubing and use the hot air gun to seal the tubes.





4. Connect the battery cable to the battery terminal and use a cable tie to tie the magnetic ring and cables.



Figure 4-16 Connect Battery Cables



# 4.3.5 Communication Wiring

#### 4.3.5.1 Connect the Wi-Fi Module

- 1. Remove the silicone cover from the wire box.
- 2. Insert the Wi-Fi module into the Wi-Fi port until you hear a click sound.

**NOTE**: The indicator of the Wi-Fi module faces outward.



Figure 4-17 Install the Wi-Fi Module

### 4.3.5.2 Connect Communication Cables



#### Table 4-3 Communication Cable Ports

No.	Port Function	
1	Connects the 14-pin terminal.	
2	Connects the optional CPS Meter Kit.	
3	Connects the BMS (CAN communication).	
4	Connects EMS and BMS (RS485 communication).	
5	Parallel communication connection between multiple inverters.	



Select the pins to connect the communication cables according to the actual usage or application upon the following definition of dry contacts:

PIN	Name	Definition	Function
1	BAT_T+	Battery temperature positive port	Decide the better sternereture
2	BAT_T-	Battery temperature negative port	Reads the battery temperature.
3	CT1+	External CT1 positive port	
4	CT1-	External CT1 negative port	Reads the current phase A by external CT.
5	CT2+	External CT2 positive port	
6	CT2-	External CT2 negative port	Reads the current phase B by external C1.
7	DI+	Digital input positive port	
8	DI-	Digital input negative port	Digital signal input (reserve).
9	GEN_S+	Generator startup signal positive port	Condo the recorden startum signal
10	GEN_S-	Generator startup signal negative port	Sends the generator startup signal.
11	NC	Reserved	-
12	NC	Reserved	-
13	RSD+	Rapid shutdown device positive port	Receives the RSD initiation signal
14	RSD-	Rapid shutdown device negative port	(for parallel connection).



1 2 3 4 5	5 6 7 8 9 10 11 12 13 14	Concernance of the second
		0
BAT_T+ BAT_T+ BAT_T- CT1+ CT1+ CT1- CT2+	CT2- CT2- 0+ 0+ 0- NC NC NC NC RS0+ RS0-	Contra Co
Dry	contact	Meter
Conversion of the second		



Figure 4-18 Dry Contacts



# 4.4 Inverter Parallel Connection

The inverter supports the following three parallel modes:

- Multiple inverters in parallel: 120/240 V.
- Two (2) inverters in parallel: 120/208 V.
- Three (3) inverters in parallel: 120/208 V.



### NOTICE:

When the quantity of parallel inverters is greater than three (3) for PV + Battery applications, please contact CPS customer support.

The positions of the Grid and Backup Load terminals are shown in Figure 4-19 below. Before parallel connection, turn the CAN DIP switch ① of each inverter to the ON position.



Figure 4-19 Positions of Grid and Load Terminals



## 4.4.1 Multiple Inverters in Parallel – 120 / 240 V



## NOTICE:

If the quantity of parallel inverters is more than three (3) for PV + Battery applications, contact CPS customer service.

The load of each inverter runs in parallel mode.

	Grid		
Inverter	Phase A	Phase B	
Primary			
Secondary 1	GRID L1	GRID L2	
Secondary 2			

#### 4.4.2 Two Inverters in Parallel – 120 / 208 V

This mode consists of one primary inverter and one secondary inverter.

The load of each inverter runs in parallel mode.

	Grid		
Inverter	Phase A	Phase B	Phase C
Primary	GRID L1	GRID L2	-
Secondary	- GRID L1 GRID L2		

## 4.4.3 Three Inverters in Parallel – 120 / 208 V

This mode consists of one primary inverter and two secondary inverters.

The load of each inverter runs in parallel mode.

	Grid		
Inverter	Phase A	Phase B	Phase C
Primary	GRID L1	GRID L2	-
Secondary 1	-	GRID L1	GRID L2
Secondary 2	GRID L2	-	GRID L1



# 4.5 Meter and CT Connection

Connecting the CPS Meter Kit and CTs is optional:

- In grid-tied PV only applications, there is no need to connect the CPS Meter Kit.
- If there are multiple PV + Battery systems operating in parallel, it is necessary to connect the meter and CT.

For more detailed information, refer to the application notes or user manuals of the meter and CT.

### 4.6 Inverter and Parallel Connection Functions

### 4.6.1 Setting the Primary Inverter and Secondary Inverter

The inverter parallel connection plan adopts primary-secondary control mode. Each inverter address can be set in the app (see Section 8.4.2.4 Setting). **NOTE**: For grid-tied PV only applications, multiple inverters can operate independently in the "Single Machine" mode.

## 4.6.2 Synchronization of Parallel System (Not Applicable for PV Only Systems)

- Powering inverters in the parallel system ON/OFF:
  - o The powering ON and OFF of all the inverters in a parallel system is controlled by the primary inverter.
  - If the primary inverter is powered on, all the inverters in the parallel system are powered on and if the primary inverter is powered off, all the inverters in the parallel system are powered off.
- Inverter failure in a parallel system: If any inverter (primary or secondary) in the parallel system fails, the entire system will stop running.

## 4.6.3 Current Sharing Control (Not Applicable for PV Only Applications)

- In on-grid mode:
  - Power limit: When inverters are connected in parallel, the primary inverter will connect to and receive grid power from the electricity meter. The primary inverter will then deliver power distribution value to the secondary inverters according to the parallel connection mode. In on-grid mode, the states of the inverters and the batteries are different and no current sharing control is performed.
  - Parameter setting synchronization: The primary inverter synchronizes its own registered parameters to the secondary inverters to ensure consistent running parameters.
- In off-grid mode: Due to the different PV and batteries connected to each inverter, the inverter output cannot achieve current sharing control when the power is insufficient.



# 5 Commissioning



#### WARNING:

To eliminate possible danger, read and follow the steps described below in Section 5.1 *before* performing any on-grid operations.

## 5.1 **Pre-Commissioning Checks and Preparation**

### 5.1.1 Mechanical Installation Checks

Perform the following inspections by referring to Section 3 Mechanical Installation:

- Ensure all the mounting brackets are secure.
- Ensure all the screws have been tightened to the specified torque values.

### 5.1.2 Cable Connections Checks

Perform the following inspections by referring to Section 4 Electrical Connection:

- Ensure all the cables are connected to the correct lugs and properly labeled.
- Ensure the cables are appropriately managed to avoid physical damage.
- Check the polarity of the DC input conductors (the DC switches must be in the OFF position).

## 5.1.3 Electrical Connection Checks

Perform the following inspections by referring to Section 4 Electrical Connection:

- Ensure the AC circuit breaker and/or fused switch disconnect is appropriately sized.
- Test and check that the AC voltage is within the normal operating range.
- Ensure that the DC open circuit voltage of the PV input strings is less than 600 V.



# 5.2 Commissioning Steps

- 1. Open the front cover and turn the LOAD, BAT, and GEN switches to the ON position before closing the front cover again.
- 2. Set the inverter DC switch to the ON position. When the solar array produces enough power, the inverter's LED power indicator will be lit and the inverter will enter the self-check state.

Once powered, the inverter will automatically create a wireless Bluetooth network that is visible as an access point from the user communication devices (e.g., tablet, smartphone). Users can download the MatriCloud app for iOS from the App Store or for Android from the Google store; the app can be also downloaded by scanning the QR code below (supports Android 4.4 and iOS 11.0 or later).





# 6 App Local Control

# 6.1 App Quick Connection and Configuration



## INSTRUCTION:

Complete the test and inspection BEFORE operation to confirm that there is no error.

Users can perform the following procedures to set up the app.

- 1. Turn on the device's Bluetooth.
- 2. Open the MatriCloud app.
- 3. Tap the **Settings** icon at the top of the screen, then select the correct server and language.

- North America 👻 📟 English	🛞 North America 🔊 👼 English	North America      English
MatriCloud	MatriCloud	MatriCloud
Email	Email	Email
٢	©	©
Forgot Password	Forgot Password	Forgot Password
Log in	Log in	Log in
I've read and agreed (PRIVACY POLICY) Sign up	POLICY POLICY Sign up	I've read and agreed 《PRIVACY Sign up POLICY》
	Asia-Pacific	中文
Guest Login	Europe	English
Image: Constant of the second seco	North America	Deutsch

Figure 6-1 Select the Server and Language



4. After selecting the server and language, tap **Quick Install** at the bottom of the screen.

MatriCloud	đ
all	
	Ì
	Forgot Passwor
Log in	
Log in	Y Sign up
Log in I've read and agreed (PRIVAC POLICY)	Y Sign up
Log in I've read and agreed (PRIVAC POLICY)	Υ Sign up
Log in I've read and agreed 《PRIVAC POLICY》	Y Sign up
Log in I've read and agreed (PRIVAC POLICY)	γ Sign up
Log in I've read and agreed 《PRIVAC POLICY》 Guest Login 2.4.0	τΥ Sign up

Figure 6-2 Quick Install

5. On this page, tap **Bluetooth Connect** at the bottom of the screen to open the device name list. The device name *XXXXXXXX* is the last eight (8) digits of the SN on the Wi-Fi module label.

**NOTE**: The NFC function is now unavailable.

<	Device Acces	S	<	Bluetooth Connect	
				Left Swipe To	Configu
	0				đ
	QR Scan		24170008	3 (CPS 4G Kit-CN)	al
O F	Firmware Download	Cloud Synch ronization	-		2
connection	History				
24170008	-CPS 4G Kit-CN	10:35:16			
Connection I	Duration 3Second	Connect			
03261944	-SCS100A05-C	10:32:20			
Connection I	Duration 4Second	Connect			
23170008	-CPS 4G Kit-CN-A(US	11-27 15:19:57			
Connection	Duration 5Second	Connect			
Connection					

Figure 6-3 Connect to Inverter



6. When the app is successfully connected to the inverter, the **Installation Settings Wizard** page will appear (Figure 6-4). Check if the cables are connected correctly; if yes, tap **Next Step**.

	Device Connection	Installation Settings Wizard
Start C	Connecting 1	Connection Parameter network completed
		Please check and confirm if the inverter connection line is correct
		1, External grounding cable connection
		2. AC cable connection (LOAD, GRID and GEN)
		3, PV cable connection
		4, BAT cable connection
		5, Communication connection
	Reconnect Terminal	
Tip: E Bluet Bluet	Bluetooth connection requires the ooth switch on and requires ooth and location permissions.	
user'	ng Bluetooth on will not obtain the s location.	Next Step

Figure 6-4 Connection Check

7. In the next step of the **Installation Settings Wizard**, parameter configuration, you can set up the grid information, parallel mode, device access, and running mode parameters by tapping each setup wizard one by one.

<	Installation Settin	gs Wizard
Conne	ection Parameter ne	3 4 etwork completed
	Setup Wizard Grid	>
	Setup Wizard Parallel Mo	ode >
	Setup wizard Device Acc	ess >
	Setup Wizard Running M	ode >
F	Previous Step	Next Step
	<u> </u>	

Figure 6-5 Parameter Configuration



- a. Setup Wizard Grid: Select the standard value according to the requirements of your local authority.
  - The available grid standards are IEEE 1547-2018, CA Rule 21, and HECO.
  - Choose the grid type, such as 120/240 V split phase or 120/208 V three phrase.
  - Choose rated frequency: 50 Hz or 60 Hz.

<	Setup Wizard Grid	
StandardV	alue	
IEEE1547	/_2018	•
GridType		
120/240	√ Split Phase	• )
RatedFreq		
50Hz		•
	Go back	

Figure 6-6 Setup Wizard Grid



#### INSTRUCTION:

Check with your local electric supply company *before* selecting a grid standard. If the inverter operates with an incorrect standard, the electric supply company can cancel the interconnection agreement.



b. Setup Wizard Parallel Mode: Set the parallel mode of the inverter to "single machine" or "two phases in parallel."

**NOTE**: If the inverters run in parallel, you can set their address as "Primary" or "Secondary," as well as the quantity of parallel inverters.

<	Setup Wizard Grid	
StandardVal	Je	
IEEE1547_3	2018	•
GridType		
120/240V :	Split Phase	•
RatedFreq		
50Hz		•
	Go back	

Figure 6-7 Setup Wizard Parallel Mode

c. Setup Wizard Device Access: Set the battery type and generator type.

<	Setup wiz	ard Devic	e Access	
Battery	Type			
Li				•
GENTyp	e			
Null				• )
		2010		
		Go back		

Figure 6-8 Setup Wizard Device Access



d. Setup Wizard Running Mode: Set the running mode to any option listed in the dropdown list.



Figure 6-9 Setup Wizard Running Mode

After setting the system running mode, you can also set other relevant parameter items in the **SysRunMode** dropdown:

- FeedbackGridPower: The maximum power fed from the inverter to the grid.
- LiBatBackupMinSOC: Battery backup minimum SOC. When the battery is discharged to minimum SOC in ongrid mode, it will not continue to discharge unless it is off-grid.
- **GridChgEn**: Enable or disable the ability of the battery to draw power from the grid.
- **BatFromGridPower**: The maximum power at which the power grid can charge batteries; i.e., the power grid will charge the batteries at a power rate lower than the preset value.
- BatFromGridStartTime: Start time of charging the battery by drawing power from the grid.
- **BatFromGridEndTime**: End time of charging the battery by drawing power from the grid.
- AntiFeedbackGridEn: Enable or disable the anti-feedback function.



- 8. After finishing parameter configuration, tap **Next Step** to proceed to the network configuration page.
- 9. In the next step of the **Installation Settings Wizard**, network connection configuration:
  - a. Tap Wi-Fi, then tap Select to choose the desired Wi-Fi and enter its password.

Installation Settings Wizard (CPS EC
1-2-3-4
Connection Parameter network completed
Network Connection Configuration:
Please confirm if the communication stick has 4G function, otherwise select Wi Fi connection, please confirm that the communication stick STA indicator light is flashing.
*The standard communication rod of the inverter does not have 4G function.
Wi-Fi
H
12mag.cm
Q 4G
Previous Step Next Step

Figure 6-10 Network Configuration

b. After choosing the Wi-Fi and entering its password, tap Confirm, then Next Step.

← Installation Settings Wizard	÷	Installatio	on Setting	s Wizard		$\leftarrow$ Installation Settings Wizard
Connection Parameter network completed	Conne	ection Paran	neter net	3 work com	4 pleted	Connection Parameter network completed
Network Connection Configuration: Please confirm if the communication stick has 4G function, otherwise select Wi Fi connection, please confirm that the communication stick STA indicator light is flashing.	Netwo Please functio please indicat	ork Connect confirm if th on, otherwise confirm that cor light is fla	etion Cont e commun e select Wi t the comm shing.	figuration: ication stick Fi connectio unication sti	has 4G n, ck STA	Network Connection Configuration: Please confirm if the communication stick has 4G function, otherwise select Wi Fi connection, please confirm that the communication stick STA indicator light is flashing.
cps-machine	Ca	ncel Wi-	Fi passwo	ord Con	firm	*The standard communication rod of the inverter does not have 4G function.
chint-group	ch	intpower77	88		×	Wi-Fi
chint-vip	88		- File File File File File File File File	•••••		CPS-VIP Select
CPS-GUEST	,	分词	ABC	DEF	$\otimes$	chintpower7788
CPS-VIP	° ?	GHI	JKL	MNO	0	0 4G
CPS-INTERNET	1	PQRS	TUV	WXYZ	拖行	
PIS-WIFI-CHINSOFT_5G_Wi-Fi5	符号	中/英 ®	. Å	123	17	Previous Step Next Step

Figure 6-11 Select Wi-Fi



- 10. On the final page, tap **Complete and reboot** to complete the Installation Settings Wizard.
  - If the screen shows "Initialization setting completed" (see Fig. 6-12), the inverter will automatically restart when **Complete and reboot** is tapped.

Connection P	arameter net	twork complete
н¢		the
(		
33%		
Battery 17.55 kw	Backup Load 0.00 kw	Non-Backup Load 13.50 kw
Initial	ize settings c	ompleted
The device has	no faults and th	e parallel operation

Figure 6-12 Settings Completed Page

• If there is equipment failure, it will display as shown in Figure 6-13.

< Inst Connection	2 Parameter	ttings Wiz	completed
Eattery 0.00 kw	Backuy	5 Load kw	Non-Backup Load 0.00 kw
Only after com	Device f	aults: ault handlir	ıg can it C
Low Bat	t		>
Previous	Step	Not pro	cessing yet

Figure 6-13 Troubleshooting or Skip Device Faults

a. If this occurs, troubleshoot until the failures have been cleared.

NOTE: You can also tap Not processing yet to skip troubleshooting.

- b. Tap the refresh icon C to check for further equipment failure.
- c. If there are no additional failures, the **Complete and reboot** button will appear; tap it to continue.



11. From the login screen, tap Device Access at the bottom, then tap Bluetooth Connect to open the device list.

I North America 💌 👼 English	< Device Access		< Bluetooth Connect	Q
MatriCloud			Left Swipe	To Configure
	0			al.
Email	QR Scan		24170008 (CPS 4G Kit-CN)	llı.
Forgot Password	Firmware Download	Cloud Synch ronization		2
Log in	Connection History			- e
<ul> <li>I've read and agreed (PRIVACY POLICY)</li> </ul>	24170008-CPS 4G Kit-CN Connection Duration 3Second	10:35:16 Connect		
	03261944-SCS100A05-C	10:32:20 Connect		
Guest Login	23170008-CPS 4G Kit-CN-A(US.	. 11-27 15:19:57		
2.3.0 ② Device Access ③ Quick install	Connection Duration 5Second Bluetooth Connect	Connect		

Figure 6-14 Connect Bluetooth

You will be redirected to the home screen after selecting a device from the device list to connect.



## 6.2 Home Menu



### NOTICE:

The parameters displayed on the interfaces throughout this chapter may vary with specific product models and user choices. Always refer to the actual interface shown on your device.

After successful connection, the main interface will be displayed as follows:

1. **Terminal parameter settings**: Tap the icon in the top right corner to enter the terminal parameter settings interface.

Here, users can set the Wi-Fi, users need to set or modify the **wifi ssid** and **wifi pwd** to ensure the inverter is connected to the internet. (For more information, see Section 6.4.8 Gateway Configuration.)

241700	80			<	Terminal Pa	rameter Set	ting 👔	<	Basic Configuration	
		Power	on/off		Model: CPS	4G Kit-CN (2)	MB)	Gateway Configuratio	n	Modify
	8		41 • I Conne	46 ,       -71 dBm     €        Connected to Server     Reboot     Save		Save	wifi ssid	CPS-VIP	Modify	
<u>}</u>			After th	After the parameters are set and saved, restart the			wifi pwd	****	Modify	
				device	to be effective	Version		net	4G	Modify
CI SN: 1	PS ECH 11090001	12KTL/U	S 2 10	6805	800124170008	9.02		tz	8	Modify
Running	Running Self Powered On Grid		• IME	IMEI     IMSI		02474050	uart0	115200	Modify	
SysRunState	RunM	Node	OnOffGrid	8087	38008082133	4002402	03474035	period(min)	1	Modify
<b>4.2</b> PV_TodayEnerg		<b>2141</b> PV_Tot	alEnergy kWh		Basic Co	onfiguratior				
224.7 PV_TodayTime	(F) min	1870 PV_Tot	alTime h		Advance	ed Configur	ation >			
	AntiFeed	lbackGric	dEn: Disabled		Enable I	-og				
1.32 kw			0.67 kw			,	/iew Log >			
Home	Sett	ings	More							

Figure 6-15 Communication Mode Configuration



- 2. The **Power on/off** button controls turning the inverter on and off.
- 3. The system status (SysRunState) has four inverter modes:
  - Standby: After the inverter is powered on, it enters Standby mode and the **Power on/off** button will be gray.
  - **PreChecking**: After sliding the **Power on/off** button to *on*, after which it will appear blue, the inverter will begin a series of self-checks.
  - **Running**: If there is no failure and the **Power on/off** button remains blue, the inverter will turn on and begin running.
  - Fault: If there are any failures, the Power on/off button will return to gray and a red fault message will appear beneath it. Tap **View** in this fault message to access the fault records and clear faults.



Figure 6-16 Switch On/Off and System Modes



- 4. There are multiple running modes (**RunMode**), which can be set up in the **Settings** menu (see Section 6.3.18 EMS Parameters):
  - Pure PV
  - Self-Powered
  - Fully Fed
  - Emergency Charging
  - Forced Off-Grid
  - TOU function



Figure 6-17 RunMode



5. **OnOffGrid** shows the on-grid or off-grid status of the inverter, which cannot be set in this interface and will change according to the actual grid connection state.

241700	08			
		Power on/off		
C SN:	PS ECH	12KTL/US		
Running SysRunState	Self Po Runt	owered On Grid Mode OnOffGrid		
<b>4.2</b> PV_TodayEnerg		2141 (F) PV_TotalEnergy kWh		
<b>224.7</b> PV_TodayTime		1870 📀 PV_TotalTime h		
C	AntiFeed	dbackGridEn: Disabled		
DC Solar 1.32 kw		Grid 0.67 kw		
Home	Sett	tings More		

Figure 6-18 OnOffGrid

6. Below **SysRunState**, **RunMode**, and **OnOffGrid**, the energy generation statistics are displayed: the current day's energy generation, energy from PV in total, the current day's PV generation time in minutes, and the current day's PV generation time in hours.



Figure 6-19 Energy Generation Statistics



7. Tap AntiFeedbackGridEn to enable or disable the anti-feedback (anti-backflow) function:



Figure 6-20 Enable or Disable Anti-feedback



8. This portion of the screen has a series of tabs, and by selecting these tabs, you can see the generation capacity and access eight submenus: Detail, Parallel operation, PV, Power grid, Inversion, Battery information, Temperature, Rated parameter, Version, and Other.

24170	8000			
Battery 0.00 kw	Backup Load 0.05 kw	Non-Backup Load 0.00 kw		
Detail	Parallel operati	on PV		
Energy Stor	age charge E	nergy Storage disch		
ES_TodayCh	gEnergy	0.3 kWh		
ES_TotalChg	Energy	1018 kWh		
ES_TodayCh	gTime	54.7 min		
ES_TotalChg	Time	1442 h		
Home	Settings	More		

Figure 6-21 Parameter Subcategories

- **Detail**: Displays energy storage charge and energy storage discharge information, power purchase, power feedback, load consumption, and charge and discharge information.
- Parallel operation: Displays the total power of PV inverters, batteries, loads, and generators in parallel.
- PV: Displays the average voltage, average current, and power of the three (3) MPPT channels (PV1, PV2, and PV3).
- Battery information: Displays battery parameters, including voltage, current, temperature, SOC, and SOH.
- **Inversion**: Displays two-phase voltage, current, frequency, and power, reactive power values, total power, power factor, and apparent power parameters of the inverter.
- Power grid: Displays the two-phase voltage, current, power, and reactive power values of the power grid.



24170008	- 8	24170008	<u> </u>	24170008	A 1
0.05 kv	v 0.00 kw	Detail Parallel operat	tion PV	arallel operation	battery informat
Detail Parallel opera	ation PV	ParallelPVTotalPwr	0.75 kW	PV1AvgVol	0.0 V
Energy Storage charge	Energy Storage disch	ParallelBatteryTotalPwr	0.04 kW	PV2AvgVol	340.5 V
	0.3 kWb	ParallelBatteryAvgSOC	2.0 %	PV3AvgVol	0.0 V
ES_TotalChgEnergy	1018 kWh	ParallelLoadL1TotalPwr	0.01 kW	PV1AvgCurr	0.00 A
ES_TodayChoTime	54 7 min	ParallelLoadL2TotalPwr	0.00 kW	PV2AvgCurr	2.21 A
ES_TotalChoTime	1442 h	ParallelLoadL3TotalPwr	0.00 kW	PV3AvgCurr	0.00 A
Lo_lotalonghine	1772 11	ParallelGenL1TotalPwr	0.00 kW	PV1Power	0.00 kW
		ParallelGenL2TotalPwr	0.00 kW	PV2Power	0.75 kW
				PV3Power	0.00 kW
Home Settings	More	Home Settings	More	Home Settings	More

PV battery infor	mation inversion	tery information	Power grid T	on Inversion Power gri	d Temperatu
	48.0.1/	InvL1Curr	3.03 A		
satteryvoi	48.9 V	InvL2Curr	3.06 A	GridFreq	50.00 Hz
BatteryCurr	0.00 A	InvL1Freq	50.01 Hz	GridL1Volt	127.6 V
atPower	0.00 kW	InvL2Freq	50.01 Hz	GridL2Volt	127.5 V
atteryState	Standby	InvL1Power	0.35 kW	GridL1Curr	4.13 A
atterySOC	2 %	InvL2Power	0.35 kW	GridL2Curr	4.15 A
hargeCurrLimt	200.00 A	InvPower	0.70 kW	GridL1Power	-0.37 kW
isChargeCurrLimt	0.00 A	Invi 1RoactiveRower	0.02 kVor	GridL2Power	-0.37 kW
attRateCap	400 Ah	Invertiee Civer Ower	0.02 KVai	GridPower	-0.75 kW
BF_Rated_Capacity	1600 kWh	InvL2ReactivePower	0.01 kVar	GridL1ReactivePower	-0.31 kVar
		InvReactivePower	0.03 kVar	GridL2ReactivePower	-0.29 kVar
		InvL1ApparentPower	0.38 kVA	GridReactivePower	-0.62 kVar
		InvL2ApparentPower	0.39 kVA	<u></u>	
		InvApparentPower	0.77 kVA		
		InvL1PF	0.899		
		InvL2PF	0.897		

Figure 6-22 Detail, Parallel Operation, PV, Battery Information, Inversion, and Power Grid Subcategories



- **Temperature**: Displays the temperature for the environment, inverter mode heat sink, PCB, battery, junction box interior, Acs, and Dcs.
- **Other**: Displays important parameters of the generator, power and voltage values of critical loads, ordinary loads, and the inverter.
- Rated parameter: Displays the three main rated parameters (frequency, voltage, and power) of the inverter.
- Version: Displays the software version numbers of the current six modules for customers to check if the software is updated to the latest version.

24170008		24170008	8	24170008		24170008	
Power grid Tempera	ture Other R	Temperature Other	Rated parameter	Dither Rated	parameter Version	• Other Rated pa	rameter Version
EnvTemp	22.4 °C	PBusVol	207.4 V	RatedFreq	50.00 Hz	LCDVersion	03.06
InvModelHeatsinkTemp	18.0 °C	NBusVol	207.8 V	RatedVolt	120.0 V	LCDBootVersion	00.00
PVModelHeatsinkTemp	17.8 °C	GenVolt	0.0 V	RatedPower	12000 W	DSPVersion	01.03.04
BatModelHeatsinkTemp	17.9 °C	GenL1Curr	0.00 A			DSPBootVersion	01.00
PCBTemp	19.0 °C	GenL2Curr	0.00 A			CPLDVersion	02.00
BatTemp	5.2 °C	GenL1Power	0.00 kW				
JunctionBoxInsideTemp	-3.3 °C	GenL2Power	0.00 kW				
AcsTemp	-3.3 °C	GenPower	0.00 kW				
DcsTemp	-3.3 °C	GenOnOffState	Off				
		CriticalLoadL1Power	0.10 kW				
		CriticalLoadL2Power	0.10 kW				
		CriticalLoadL1Volt	126.5 V				
		CriticalLoadL2Volt	126.4 V				
		OrdinaryLoadL1Power	0.00 kW				
		OrdinaryLoadL2Power	0.00 kW				
		OrdinaryLoadPower	0.00 kW				
Home Setting	is More	Home Settings	More	Home Set	ttings More	Home Setting	s More

Figure 6-23 Temperature, Rated Parameter, Version, and Other Subcategories



## 6.3 Settings Menu



## NOTICE:

The following screenshots show parameters in accordance with IEEE 1547-2018.

- 1. Tap the **Settings** icon at the bottom of the screen.
- 2. Enter "1111" as the password to enter the settings interface.

24170008	~	- 8	24170008				
Power on/off			Q, Search	Register Addre			
			Input Register Map				
	2				9		
1					-		
	-			Please Enter Password			
CPS I SN: 1109	ECH12KTL/U 000012417002	S 2 D					
Running Se	Running Self Powered On Grid						
SysRunState	SysRunState RunMode OnOffGrid		Cancel				
4.2 (	2141	Ŧ	Hold Register Map				
PV_TodayEnergy kV	PV_TodayEnergy kWh PV_TotalEnergy kWh		Grid Voltage Pro	tection			
225.4 (	225.4 (7) 1870 (7)		Parameters	10011011	17		
PV_TodayTime min	PV_TodayTime min PV_TotalTime h			Q W E R T Y U I O P			
Ant	iFeedbackGrid	En: Disabled	ASDF	GHJ	κL		
			★ Z X C	VBN	M 🗵		
DC Solar 1.14 kw		Grid 0.91 kw	123	space	return		
•	0	•		•			
Home	Settings	More					

Figure 6-24 Settings Interface



The Settings page comprises two parts: Input Register Map and Hold Register Map. (The Input Register Map is read only.)

	24170008			-				
Se	arch	Register Add	ress	D				
•	Common Info		9	•				
•	BMS Info		42	•				
•	Anti-BackFlow_I	nfo	25	×				
•	PCS Info		142	×				
•	Energy Info		26	×				
Hold	Hold Register Map							
•	Grid Voltage Pro Parameters	17	×					
•	Grid Frequent Pr Parameters	18	×					
-	Voltage Ride-Thr	ouah						
	iome s	<b>O</b> Settings	M	Dore				

Figure 6-25 Input Register map

#### Input Register Map:

- Common Info
- BMS Info
- Anti-backflow Info
- PCS Info
- Energy Info





Figure 6-26 Hold Register Map

#### Hold Register Map:

- Grid Voltage Protection Parameters
- Grid Frequency Protection Parameters
- Voltage Ride-Through Parameters
- Active Power Regulation Control
- Reactive Power Regulation Control
- ARC Detection Parameters
- Safety Protection Parameters
- Battery Parameters
- Off-Grid Mode Parameters
- Other Parameters
- Control Commands
- Remote Scheduling
- System Configuration Parameters
- EMS Parameters
- GEN Parameters

**NOTE**: The Hold Register parameters are set by default at the factory and the user cannot modify them without authorization. If you need to modify them, contact CPS customer service.


# 6.3.1 Common Info

In Common Info, you can see the hardware and software device information.

<	Comm	on Info C
c	Device 0x0000 - 0	CPS 12kW Photovoltaic Storage
C	LCDBootVersion 0x0001 - 1	0100
c	InputRegNum 0x0003 - 3	256
c	ProVersion 0x0004 - 4	002e
c	MinorVersion 0x0005 - 5	1627
c	SN 0x0006 - 6	110900012417002 2
c	Model 0x000A - 10	CPS ECH12KTL/US
c	HoldRegNum 0x0014 - 20	512
c	HoldRegAddr 0x0015 - 21	16384

Figure 6-27 Common Info



## 6.3.2 BMS Info

In BMS Info, you can see various battery parameters such as SOC, charge/discharge limit current, voltage, current, temperature, and work status, as well as cell voltage, minimum and maximum temperature, minimum and maximum voltage address, minimum and maximum temperature address, battery SN, and software version.

< вмз	Info C	< BMS Info	C
C Batt_SOC % 0x0610 - 1552	100	C 0x061A - 1562	3.556
C Batt_SOH % 0x0611 - 1553	100	C Chint_CellMaxVolt V 0x061B - 1563	3.587
C Batt_DischgLimitCur 0x0612 - 1554	r A 200.0	Chint_CellMinTemp °C 0x061C - 1564	33
C Batt_ChgLimitCurr A 0x0613 - 1555	-10.0	C Chint_CellMaxTemp °C 0x061D - 1565	34
C Batt_Volt V 0x0614 - 1556	57.22	Chint_CellMinVoltAddr 0x061E - 1566	258
C Batt_Curr A 0x0615 - 1557	0.0	Chint_CellMaxVoltAddr 0x061F - 1567	257
C Batt_Temp °C 0x0616 - 1558	33.4	Chint_CellMinTempAddr 0x0620 - 1568	260
C Batt_WorkSta 0x0617 - 1559	Running	Chint_CellMaxTempAddr 0x0621 - 1569	257
C Chint_ProtectInfo 0x0618 - 1560		C Chint_BattSN_1_1 5d511	01123f8a8fd
C Chint_WarnInfo 0x0619 - 1561		C Chint_BattSN_1_2 5d511	01123f8a8fd
Chint_CellMinVolt V	3.556	C Chint_BattSN_1_3 5d511	01123f8a8fd

<	BMS Inf	o C	C < BM:		G
G	Chint_BattSN_1_4 0x062E - 1582	f0f0f0f0f0f0f0f0	с	Chint_BattSoftVer_1_3	16.06.03
c	Chint_BattSN_2_1 0x0632 - 1586	000000000000000000000000000000000000000	c	Chint_BattSoftVer_1_4	16.06.03
G	Chint_BattSN_2_2 0x0636 - 1590	000000000000000000000000000000000000000		Chint BattSoftVer 2.1	
c	Chint_BattSN_2_3 0x063A - 1594	000000000000000000000000000000000000000	C	0x065A - 1626	00.00.00
c	Chint_BattSN_2_4	0000000000000	c	Chint_BattSoftVer_2_2 0x065C - 1628	00.00.00
a	Chint_BattSN_3_1	000000000000000000000000000000000000000	с	Chint_BattSoftVer_2_3 0x065E - 1630	00.00.00
G	0x0642 - 1602	00	с	Chint_BattSoftVer_2_4	00.00.00
G	Chint_BattSN_3_2 0x0646 - 1606	000000000000000000000000000000000000000		Chint BattSoftVer 3 1	
G	Chint_BattSN_3_3 0x064A - 1610	0000000000000 00	G	0x0662 - 1634	00.00.00
c	Chint_BattSN_3_4 0x064E - 1614	000000000000000000000000000000000000000	С	Chint_BattSoftVer_3_2 0x0664 - 1636	00.00.00
G	Chint_BattSoftVer_1_1 0x0652 - 1618	16.06.03	с	Chint_BattSoftVer_3_3 0x0666 - 1638	00.00.00
c	Chint_BattSoftVer_1_2 0x0654 - 1 <del>628</del>	16.06.03	c	Chint_BattSoftVer_3_4 0x0668 - 1640	00.00.00

Figure 6-28 BMS Info



## 6.3.3 Anti-Backflow Info

In Anti-Backflow Info, you can access anti-backflow information such as grid power, total energy bought and sold, current day's energy bought and sold, total load energy, current day's load energy, total PV energy, current day's PV energy, ABF enable and disable, battery charge and discharge kWh, grid load power, and backup load power.



Figure 6-29 Anti-Backflow Info



## 6.3.4 PCS Info

C PV1Power kW 0x0842 - 2444

In PCS Info, you can access more detailed PCS information such as LCD/DSP version, rated power, rated frequency, rated voltage, parallel mode, generator type, grid type, battery type, standard value, inverter L1/L2 frequency, inverter L1/L2 current, inverter L1/L2 voltage, inverter L1/L2 power, PV 1/2/3 current, PV 1/2/3 voltage, generator L1/L2 power, warnings, faults, running mode, system status, and battery status.

<	PCS Inf	o C	<		PCS Info	G	<	PCS Info	C
C	Device 0x0800 - 2048	CPS 12kW Photovoltaic Storage	G	катеолог л 0x0817 - 2071		120.0	C	0x082D - 2093	125.5
c	SafetyVersion 0x0802 - 2050	01.00	G	RatedPower W 0x0818 - 2072		12000	C	InvL1L2Volt V 0x082E - 2094	250.6
c	LCDVersion 0x0803 - 2051	02.27	C	InvParallelMode 0x0819 - 2073		Single machine	C	InvL1Curr A 0x082F - 2095	1.68
c	LCDBootVersion 0x0804 - 2052	01.00	G	PVLinkMode 0x081B - 2075	Ind	dependent mode	C	InvL2Curr A 0x0830 - 2096	1.76
c	DSPVersion 0x0805 - 2053	02.16	G	GenPortType 0x081C - 2076		Null	C	InvL1Freq Hz 0x0831 - 2097	49.99
G	DSPVersion 0x0805 - 2053	01.02.16	G	GridType 0x081D - 2077		120/240V split phase	C	InvL2Freq Hz 0x0832 - 2098	49.99
C	DSPBootVersion 0x0806 - 2054	01.00	G	StandardValue 0x081E - 2078		IEEE1547_2018	C	EnvTemp °C 0x0833 - 2099	46.7
C	CPLDVersion 0x0807 - 2055	02.00	C	BatteryType 0x081F - 2079		Li	C	InvModelHeatsinkTemp °C 0x0834 - 2100	41.2
G	SN 0x0808 - 2056	110900012417002 2	G	GridPortType 0x0820 - 2080		Grid	C	PVModelHeatsinkTemp °C 0x0835 - 2101	42.5
c	Model 0x080C - 2060	CPS ECH12KTL/US	G	LoadPortType1 0x0821 - 2081		Null	C	BatModelHeatsinkTemp °C 0x0836 - 2102	44.0
c	RatedFreq Hz 0x0816 - 2 <mark>070</mark>	50.00	G	InvL1Volt V 0x082C - 2 <u>092</u>		125.1	C	PBusVol V 0x0837 - 2103	215.1
<	PCS Inf	io C	<		PCS Info	G	<	PCS Info	C
G	NBusVol V 0x0838 - 2104	214.9	G	PV3AvgCurr A 0x0840 - 2112		0.00	c	InvL1ApparentPower kVA 0x084B - 2123	0.21
G	BatteryVol V 0x0839 - 2105	52.7	G	BatPower kW 0x0841 - 2113		-0.80	c	InvL2ApparentPower kVA 0x084C - 2124	0.22
G	BatteryCurr A 0x083A - 2106	-14.60	G	PV1Power kW 0x0842 - 2114		0.00	c	InvApparentPower kVA 0x084D - 2125	0.43
G	PV1AvgVol V 0x083B - 2107	0.0	G	PV2Power kW 0x0843 - 2115		0.87	c	InvL1PF 0x084E - 2126	0.000
G	PV2AvgVol V 0x083C - 2108	303.0	G	PV3Power kW 0x0844 - 2116		0.00	c	InvL2PF 0x084F - 2127	0.000
G	PV3AvgVol V 0x083D - 2109	0.0	G	InvL1Power kW 0x0845 - 2117		0.01	c	CriticalLoadL1Power kW 0x0850 - 2128	0.00
G	PV1AvgCurr A 0x083E - 2110	0.00	G	InvL2Power kW 0x0846 - 2118		0.01	c	CriticalLoadL2Power kW 0x0851 - 2129	0.00
G	PV2AvgCurr A 0x083F - 2111	2.84	G	InvPower kW 0x0847 - 2119		0.02	С	ParallelBatteryAvgSOC % 0x0852 - 2130	28.0
G	PV3AvgCurr A 0x0840 - 2112	0.00	G	InvL1ReactivePo 0x0848 - 2120	wer kVar	-0.12	С	GenL1Power kW 0x0853 - 2131	0.00
G	BatPower kW 0x0841 - 2113	-0.80	G	InvL2ReactivePo 0x0849 - 2121	wer kVar	-0.14	c	GenL2Power kW 0x0854 - 2132	0.00

C GenPower kW 0x0855 - 2133

-0.27

0.00

C InvReactivePower kVar 0x084A - 2122

0.00



<	PCS Info	G	<		PCS Info	(	C	<	PCS Info	C
C	PvlnvL1Power kW 0x0856 - 2134	0.00	G	Fault0 0x0861 - 2145				G	OnOffGrid 0x086D - 2157	On Grid
G	PvlnvL2Power kW 0x0857 - 2135	0.00	G	Fault1 0x0862 - 2146				G	BatteryState 0x086E - 2158	Charge
G	PvlnvPower kW 0x0858 - 2136	0.00	C	Fault2 0x0863 - 2147				C	SysRunState 0x086F - 2159	Running
C	OrdinaryLoadL1Power kW 0x0859 - 2137	0.00	G	Fault3 0x0864 - 2148				C	PCBTemp °C 0x0870 - 2160	48.0
c	OrdinaryLoadL2Power kW 0x085A - 2138	0.00	G	Fault4 0x0865 - 2149				C	BatterySOC % 0x0871 - 2161	28
c	OrdinaryLoadPower kW 0x085B - 2139	0.00	G	PFault 0x0866 - 2150				C	ChargeCurrLimt A 0x0872 - 2162	200.00
G	OnOff 0x085C - 2140	Power on	G	MCUFault 0x0867 - 2151				C	DisChargeCurrLimt A 0x0873 - 2163	200.00
c	Warning0 0x085D - 2141	Ex Fan Abn	c	FaultTime 0x0868 - 2152		2024-09-18 10:05:24		C	DrivePwrSignal 0x0874 - 2164	Norm
G	Warning1 0x085E - 2142		c	RunMode 0x086C - 2156		Self Powered		C	OnOffOrderState dB 0x0875 - 2165	1
c	Warning2 0x085F - 2143			SusState		InverterRun GridOk Derating		C	PvSysMode 0x0876 - 2166	4
C	MCUWarn 0x0860 - <u>2144</u>		G	0x086D - 2157		OnOffGrid:On Grid;		C	BatSysMode 0x0877 - 2 <del>467</del>	4
CS In	fo C <	PCS	Info		G <	PCS	S Info	)	C <	PCS Infe

<	PCS Info	C	< PCS Info	C	PCS Info	C	< PCS Info	C
G	InvSysMode 0x0878 - 2168	4	C GridL2Power kW 0x0890 - 2192	0.00	C ExtL2Curr A 0x089C - 2204	0.20	C OffsetAddrOfBat	2256
C	PvinvL1Volt V 0x0883 - 2179	0.0	C GridPower kW 0x0892 - 2194	0.00	C BatTemp °C 0x089D - 2205	33.4	0x08A3 - 2211	
c	PvinvL2Volt V 0x0884 - 2180	0.0	C GridL1ReactivePower kVar	0.13	JunctionBoxInsideTemp	31.2	C 0x08A6 - 2214	Off
c	PvinvL1Curr A 0.	.00	GridL2ReactivePower	0 14	AcsTemp °C	31.2	C BattRateCap Ah 0x08A8 - 2216	400
~	PvInvL2Curr A		0x0894 - 2196	0.14	DcsTemp °C		C ParallelPVTotalPwr kW 0x08BB - 2235	0.87
G	0x0886 - 2182 0	0.00	<b>C</b> 0x0895 - 2197	0.27	G <sub>0x08A0 - 2208</sub>	31.2	ParallelBatteryTotalPwr C kW	-0.78
G	GridFreq Hz 49. 0x0888 - 2184	.99	C CriticalLoadL1Volt V 0x0896 - 2198	126.8	C BatteryProtocol 0x08A1 - 2209	1	0x08BC - 2236 ParallelLoadL1TotalPwr	0.00
G	GridL1Volt V 12 0x0889 - 2185	27.0	C CriticalLoadL2Volt V 0x0897 - 2199	126.7	C BatNumOfReg 0x08A2 - 2210	39	Ox08BD - 2237 ParallelLoadL2TotalPwr	0.00
C	GridL2Volt V 12 0x088A - 2186 12	27.0	C GenVolt V 0x0898 - 2200	0.0	C OffsetAddrOfBat 0x08A3 - 2211	2256	C kW 0x08BE - 2238	0.00
c	GridL1Curr A 1. 0x088C - 2188 1	.63	C GenL1Curr A 0x0899 - 2201	0.00	C GenOnOffState 0x08A6 - 2214	Off	ParallelLoadL3TotalPwr C kW 0x08BF - 2239	0.00
c	GridL2Curr A	.94	C GenL2Curr A	0.00	G BattRateCap Ah	400	C ParallelGenL1TotalPwr kW 0x08C0 - 2240	0.00
~	GridL1Power kW		- 0x089A - 2202		QXU8A8 - 2216		ParallelGenL2TotalPwr C kW	0.00
G	0x088F - 2 <u>191</u> 0.	.00	G <sub>0x089B - 2<del>203</del></sub>	• 0.18	С <sub>0х08BB</sub> - <u>2235</u>	0.87	0x08C1 - 2241	

## Figure 6-30 PCS Info



## 6.3.5 Energy Info

In Energy Info, you can access energy information such as the ES and PV total charge / discharge energy and time, ES and PV charge / discharge energy and time for the current day, grid total buy / sell energy and time, grid buy / sell time for the current day, load total buy / sell energy and time, and load buy / sell energy and time for the current day.



Figure 6-31 Energy Info



## 6.3.6 Grid Voltage Protection Parameters

The Grid Voltage Protection Parameters interface displays the protection parameters of the AC grid voltage such as maximum and minimum grid voltage in various levels, maximum and minimum grid trip time in various levels, and over voltage / under voltage recovery value and time. Additionally, you can enable or disable over voltage / under voltage protection.

<	Grid Voltage Protection	Param	C	<	Grid Voltage Protection	Param	C
G	OVEnable 0x4000 - 16384	Enabled	۲	c	UVEnable	Enabled	,
G	GridV.Max_1 % 0x4001 - 16385	115.0	•		GridV Min 1 %		
c	VolMaxTripTime_1 s	13.00		G	0x4008 - 16392	88.0	•
	GridV Max 2 %			G	VolMinTripTime_1 s 0x4009 - 16393	21.00	٠
G	0x4003 - 16387	120.0	•	C	GridV.Min_2 %	50.0	
G	VolMaxTripTime_2 s 0x4004 - 16388	0.16	•	Ŭ	0x400A - 16394	00.0	
c	GridV.Max_3 %	120.0	,	G	VolMinTripTime_2 s 0x400B - 16395	2.00	٠
	0x4005 - 16389			G	GridV.Min_3 %	50.0	
G	VolMaxTripTime_3 s 0x4006 - 16390	0.16	•		0,4000 - 16396		
c	UVEnable 0x4007 - 16391	Enabled		G	0x400D - 16397	2.00	٠
c	GridV.Min_1 %	88.0		G	GridVolRecover_Max % 0x400E - 16398	110.0	•
	0x4008 - 16392			C	GridVolRecover_Min	91.7	
G	VolMinTripTime_1 s 0x4009 - 16393	21.00	٠		0x400F - 16399	51.7	·
c	GridV.Min_2 % <sup>57/79</sup> 0x400A - 1 <u>6394</u>	50.0	•	G	s 0x4010 - 16400	300.00	•

Figure 6-32 Grid Voltage Protection Parameters



### Table 6-1 Grid Voltage Protection Parameters

Parameter	Group	Setting Range									
Deremeter Neme	Description	IEE	E 1547-201	18		Rule 21			HECO		
Parameter Name	Description	Min	Default	Мах	Min	Default	Мах	Min	Default	Max	
		Grid	Over Volta	ge Prote	ction						
OVEnable	-	Disabled	Enab	led	Disabled	Enab	led	Disabled	Enal	bled	
GridV.Max_1 (%)	Threshold level 1 max. grid voltage	100.0	110.0	135.0	100.0	110.0	135.0	100.0	110.0	135.0	
VolMaxTripTime_1 (s)	Trip time level 1 max. grid voltage	0	13.00	655.35	0	13.00	655.35	0	13.00	655.35	
GridV.Max_2 (%)	Threshold level 2 max. grid voltage	100.0	120.0	135.0	100.0	120.0	135.0	100.0	120.0	135.0	
VolMaxTripTime_2 (s)	Trip time level 2 max. grid voltage	0	0.16	655.35	0	0.16	655.35	0	0.16	655.35	
GridV.Max_3 (%)	Threshold level 3 max. grid voltage	100.0	120.0	135.0	100.0	120.0	135.0	100.0	120.0	135.0	
VolMaxTripTime_3 (s)	Trip time level 3 max. grid voltage	0	0.16	655.35	0	0.16	655.35	0	0.16	655.35	
GridVolRecover_Max (%)	Over voltage recovery parameter	100.0	105.0	110.0	100.0	108.0	110.0	100.0	108.0	110.0	
		Grid L	Jnder Volta	ige Prote	ction						
UVEnable	-	Disabled	Enab	led	Disabled	Enab	led	Disabled	Enal	oled	
GridV.Min_1 (%)	Threshold level 1 min. grid voltage	0	88.0	100	0	88.0	100	0	88.0	100	
VolMinTripTime_1 (s)	Trip time level 1 min. grid voltage	0	21.00	655.35	0	21.00	655.35	0	21.00	655.35	
GridV.Min_2 (%)	Threshold level 2 min. grid voltage	0	50.0	100	0	50.0	100	0	10.0	100	
VolMinTripTime_2 (s)	Trip time level 2 min. grid voltage	0	2.00	655.35	0	2.00	655.35	0	2.00	655.35	
GridV.Min_3 (%)	Threshold level 3 min. grid voltage	0	50.0	100	0	50.0	100	0	10.0	100	
VolMinTripTime_3 (s)	Trip time level 3 min. grid voltage	0	2.00	655.35	0	2.00	655.35	0	2.00	655.35	
GridVolRecover_Min (%)	Under voltage recovery parameter	88.0	91.7	100.0	88.0	90.0	100.0	88.0	90.0	100.0	
GridVolRecover_Time (s)	Over and under voltage recovery time	0	300.00	655.35	0	300.00	655.35	0	300.00	655.35	



## 6.3.7 Grid Frequency Protection Parameters

The Grid Frequency Protection Parameters interface displays the protection parameters of the grid frequency such as maximum and minimum grid frequency at various levels, maximum and minimum grid trip time at various levels, and over frequency / under frequency recovery values and times. Additionally, you can enable or disable over frequency / under frequency protection.

← Grid Freq	quency Protection Para	C	÷	Grid Frequency Protection	Para	C
C UFEnable 0x4027 - 1643	23 Enable	d 🕨	C	OFEnable 0x4020 - 16416	Enabled	•
C GridF.Min_1 H 0x4028 - 164	Hz 58.5 24	0 •	C	GridF.Max_1 Hz 0x4021 - 16417	61.20	•
C FreqMinTripTi 0x4029 - 164	ime_1 s 300.0 25	0 •	C	FreqMaxTripTime_1 s 0x4022 - 16418	300.00	٠
C GridF.Min_2 F 0x402A - 164	Hz 56.5 126	0 •	c	GridF.Max_2 Hz 0x4023 - 16419	62.00	•
C FreqMinTripTi 0x402B - 164	ime_2 s 127 0.1	6 •	c	FreqMaxTripTime_2 s 0x4024 - 16420	0.16	•
C GridF.Min_3 H 0x402C - 164	Hz 56.5 128	0 •	G	GridF.Max_3 Hz 0x4025 - 16421	62.00	•
C FreqMinTripTi 0x402D - 164	ime_3 s 129 0.1	6•	G	FreqMaxTripTime_3 s 0x4026 - 16422	0.16	•
C FreqRecover_ 0x402E - 164	_Max Hz 60.1 30	0 •	c	UFEnable 0x4027 - 16423	Enabled	•
C FreqRecover_ 0x402F - 164	_Min Hz 59.5 31 59.5	0 •	G	GridF.Min_1 Hz 0x4028 - 16424	58.50	•
C FreqRecover_ 0x4030 - 164	_Time s 0.0	0 •	c	FreqMinTripTime_1 s 0x4029 - 16425	300.00	•
C GridFaultPSta 0x4031 - 1643	aTime s 20. 33	0 •	c	GridF.Min_2 Hz 0x402A - 16426	56.50	•

Figure 6-33 Grid Frequency Protection Parameters



Paramete	r Group	oup Setting Range								
Deremeter Neme	Description	IEE	E 1547-201	18		Rule 21			HECO	
Parameter Name	Description	Min	Default	Мах	Min	Default	Мах	Min	Default	Мах
		Grid O	ver Freque	ency Pro	tection					
OFEnable	-	Disabled	Enab	led	Disabled	Enab	led	Disabled	Enat	bled
GridF.Max_1 (Hz)	Threshold level 1 max. grid frequency	50.00	61.20	62.00	50.00	60.50	135.0	50.00	63.00	62.00
FrqMaxTripTime_1 (s)	Trip time level 1 max. grid frequency	0	300.00	1310.7	0	300.00	1310.7	0	180.00	1310.7
GridF.Max_2 (Hz)	Threshold level 2 max. grid frequency	50.00	62.00	62.00	50.00	62.00	135.0	50.00	65.00	65.00
FrqMaxTripTime_2 (s)	Trip time level 2 max. grid frequency	0	0.16	1310.7	0	0.16	1310.7	0	0.16	1310.7
GridF.Max_3 (Hz)	Threshold level 3 max. grid frequency	50.00	62.00	62.00	50.00	62.00	135.0	50.00	65.00	65.00
FrqMaxTripTime_3 (s)	Trip time level 3 max. grid frequency	0	0.16	1310.7	0	0.16	1310.7	0	0.16	1310.7
FreqRecover_Max (Hz)	Over frequency recovery parameter	50.00	60.10	51.00	50.00	60.40	51.00	50.00	60.10	65.00
	-	Grid Ur	nder Frequ	ency Pro	otection			1		
UFEnable	-	Disabled	Enab	led	Disabled	Enab	led	Disabled	Enabled	
GridF.Min_1 (Hz)	Threshold level 1 min. grid frequency	38.00	58.5	50.00	38.00	58.5	50.00	38.00	57.0	65.00
FrqMinTripTime_1 (s)	Trip time level 1 min. grid frequency	0	300.00	1310.7	0	300.00	1310.7	0	180.00	1310.7
GridF.Min_2 (Hz)	Threshold level 2 min. grid frequency	38.00	56.5	50.00	38.00	57.0	50.00	38.00	50.0	65.00
FrqMinTripTime_2 (s)	Trip time level 2 min. grid frequency	0	0.16	1310.7	0	0.16	1310.7	0	0.16	1310.7
GridF.Min_3 (Hz)	Threshold level 3 min. grid frequency	38.00	56.5	50.00	38.00	57.0	50.00	38.00	50.0	50.00
FrqMinTripTime_3 (s)	Trip time level 3 min. grid frequency	0	0.16	1310.7	0	0.16	1310.7	0	0.16	1310.7
FreqRecover_Min (Hz)	Under frequency recovery parameter	49.00	59.50	50.00	49.00	58.60	50.00	49.00	59.50	65.00
FreqRecover_Time (s)	Over and under						655 D5		200.00	655 35
	frequency recovery time	0	30.00	655.35	0	30.00	000.00	0	300.00	000.00



# 6.3.8 Voltage Ride-Through Parameters

The Voltage Ride-Through Parameters interface displays the LVRT and HVRT protection parameters.

<	Voltage Ride-Through Parame	G
G	HVRTEnable Enabled	•
G	HVRTTripVol % 110.0	•
C	LVRTEnable Enabled	•
C	LVRTTripVol % 88.0 0x4043 - 16451	•
G	FVRTPowerStep %/s 100.0 0x4047 - 16455	•

### Figure 6-34 Voltage Ride-Through Parameters

### Table 6-3 Voltage Ride-Through Parameters

Paramet	er Group		Setting Range								
Parameter Name	Description	IEEE 1547-2018				Rule 21			HECO		
Farameter Name	Description	Min	Default	Max	Min	Default	Мах	Min	Default	Мах	
	HVRT										
HVRTEnable	Enable or disable HVRT protection	Disabled	Enabl	ed	Disabled	Enabl	ed	Disa	bled	Enabled	
HVRTTripVolt	HVRT trigger voltage	100%	<b>110%</b> 120%		100%	110%	120%	100%	110%	120%	
			Ľ	VRT							
LVRTEnable	Enable or disable LVRT protection	Disabled	Enabl	ed	Disabled	Enabl	ed	Disa	bled	Enabled	
LVRTTripVolt	LVRT trigger voltage	70%	88%	100%	70%	88%	100%	70%	88%	100%	
	FVRT										
FVRTPowerStep (%/s)	Power step size when crossing	-	100.0	-	-	100.0	-	-	100.0	-	





Figure 6-35 HVRT Curve



Figure 6-36 LVRT Curve



## 6.3.9 Active Power Regulation Control

The Active Power Regulation Control interface allows you to set the inverter L1/L2 active power, over frequency / under frequency derating slope, frequency active power recovery time, frequency active response time, over voltage derating start voltage, over voltage derating end voltage, over voltage derating start power, over voltage derating end power, voltage derating response time, and more.

<	Active Power Regulation	n Control	C	<	Active Power Regula	tion Control	C
G	InvL1CSPPer % 0x4050 - 16464	100.0	٠	c	FWdbUF Hz	0.036	
c	InvL2CSPPer % 0x4051 - 16465	100.0	•	C	50x4057 - 16471	0.050	
~	PActStep %			Ŭ	0x4058 - 16472	0.000	
G	0x4053 - 16467	100.0	•	C	FWRecPowerTime s 0x4059 - 16473	10.0	•
C	FWEnable	Enabled					
	0,4034 - 10400			C	0x405A - 16474	5.0	•
G	FWdbOF Hz 0x4055 - 16469	0.036	٠	C	VWEnable 0x405B - 16475	Disabled	•
C	FWkOF	0.050	,				
	0x4056 - 16470			C	0x405C - 16476	106.0	•
G	FWdbUF Hz 0x4057 - 16471	0.036	٠	C	VWCurvePow1 %	100.0	
	EWFITE				0,4000 10477		
G	0x4058 - 16472	0.050	•	C	VWCurveVolt2 % 0x405E - 16478	110.0	•
G	FWRecPowerTime s 0x4059 - 16473	10.0	•	C	VWCurvePow2 % 0x405F - 16479	0.0	•
C	FWActTime s 0x405A - 16474	5.0	•	c	VWActTime s 0x4060 - 16480	10.0	•

Figure 6-37 Active Power Regulation Control





### Table 6-4 Active Power Parameters

Paran	neter Group				Se	etting Rang	le			
Parameter		IEE	EE 1547-20	18		Rule 21			HECO	
Name	Description	Min	Default	Мах	Min	Default	Max	Min	Default	Мах
InvL1CSPPer (%)	Inverter L1 active power setting	-100	100	100	-100	100	100	-100	100	100
InvL2CSPPer (%)	Inverter L2 active power setting	-100	100	100	-100	100	100	-100	100	100
PActStep (%)	Active response step size	0.1	100	100.1	0.1	0	100.1	0.1	0	100.1
FWEnable	Frequency active control enable	Disabled	Enal	bled	Disabled	Enal	bled	Disabled	Enat	bled
FWdbOF (Hz)	Over frequency derating trigger frequency	0.001	0.036	1.000	0.001	0.036	1.000	0.001	0.036	1.000
FWkOF	Over frequency derating slope	0.001	0.050	1.000	0.001	0.050	1.000	0.001	0.040	1.000
FWdbUF (Hz)	Under frequency derating trigger frequency	0.001	0.036	1.000	0.001	0.036	1.000	0.001	0.036	1.000
FWkUF	Under frequency derating slope	0.001	0.050	1.000	0.001	0.050	1.000	0.001	0.040	1.000
FWRecPowerTime	Frequency active power recovery time	0.0	10.0	60.0	0.0	10.0	60.0	0.0	10.0	60.0
FWActTime	Frequency active response time	0.2	5.0	10.0	0.2	5.0	10.0	0.2	0.5	10.0
VWEnable	Overvoltage derating enable	Disa	bled	Enabled	Disa	bled	Enabled	Disabled	Enat	bled
VWCurveVolt1 (%)	Over voltage derating starting voltage	105	106	109	105	106	109	105	106	109
VWCurvePow1 (%)	Over voltage derating starting power	0	100	100	0	100	100	0	100	100
VWCurveVolt2 (%)	Over voltage derating end voltage	106	110	110	106	110	110	106	110	110
VWCurvePow2 (%)	Over voltage derating end power	-100	0	100	-100	0	100	-100	0	100
VWActTime	Voltage derating response time	0.5	10	60	0.5	10	60	0.5	10	60



# 6.3.10 Reactive Power Regulation Control

In Reactive Power Regulation Control, you can choose different reactive power control modes by tapping **CSQCtrModeSet** and setting the corresponding parameters that appear under the running mode.

<	Reactive Power Regula	tion Co	C	<	Reactive Power I	Regulation Co	C
G	CSQCtrModeSel 0x4070 - 16496	PF mode	•	C	CSQCtrModeSel 0x4070 - 16496	PF mode	•
G	InvL1CSPFSet 0x4071 - 16497	1.000	•	G	InvL1CSPFSet 0x4071 - 16497	1.000	•
G	InvL2CSPFSet 0x4072 - 16498	1.000	•	C	InvL2CSPFSet 0x4072 - 16498	1.000	•
C	QActStep % 0x4077 - 16503	100.0	•	C	QActStep % 0x4077 - 16503	100.0	•
				Can	cel CSQCtrM	odeSel Co	onfirm
					Disab	bled	
					PF m	ode	
					Constant reactiv	ve power mode	
					PFP curv	e mode	
					QU curve	e mode	
					QP curve	e mode	

Figure 6-40 Reactive Power Regulation Control

In this menu, the five different modes have different register parameters.

- PF mode
- Constant reactive power mode
- PFP mode
- QU curve mode
- QP curve mode



## 6.3.10.1 PF Mode

In this mode, you can set the inverter L1/L2 PF and reactive power response step.



Figure 6-41 PF Mode

Table	6-5	PF	Mode	Parameters
Table	0-0		moue	i arameters

Para	meter Group	Setting Range									
Parameter Nama	Description	IE	EE 1547-20	18		Rule 21			HECO		
Falameter Name	Description	Min	Default	Мах	Min	Default	Max	Min	Default	Max	
PFMode	Constant power factor mode	-	-	-	-	-	-	Disabled		Enabled	
InvL1CSPFSet (%)	Inverter L1 PF settings	-1.000, -0.800	1.000	0.800, 1.000	-1.000, -0.800	1.000	0.800, 1.000	-1.000, -0.800	-0.950	0.800, 1.000	
InvL2CSPFSet (%)	Inverter L2 PF settings	-1.000, -0.800	1.000	0.800, 1.000	-1.000, -0.800	1.000	0.800, 1.000	-1.000, -0.800	-0.950	0.800, 1.000	
QActStep (%)	Reactive power response step	0.1	100.0	100.1	0.1	100.0	100.0	0.1	100.0	100.1	



## 6.3.10.2 Constant Reactive Power Mode

In this mode, you can set the inverter L1/L2 reactive power and reactive power response step.



Figure 6-42 Constant Reactive Power Mode

	Table	6-6	Constant	Reactive	Power	Mode	Parameters
--	-------	-----	----------	----------	-------	------	------------

Pa	arameter Group	Setting Range										
Parameter	Description	IEEE 1547-2018				Rule 21			HECO			
Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Мах		
QMode	Constant Q Mode	Di	sabled	Enabled	Disabled Enabled Disabled		Disabled					
InvL1CSQPer (%)	Inverter L1 reactive power settings	-60.0	0.0	60.0	-60.0	0.0	60.0	-60.0	0.0	60.0		
InvL2CSQPer (%)	Inverter L2 reactive power settings	-60.0	0.0	60.0	-60.0	0.0	60.0	-60.0	0.0	60.0		
QActStep (%)	Reactive power response step	0.1	100.0	100.1	0.1	100.0	100.0	0.1	100.0	100.1		



## 6.3.10.3 PFP Mode

In this mode, you can set the PFP curve P1/PF1, PFP curve P2/PF2, and PFP curve trigger / withdrawal voltage.

<	Reactive Power Re	gulation Co	C
c	CSQCtrModeSel 0x4070 - 16496	PFP curve mode	•
C	QActStep % 0x4077 - 16503	100.0	٠
G	PFPCurveActPw1 % 0x4086 - 16518	50.0	•
G	PFPCurvePF1 0x4087 - 16519	1.000	•
C	PFPCurveActPw2 % 0x4088 - 16520	100.0	•
C	PFPCurvePF2 0x4089 - 16521	-0.900	٠
G	PFPCurveLockInV % 0x408A - 16522	100.0	•
C	PFPCurveLockOutV % 0x408B - 16523	90.0	•

Figure 6-43 PFP Mode



### Table 6-7 PFP Mode Parameters

Paramete	r Group	Setting Range									
Devery story Name	Description	IE	EE 1547-20	18		Rule 21			HECO		
Parameter Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Max	
PFPMode	Power factor – power mode	-	-	-	-	-	-	Dis	abled	Enabled	
QActStep (%)	Reactive power response step	0.1	100.0	100.1	0.1	100.0	100.0	0.1	100.0	100.1	
PFPCurveActPw1 (%)	PFP curve P1	-100	50	100	-100	50	100	-100	50	100	
PFPCurvePF1	PFP curve PF1	-1.000, 0.800	1.000	-0.800, 1.000	-1.000, 0.800	1.000	-0.800, 1.000	-1.000, 0.800	1.000	-0.800, 1.000	
PFPCurveActPw2 (%)	PFP curve P2	-100	100.0	100	-100	100.0	100	-100	100.0	100	
PFPCurvePF2	PFP curve PF2	-1.000, 0.800	-0.900	-0.800, 1.000	-1.000, 0.800	-0.900	-0.800, 1.000	-1.000, 0.800	-0.900	-0.800, 1.000	
PFPCurveLockInV (%)	PFP curve trigger voltage	100.0	100.0	110.0	100.0	100.0	110.0	100.0	100.0	110.0	
PFPCurveLockOutV (%)	PFP curve withdrawal voltage	80.0	90.0	100.0	80.0	90.0	100.0	80.0	90.0	100.0	

PF(P) curve: PF curve mode; note that the power factor changes according to the power change, as shown in Figure 6-42.







## 6.3.10.4 QU Curve Mode

In this mode, you can set the Qu curve U1/Q1, Qu curve U2/Q2, Qu curve U1i/Q1i, Qu curve U2i/Q2i, Qu curve trigger / withdrawal voltage, Qu curve response time, Qu curve Vref adjustment time / enable, and more.

<	Reactive Power Re	gulation Co	C	<	Reactive Power Regulati	on Co	G
c	CSQCtrModeSel 0x4070 - 16496	QU curve mode	,	С	QUCurveVolt1i % 0x407C - 16508	98.0	•
c	QActStep % 0x4077 - 16503	100.0	٠	С	QUCurveReactPw1i % 0x407D - 16509	0.0	•
c	QUCurveVolt1s % 0x4078 - 16504	102.0	•	C	QUCurveVolt2i % 0x407E - 16510	92.0	•
c	QUCurveReactPw1s % 0x4079 - 16505	0.0	•	c	QUCurveReactPw2i % 0x407F - 16511	44.0	•
G	QUCurveVolt2s % 0x407A - 16506	108.0	•	c	QUCurveLockInP % 0x4080 - 16512	20.0	•
C	QUCurveReactPw2s % 0x407B - 16507	-44.0	٠	С	QUCurveLockOutP % 0x4081 - 16513	5.0	•
c	QUCurveVolt1i % 0x407C - 16508	98.0	•	C	QUCurveActTime s 0x4082 - 16514	10.0	•
с	QUCurveReactPw1i % 0x407D - 16509	0.0	•	C	QUCurveVRef % 0x4083 - 16515	100.0	•
c	QUCurveVolt2i % 0x407E - 16510	92.0	•	C	QUCurveVRefTime s 0x4084 - 16516	300	•
c	QUCurveReactPw2i % 0x407F - 16511	44.0		С	QUCurveVRefEn 0x4085 - 16517	Disabled	•

### Figure 6-45 QU Curve Mode

#### Table 6-8 QU Curve Mode Parameters

Parameter	Group	Setting Range									
Deservator Nome	Description	IEEE 1547-2018				Rule 21			HECO		
Parameter Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Max	
QUmode	Vol-Var mode	-	-	-	-	-	-	Disa	bled	Enabled	
QActStep (%)	Reactive power response step	0.1	100.0	100.1	0.1	100.0	100.0	0.1	100.0	100.1	
QUCurveVolt1s (%)	Qu curve U1	90.0	102.0	120.0	90.0	103.3	120.0	90.0	100.0	120.0	
QUCurveReactPw1s (%)	Qu curve Q1	-60.0	0.0	60.0	-60.0	0.0	60.0	-60.0	0.0	60.0	
QUCurveVolt2s (%)	Qu curve U2	100.0	108.0	120.0	100.0	107.0	120.0	100.0	106.0	120.0	
QUCurveReactPw2s (%)	Qu curve Q2	-60.0	-44.0	60.0	-60.0	-30.0	60.0	-60.0	-44.0	60.0	
QUCurveVolt1i (%)	Qu curve U1i	80.0	98.0	110.0	80.0	96.7	110.0	80.0	98.0	110.0	



Parameter	Group					Setting R	ange			
Deveryotan News	Decerintien	IE	EEE 1547-2	018		Rule 21			HECO	
Parameter Name	Description	Min	Default	Мах	Min	Default	Max	Min	Default	Max
QUCurveReactPw1i (%)	Qu curve Q1i	-60.0	0.0	60.0	-60.0	0.0	60.0	-60.0	0.0	60.0
QUCurveVolt2i (%)	Qu curve U2i	80.0	92.0	100.0	80.0	92.0	100.0	80.0	92.0	100.0
QUCurveReactPw2i (%)	Qu curve Q2i	-60.0	44.0	60.0	-60.0	30.0	60.0	-60.0	44.0	60.0
QUCurveLockInP (%)	Qu curve trigger voltage	0.1	20.0	20.0	0.1	20.0	20.0	0.1	20.0	20.0
QUCurveLockOutP (%)	Qu curve withdrawal voltage	0.1	5.0	20.0	0.1	5.0	20.0	0.1	5.0	20.0
QUCurveActTime (s)	Qu curve response time	0.5	10.0	90.0	0.5	10.0	90.0	0.5	5.0	90.0
QUCurveVRef (%)	Qu curve Vref	95.0	100.0	105.0	95.0	100.0	105.0	95.0	100.0	105.0
QUCurveVRefTime (s)	Qu curve Vref adjustment time	300	300	5000	300	300	5000	300	300	5000
QUCurveVRefEn	Enable / disable Qu curve Vref adjustment	Dis	sabled	Enabled	Dis	sabled	Enabled	Disa	bled	Enabled

Qu Curve: QU curve mode; note that the reactive compensation changes according to the grid voltage change, as shown in Figure 6-44.



Figure 6-46 QU Curve



## 6.3.10.5 QP Curve Mode

In this mode, you can set the QP curve P1/Q1, QP curve P2/Q2, QP curve P3/Q3, QP curve P1i/Q1i, QP curve P2i/Q2i, QP curve response time, and more.

<	Reactive Power Reg	gulation Co	C	<	Reactive Power Regulation	on Co	C
G	CSQCtrModeSel 0x4070 - 16496	QP curve mode	•	С	QPCurveQ2s % 0x408F - 16527	0.0	•
G	QActStep % 0x4077 - 16503	100.0	٠	С	QPCurveP3s % 0x4090 - 16528	100.0	•
G	QPCurveP1s % 0x408C - 16524	20.0	•	c	QPCurveQ3s % 0x4091 - 16529	-44.0	•
G	QPCurveQ1s % 0x408D - 16525	0.0	•	c	QPCurveP1i % 0x4092 - 16530	-20.0	٠
G	QPCurveP2s % 0x408E - 16526	50.0	٠	С	QPCurveQ1i % 0x4093 - 16531	0.0	•
G	QPCurveQ2s % 0x408F - 16527	0.0	•	c	QPCurveP2i % 0x4094 - 16532	-50.0	•
G	QPCurveP3s % 0x4090 - 16528	100.0	•	G	QPCurveQ2i % 0x4095 - 16533	0.0	•
G	QPCurveQ3s % 0x4091 - 16529	-44.0	•	c	QPCurveP3i % 0x4096 - 16534	-100.0	•
G	QPCurveP1i % 0x4092 - 16530	-20.0	٠	c	QPCurveQ3i % 0x4097 - 16535	44.0	•
C	QPCurveQ1i % 0x4093 - 16531	0.0	•	c	QPCurveActTime s 0x4098 - 16536	10.0	•

### Figure 6-47 QP Curve Mode

### Table 6-9 QP Curve Mode Parameters

Paramete	er Group	Setting Range									
Deremeter Neme	Description	IEE	EE 1547-20	18		Rule 21			HECO		
Parameter Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Max	
QPMode	VAR-Watt mode	-	-	-	-	-	-	Dis	abled	Enabled	
QActStep (%)	Reactive power response step	0.1	100.0	100.1	0.1	100.0	100.1	0.1	100.0	100.1	
QPCurveP1s (%)	QP curve P1s	0.0	20.0	40.0	0.0	20.0	40.0	0.0	20.0	40.0	
QPCurveQ1s (%)	QP curve Q1s	-60.0	0.0	60.0	-60.0	0.0	60.0	-60.0	0.0	60.0	
QPCurveP2s (%)	QP curve P2s	40.0	50.0	80.0	40.0	50.0	80.0	40.0	50.0	80.0	



Paramete	er Group		Setting Range									
Devenue for Norro	Decerintien	IEE	E 1547-20	18		Rule 21		HECO				
Parameter Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Max		
QPCurveQ2s (%)	QP curve Q2s	-60.0	0.0	60.0	-60.0	0.0	60.0	-60.0	0.0	60.0		
QPCurveP3s (%)	QP curve P3s	60.0	100.0	100.0	60.0	100.0	100.0	60.0	100.0	100.0		
QPCurveQ3s (%)	QP curve Q3s	-60.0	-44.0	60.0	-60.0	-44.0	60.0	-60.0	-44.0	60.0		
QPCurveP1i (%)	QP curve P1i	-40.0	-20.0	0.0	-40.0	-20.0	0.0	-40.0	-20.0	0.0		
QPCurveQ1i (%)	QP curve Q1i	-60.0	0.0	60.0	-60.0	0.0	60.0	-60.0	0.0	60.0		
QPCurveP2i (%)	QP curve P2i	-80.0	-50.0	-40.0	-80.0	-50.0	-40.0	-80.0	-50.0	-40.0		
QPCurveQ2i (%)	QP curve Q2i	-60.0	0.0	60.0	-60.0	0.0	60.0	-60.0	0.0	60.0		
QPCurveP3i (%)	QP curve P3i	-100.0	-100.0	-60.0	-100.0	-100.0	-60.0	-100.0	-100.0	-60.0		
QPCurveQ3i (%)	QP curve Q3i	-60.0	44.0	60.0	-60.0	44.0	60.0	-60.0	44.0	60.0		
QPCurveActTime (s)	QP curve response time	0.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0		

The QP curve in QP curve mode is as shown below in Figure 6-46:



Figure 6-48 QP Curve



# 6.3.11 ARC Detection Parameters

In the **ARC Detection Parameters** interface, you can enable and disable arc detection, change the sensitivity of arc detection, and set the ArcFactory values, arc base and differential values, and arc recovery time.

<	Arc Detection Paramet	ers	C	<	Arc Detection Parameters		C
G	ARCEnable 0x40A0 - 16544	Enabled	٠	c	ArcFactoryI2 K 0x4048 - 16552	40	
c	ArcFactoryB1 K 0x40A1 - 16545	10	٠	c	ArcFactoryF2	25	
c	ArcFactoryl1 K 0x40A2 - 16546	20	•	a	0x40A9 - 16553 ArcFactoryD2 %	20	
c	ArcFactoryF1 0x40A3 - 16547	25	•	C	0x40AA - 16554	20	
c	ArcFactoryD1 % 0x40A4 - 16548	20	•	G	0x40AB - 16555	800	•
c	ArcFactoryT1 dB 0x40A5 - 16549	800	•	C	ArcFactoryC2 dB 0x40AC - 16556	80	•
c	ArcFactoryC1 dB 0x40A6 - 16550	80		G	ArcBase1 K 0x40AD - 16557	30	•
c	ArcFactoryB2 K 0x40A7 - 16551	10		C	ArcBase2 K 0x40AE - 16558	30	•
c	ArcFactoryl2 K 0x4048 - 16552	40		G	ArcDiffer1 K 0x40AF - 16559	5	•
c	ArcFactoryF2	25		C	ArcDiffer2 K 0x40B0 - 16560	5	•
c	ArcFactoryD2 %	20		c	ARCRecoverTime s 0x40B1 - 16561	300.0	•

### Figure 6-49 ARC Detection Parameters

Paramete	er Group		Setting Range									
Deremeter Neme	Description	IEE	E 1547-201	18		Rule 21		HECO				
Parameter Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Мах		
ARCEnable	Enable or disable arc protection	Disabled	Enab	Enabled		Disabled Enabled		Disabled	Enab	led		
ArcFactoryB1 (K)	Arc parameter bandwidth 1	0.0	10	100.0	0.0	10	100.0	0.0	10	100.0		
ArcFactoryL1 (K)	Arc parameter starting frequency 1	0.0	20	100.0	0.0	20	100.0	0.0	20	100.0		
ArcFactoryF1	Arc parameter weight 1	0.0	25	100.0	0.0	25	100.0	0.0	25	100.0		



Paramete	er Group	Setting Range										
Doromotor Norro	Description	IEE	E 1547-201	8		Rule 21			HECO			
Parameter Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Мах		
ArcFactoryD1 (%)	Arc parameter filter parameter 1	0.0	20	100.0	0.0	20	100.0	0.0	20	100.0		
ArcFactoryT1 (dB)	Arc parameter threshold 1	0.0	740	1000	0.0	740	1000	0.0	740	1000		
ArcFactoryC1 (dB)	Arc parameter single cycle limit value 1	0.0	74	100.0	0.0	74	100.0	0.0	74	100.0		
ArcFactoryB2 (K)	Arc parameter bandwidth 2	0.0	10	100.0	0.0	10	100.0	0.0	10	100.0		
ArcFactoryL2 (K)	Arc parameter starting frequency 2	0.0	40	100.0	0.0	40	100.0	0.0	40	100.0		
ArcFactoryF2	Arc parameter weight 2	0.0	25	100.0	0.0	25	100.0	0.0	25	100.0		
ArcFactoryD2 (%)	Arc parameter filter parameter 2	0.0	20	100.0	0.0	20	100.0	0.0	20	100.0		
ArcFactoryT2 (dB)	Arc parameter threshold 2	0.0	690	1000	0.0	690	1000	0.0	690	1000		
ArcFactoryC2 (dB)	Arc parameter single cycle limit value 2	0.0	69	100.0	0.0	69	100.0	0.0	69	100.0		
ArcBase1 (K)	Band 1 fundamental amplitude	0.0	30	100.0	0.0	30	100.0	0.0	30	100.0		
ArcBase2 (K)	Band 2 fundamental amplitude	0.0	30	100.0	0.0	30	100.0	0.0	30	100.0		
ArcDiffer1 (K)	Band 1 difference threshold	0.0	5	100.0	0.0	5	100.0	0.0	5	100.0		
ArcDiffer2 (K)	Band 2 difference threshold	0.0	5	100.0	0.0	5	100.0	0.0	5	100.0		
ARCRecoverTime (s)	Arc recovery time	0.0	300.0	655.35	0.0	300.0	655.35	0.0	300.0	655.35		



## 6.3.12 Safety Protection Parameters

In the **Safety Protection Parameters** interface, you can enable and disable insulation resistance detection, leakage current CT detection, dynamic leakage current detection, static leakage current detection, rapid shutdown, island detection, instantaneous over voltage detection, and DCI detection. Additionally, you can set the ISO protection value, maximum leakage current, island trigger frequency and threshold, switching over voltage, and DCI maximum value.

<	Safety Protection Param	eters	C	<	Safety Protection Param	eters	C
C	ISOChkEnable 0x40C0 - 16576	Enabled	٠	C	GFCIStyChkEnable 0x40C4 - 16580	Enabled	•
c	IsolmpMin kohm 0x40C1 - 16577	100	٠	G	GFCIMax mA 0x40C5 - 16581	250	•
c	GFCICTChkEnable 0x40C2 - 16578	Enabled	•	c	RSDEnable 0x40C6 - 16582	Enabled	٠
c	GFCIDynChkEnable 0x40C3 - 16579	Enabled	٠	C	AlEnable 0x40C7 - 16583	Enabled	•
G	GFCIStyChkEnable 0x40C4 - 16580	Enabled	٠	C	AlTripFreq Hz 0x40C8 - 16584	2.00	•
G	GFCIMax mA 0x40C5 - 16581	250	•	C	AlDisFreq Hz 0x40C9 - 16585	0.04	•
c	RSDEnable 0x40C6 - 16582	Enabled	٠	C	InstVolChkEnable 0x40CA - 16586	Enabled	•
c	AlEnable 0x40C7 - 16583	Enabled	•	C	OpVoltOver % 0x40CB - 16587	130.0	•
c	AlTripFreq Hz 0x40C8 - 16584	2.00	٠	C	DCIEnable 0x40CC - 16588	Enabled	•
c	AlDisFreq Hz 0x40C9 - 16585	0.04	•	c	DCIMax mA 0x40CD - 16589	250	•

Figure 6-50 Safety Protection Parameters



### Table 6-10 Safety Protection Parameters

Parame	ter Group				Se	tting Rang	9			
		IEE	E 1547-201	8		Rule 21			HECO	
Parameter Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Мах
ISOChkEnable	Enable / disable insulation resistance detection	Disabled	Enab	led	Disabled	Enab	led	Disabled	Enab	led
lsolmpMin (kohm)	ISO protection value	0	100	<b>100</b> 2000		100	2000	0	100	2000
GFCICTChkEnable	Enable / disable leakage current CT detection	Disabled	Enabled		Disabled	Enab	Enabled		Enabled	
GFCIDynChkEnable	Enable / disable dynamic leakage current detection	Disabled	Enabled		Disabled	Enabled		Disabled	Enab	led
GFCIstyChkEnable	Enable / disable static leakage current detection	Disabled	Enabled		Disabled	Enabled		Disabled	Enab	led
GFCIMax (mA)	Maximum leakage current	100	250	1000	100	250	1000	100	250	1000
RSDEnable (%)	Enable / disable rapid shutdown	Disabled	Enab	led	Disabled	Disabled Enabled		Disabled	Enab	led
AlEnable	Enable / disable island detection	Disabled	Enab	led	Disabled	Enab	led	Disabled	Enabled	
AlTripFreq (Hz)	Island trigger frequency	0.0	2.0	10.0	0.0	2.0	10.0	0.0	2.0	10.0
AlDisFreq (Hz)	Island frequency threshold	0.0	0.04	1.0	0.0	0.04	1.0	0.0	0.04	1.0
InstVolChkEnable	Enable / disable instantaneous over voltage detection	Disabled	Enab	led	Disabled	Enab	led	Disabled	Enab	led
OpVoltOver (%)	Switching over voltage	100	130	150	100	130	150	100	130	150
DCIEnable	Enable / disable DCl detection	Disabled	Enabled		Disabled	ed Enabled		Disabled	Enabled	
DCIMax (mA)	Maximum DCI	0	250	1000	0	250	1000	0	250	1000



# 6.3.13 Battery Parameters

In the **Battery Parameters** interface, you can change the charging current, discharging current, voltage, and more.

<	Battery Parameters		C	<	Battery Parameters		C
c	LiChargeVoltLimt V 0x40E1 - 16609	57.6	•	C	LiDisChargeCurrLimt A 0x40E4 - 16612	200.0	•
С	LiDisChargeVoltLimt V 0x40E2 - 16610	43.5	•	C	LiBatteryVoltMax V 0x40E5 - 16613	60.0	•
c	LiChargeCurrLimt A 0x40E3 - 16611	-200.0	•	C	LiBatteryVoltMin V 0x40E6 - 16614	40.0	•
c	LiDisChargeCurrLimt A 0x40E4 - 16612	200.0	•	C	LiBatChargeCurrMax A 0x40E7 - 16615	-220.0	•
c	LiBatteryVoltMax V 0x40E5 - 16613	60.0	•	C	LiBatDisChargeCurrM ax A 0x40E8 - 16616	220.0	•
c	LiBatteryVoltMin V 0x40E6 - 16614	40.0	•	C	LiBatFactory 0x40F5 - 16629	Chint	•
c	LiBatChargeCurrMax A 0x40E7 - 16615	-220.0	•	C	LiBatRatedCap Ah 0x40F6 - 16630	400	•
c	LiBatDisChargeCurrM ax A 0x40E8 - 16616	220.0	•	C	LiBatBackupMinSOC % 0x40F7 - 16631	20.0	•
C	LiBatFactory 0x40F5 - 16629	Chint	•	C	LiBatDisChargeMinSO C % 0x40F8 - 16632	10.0	•
C	LiBatRatedCap Ah 0x40F6 - 16630	400	•	C	LiBatChargeMaxSOC % 0x40F9 - 16633	100.0	

Figure 6-51 Battery Parameters



### Table 6-11 Battery Parameters

Parame	Parameter Group		Setting Range							
Devenue for Name	Description	IE	EE 1547-20	18		Rule 21			HECO	
Parameter Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Мах
LiChargeVoltLimit (V)	Battery charge voltage limit	50.0	57.6	60.0	50.0	57.6	60.0	50.0	57.6	60.0
LiDisChargeVoltLimit (V)	Battery discharge voltage limit	40.0	51.0	50.0	40.0	51.0	50.0	40.0	51.0	50.0
LiChargeCurrLimit (A)	Battery charge current limit	-200	-200	0.0	-200	-200	0.0	-200	-200	0.0
LiDisChargeCurrLimit (A)	Battery discharge current limit	0.0	200.0	200.0	0.0	200.0	200.0	0.0	200.0	200.0
LiBatteryVoltMax (V)	Battery voltage upper limit	50.0	60.0	65.0	50.0	60.0	65.0	50.0	60.0	65.0
LiBatteryVoltMin (V)	Battery voltage lower limit	35.0	46.0	50.0	35.0	46.0	50.0	35.0	46.0	50.0
LiBatChargeCurrMax (A)	Battery charge current protection point	-250	-220	0.0	-250	-220	0.0	-250	-220	0.0
LiBatDisChargeCurrMax (A)	Battery discharge current protection point	0.0	220.0	250.0	0.0	220.0	250.0	0.0	220.0	250.0
LiBatFactory	Battery factory	Null	Chint	Chint	Null	Chint	Chint	Null	Chint	Chint
LiBatRatedCap (Ah)	Battery rated capacity	0	400	2000	0	400	2000	0	400	2000
LiBatBackupMinSOC (%)	Battery backup SOC	0.0	20.0	100.0	0.0	20.0	100.0	0.0	20.0	100.0
LiBatDisChargeMinSOC (%)	Minimum discharge SOC	0.0	10.0	20.0	0.0	10.0	20.0	0.0	10.0	20.0
LiBatChargeMaxSOC (%)	Maximum charge SOC	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0



## 6.3.14 Off-Grid Mode Parameters

In **Off-Grid Mode Parameters**, you can enable and disable on/off grid mode automatic switching and set voltage source (VS) voltage and frequency.



### Figure 6-52 Off-Grid Mode Parameters

#### Table 6-12 Off-Grid Mode Parameters

Parame	eter Group		Setting Range									
Deremeter Neme	Description	I	EEE 1547-201	8		Rule 21			HECO			
	Description	Min	Default	Мах	Min	Default	Max	Min	Default	Max		
OnOffGridAutoEn	On/off grid automatic switching {Disabled, Immediately Off Grid, After Ride Through Off Grid}	-	Immediately Off Grid	-	-	Immediately Off Grid	-	-	Immediately Off Grid	-		
VSVolSet (V)	VS voltage setting	108.0	120.0	132.0	108.0	120.0	132.0	108.0	120.0	132.0		
VSFreSet (Hz)	VS frequency setting	55.0	60.0	65.0	55.0	60.0	65.0	55.0	60.0	65.0		



## 6.3.15 Other Parameters

In the **Other Parameters** interface, you can enable or disable DCV, fan detection, IV scan, pure PV off-grid operation, battery recovery, and internet access with battery power function and set parameters such as IV curve scan cycle, bi-directional DC current maximum, inverter current maximum, bias upper limit, DCI bias error allowable upper limit, bus / half-bus voltage upper limit, power on delay, soft-start time, soft-stop time, and filter capacitor damping.

4	<	Others Parameters		G		<	Others Parameters		C
	G	DCVEnable 0x4120 - 16672	Disabled	٠	•				
	C	APFCtrlScale % 0x4121 - 16673	CtrlScale % 10 •		G	0x412F - 16687	150.0	٠	
	C	FanChkEnable	Enabled			C	PowerOnDelayTime s 0x4130 - 16688	0	٠
	a	BiDirDCCurrMax A	20.0		· · · · · · · · · · · · · · · · · · ·		PSoftStaTime s 0x4131 - 16689	1.0	•
	G	0x4125 - 16677	20.0	•			PSoftSTopTime s	1.0	
	C	InvCurrMax A 0x4126 - 16678	188.0	•			ResComp mohm		
	G	InvCurrOffsetDiffMax 0x4127 - 16679	100	•			0x4133 - 16691	0	
	C	DCIOffsetDiffMax 0x412A - 16682	500	•			IVCurrScanEnable [ 0x4134 - 16692 [	Disabled	٠
	c	EnvironmentTmpMax °C	83.0	•			IVCurrScanCycle s 0x4135 - 16693	3000	•
	G	ModuleTmpMax °C 0x412C - 16684	92.0	•		G	PurePVOffGridRunEn [ 0x4136 - 16694 [	Disabled	•
	C Bus	BusVolMax V 0x412D - 16685	550.0			C	VSBatRecoverEnable 0x4138 - 16696	Disabled	•
	c	CapVolMax V 0x412E - 16686	280.0	•		C	BatPowerToGridEnable 0x4139 - 16697	Enabled	•

Figure 6-53 Other Parameters



### Table 6-13 Other Parameters

Parameter	Group	Setting Range									
	_	IEI	EE 1547-20	18		Rule 21		HECO			
Parameter Name	Description	Min Default		Мах	Min	Default	Max	Min	Default	Мах	
DCVEnable	DCV enable / disable	Disa	abled	Enabled	Disa	Disabled		Disa	abled	Enabled	
APFCtrlScale (%)	Harmonic suppression coefficient	0	10	100	0	0 10		0	10	100	
FanChkEnable	Enable / disable fan detection	Disabled	Enabled		Disabled	Enabled		Disabled	Enab	led	
BiDirDCCurrMax (A)	Bi-directional DC current maximum	0	20	100	0	20	100	0	20	100	
InvCurrMax (A)	Inverter current maximum	0	145	200	0	145	200	0	145	200	
InvCurroffsetDiffMax	Inverter current bias upper limit	0	100	1000	0	100	1000	0	100	1000	
DClOffsetDiffMax	DCI bias error allowable upper limit	0	500	1500	0	0 <b>500</b>		0	500	1500	
EnvironmentTmpMax (°C)	Ambient temperature maximum	0	83	100	0	83	100	0	83	100	
ModuleTmpMax (°C)	Inverter module temperature maximum	0	92	120	0	92	120	0	92	120	
BusVolMax (V)	Bus voltage maximum	400	580	600	400	580	600	400	580	600	
CapVolMax (V)	Half bus voltage maximum	200	300	350	200	300	350	200	300	350	
PVStartUpVol (V)	PV startup voltage	0	150	500	0	150	500	0 150		500	
PowerOnDelayTime (s)	Power on delay time	0	300	1000	0	15	1000	0	300	1000	
PSoftStaTime (s)	Power soft-start time	1	300	1000	1	10	1000	1	300	1000	



Parameter (	Group	Setting Range									
Deveneter Name	Description	IEEE 1547-2018				Rule 21		HECO			
Parameter Name	Description	Min Default		Max	Min	Default	Max	Min	Default	Max	
PSoftSTopTime (s)	Power soft-stop time	1	<b>1</b> 120		1	1	120	1	1	120	
ResComp (mohm)	Filter capacitor damping	0	1000	5000	0	0 1000		0	1000	5000	
IVCurrScanEnable / disa IV scan		Disabled		Enabled	Disabled		Enabled	Disabled		Enabled	
IVCurrScanCycle (s)	IV curve scan cycle	0	3000	3000	0	3000	3000	0	3000	3000	
PurePVOffGridRunEn	Enable / disable pure PV off-grid operation	Disabled		Enabled	Disabled		Enabled	Disabled		Enabled	
VSBatRecoverEnable	Enable / disable battery recovery	Disa	bled	Enabled	Disabled		Enabled	Disabled		Enabled	
BatPowerToGridEnable	Enable / disable internet access with battery power	Disabled	Enat	bled	Disabled	Ena	bled	Disabled	Enab	led	



## 6.3.16 Control Commands

In the **Control Commands** interface, you can set the power on/off, restart, restore factory, arc self-check, clear arc fault, IV curve scanning, battery wake-up, and overload fault clearing commands.

<	Control Commands	C
c	ComdOnOff 0x4150 - 16720	•
G	QuitShutModeOrder 0x4151 - 16721	•
C	CallDefaultValueOrder 0x4152 - 16722	•
c	ARCSelfCheck 0x4153 - 16723	•
G	ClearARCFault 0x4154 - 16724	•
С	ComdIVScan 0x4156 - 16726	•
c	BattervWakeup 0x4157 - 16727	•
c	OverLoadClear 0x4158 - 16728	•

Figure 6-54 Control Commands

### **Table 6-14 Control Commands Parameters**

Parameter Name	Description
ComdOnOff	Power on/off command
QuitShutModeOrder	Force restart command
CallDefaultValueOrder	Restore factory command
ARCSelfCheck	Arc self-check command
ClearARCfault	Clear arc fault command
ComdIVScan	IV curve scanning command
BatteryWakeup	Battery wake-up command
OverLoadClear	Overload fault clearing action



# 6.3.17 System Configuration Parameters

In the System Configuration Parameters interface, you can set the parameters listed in Table 6-15 below.

<	System Configura	tion Parame	C	<	System Configuration	on Parame	C	<	System Configurati	on Parame	(
C	PVLinkMode I 0x41A1 - 16801	ndependent mode	•	c	InvParallelNum 0x41AE - 16814	1	×	c	BMS 485 address 0x41B4 - 16820	1	•
C	GENType 0x41A2 - 16802	Null	•	C	External 485 address 0x41B0 - 16816	1	•	G	BMS 485 baudrate 0x41B5 - 16821	9600 (default)	•
c	GridType 0x41A3 - 16803	120/240V Split Phase	٠	c	External 485 baudrate 0x41B1 - 16817	9600 (default)	•	C	system time 0x41B6 - 16822	2024-09-19 12:03:53	
C	InvParallelMode 0x41A4 - 16804	Single machine	•	C	Meter 485 address 0x41B2 - 16818	1	•	c	LED test 0x41BA - 16826		•
c	SerialNumber 0x41A5 - 16805	110900012417002 2	•	c	Meter 485 baudrate 0x41B3 - 16819	9600 (default)	•	c	EEPROM test 0x41BB - 16827		•
C	StandardValue 0x41A9 - 16809	IEEE1547_2018	•	c	BMS 485 address 0x41B4 - 16820	1	•	c	FLASH test 0x41BC - 16828		•
C	RatedFreq 0x41AA - 16810	50Hz	•	G	BMS 485 baudrate 0x41B5 - 16821	9600 (default)	•	G	System data clear 0x41BD - 16829		
C	InvParallelAddr 0x41AB - 16811	Host	•	C	system time 0x41B6 - 16822	2024-12-19 10:52:34	•	C	GridQShiftCnt 0x41C5 - 16837	100	,
C	RatedPower 0x41AC - 16812	12.0kW	٠	C	LED test 0x41BA - 16826		•	G	GridPortType 0x41C6 - 16838	Grid	•
C	BatteryType 0x41AD - 16813	Lì	•	C	Ox41BB - 16827		•	c	LoadPortType 0x41C7 - 16839	Null	

C

Figure 6-55 System Configuration Parameters



### Table 6-15 System Configuration Parameters

Parameter Name	Description
PvLinkMode	PV connection mode. If the system consists of multiple inverters, choose <b>parallel mode</b> ; otherwise, choose <b>independent mode</b> .
GENType	Generator type. If the inverter is connected to a microinverter, choose <b>Connect Inv</b> ; If the inverter is connected to a generator, choose <b>Connect GEN</b> ; otherwise, choose <b>Null</b> .
GridType	Choose grid type (120/240 V split phase or 120/208 V three-phrase) according to the grid voltage.
InvParallelMode	Parallel mode. If you select a PCS system consisting of more than one inverter, choose <b>Multi</b> machine parallel; otherwise, choose <b>Single machine</b> .
SerialNumber	Serial number of hybrid inverter.
StandardValue	Choice of regulations. Choose the inverter standard (IEEE 1547-2018, CA Rule 21, or HECO) applicable to the local area. The parameters of the three standard values are different, as shown in the parameter tables in this document.
RatedFreq	Rated frequency: 50 Hz or 60 Hz.
InvParallelAddr	Parallel address: primary or secondary 1-11.
RatedPower	Select the rated power (7.6, 9.6, or 12.0 kW) according to the inverter type.
BatteryType	Battery type selection: lithium.
BMS 485 address	BMS 485 address.
BMS 485 baudrate	BMS 485 baudrate: 2400, 4800, 9600 (default), or 19200.
System time	System time format setting.
LED test	LED test.
EEPROM test	EEPROM test.
FLASH test	Flash test.
System data clear	System data clear.
GridQShiftCnt	Grid reactive power sampling offset value.
GridPortType	Grid port type: no grid, grid, or grid with load.
LoadPortType	Load port type: null or inverter.


#### 6.3.18 EMS Parameters

In the **EMS Parameters** interface, you can set the running mode (see Section 2.5 System Working Modes), maximum battery charging grid power, maximum online power, grid charging battery start time, and grid charging battery end time. Additionally, you can enable and disable power limit and power grid charging.

<	EMS Parameters		C	<	EMS Parameters		C
C SysRur 0x41D0	nMode D - 16848	Fully Fed	•	c	SysRunMode 0x41D0 - 16848	Pure Pv	٠
C BatFrom	mGridPower kW 2 - 16850	10.0		с	BatFromGridPower kW 0x41D2 - 16850	10.0	•
C AntiFee	edbackGridEn 3 - 16851	Disabled	•	c	AntiFeedbackGridEn 0x41D3 - 16851	Disabled	•
C kW	ackGridPower	12.0	•	c	FeedbackGridPower kW 0x41D4 - 16852	12.0	•
Cancel	SysRunMode	Co	nfirm	c	GridChgEn 0x41D6 - 16854	Enabled	•
	Pure Pv Self Powered			с	BatFromGridStartTime 0x41D7 - 16855	00:00	•
	Fully Fed			c	BatFromGridEndTime 0x41D8 - 16856	23:59	•
	Emergency charging	i					
	Forced Off-Grid						
	тои						

#### Figure 6-56 EMS Parameters

#### Table 6-16 EMS Parameters

P	Setting Range									
Parameter	Description	IEEE 1547-2018				Rule 21		HECO		
Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Max
BatFromGrid Power (kW)	Maximum power at which the grid can charge batteries	0	10	10	0	10	10	0	10	10
AntiFeedback GridEn	Enable / disable power limit	Disa	bled	Enabled	Disabled		Enabled Disabled		bled	Enabled
FeedbackGrid Power (kW)	Maximum online power	0	12	12	0	12	12	0	12	12
GridChgEn	Enable / disable power grid charging	Disabled	Enat	bled	Disabled	Enal	bled	Disabled	Enat	bled
BatFromGrid StartTime	Starting time at which power grid begins to charge batteries	00:00	00:00	24:00	00:00	00:00	24:00	00:00	00:00	24:00
BatFromGrid EndTime	End time at which the power grid stops charging batteries	00:00	23:59	23:59	00:00	23:59	23:59	00:00	23:59	23:59



#### 6.3.19 GEN Parameters

In the GEN Parameters interface, you can set parameters related to the generator.



#### Figure 6-57 GEN Parameters

The generator can only start in off-grid mode, and the N line of the generator needs to be connected to the N line of the inverter. Parallel inverters on a three-phase grid do not support diesel generators.



#### NOTICE:

The maximum allowable generator power is 24 kW. The power of the generator must be greater than the load, and it is not recommended for the generator to operate at full power; the maximum recommended value is 80% of the rated power.



The generator can be started up in two ways: manually or automatically.

- 1. Manual startup:
  - a. In the GEN Parameters interface, tap GenStartupWay.
  - b. Select Manually.
  - c. Return to the GEN Parameters interface and tap GenOnOff.
  - d. Select **On** to start up the generator and **Off** to shut down the generator.



#### Figure 6-58 Manual Startup

#### Table 6-17 Manual Startup Parameters

Parameter Group		Setting Range									
Parameter	Description	IEEE 1547-2018			R	ule 21		HECO			
Name	Description	Min	Default	Max	Min	Default	Max	Min	Default	Max	
GenStartMode	Generator startup mode	Automatically	Manua	ally	Automatically	Manua	ally	Automatically	Manua	ally	
GenOnOff	Turn generator on / off	Off	Off	On	Off	Off	On	Off	Off	On	
BatFromGenEn	Enable / disable generator charging	Disabled	Enabl	led	Disabled	Enabl	ed	Disabled	Enabl	ed	
BatFromGridPower (kW)	Generator charging power	0.1	10.0	10.0	0.1	10.0	10.0	0.1	10.0	10.0	
GenOutPower (kW)	Generator output power	0.0	0.0	24.0	0.0	0.0	24.0	0.0	0.0	24.0	



- 2. Automatic startup:
  - a. In the GEN Parameters interface, tap GenStartupWay.
  - b. Select Automatically.
  - c. Set the GenStartSoc %; if the SOC value is lower than the set value, the generator will start up.
  - d. Set the **GenEndSoc** %; if the SOC value is higher than the set value, the generator will shut down.

< GEN Param	eters C	<	GEN Pai	rameters	C	<	GEN Pa	rameters	C
C GenStartMode	Automatically	C Ge	enStartMode	Automatic	cally •	C	GenStartMode	Automatically	•
C GenStartSoc %	20 ►	C Ge	enStartSoc %		20 🕨	C	GenStartSoc %	20	) >
C GenEndSoc %	80 ►	C Ge	enEndSoc %		80 •	C	GenEndSoc %	80	) •
C BatFromGenEn	Enabled 🕨	CG	enStartSoc %	0 ~ 50		C	GenEndSoc %	51 ~ 100	•
C BatFromGridPower kW	10.0 •	C (	20 Step Offset : 1.0			C	80 Step Offset : 1.0		) •
C GenOutPower kW	12.0 •	C	Clear	Cancel Confir	rm	C	Clear	Cancel Confirm	

#### Figure 6-59 Automatic Startup

#### **Table 6-18 Automatic Startup Parameters**

Parameter Group		Setting Range									
Parameter	Description	IEEE 1547-2018			R	ule 21		HECO			
Name	Description	Min	Default	Мах	Min	Default	Max	Min	Default	Мах	
GenStartMode	Generator startup mode	Automatically	Manua	ally	Automatically	Manua	ally	Automatically	Manua	ally	
GenStartSoc (%)	Generator start SOC	0	20	50	0	20	50	0	20	50	
GenEndSoc (%)	Generator end SOC	51	80	100	51	80	100	51	80	100	
BatFromGenEn	Enable / disable generator charging	Disabled	Enabl	ed	Disabled	Enabl	ed	Disabled	Enabl	ed	
BatFromGridPower (kW)	Generator charging power	0.1	10.0	10.0	0.1	10.0	10.0	0.1	10.0	10.0	
GenOutPower (kW)	Generator output power	0.0	0.0	24.0	0.0	0.0	24.0	0.0	0.0	24.0	





#### NOTICE:

- If the generator is set to start up manually, it will not stop working automatically. It must be shut down via the app (see Figure 6-56).
- If the generator is set to start up automatically, the generator will stop working automatically according to the preset SOC values (see Figure 6-57).

**BatFromGenEn**: Regardless of whether the generator is started up automatically or manually, **BatFromGenEn** can be enabled or disabled.

- Enabled (Quiet Mode): In this mode, the generator and PV will supply power to the load and charge the battery at the same time.
- Disabled (Economy Mode): In this mode, the generator and PV will supply power to the load preferentially and will charge the battery only when there is surplus.



Figure 6-60 BatFromGenEn



**BatFromGridPower**: The maximum power at which the power grid can charge batteries (i.e., the power grid will charge batteries at a power rate lower than the preset value).

<	GEN Parameters	C
c	GenStartMode Automatically	•
C	GenStartSoc % 20	·
C	GenEndSoc % 80	·
С	BatFromGridPower kW 0.0 ~ 10.0	•
c	10.0	
c	Step Offset : 0.1 Clear Cancel Confirm	

Figure 6-61 BatFromGridPower

GenOutPower: Generator power output.

<	GEN Parameters	C
C	GenStartMode Automatically	·
C	GenStartSoc % 20	•
G	GenEndSoc % 80	,
c	GenOutPower kW 0.0 ~ 24.0	•
C	12.0	•
c	Step Offset : 0.1 Clear Cancel Confirm	

Figure 6-62 GenOutPower



## 6.4 More Menu

Tap the More icon in the bottom right corner of the screen to access the following parameters:

- Basic Settings
- Fault History
- Operation History
- Running Log
- Upgrade
- Yield Statistics
- Mode
- NFC Write (reserved)
- Gateway Configuration



Figure 6-63 More Menu



## 6.4.1 Basic Settings

In the **Basic Settings** interface, users can set the generator type, grid type, inverter parallel mode, standard value, rated frequency, inverter parallel address / number, battery type, grid / load port type, and more.

<	Basic	Settings	
С	GENType 0x41A2 - 16802	Null	•
c	GridType 0x41A3 - 16803	120/240V Split Phase	٠
c	InvParallelMode 0x41A4 - 16804	Single machine	•
c	StandardValue 0x41A9 - 16809	IEEE1547_2018	•
С	RatedFreq 0x41AA - 16810	50Hz	•
c	InvParallelAddr 0x41AB - 16811	Host	•
c	BatteryType 0x41AD - 16813	Lì	•
c	InvParallelNum 0x41AE - 16814	1	•
c	GridPortType 0x41C6 - 16838	Grid	•
	LoadPortType	onfirm	

Figure 6-64 Basic Settings



#### 6.4.2 Fault History

In the **Fault History** interface, you can find a list of faults: current faults are in the **Current Faults** tab, and a list of all previous faults can be found in the **Historic Faults** tab. Current faults show their severity level; tap any fault to view its cause.



Figure 6-65 Fault History

#### 6.4.3 Operation History

In this interface, you can find the operation history of the inverter.



Figure 6-66 Operation History



## 6.4.4 Running Log

In this interface, you can find the history log of the running status of the inverter (e.g., standby, prechecking, running, or fault).



Figure 6-67 History Running Log and Yield Statistics

## 6.4.5 Upgrade

If a firmware upgrade is needed, contact CPS customer service.



#### 6.4.6 Yield Statistics

In this interface, yield statistics can be shown for the day, month, and year. After setting the parameters for PV yield, loads, battery charge, battery discharge, import, and export, corresponding line charts of yield statistics will appear.



Figure 6-68 Yield Statistics



#### 6.4.7 Mode

In this interface, you can configure the system running mode. See Section 2.5 System Working Modes for further information on the different modes; see Section 6.3.18 EMS Parameters for details on the parameters and value settings.



Figure 6-69 Mode Configuration



## 6.4.8 Gateway Configuration

In this interface, you can access the Gateway settings.



Figure 6-70 Gateway Configuration

• Basic Configuration: Set the protocol, Wi-Fi, network, uart, and period.

Terminal Parameter Setting     Image: Setti			<	Basic Configuration	
Model: CPS 40	G Kit-CN (2M	B)	Protocol		Modify
40 	C Reboot	Save	wifi ssid	HUAWEI_B535_0F2F	Modify
After the parameters are s device to be effective	et and saved	, restart the	wifi pwd	•••••	Modify
• SN	• Version		net	4G	Modify
6805800124170008	9.02		uart0	115200	Modify
<ul> <li>IMEI</li> <li>868768068082133</li> </ul>	<ul> <li>IMSI</li> <li>46024020</li> </ul>	3474059	period(min)	1	Modify
Basic Cor	nfiguration				
Advanced	d Configura	tion >			
Enable Lo	g				
	V	iew Log >			

Figure 6-71 Basic Gateway Configuration



• Advanced Configuration: Set the MQTT host and port. If a firmware upgrade is needed, contact CPS Customer Service.



Figure 6-72 Advanced Gateway Configuration

• Enable Log: Enable the log to view the Gateway log.



Figure 6-73 Enable Gateway Log



# 7 App Remote Control

## 7.1 Login Interface

Open the app to see the login interface:

Morth America Sector English MatriCloud	-0
Email	
Please enter the email	
Please enter password	
Forgot Password	
Log in	3
I've read and agreed 《PRIVACY POLICY》	
	5
Guest Login	6 7
<ul> <li>Device Access</li> <li>Quick install</li> </ul>	8

Figure 7-1 Login Interface

No.	Name	Description
1	Setting	Select the server: Switch a Cloud platform site (e.g., China, Europe, and the US). Multi-language setting: Select the system language.
2	Email input field	Login: Enter the account's email and password. Forgot password: Tap <b>Forgot Password</b> to retrieve the account password.
3	Login	After inputting the account email and password, tap <b>Login</b> to log into the app.
4	Sign up	Register an account: See Section 7.1.1 Account Registration for details.
5	Privacy policy	Privacy policy: Check the privacy policy and log in after agreeing. Refer to the description of Privacy Policy for details.
6	Guest login	For temporary visitors to view remote control interfaces.
7	Version number	The latest app version number.
8	Device access & quick install	Buttons to achieve local control of the app; see Section 6 App Local Control.



## 7.1.1 Sign Up

There are two account types: distributor and installer. The distributor / installer can help the owner user create the site, manage the installed / operated and maintained sites, and manage users and organizations.

🛞 North America 👻 🔲 English	< Registration	< Distributor registration
MatriCloud		
	Select Server Address	Company Name
	Server area description: Select the corresponding	Please enter company name
mail	area according to your business range, and the system will register in the corresponding area.	* Region
Please enter the email	North America	Please select region
		* E-mail
Please enter password	Select Category	Please enter the email
Forgot Password	••	* Verification Code
Log in		Please enter the verification Send Code
I've read and agreed (PRIVACY	ar the installer	* Password
POLICY Sign up		Please enter password, 8-15 digits
	Note: The owner does not need to sign up. Once the	* Verify Password
	retailer/installer has created a site, Matricloud will automatically generate account and send it to the	Verify Password
Guest Login	owner.	* Access Code
2.4.0		Please enter the Access code
Device Access     Quick install	Next Step	Note: Organization code of upper level service provider. You can contact your upper level distributor/linstaller to get its organization code.

Figure 7-2 Distributor Signup Process

💮 North America 🔻 👦 English	< Registration	Installer registration
MatriCloud		
		<ul> <li>Company Name</li> </ul>
	Select Server Address	Please enter company name
mail	area according to your business range, and the system will register in the corresponding area.	Region
Please enter the email	(iii) North America	Please select region
		* E-mail
Please enter password	Select Category	Please enter the email
Forgot Password	••	Verification Code
Log în		Please enter the verification Send Cod
I've read and agreed (DDIVACY		* Password
POLICY)		Please enter password, 8-15 digits
	Note: The owner does not need to sign up. Once the	* Verify Password
	retailer/installer has created a site, Matricloud will automatically generate account and send it to the	Verify Password
Guest Login	owner.	* Access Code
2.4.0		Please enter the Access code
Device Access     Quick install	Next Step	<ol> <li>Note: Organization code of upper level servic provider. You can contact your upper level</li> </ol>

Figure 7-3 Installer Signup Process



To register an account:

- 1. Tap **Sign up** to enter the user registration interface.
- 2. According to the account type, select the distributor or installer to enter the corresponding registration interface.
- 3. Enter the registration information, which includes:
  - Company name
  - Country
  - Email
  - Verification code
  - Password
  - Distributor number
- 4. Tap **Submit** to complete the account registration.



#### INSTRUCTION:

The distributor number can be obtained by contacting your distributor or CPS customer service.



## 7.1.2 Site and Language Selection

- 1. Tap the globe icon in the top left of the screen, then select the correct service area and site.
- 2. Tap the speech icon in the top right of the screen, then select the desired language.

North America English	North America      English
MatriCloud	MatriCloud
Email	Email
Please enter the email	Please enter the email
Please enter password	Please enter password
Forgot Password	Forgot Password
Log in	Log in
I've read and agreed 《PRIVACY POLICY》	POLICY     Sign up
Asia-Pacific	中文
Europe	English
North America	Deutsch

Figure 7-4 Site Selection



## 7.1.3 Account Login

Before logging into the MatriCloud app, the MatriCloud app must be installed and an account must be registered, OR an account and password to log into the app have been obtained from the distributor/installer or CPS.

To log in:

- 1. Enter the account email and password into the login interface.
- 2. Read the privacy policy and check  $\checkmark$  the "I have read and agreed" box.
- 3. Tap Log in to log into the app successfully and access the Data Overview screen.

left North America 💌 👼 English	Data Overview	North America
MatriCloud	Daily yi 0.03 MWh	and the second sec
@chint.com	and	and the second s
Forgot Password	37.20 (USD) Daily revenue	F 0.04 (MWh) Daily yield
3 Log in 2 ≥ I've read and agreed 《PRIVACY Sign up	229.20 229.20 Monthly Annual revenue(USD) revenue(USD	) <b>1.18W</b> Total ) revenue(USD)
Guest Login	6 Site Total 0 1	Residential PV Residential ESS C&I PV C&I Storage PV Utility Energy Storage
2.4.0	Home III	Application Account

#### Figure 7-5 Account Login and Data Overview

Navigation Bar	Description
Home Page	View the electricity generation data and energy conservation and emission reduction indexes of all sites on the account. See Section 7.2 Home Page for details.
Site	View all sites on the account, create a site, view site information, and set up a site. See Section 7.3 Site for details.
Application	Alarm, device center, gateway center, maintenance service, and other applications. See Section 7.4 Application for details.
Account	View and set the account information. See Section 7.5 Account for details.



#### 7.1.4 Reset Password

- 1. Tap Forgot Password on the login interface.
- 2. Enter the account's email address and tap Send Code.
- 3. Enter the verification code.
- 4. Change the login password.

NOTE: The password must be at least eight characters and must contain one letter and one number.

5. Tap **Submit** when finished.

🌐 North America 👻	飅 English	< Forgot Password	
MatriCloud	d		
		Please enter the email	
Email		Please enter the verification code	Send Code
	<u></u>	Please enter the new password	Ì
Г	Eorgot Password	New password 6-18 characters + uppercase numbers + special characters	+ lowercase +
L	orgot rassinora	Confirm password	Ø
Log in			
✓ I've read and agreed 《PRIVAC POLICY》	Ƴ Sign up	Submit	
Guest Login 2.4.0			
O Device Access     O	Quick install		

#### Figure 7-6 Reset Password

# $\bigwedge$

#### NOTICE:

Password retrieval is not supported in the following cases:

- The account is not associated with a mobile phone number or an email address.
- Personal information (such as phone number and email) is deleted for user privacy protection.
- The associated mobile phone number or email address was forgotten.
- If any of the above situations occur, please contact CPS Customer Service.



## 7.2 Home Page

On the **Data Overview** screen, users can view the daily yield, the total revenue, and the revenue for the current day, and month. Additionally, users can access online / offline / abnormal sites, monthly yield chart, revenue history chart, and the energy conservation and emission reduction indexes of all sites associated with the account.



Figure 7-7 Data Overview



#### 7.3 Site

After logging into the app, tap **Site** to enter the **Site List** interface.



#### Table 7-1 Site List Interface

No.	Name	Description
1	New site	Tap to enter the site creation interface. See Section 7.3.1 Create Site for details.
2	Search box	Search for the site by its name.
3	Status bar	Filter by site status: All, Online, Offline, and Abnormal.
4	Site list	Tap a site to view its details.



#### 7.3.1 Create Site

The interface for creating a new site will differ depending on the site type, inverter type, and communication device. For specific instructions, please refer to the app interface.

Before creating a site:

- An account must be registered or an account and password have been obtained from the distributor/installer or CPS to log into the MatriCloud app.
  - If the owner user gives the site to the distributor/installer for management, they must obtain the distributor/installer code from the distributor/installer.
  - If the distributor/installer helps the owner user set up a new site, they must obtain the mobile phone number from the owner user.
- The inverter must be connected to the communication device and operating normally.

#### To create a new site:

1. Tap the + icon in the upper right corner of the screen.



Figure 7-8 Create New Site



2. Tap Scan to add device to scan the barcode on the dongle, then tap Confirm.

NOTE: If the barcode cannot be scanned, you can also enter the dongle serial number manually.



Figure 7-9 Scan to Add Device



3. Enter the required information, then tap **Next Step**.

<	Create site	
1	2	3
Add Device	Site Information	Connected Account
* Site Name		
Please ente	r Site Name	
* Site Addres	S	
Please ente	r Site Address	
* Region		
Please sele	ct region	•
* Time Zone		
Please sele	ct Time Zone	•
* Site Type		
Residential	PV	*
* Grid-connec	cted Type	
Distributed	and All to the Grid	-
Previous S	itep	Next Step

Figure 7-10 Enter Required Information



4. Tap the company name to filter the results, select an existing account to connect, then tap Create to create the site.

NOTE: You can create a new account by tapping Create Account and entering the required information.



Figure 7-11 Select Connected Account or Create Account



#### 7.3.2 Site Details

In the **Site Details** interface, you can view the electricity generation and device information of a site. On the **Site List** screen, tap the site name to see its details.

**NOTE**: The parameters displayed on the interface will differ for different types of sites; please refer to the app interface.





Figure 7-12 Site Details



## 7.4 Application

Operations such as device maintenance, asset management, and maintenance services can be accessed in the **Application** menu.

		Applicatio	n Center		
	Maintenar	nce Tool			
0-		larm	U U	pgrade	-2
	Asset Mar	nagement			
3-	-	evices	G	ateway	-4
	Maintenar	nce Service			
5	IV Curve	Log Manag ement	Users	Company Manageme nt	
	Home	Site	Application	Account	

No.	Name	Description		
1	Alarm	Tap to enter the alarm information page, which shows all alarm information for the account.		
2	Update	The device can be remotely upgraded with firmware in the cloud and the app.		
3	Devices	View all devices on the current account, including inverters and energy storage devices.		
4	Gateway	View all gateway devices on the current account.		
		IV Curve: IV curve scanning.		
5	Maintenance Service	Log Management: System log management.		
5		Users: Management of users on the current account.		
		Device Type: Device types can be added or deleted.		



#### 7.4.1 Alarm

The alarm information list can be used to screen sites by selecting the time range, entering the keywords to search, and selecting the alarm type. The alarm information is sorted into the following status categories:

- **Resolved**: Indicates that the fault status has been recovered.
- **Pending**: Indicates ongoing fault status.



Alarm Type	Description	
Urgent	The device stops running and immediate intervention is required.	
Important	The efficiency of the device is affected and intervention is required.	
Commonly	No impact on device operation and intervention is optional.	
Prompt	Messages are prompted.	



## 7.4.2 Firmware Upgrade (Remote)

If the inverter firmware needs to be updated, contact CPS customer service.

#### 7.4.3 Device

This interface contains the details and settings of the devices managed by the current login account. Users can input the inverter name or SN to search for a certain device or sort by status (operating / fault / offline) to see device information. After locating the target device, you can tap it to see more detailed information.

In the **Overview** tab, users can view the serial number, operation status, overview information, DC information, AC information, and device information. Please note that the exact information displayed will vary by equipment type; refer to the app screen.

- Details: Users can view the running status, running mode, daily yield, SOC, and device profile.
- Chart: Select Day, 3-Day, or 7-Day for the chart, or set the desired display time range, or turn detail charts on and off. Switch tabs to view the power and DC and AC curves of the inverter.



Figure 7-13 Device Information



- Alarms: Users can view alarm history in this tab. For the alarm definitions see Section 7.4.1 Alarm.
- More: This tab includes the device remote setting, yield, data, upgrade history, mode, and configuration settings.



Figure 7-14 Device Information



#### 7.4.4 Gateway

The **Gateway** interface features the details and settings of gateways managed by the current login account. Users can input the SN to search for a certain gateway or sort by status (operating / fault / offline). After locating the target gateway, you can tap it to see more detailed information.

Gat	eway	
IR Please enter SN		
All Online 3	Offline 3	Alarm 0
Online 6		
S/N: 6 al and Test		
Model	Signal Strength	
CPS 4G Kit-CN	-63 dBm	all
SEC100H0	0 dBm	at
SEC100H0	0 dBm	all
Online 68	100 M	
5/N: 68	1	
Site: 1 ESS 12kW T	est (Battery only)	
Model	Signal Strength	
CPS 4G Kit-CN-A(USB)	-42 dBm	atl
Offine 64		
S/N: 68=		

Figure 7-15 Gateway Interface

- **Details**: Displays the overview and detailed information of gateway devices.
- **Devices**: Displays the devices affiliated with the gateway.
- **Upgrade History**: Displays the upgrade history of the gateway.
- More: Set gateway parameters.

< Ga	ateway	< Gateway	< Gateway	< Gateway	
Details Devices	Upgrade More History	Details Devices Upgrade More	Details Devices Upgrade History More	Details Devices Upgrad History	e More
Device Summary	2025-01-07 14:51:44 C	Rummoy 61	Select Date to Select Date >	Upload Interval(min)	1 >
Device Status	Signal Strength	SN:1 Site Name:Son.Vo TX Test Communication Address:1	Firmware Version 9.02 successful	Baud Rate	115200 ⊧
Online	-63 dBm		Creator : # ###### Created Time : 2024-11-28 14:19:45	Reboot	×
Software Version ID			Upgrade Progress : Execute upgrade:Upgrade succeed,restarting 2024-11-28 14:2114-08:00	Electric Meter	*
5.02			Firmware Version 7.08 successful	Protocol Config	
Gateway Details			Creator :	Remote read write	×
• SN	Model     CPS 4G Kit-CN		Upgrade Progress : 2024-08-12 15:17:31+08:00	Distribution	*
Device Name	Upload Interval(		Firmware Version 7.07 successful		
6	1		Creator : Created Time : 2024-08-09 19:44:00		
Created Time			Upgrade Progress : • 2024-08-09 19:45:48+08:00		
2024-07-09 23:39			Firmware Version 6.06 successful		
			Creator : stilling		

Figure 7-16 Gateway Details, Devices, Upgrade History, and More



## 7.4.5 Maintenance Services

The Maintenance Services interface includes Equipment Type, IV Curve, Log Management, and Users.

Maintenance Service				
~	<b>_</b>			
IV Curve	Log Manag ement	Users	Company Manageme nt	

Name	Description	
IV Curve	IV curve function; able to be searched by time range or device name / SN.	
Log Management	View and manage the system log.	
Users	Manage users on the current account.	
Company Management	Manage company, edit company information, or add a new company.	



#### NOTICE:

The parameters displayed on the interface will vary for different models of gateways. Refer to the app interface.



## 7.5 Account

After logging into the app, tap **Account**. On this screen, users can access account information modification, security settings, account logout, general settings, and software information.

	Account	
	US- @chint.com fl CPS America Access Code:1:	>
1	Account And Security	>
•	Device Access	>
0	Settings	>
1	About	>
0	Language	>
0	Log out	>
Hom	e Site Application	Account

#### Figure 7-17 Account

Name	Description
Account and Security	Change the email address and password.
Device Access	Local debugging and testing functions.
Settings	Delete account.
About	Displays the app software version and download QR code.
Language	Set the system language.
Log Out	Log out of the system.



### 7.5.1 Account and Security

In this interface, you can add or update the email address and password associated with the account.

To modify the email address:

- 1. Tap Account and Security.
- 2. Tap **Modify** next to the email address you wish to change.
- 3. Tap **Send Code** and wait for a maximum of 60 seconds.
- 4. Enter the received verification code, then tap **Confirm** to proceed to the modify interface.
- 5. Enter the new email address to be associated with the account, then tap Confirm.

< Account And Security		< Modify E-mail	
E-mail @chint.com	Modify	1 Authentication	Modify E-mail
Modify password		@chint.com	
		Please enter the verification code	Send Code
		Confirm	

Figure 7-18 Modify Email Address



To reset the password:

- 1. In the Account and Security interface, tap Modify password.
- 2. On the next screen, enter the old password and the new password into the appropriate fields.
- 3. Tap Confirm.



Figure 7-19 Modify Account Password


## 7.5.2 Device Access

In **Device Access**, users can view and set parameters for the local inverter via Bluetooth connection. This function is provided based on the specific needs of the customers or O&M personnel. It can be used for local troubleshooting and testing, O&M, parameter configuration, fault reading, and other device functions.

< Device Access	
C QR Scan	
Firmware     Download	Cloud Synch ronization
Connection History	
24170008-CPS 4G Kit-CN	09-19 11:52:38
Connection Duration 04min 56Second	Connect
22310028-SCS100A05-S	07-29 13:57:54
Connection Duration 42Second	Connect
24210005-SCS100B05-R	05-30 13:36:08
Connection Duration 08min 03Second	Connect
Bluetooth Connect 50/64	NFC

Figure 7-20 Device Access



## 7.5.3 Settings

In Settings, you can delete your account. After tapping Delete Account, you must wait for review.



Figure 7-21 Settings



#### NOTICE:

After account cancellation, ALL relevant information associated with the account will be **permanently deleted** and cannot be recovered.



## 7.5.4 About

In this interface, you can find the QR code to download the MatriCloud app, the user agreement, and the privacy policy.



Figure 7-22 About

## 7.5.5 Language

In this interface, you can select Chinese or English for the app language.



Figure 7-23 Language



## 7.5.6 Log Out

When you have finished browsing and want to log out of the app, navigate to this interface to confirm logout. To log in after logging out, you can log back in with your current account.

NOTE: Logging out only exits from the account; the account will not be deleted or forfeited.



Figure 7-24 Logout



# 8 MatriCloud Platform

## 8.1 System Login

## 8.1.1 Sign Up and Login



#### INSTRUCTION:

This section applies to users who provide the owner with services such as site construction, installation, and operation and maintenance.

There are two methods for creating a MatriCloud account: contact the superior company for registration assistance, or self-register.

To self-register:

- 1. In your device's browser, navigate to <u>https://icloud.chintpowersystems.com</u> to access the login page.
- 2. Click **Sign Up Now** to access the registration page.

and a starting	
MatriCloud	Sign in
unue estilitate	Enter email
San and San Assessed	Enter your password
SA	Forget password
	Sign In Guest Sign Up Now

3. Select your account type (distributor or installer), then click Next.

	Already have an account? Sign in>>		Already have an account? Sign in>>
	Sign op Now		Sign Op reor
Service Area:	NorthAmerican Server	Service Area:	NorthAmerican Server
Select your account type:		Select your account type:	
	H X		(#) (X)
	Distributor Account     Installer Account		Distributor Account
	Note: The owner does not need to sign up. Once the relaterinistatier has created a site, Mathicioud will automatically generate account and send it to the owner.		Note: The owner does not need to sign up. Once the retailerinstatiler has created a site, Matricioud will automatically generate account and send it to the owner.
	Next		Next



4. Enter your registration information, check the box to agree to the privacy policy, and click **Submit** to complete registration.

	Already have an a Distributor Account	account? Sign in>>		Aiready have an a Installer Account	account? Sign in>>
* Company name	Enter company name		* Company name	Enter company name	
* Region	Please select v		* Region	Please select V	
* Email	Enter email		* Email	Enter email	
* Password	New password		* Password	New password 😽	
* Confirm password	Confirm password		* Confirm password	Confirm password	
* Code	Verification code Send		* Code	Verification code Send	
* Access code	Access code	0	* Access code	Access code	0
I acc	rept to Terms of Use , and have read Privacy Policy		I acce	ept to Terms of Use ,and have read Privacy Policy	
	Submit			Submit	
	< <go back<="" th=""><th></th><th></th><th>&lt;<go back<="" th=""><th></th></go></th></go>			< <go back<="" th=""><th></th></go>	

Field	Description
Company name	Enter the company name.
Region	Select a region from the dropdown list.
Email	Enter the associated email address.
Password	Create and enter a password; it must be between 6-18 characters, including upper / lower case letters, numbers, and special characters.
Confirm password	Re-enter the password you just created.
Code	Click <b>Send</b> to receive a verification code to the associated email address, then enter it here.
Access code (manufacturer number / distributor number)	Enter the organization code of the superior service provider. This can be obtained by contacting the superior service provider; once that code is entered in account registration, the provider can browse and manage the site associated with the account.
Terms of use & privacy policy	Read the terms of use and privacy policy, then check the box to indicate you agree.

5. Return to the login page and enter your email and password, then click **Sign in**.

my man	
MatriCloud	Sign in
	Forget password
the second second	Sign in Guest Sign Up Now



## 8.1.2 Reset Password

There are two methods to retrieve a password:

- Contact the service provider to reset the password. After resetting, the new password will be sent to the email address associated with the account.
- Reset it directly in MatriCloud.

To reset the password yourself directly in MatriCloud:

- 1. In your device's browser, navigate to <u>https://icloud.chintpowersystems.com</u> to access the login page.
- 2. Click Forget password to access the password retrieval page.

man and a second	
MatriCloud	Sign in
	Enter email
- And	Enter your password
A DEST	Forget password Sign in
and a state of the	Guest Sign Up Now

3. Enter the correct information in the appropriate fields, then click **Confirm** to reset / retrieve the password.

manufacture and	Retrieve password	
MatriCloud	Enter email	
. ustitute.	Verification code Send	
A A A A A A A A A A A A A A A A A A A	New password 🛶	
JAN	Confirm password	
	Confirm	l i
and a second sec	Go back	

Field	Description
Email	Enter the associated email address.
Verification code	Click <b>Send</b> to receive a verification code to the associated email address, then enter it here.
New password	Create and enter a password; it must be between 8-30 characters, letters, and/or symbols.
Confirm password	Re-enter the password you just created.



## 8.2 Home

After logging into MatriCloud, you can enter the Home page. From here, you can view the status, KPI, yield, and revenue of all sites associated with the account. Information such as active alarms, yield trends, yield ranking, and CERs can also be checked in this interface.





### 8.3 Site Management

On the **Site** page, click any site name to view site information, the number of devices at the site, its energy yield, its revenue, as well as an overall site list.

## 8.3.1 Site

On the Site page, you can view information about the site details, number of devices, energy yield, and revenue.

MatriCloud 🚞						3 Site Name/Gatewa	y Sn/Inverter Sn		13	00	5 mm ~	English
s Site ×												
Home Account Site	×	u Site	6 Total	Residential PV 1 Residential ESS 3 C&I PV 0 C&I Storage 0 PV Utility 1 Energy Storage 1	-	Power generati 0 Residenti 0 C&I P	on day al PV V	F	85.3 kWh lesidential ESS 0 PV Utility	2025-01- Monday	06 15:52:42 January 6	-4
Sateway Inverter Upgrade		Device	21 Total	Gateway 5 Inverter 5 Storage 10	~	Revenue (USD) 35. Daily rev 189 Monthly re	3 enue ) venue	,	189 Innual revenue 11.75 K Total revenue			0
Maintenance		the Site list	lor accoun ~ ] [ All status	~][1		Search						Opti
		Site status	Site name	Site Type	Username	Site location	Online rate	Capacity $\oplus$	Power generation	Power generation day	Affiliated company	Opera
		onte	12kw Resi ESS	Residential ESS		5F.No. 4	0%	1 KWP	0 KW	0 kWh	CPS America	
		-			CPS Am				7. a.		-	

#### 8.3.1.1 Search for Site

For the site list, enter the relevant search information into the **Select superior account**, **All status**, and **Search by site name** search boxes to the left of the blue **Search** button.

IIII Site list									Optional
Select supe	rior account 🗸 🗌 All status	~][	Search by site name	Search					Create Site
Site status	Site name	Site Type	Username	Site location	Online rate	Capacity	Power generation	Power generation	Operation
Offline		10.00		1380 President	0%	0 kWp	0 kW	0 kWh	
Offline	1.10	(0, 0, 0)	122	111 SPEEN ST	0%	125 kWp	0 kW	0 kWh	
Online	61 M R	and the second	com	11527 Lochlyn	100%	5 kWp	-0.13 kW	3.5 kWh	

You can also change the information columns by clicking **Optional** in the top right corner (above the **Create Site** button). Check the desired boxes and click **Confirm** to hide or show different columns.

		Optional		×		
	Select information to display					
an Site	She status	😥 Site name	Site Type		2024-12-25 18:33:34 Wednesday December 25	
6 Total	Username	Site location	Online rate			
	Capacity	Power generation	Power generation day			-
Device	Affiliated company	Created time	Updated time			
29 Total		Cancel	onfirm	-		
dut Site list						Optional
Select superior accoun ~		e name Search				Create Site
Site status Site name	Site Type User	ame Site location Online	rate Capacity Power	generation Power generation day	Attiliated company Created time	Operation
	a state of		i 0 kWp	0 kW 0 kWh	CPS America 2024-10-03 06:42:26 +08	1:0
	and the second second		i 125 kWp	0 kW 0 kWh	CPS America 2024-08-14 07:59:21 +08	



#### 8.3.1.2 Create Site

To create a site:

1. Click the **Create Site** button in the top right corner; this will produce the dialog box used to create a new site.

ill Site list     Optional       Select superior account     All status       Search by site name     Search										
Site status	Site name	Site Type	Username	Site location	Online rate	Capacity	Power generation	Power generation	Operation	
Offline	10.000 A	$(a,b,c) \in \mathcal{C}$	1.1	1380 President	0%	0 kWp	0 kW	0 kWh		
Offline		$(A_{ij})_{i \in I} = (A_{ij})_{i \in I}$	-	111 SPEEN ST	0%	125 kWp	0 kW	0 kWh		

2. Enter the gateway information (or skip this step, as it is optional).

	Create Site	
Gateway Information	2 Site Info	3 Account information
Please enters		⊖ Remove
	Add Gateway	
	Cancel	ikip

3. Enter the basic information for the site.

		Crea	te Site	
	1		2	3
atewa	ay Information	Sit	e Info	Account information
	* Site name			
	Site name			
	* Address			
	Address			
	* Region		* Timezone	
	Please select	~	Please select	~
	* Site 🕖		* On-Grid	
	Residential PV	~	Distributed and A	All to the Gri $\smallsetminus$
	* Currency unit		* Temperature unit	
	Please select	~	Please select	~
	* Capacity(kwp)		* Tariff()/kWh	
	Associated account     Create a new account     Temporarily not associate	O Sele	ect an existing account	
	Cancel	Pre	vious	Next



Field	Description
Site name	Enter the name of the site; if you need to modify it after, go to the <b>Site Details</b> page.
Address	Enter the address of the site.
Region	Select the region where the site is located.
Time zone	Select time zone based on the site location.
Site type	Select the site type.
On-grid	Select according to the site. DAG: Distributed full feed-in DSC: Distributed self-consumption OG: Off-grid AG: Ground-mounted power station full feed-in
Currency unit	Select based on the selected region.
Temperature unit	Automatically chosen based on the selected region.
Capacity	Set according to the site.
Tariff	Automatically chosen based on the selected region.
Associated account	Create a new count or select an existing one.

4. Select the company and language and enter the mobile phone number.

		Create Site		
1		2	(	3
Galeway Inic	ormauon	Site Inio	Account i	normation
* S	upervisor			
	Please select		~	
* L	anguage			
	English		~	
* E	mail			
	Enter email			
	Cancel	Previous	Confirm	

5. Click **Confirm** to confirm the account information.



#### 8.3.1.3 Site Overview

Click on the site name from the list to enter the site overview interface.

After clicking **Edit** in the basic information area of the site, you can edit and modify the site information. After the specific address of the site is entered, the geographical location of the site can be located and the meteorological data of the last seven (7) days can be displayed according to the preset site coordinates.

The flow diagram shows the current power supply equipment, site, feed volume, load consumption, purchased power, and power supply direction. With these data values, the contribution area on the right can show the energy saving and emission reduction effect on the current site.

To add a Gateway, click **Add Gateway**, enter the Gateway SN, and click **Confirm**. After being added successfully, the Gateway will automatically display in the Gateway list; the inverters associated with the Gateway will also appear in the inverter list.



			Add Ga	teway X		0 9 1	8 us∎ ∨	🌐 English 🗸
	Battery 0 kW		* Gateway SN: Please	Confirm	Non-Backup Load 0 kW	5.28 C	K Ton 13.16 Ton CO2	730.7 trees Trees
Edit	Gateway In	werter to search						Add Gateway
3	Status Nam	10	Model	Serial No.	Signal intensity	Software version	Created time 🌲	Operation
3	Online	ang san	CPS 4G Kit-CN			9.02	2024-07-09 10:39:00-05:00	🗇 Unbind



### 8.3.1.4 Chart

In the Chart menu, users can select specific devices and parameters to visually compare data within the power station.

Overview	Chart	Generation	Alarm	Settings	Commissioning	
Select devic	es and measu	rement points	Please s	elect model	✓ – Select Device/SN ✓ – ♥ Filter measurement points	
Day 31	Day Week	<b>2025-01</b>	06 - 2025	-01-06	(UTC-06:00) Central Tim V Not refresh V Search	C

Select the model, SN, and measurement points, and the data chart will automatically appear. Hover the mouse over the chart to display detailed data for the measurement points.

Overview	Chart	Gene	ation Alarm Settings Commissioning	
Select devices	s and meas	uremen 190001233	points:         CPS ECH12KTL/US         V         —         1109000123310003         + 2         V         —         Tilter measurement points           10003 ×         1109000124170017 ×         1109000124170019 ×            Clear	rall
Day 3Da	iy Week		2025-01-06 - 2025-01-06 (UTC-06:00) Central Tim V Not refresh V Search	
% 50	Current (A) 1	kWh 0.2	Voltage Power (V) (kW) 60 1	
43.78	0.88	0.18	5254 0.88	
40	0.8	0.15	2025-01-06 02:00:00-06:00 1109000123310003 0.8 PV_TodayEnergy (kWh) • 0 40	
30	0.6	0.1	ES_TodayChgEnergy (kWh)         0         0.6           ES_TodayDischgEnergy (kWh)         0         0.6	
20	0.4	0.1	Grid_TodaySellEnergy (kW) • 01 30 Grid_TodaySellEnergy (kW) • 0 0.4 BatteryVol (V) • 52.3 20	
10	0.2	0.05	BatteryCurr (A)         0         10           BatPower (kW)         0         0.2           BatterySCC (%)         48         10	
0	0	0,		
			2023-02-00 000000-0000 2023-02-00 02000-0000	



#### 8.3.1.5 Generation

1. In the **Generation** menu, click **Select Device**, then select a device to view its site.

Overview	Chart	Generation	Alarm	Settings	Commissior	ing			
Select Device	Year	Month [	Day 🗐 202	4-12	(UTC-06:0	00) Central Ti	m ~ 🗹	Display total yield	Download
Energy (kWh)									
Overview-Texas Re	si ESC 4000	N T k /D-44							
Overview	CI	CPS 🖉	4G Kit-CN-A(U	SB): 6805790	)123200	Online			
		CPS	ECH12KTL/US	: 1109000123	3310003	Running			
Select Device		CPS	ECH12KTL/US	5 : 1109000124	170017	Offline	I Tim $\vee$	Display total	yield Download
Energy		- : 000	000000000000000000000000000000000000000	00		Offline			
(kWh)		CPS ECH12KTL/US : 1109000124170019				Offline			

2. After selecting the device(s), the power column diagram will automatically appear.

Overview	Chart	Generation	Alarm	Settings	Commissioning								
Select Device	Year	Month Day	r 🗎 2024		(UTC-06:00)	Central Tim $\vee$	Display total yiel	d Download					
Energy (kWh) 2,500													0
2,000													
1,500													
1,000													
500													
0,													
	:024-01	2024-02	2024-	-03	2024-04	2024-05	2024-06	2024-07	2024-08	2024-09	2024-10	2024-11	2024-12



3. Select the time range.

**NOTE**: You can display the energy generation bar graph in a variety of time ranges (e.g., year, month, day). If you want to display the total yield for the entire site, select **Display Total Yield**. You can also click the **Download** button to download the searched site information for a certain device in the time range of your choosing.

Overview	Chart	Generation	Alarm	Settings	Commissionir	ıg							
Select Devic	e Year	Month Da	y 🗎 202	24	(UTC-06:00	)) Central Tim $ arsia $	Display total yiel	d Download					
Energy (kWh) 2,500													C
2,000													
1,500													
1,000													
500													
0,	2024-01	2024-02	2024	4-03	2024-04	2024-05	2024-06	2024-07	2024-08	2024-09	2024-10	2024-11	2024-12
ļ													

#### 8.3.1.6 Alarm

In case of an abnormality or fault with the device, key information (such as occurrence time and content) is recorded in real time and displayed in the alarm list. To access this information:

- 1. In the Alarm menu, click Select Device to choose the desired device.
- 2. Click Alarm Type to select the alarm level.
- 3. Select a time zone and time range to search.

The information includes the alarm level, time, device name, fault code, alarm content, and status. You can also click **Download** to save the selected fault records.

Select device alarm type	(UTC+08:00)China	V 2024-04-26 - 2024-04-25	🙁 Download Search		
Alarm Type	Time	Name	Fault code	Alarm content	Status
Commonly	2024-04-29 11:58:04+08:00	100000000000020	Warn100	Low battery SOC	Restore
Commonly	2024-04-29 11:54:30+08:00	100000000000020	Warn100	Low battery SOC	Generate
Commonly	2024-04-29 11:04:15+08:00	100000000000020	Warn000	Battery Low Voltage	Restore
Commonly	2024-04-29 11:04:04+08:00	100000000000020	Warn000	Battery Low Voltage	Generate
Commonly	2024-04-29 11:04:04+08:00	100000000000020	Warn2040	DSP Comm Abn	Restore
Commonly	2024-04-29 11:04:03+08:00	100000000000020	Warn2040	DSP Comm Abn	Generate
Commonly	2024-04-29 11:04:03+08:00	100000000000020	Warn2050	BMS Comm Abn	Restore

Alarm Type	Description
Urgent	The device stops running and immediate intervention is required.
Important	The efficiency of the device is affected and intervention is required.
Commonly	No impact on device operation and intervention is optional.



Prompt	Messages are prompted.
--------	------------------------

## 8.3.1.7 Commissioning

The **Commissioning** menu is used to generate the commission report.

1. In the **Commissioning** tab, click **Create**.

Overview Chart	Generation Alarm	Settings	Commissioning					
⊖ Create 🗈 Delete	e 🛛 Q Update							
Name	Status	Progress	Email	Created time	Updated time	Download	Operation	0
			No D	ata				
			Total 0 10/page <	1 > Go to 1				

2. Enter the report name and (optional) email, select the Gateway, and click Confirm.

	Create a commission report	
* Report	Name	
repor	t	
Email		
Pleas	e input email address	
	Gateway SN : Inverter SN Model	Status
	6805790123200322 : 1109000123310003	Running
	6805790123200322 : 0000000000000000	Offline
	6805790123200322 : 1109000124170019	Offline
	6805790123200322 : 1109000124170017	Offline
	Total 4 10/page v < 1 > Go to 1	
	Cancel	

- 3. Click **PDF** to download the report when it is complete.
- 4. Click **Update** to update the report.

Overviev	/ Chart	Generation	Alarm	Settings	Commissioning						
⑦ Creat	e 🗊 Delete	C Update	I								
	Name	SI	tatus	Progress		Email	Created time	Updated time	Download	Operation	0
	report 🗹	Fin	ished		100%	- ∜Send Email	2025-01-06 03:35:24-06:00	2025-01-06 03:35:38-06:00	PDF	Update 🗊 Delete	
						Total 1 10/page V K 1 V	Go to 1				



#### 8.3.2 Gateway

Click **Gateway** on the left side of the screen to enter the Gateway interface. In this interface, you can view the Gateway status, Gateway type, and firmware version information.

Home Gateway ×											
f Home		📮 Status			🗲 Firmw	vare version			2025-01-08 17:4	17:07	
Account	Ŷ		6	Online 3			<ul> <li>9.02 3</li> <li>00.99 1</li> </ul>		wednesday Janu	iry s	
🖴 Site	^		Total	Abnormal 0	5		<ul> <li>01.105 1</li> <li>Others 1</li> </ul>			^	
Site		<ul> <li>Gateway</li> </ul>								< 0	X
Gateway											
Inverter			6	<ul> <li>CPS 4G Kit-CN 3</li> <li>SEC100H0 2</li> </ul>	0			. 10			10
Upgrade	×		Iotal	<ul> <li>CPS 4G Kit-CN-A(USB) 1</li> <li>1/2 </li> </ul>							
Maintenance		dateway I	ist								Optional
		Please select	model v Please	select state v	Version	Enter Gateway SN	Search				
		Status	Gateway name	Gateway SN	Site name	Gateway model	Firmware version	Signal intensity	Created time	Updated time	Operation
		Online	6	1011010	1000	CPS 4G Kit-CN	9.02	-63 dBm	2024-07-09 23:39:00 +08:00	2025-01-06 11:30:22 +(	
		Online	1000	100000	24	SEC100H0	01.105		2024-06-12 08:36:31 +08:00	2024-12-29 02:53:36 +(	
		Online	6	100,000	10000	st CPS 4G Kit-CN-A(USB)	9.02	-42 dBm	2023-06-01 00:54:37 +08:00	2024-12-23 16:47:06 +(	

#### 8.3.2.1 Search for Gateway

- 1. On the Gateway > Gateway List page, select the gateway type (Wi-Fi) in the Please select model box.
- 2. Select the status (online, offline, faulty) in the Please select state box.
- 3. Enter the version in the **Version** box.
- 4. Enter the serial number in the Enter Gateway SN box, then click Search.
- 5. Click **Optional** in the top right corner to filter the content categories you want to display.
- 6. Click "..." in the Operation column to distribute or rename a gateway.

Home Gateway ×									
6 Home			6 Total	<ul> <li>Online 3</li> <li>Offline 3</li> <li>Abnormal 0</li> </ul>				00.99 1 01.105 1	
Account	~							Uthers I	
🖴 Site	^	<ul> <li>Gateway</li> </ul>							
Site			6	CPS 4G Kit-CN 3					
Gateway			Total	<ul> <li>SEC100H0 2</li> <li>CPS 4G Kit-CN-AI</li> <li>1/2 ▼</li> </ul>	(USB) 1	0			ill
Inverter									
🕤 Upgrade	~	III Gateway li	st					1	Optional
Maintanana		Please select n	nodel V Please s	elect state	/ersion	Enter Gateway SN	Search		
Maintenance	Ť	Status	Gateway name	Gateway SN	Site name	Gateway model	Firmware version	Signal intensity	Created Operation
		Online	68	68	S	CPS 4G Kit-CN	9.02	I -63 dBm	< Distribution
		Online	1	14	M	SEC100H0	01.105	I 0 dBm	2024-06-12 08:: •••



#### 8.3.2.2 Gateway Overview

Online Device status	~	-63 dBm Signal intensity	4	9.02 Software version No.		1 Min Upload interval	
Basic inform	nation						
Device name:		Device SN:		Equipment model: CPS 4G Kit–CN		Created time: 2024–07–09 07:39:00–08	3:00
Updated time: 2025-01-05 19	:30:22-08:00						
Devices							
Communication Address	Model	Status	Serial No.	Name	Firmware	Created time	Operatio

Click the Gateway name from the list to view the details of a Gateway. Click Delete to delete the current device.

#### 8.3.2.3 Setting

In the network card parameter setting, the user can match the model protocol, upload interval, device address, and more to configure the device data parsing rules.

- 1. Click Add Protocol to add the protocol address and protocol selections.
- 2. Click Submit to submit the NIC settings and restart the device (10-20 s).
- 3. Click Intellisense to automatically identify the device protocol.

Protocol	* Select protocol
Forwarding settings	CPS_12KW_ECH12KTL_47_1 V Delete Protocol
Forwarding settings	* Modbus Address
Forwarding Serial Port	
TCP forwarding	
Upload interval	* Select protocol
Baud rate	Select V Delete Protocol
Reset	* ModbusAddress
	Start End 💿

Field	Description
Select protocol	Select the parsing protocol used by the device under the network card and the data uploaded by the user parsing device.
Modbus address	Set the parsing address for the protocol.



NOTE: If there is more than one protocol, click Delete Protocol to remove it.

Forwarding settings: Select the forwarding settings.

Overview Setting Upgra	ide
Protocol	Forwarding settings
Forwarding settings	Please select v
Forwarding Serial Port	Submit
TCP forwarding	
Upload interval	
Baud rate	
Reset	

Forwarding serial port: Enter the communication port, baud rate, check bit, protocol type, and other information.

Overview Setting Upgra	ide
Protocol	* Serial Port
Forwarding settings	Please enter
Forwarding Serial Port	* Baud rate
- onwarding ophart off	Select ~
TCP forwarding	* Check Bit
Upload interval	Select ~
Baud rate	
Reset	* Stop Bit
	Select
	* Protocol Type
	Select ~
	* Restart Flag
	No restart required     Restart required
	Submit



TCP forwarding: Set the serial port and protocol type, as well as whether a restart flag is required.

Overview Setting Upgr	rade
Protocol	* Serial Port
Forwarding settings	Please enter
Forwarding Serial Port	* Protocol Type
TCP forwarding	Select ~
Upload interval	Restart Flag     No restart required     Restart required
Baud rate	Cubratt
Reset	Submit

Upload interval: Configure the upload time of device data and select whether to restart safely.

Overview Setting Upgra	ade
Protocol	* Upload interval (mins)
Forwarding settings	
Forwarding Serial Port	* Restart Flag
TCP forwarding	
Upload interval	Submit
Baud rate	
Reset	



**Baud rate**: Set the upload speed of communication data; note that this must be consistent with the baud rate of the device. Select or enter the corresponding values or options in each text box.

Overview Setting Upgra	ide
Protocol	* port Type
Forwarding settings	COM1 ~
Forwarding Serial Port	* Baud rate
	115200 ~
TCP forwarding	* Restart Flag
Upload interval	No restart required     Restart required
Baud rate	Cubmit
Reset	Subhitt

#### Reset: Click to reset the gateway.

Overview Setting Upgr	de	
Protocol	Reset	
Forwarding settings		
Forwarding Serial Port		
TCP forwarding		
Upload interval		
Baud rate		
Reset		

### 8.3.2.4 Upgrade

If a firmware upgrade is needed, contact CPS Customer Service.



#### 8.3.3 Inverter

On the **Inverter** page, you can select the status of the device in the **All status** box, search for the model of the device in the **Model** box, enter a keyword in the **Please enter search** box, and click **Search** to search for eligible devices that meet the selected requirements.

For a specific device item, you can click the "..." in the operation column to delete or rename it.

6 Home		All status	~ ] [ model	· · ·	Please enter search	Search		
Account	~	Device status	Name	Device SN	Site name	Gateway SN	Equipment model	Circowers Operation
🖴 Site	^	Running	6	1		68	CPS ECH12KTL/US	O Details Cs ⊘ Rename ···· I III Delete
Site		Running	12	1		68	CPS ECH12KTL/US	lcd: 03.00
Inverter		Offline	6	1	-	68	CPS ECH12KTL/US	dsp: 01.03.04 Icd: 03.05
🗊 Upgrade	~	Offline	6	(	-	68	-	dsp: 00.00.00 Icd: 03.00
Maintenance	~	000	00050004044700474	4400000404470000	Tours Davi Doursta	- 0005000404470047		dsp: 01.03.00

#### 8.3.3.1 Details

From the device list page, click any device name or serial number to enter its **Details** page. You can also click the **Power on/off command** button in the top right to easily power devices on and off.

Details Chart Generation Alarm E	ata Settings Mode Upgrade		() power on/off
Running Run status	Self Powered Run Mode	40.2 kWh Daily PV power generation	29 % soc
Device info	Duving Obli	Contract and all	Colours Oli
6	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	CPS ECH12KTL/US	Galeway Shi.
Site:	Software version No.: LCD:03.00 ()	Created time: 2024-07-09 10:40:24-05:00	
PCS Information			
PV_TodayEnergy: 40.2 kWh	PV_TotalEnergy: 7480 kWh	OnOffGrid: On Grid	InvPower: 9.1 kW
Power Grid Information			
Grid_TodayBuyEnergy: 47.1 kWh	Grid_TotalBuyEnergy: 6556 kWh	Grid_TodaySellEnergy: 11.1 kWh	Grid_TotalSellEnergy: 3822 kWh



#### 8.3.3.2 Chart

Chart data is displayed by selecting the chart style (simplified or detailed), time interval, unit of time, time range, refresh interval, and filtering curve parameters (measurement points). Hover the mouse over the chart to display detailed data for the measurement points.



#### 8.3.3.3 Generation

- 1. Select the unit of time (year, month, day).
- 2. Click the calendar to select the time or time range.
- 3. Click Search.

**NOTE**: You can also click **Download** to save the energy yield information of a searched device for a certain time range.





#### 8.3.3.4 Alarm

You can search for alarm events that occurred within a specified period of time by selecting the alarm severity and time range within which the alarm occurred. Click **Download** to save this information.

Details Chart Generation	Alarm Data Settings Mode Upgrade			() power on/off
Please select	✓ (UTC-06:00) Central Tim ✓	19-24 - 2024-09-30 <b>±</b> Down	load Search	
Alarm Type	Time	Fault code	Alarm Info	Status
Important	2024-09-30 04:03:38-05:00	Fault0205	Inv Mode Conn Gen	Recovered
Important	2024-09-30 03:58:51-05:00	Fault0205	Inv Mode Conn Gen	Occurring
Important	2024-09-25 14:41:44-05:00	Protect0630	ARC Prot	Recovered
Commonly	2024-09-25 14:40:28-05:00	Warn0210	Grid Inst Over Volt	Recovered
Commonly	2024-09-25 14:40:17-05:00	Warn0210	Grid Inst Over Volt	Occurring
Important	2024-09-25 14:36:44-05:00	Protect0630	ARC Prot	Occurring

#### 8.3.3.5 Data

- 1. Select a time range.
- 2. Click **Search** to search for data within that time range.
- 3. Click **Download** to save the data.

D	etails Chart Generatio	n Alarm Data S	ettings Mode Upgrade				¢	power on/off
	2025-01-06 - 2025-01-06	(UTC-06:00) Central Tim	V Search Download					
	Time \$	E\$_TodayChgEnergy(kWh)	ES_TotalChgEnergy(kWh)	ES_TodayChgTime(min)	ES_TotalChgTime(h)	ES_TodayDischgEnergy(kWh)	E\$_TotalDischgEnergy(kWh)	ES_TodayP <sup>1</sup>
	2025-01-06 20:57:00-06:00	26.2	3157	372.6	1122	25.2	2906	3
	2025-01-06 20:56:00-06:00	26.2	3157	372.6	1122	25.2	2906	3
	2025-01-06 20:55:00-06:00	26.2	3157	372.6	1122	25.2	2906	3
	2025-01-06 20:54:00-06:00	26.2	3157	372.6	1122	25.2	2906	3



## 8.3.3.6 Mode

1. In the Inverter interface, click any device name to enter the Details page.

## 2. Click **Mode** at the top.

etails Chart Generation Alarm	Data Settings Mode Upgrade	ථ power on/off
O Pure Pv Not used ≅ Setting	Self Powered Enabled	C Fully Fed Not used
PV power generation will be directly connected to the grid in full amount, and both load and energy storage cannot be used under only PV operation mode.	PV supplies loads first, surplus charges battery, then feeds grid. When PV is insufficient, batteries provide power; if battery capacity runs low, grid backs up. No battery discharge to the grid.	PV power generation is first for load, surplus power connected to the grid, and residue for battery charging. When PV power is insufficient, battery shall be discharged to increase on-grid power as much as possible until it is exhausted
C Emergency charging stused  ≣ Setting	C Forced Off-Grid Not used	O TOU ■ Setting
This mode is for emergency charging in bad weather. Charge battery fully as quickly as possible and then left to stand (Keep from discharging) until it enters off-grid operation or switches to another mode	Upon triggering, the system can voluntarily shift to off-grid mode with grid as backup, facilitating off-grid testing, runtime estimation, and UX. Manual off-grid requires higher battery charge and lower loads, with an option to early switch back to on-grid mode.	Create typical day scenarios and assign various base modes by time slots. Categorize days by week to match these scenarios; set seasonal operation rules. Lastly, allow setting unique strategies for holidays throughout the year.

Mode	Description
Pure PV	PV site will be directly and fully connected to the grid. Both load and energy storage cannot be used in PV operation mode.
Self-powered	PV supplies load first, surplus charges the battery, then feeds the grid. When PV is insufficient, batteries are preferred to provide power. If battery capacity runs low, the grid backs up. No battery discharge to the grid.
Fully fed	PV supplies load first, surplus power connected to the grid, residual charges battery. When PV power is insufficient, the battery will be discharged to increase on-grid power as much as possible until it is exhausted.
Emergency charging	This mode is for emergency charging in bad weather. The battery is fully charged as quickly as possible, then left to stand (to prevent discharging) until it enters off-grid operation or switches to another mode.
TOU function	Creates typical day scenarios and assigns various base modes by time slots, categorizes days by week to match these scenarios, sets seasonal operation rules, and allows custom settings for certain days of the year.
Forced off-grid	Upon triggering, the system can voluntary shift to off-grid mode with grid as backup, facilitating off-grid testing, runtime estimation, and UX. Manual off-grid requires higher battery charge and lower load, with an option to switch back to on-grid mode.



3. Click **Setting** to set the parameters of the corresponding mode. See the screenshot below for TOU mode as an example:

Baf-remGridPower(WP)	
10.0	
Value Range: (0, 10) Offset value: 0, 1	
AntiFeedbackGridEn	
Disabled $\lor$	
FeedbackGridPower(IW)	
120	
Value Range: (0,12) Offset value: 0,1	
GridChgEn	
Enabled $\lor$	
BalFromGridStartTime	
0 00:00	
BatFromGridEndTime	
0 2359	
Serial No. Mode Operation	
1 Configuration	
2 EVErty Configuration	
3 EARTY Configuration	

#### 8.3.3.7 Upgrade

If a firmware upgrade is needed, contact CPS Customer Service.

### 8.4 Maintenance

#### **Alarm Management**

Select a site in the **Site screening** box, a serial number in the **SearchSN** box, an alarm level in the **Please select** box, a time zone in the time zone box, and a time range in the time range box to view alarm information that meets these selections.

NOTE: You can also click Download to save this information.

Site screening	SearchSN	Please select	~	(UTC+08:00)China V	2024-11-01 - 2024-11-08	± Download
alarm type	Site	Time	Devices	Fault code	Alarm Info	Status
Commonly	12kW T	2024-11-08 23:56:07+08:00	1	Warn0070	Low Batt volt	Occurring
Commonly	12kW T	2024-11-08 22:52:26+08:00	1	Warn0040	Low Batt	Recovered
Commonly	12kW T	2024-11-08 22:51:51+08:00	1	Warn0040	Low Batt	Occurring
Important	12kw Resi ESS	2024-11-01 15:55:58+08:00	1	Protect0190	Iso Resistance Low	Recovered

Alarm Type	Description
Urgent	The device stops running and immediate intervention is required.
Important	The efficiency of the device is affected and intervention is required.
Commonly	No impact on device operation and intervention is optional.
Prompt	Messages are prompted.



# 9 Operation and Maintenance



#### WARNING:

Prior to performing any product maintenance, the inverter must not be running, the AC circuit breaker must be connected to the grid, and the PV input on the DC side must all be disconnected. After these steps have been taken, wait at least five (5) minutes before performing any maintenance.



#### WARNING:

These instructions are for use by qualified personnel ONLY.

Do reduce the risk of electrical shock, do NOT perform any other maintenance or services other than those specified in these instructions unless qualified to do so.

## 9.1 Check Electrical Conditions

- Check all the cable connections as part of a regular maintenance inspection every six (6) to 12 months.
- If any cable connections are loose when checked, tighten them according to Section 4.3 Electrical Cable Connection.
- Check for cable damage, especially whether the cable surface is scratched. Repair or replace the cables if necessary.

## 9.2 Clean Fan Inlets and Outlets

The inverter produces heat during running and uses a forced air-cooling method to ensure normal running. To ensure good head dissipation, check its fan inlets and outlets regularly to ensure they are not dirty or obstructed. If necessary, use a soft brush or vacuum to clean the inverter inlets and outlets.



## 9.3 Replace Fans

If the fan inlets and outlets are all functioning normally but the inverter temperature is high or producing abnormal noise, the fans need to be replaced according to the following steps:

1. Remove the three (3) screws of the fan bracket with a no. 2 Phillips screwdriver, then pull out the fan bracket until you can see the connector.



Figure 9-1 Remove Fan Bracket Fastening Screws



2. Disconnect the watertight cable connector from the cooling fan and pull out the entire fan bracket from the inverter.



Figure 9-2 Disconnect Watertight Cable Connector

3. Use the no. 2 Phillips screwdriver to remove the four (4) fastening screws.



Figure 9-3 Remove Screws

- 4. Fasten the new cooling fans onto the fan tray using the no. 2 Phillips screwdriver and torque to 12.2-15.6 lbf-in (14-18 kgf-cm).
- 5. Use the no. 2 Phillips screwdriver to reinstall the assembled fans onto the inverter and torque to 13.9 lbf in (16 kgf-cm).



## 9.4 Replace Inverter



#### INSTRUCTION:

The inverter can only be replaced when it is completely powered OFF.

- 1. Turn OFF the AC and DC switch of the inverter.
- 2. Disconnect the AC wires, grounding wires, PV wires, and battery wires (see Section 4.3 Electrical Cable Connection).
- 3. Remove the two screws and, if present, the anti-theft padlock.



Figure 9-4 Remove the Screws and Lock

4. Remove the four M6x20 hexagon socket head combined screws on both sides of the inverter.



Figure 9-5 Remove M6x20 Screws



5. Remove the inverter from the upper mounting bracket.



## NOTICE:

The weight of the inverter is approximately 139 lb (63 kg). If manually lifting the inverter, is recommended to have at least two people to hang it.

Lift mounting: Tighten the M10 lifting eye nuts (supplied by customer) to lift the inverter onto the upper mounting bracket.

Manual mounting: Use at least two people to lift the inverter safely using the four arrow positions shown in Figure 9-6.



Figure 9-6 Lift the Inverter

6. Install a new inverter using the instructions in Section 3.5 Installation Procedure.



# **10 Troubleshooting**

## 10.1 LED Indicator Troubleshooting

If the LED light indicates any faults, please perform troubleshooting according to Table 10-1 and Table 10-2.

#### LED Indication **Possible Fault** Off ARM and DSP CAN communication fault Inversion fault, DC fault, or PV fault Flashing (green) (') ARM and DSP CAN communication fault Off On (red) System fault On (yellow) Meter communication fault On (red) BMS communication fault or the battery is not connected ((†)) Flashing (red) ARM and DSP CAN communication fault BMS CAN communication fault, ARM and DSP CAN communication fault, or meter Off communication fault

#### Table 10-1 LED Indicator Fault Descriptions

#### Table 10-2 Troubleshooting

Fault Name	Solution
Battery connection failure	<ol> <li>Check if the battery switch is closed.</li> <li>Check if the battery voltage is too low.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Temperature sensor abnormality	1. Check the temperature display value.
Internal communication failure	<ol> <li>Disconnect the power grid switch, backup switch, battery power switch, and PV input switch.</li> <li>Wait for 60 seconds to discharge, then power on again.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Bus voltage too high	



Fault Name	Solution
EEProm fault	<ol> <li>Observe for 5 minutes to see if the inverter will automatically clear the alarm.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Internal fan abnormality	<ol> <li>Observe for 5 minutes to see if the inverter will automatically clear the alarm.</li> <li>Disconnect the power grid switch, backup switch, battery power switch, and PV input switch</li> </ol>
Internal communication failure	3. If the fault persists, contact CPS Customer Service.
Over-temperature protection	<ol> <li>Reduce the load and observe whether the alarm will be automatically cleared after the inverter drops to 158°F (70°C).</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Power grid relay	1. Disconnect the power grid switch, backup switch, battery power switch, and PV input switch
abnormality	2. If the fault persists, contact CPS Customer Service.
Low grid frequency	<ol> <li>If this occurs accidentally, it may be due to a short-term abnormality in the power grid. After it has been detected that the power grid is normal, the inverter will resume normal operation without any manual intervention</li> </ol>
High grid frequency	<ol> <li>If it occurs frequently, check whether the grid frequency is within the allowable range.</li> </ol>
Grid phase voltage over threshold	<ul> <li>If the grid frequency is outside the allowable range, contact the local power operator.</li> <li>If the grid frequency is within the allowable range, modify the inverter's grid over freque threshold or disable the grid over frequency protection function after obtaining the cons of the local power operator.</li> </ul>
High inverter current	<ol> <li>Modify the load or make the on-grid power lower than the rated output power.</li> <li>Observe to see if the fault automatically disappears.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
PV overcurrent	1. Check whether the PV input current is within the parameter range.
PV2 voltage too high	<ol> <li>Disconnect the power grid switch, backup switch, battery power switch, and PV input switch.</li> <li>Wait for 6 seconds to discharge, then power on again.</li> </ol>
PV1 voltage too high	4. If the fault persists, contact CPS Customer Service.



Fault Name	Solution
Leakage current CT abnormality	Contact CPS Customer Service.
Inverter relay abnormality	
Bus fault	
Bus hardware overvoltage	<ol> <li>Force-restart the software.</li> <li>Observe whether the fault disappears automatically.</li> <li>Disconnect the power grid switch, backup switch, battery power switch, and PV input switch.</li> <li>Wait 60 seconds to discharge, then power on again.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Inverter hardware overcurrent	
LLC hardware overcurrent	
PV hardware overcurrent	
Leakage current too high	4. Check whether the DV cells and ground cells are named (as since of breakans, distortion, or
Insulation impedance too low	<ol> <li>Check whether the PV cable and ground cable are normal (no signs of breakage, distortion, of damage).</li> <li>Restart the inverter to see if the fault will automatically disappear.</li> </ol>
Steady-state leakage current protection	3. If the fault persists, contact CPS Customer Service.
DCI too high	1. Set the maximum DCI.
	<ol> <li>Restart the inverter to see if the fault will automatically disappear.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Bidirectional DC overcurrent	<ol> <li>Check whether the off-grid load is too high.</li> <li>Restart the inverter to see if the fault will automatically disappear.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>



Fault Name	Solution
PV2 input reverse connection	<ol> <li>Check whether the PV cable is connected reversely.</li> <li>Disconnect the power grid switch, backup switch, battery power switch, and PV input switch.</li> <li>Wait 60 seconds to discharge, then exchange the positive and negative poles of the reversed</li> </ol>
PV1 input reverse connection	branch. 4. Restart the inverter and observe to see if it returns to normal. 5. If the fault persists, contact CPS Customer Service.
Arc protection	<ol> <li>Disconnect the PV input switch and check the wiring of the PV panel.</li> <li>After troubleshooting, turn the device on again.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Battery voltage too low	<ol> <li>Stop discharging or switch to emergency backup mode.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Battery voltage too high	<ol> <li>Stop charging, then wait for a moment to discharge; the voltage will become normal.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
System fault	<ol> <li>Disconnect the power grid switch, backup switch, battery power switch, and PV input switch.</li> <li>Wait 60 seconds to discharge, then restart the device to see if the fault will automatically disappear.</li> <li>Check whether the ground cable is connected correctly, firmly, and reliably.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
PV fault	<ol> <li>Check whether the wiring mode (parallel mode or independent mode) matches the setting.</li> <li>Disconnect the power grid switch, backup switch, battery power switch, and PV input switch.</li> <li>Wait 60 seconds to discharge, then restart the device to see if the fault will automatically disappear.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>



Fault Name	Solution
DC fault	
Inverter fault	<ol> <li>Disconnect the power grid switch, backup switch, battery power switch, and PV input switch.</li> <li>Wait 60 seconds to discharge, then restart the device to see if the fault will automatically disappear.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Intermediate bus fault	
Overload	<ol> <li>Check whether the output power exceeds the rated power.</li> <li>Cut off the load output and observe whether the fault disappears automatically.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Battery fault	<ol> <li>Check whether the battery parameter is consistent with the settings.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Output fault	<ol> <li>Check whether the load cable is short-circuited.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Steady-state leakage current protection	<ol> <li>Determine whether the battery switch is closed.</li> <li>Check if the battery voltage is too low.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>
Bus fault	<ol> <li>Determine whether the battery switch is closed.</li> <li>Check if the battery voltage is too low.</li> <li>If the fault persists, contact CPS Customer Service.</li> </ol>


### 10.2 Common Fault and Troubleshooting

### DANGER:



Disconnect the inverter from the AC grid and PV modules <u>before</u> opening the equipment. Make sure hazardous high voltage and energy inside the equipment has been discharged.

Do NOT operate or maintain the inverter until at least five (5) minutes after disconnecting all sources of DC and AC.

The inverter will be shut down automatically if the PV power generation system fails. Fault information will be displayed on the app interface.

•	Inverter	Energy		<	Current fault record	total3 \varTheta
Model:ECH12KTL SN:0009160011111111 RatedPower:12000W				<ul> <li>Serial nu Fault na Fault de Occurre</li> </ul>	amber:0 me: Meter Comm Failure scription: Warn2000 d time: 2023-08-02 09:09:12	
Bat	tery overview			Serial nu Fault na Fault de Occurre	umber:1 me: BMS Comm Failure scription: Fault0201 d time: 2023-08-02 08:59:25	
ES_TotalChgCnt		0		Serial nu Fault nai Fault de	imber:2 me: UPS Abn scription: Fault0204	
ES_TotalDChgCnt		0		Uccurre		
PV_TotalEnergy(kWh)		590				
PV_To	PV_TotalTime(h)					
Batt chg	Batt dischg	Photovoltaic Pr	owergrid pur			
ES_TodayCh	ES_TodayChgEnergy (kWh)					
ES_TotalCh	ES_TotalChgEnergy (kWh)					
ES_TodayC	ES_TodayChgTime (min)					
ES_TotalChgTime (h)		20				
ft Main	Set	ting	More			

Figure 10-1 Fault Codes



# **11 Technical Data**

### 11.1 Datasheet

Inverter (CPS ECH XXKTL/US)	7.6	9.6	12				
PV Input							
Max. PV input power	11.4 kW (7.5 kW per MPPT)	14.4 kW (7.5 kW per MPPT)	18 kW (7.5 kW per MPPT)				
Max. PV input voltage	600 Vdc						
Operating PV input voltage range	120-550 Vdc						
MPPT voltage range	150-480 Vdc						
Startup voltage	150 Vdc						
Number of PV inputs	6 inputs, 2 per MPPT, non-fused						
Max. input current (clipping point)	ax. input current (clipping point) 30 A						
DC disconnection type	DC switch						
Short-circuit current per MPPT	40 A						
Battery Input							
Battery type	Lithium-ion (CPS 5-20 kWh batteries)						
Battery voltage range	voltage range 40-60 V						
Max. charge/discharge current	200 A / 152 A	200 A / 192 A	200 A / 200 A				
Max. charge/discharge power	10 kW / 7.6 kW	10 kW / 9.6 kW	10 kW / 10 kW				
Generator Input							
Max. input current	100 A						
Max. input power	24 kW @ 240 Vac						
Operating input voltage range	211.2-264 Vac (@ 240 Vac)						
Full power input voltage range	240-264 Vac (@ 240 Vac)						
Grid							
Max. input current (on grid)		200					
Max. output current	31.7 A	40 A	50 A				
Max. output apparent power	7.6 kVA	9.6 kVA	12 kVA				
Standby / night consumption	< 50 W	< 50 W	< 60 W				
Output voltage range	ut voltage range 183-228.8 Va		c (@ 208 Vac) / 211.2-264 Vac (@ 240 Vac)				
Max. OCPD rating	200 A	250 A	250 A				
Output frequency		60 Hz					
Grid connection type	Split phase with N						
Rated grid frequency range 57-63 Hz							
utput voltage 240 V / 208 V (120 Vac)							
Current TRD @ rated load < 3%							
Power factor		>0.99 (adjustable ±0.8)					



Backup Port							
Max. output current (on grid)	200						
Max. output current (off grid)	31.7 A	40 A	50 A				
Max. output apparent power (off grid)	7.6 kVA	9.6 kVA	12 kVA				
On-grid / off-grid switching time	20 ms						
General Data							
Operating temperature range	-13°F to 140°F / -25°C to 60°C						
Cooling method	Variable speed cooling fan						
Audible noise < 45 dB @ 1 m and 77°F (25°C)							
Dimensions (H × W × D)	36 × 20.4 × 9.3 in (912 × 518 × 243 mm)						
Weight	Inverter: 101.7 lb (46.2 kg) Wire box: 37.2 lb (16.9 kg)						
User interface and display	LED, app, and web portal via Wi-Fi connection <sup>1</sup>						
Inverter monitoring	Wi-Fi						
Protection degree	NEMA 4X						
Max. efficiency	97.5%						
CEC efficiency	96.5%						
Surge protection	DC Type II / AC Type II						
Standard Compliance							
Certifications and standards	CSA107.1-16, UL1741/SA, UL1741 SB, UL 1998, UL 1699B, FCC Part 15						
Selectable grid standards	IEEE 1547-2018, HECO, CA Rule 21						
Warranty							
Standard	10 years						

1 Wi-Fi network connection required for web portal communication.



# **12 Limited Warranty**

The warranty policy for this product is specified in the contract; otherwise, the standard warranty is ten (10) years. For service, CPS America will provide technical support. For warranty terms, refer to the CPS America standard warranty policy in place at time of purchase.

# **13 Recycling**



This product cannot be disposed of as a household waste. When the product has reached the end of its service life, dispose of it in accordance with the local applicable electrical waste regulations and standards. For more information, contact CPS Customer Service.



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