

AIO1-5K-G1/-L

Residential Low-voltage All-In-One Device (Single Phase)

User Manual

Inverter: AIO1-PCS-3K-G1 AIO1-PCS-5K-G1 AIO1-PCS-5K-G1-L

Battery:

AIO1-P-5.12K-G2



Release Date: 17/12/2024 Version: 4.6



About this manual 1. Purpose

This manual describes the introduction, installation, operation and emergency situations of the AIO1-5K-G1 series. Please read this manual carefully before installations and operations. Keep this manual for future reference.

2. ALL IN ONE Model Description



2.1 Inverter Model

AlO1-PCS-5K-G1-L



2.2 Battery Model



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NOTE

The document content may be updated from time to time due to product version upgrade or other reasons. Without special agreement, the document content cannot replace the safety precautions in the product label. All descriptions in this document are for use only.

5. Limitation of Liability

CSE shall not be liable for any consequences like battery damage or property loss on force majeure during customer normal using and storage or behaviors inconsistent with instructions below:

• No modification should be down on the product include but not limit to disassemble, alter or reproduce.

• Only authorized person who are trained and tested qualified can do the normal product operation from installation to cycle maintain under the guidance of relative local laws.

- Do not attempt to hit, drag, pull, squeeze, crush, drop, penetrate on the product or give weight in any ways.
- Do not immerse the product in water.
- Do not try to heat the product.
- Do not touch the electrolyte.
- Do not put anything into the product.
- Power off before normal repair and maintain.
- Any defect that is unable to be detected by the existing technology at the time a product enters the market.



• Read through this document before any operation and follow instructions strictly.

6. Statement and Declaration

An All-in-One (AIO) device is mainly composed of 2 parts: a hybrid inverter and variable amount of battery modules. Available amount of battery modules ranges from 1 to 4, while the hybrid inverter can worked seperately without battery modules either. However, the inverters were not tested to Section 5 of AS/NZS 4777.2:2020 for multiple inverter combinations and/or multiple phase inverter combinations, and that combinations should not be used, or external devices should be used in accordance with the requirements of AS/NZS 4777.1. More details on parameters, please go to 4.1 Product Parameter.

7. Version

Version	Time	Notes
V1.0	10-19-2023	Initial Version (PCS: AlO Performance, Battery Module: SOC)
V2.0	11-2-2023	1. Product Appearance Update: SOC removed from BM to PCS
		Adding
V2.1	12-14-2023	(statement on multi-device parallel support, RCD relative, product
		parameter)
		Change:
		1. Layout of functional ports on PCS
V3.0	5-28-2024	2. Remove Debug port
		3. Packing List
		4.Update: System (PCS Electric) Connection Diagram
V4.0	18-9-2024	Fully upgraded
V4.1	25-9-2024	Update WIFI module
V4.2	8-10-2024	Update chapter 4.3/6.4/10.3
		Update installation position, adding inverter model, battery model in the
V4.3	23-10-2024	cover,adding the back-up load anti-pull cover, the instruction of
		commissioning inverter and inverter settings overview.
V4.4	01-11-2024	Adding a new chapter of WiFi dongle local connection setting
	12 11 2024	Update DRM connection/Installation position/Technical specification;
V4.3	13-11-2024	Adding Statement and Declaration
V4.6	18-11-2024	Update Monitoring system



Content

1 Introduction	1
1.1 Safety Symbols &Warnings	1
1.1.1 Symbols Explanation	1
1.1.2 Safety Warning	2
1.1.3 Battery Handing Guide	2
1.2 Response to Emergency Situations	
1.2.1 Leaking Batteries	3
1.2.2 Fire	3
1.2.3 Wet Battery	3
1.2.4 Damaged Battery	4
1.3 Installers	4
1.4 Scrap Battery	4
2 Guidance for Disconnection of System During Shipment	4
3. Contact Information	5
4 Product Introduction	5
4.1 Technical Specifications	5
4.2 AIO1-5K-G1 series Diagram	7
4.3 Operation Modes Introduction	7
4.4 Indicators and Ports	9
4.4.1 Battery (AIO1-P-5.12K-G2)	9
4.4.2 Inverter	10
4.4.3 Indicators	11
5 Installation Prerequisite	11
5.1 Packing List	11
5.2 Installation Position	13
5.3 Tools	15
5.4 Safety Instruments	16
5.5 Unacceptable Installations	
5.6 Storage	16
6 Installation	17
6.1 Ensure a Flat Installation Surface	17
6.2 Install the Battery	
6.3 Install the Inverter	19
6.4 Electrical Connection	20
7 Cable Connection	22
7.1 Battery Connection	22
7.2 PV Connection	23
7.3 Grid Connection	24
7.4 Back-up: Load Connection	25
7.5 Wi-Fi Connection	27
7.6 Ground Connection	27
7.7 CT&Meter Installation	28
7.8 DRM Connection	29



7.9 Install Protective Cover	29
8 Startup Procedure	30
9 Shutdown Procedure	31
10. Monitoring System	32
10.1 Software Download	32
10.2 Register Account	33
10.3 For Distributor/Installer	35
10.3.1 WIFI Dongle Local Connection	35
10.3.2 Create Site	36
10.3.3 Increasing PCS in Your Site	37
10.3.4 Mode Setting	38
10.3.5 Grid Setting of Inverter	41
10.3.6 Inverter settings Overview	44
10.4 For Home User	44
10.4.1 Create Site	44
10.4.2 Increasing PCS in Your Site	45
10.4.3 WIFI Dongle Local Connection	46
10.4.4 Inverter settings Overview	47
11 Fault Diagnosis and Solutions	47



1 Introduction 1.1 Safety Symbols &Warnings

The AIO1-5K-G1 series is designed, manufactured, and tested as per international safety standards. However, as an electrical and electric product, it must be installed, operated, and maintained strictly according to related safety notices.

If you have any problems, please contact the service center or authorized dealer. Please DO NOT install or repair the product by anyone who is not qualified by local authority.

We are not responsible for any damage or loss caused by misuse or misunderstanding of the information in the manual.

1.1.1 Symbols Explanation

	The system will be touchable or operable after at least 10 minutes disconnected, in case of any electrical shock.	Install the product out of reach of children.
	Danger of high voltage and electric shock!	Do not place nor install near flammable or explosive materials.
	Danger of hot surface and burn injury!	In case of electrolyte leakage, keep leaked electrolyte away from eyes or skin.
÷	Earth line!	Disconnect the equipment before carrying out maintenance or repair.
X	The wasted products must be sent to the authorized collecting center!	Do not connect the Pack's positive(+)and negative(-)terminal reversely.
	Refer to the operating instructions.	Take care! This module is heavy enough to cause serious injury.
<u>.</u>	Danger! Serious physical injury or even death may occur if not follow the relative requirements.	Observe precautions for handling electrostatic discharge sensitive devices.
CE	CE mark:The inverter complies with the CE directive.	Do not use the Pack beyond specified conditions.



1.1.2 Safety Warning

<u>N</u> Warning	The system must be installed according to the local standards and related standards for an electrical enterprise. Please follow the instructions in this manual to use and operate the system.
Danger	Keep the DC circuit breaker of PV is OFF. High voltage will be generated by the PV array exposed under sunshine. All the cables must be connected firmly.
D anger	PV negative(PV-) and battery negative(BAT-) on the system side are not grounded as default design. Connect PV- or BAT- to the ground are strictly forbidden.
Danger	 High voltage is a hazard, make sure the system device is away from children. Any touch with the device or terminal may cause electric shock or fire. Please follow all the safety instructions. Damaged devices or system faults may cause electric shock. Make sure that you have checked the package and the device before installation to avoid unnecessary damage or loss.
Caution	Be aware of the hot surface while the device is running.
<u>)</u> Warning	Do not open the inverter cover or change any components without our authorization, otherwise the warranty commitment of the inverter will be invalid.
 Warning	 Grounding the PV generator. Comply with the local requirements for grounding the PV modules and the PV generator. It recommends connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of system and persons
<u>)</u> Warning	 Ensure input DC voltage ≤Max. DC voltage. Over voltage may cause damage. Permanent damage to inverter or other losses, which will not be included in warranty!
Warning	 Authorized service personnel must disconnect both AC and DC power from inverter before attempting any maintenance or cleaning or working on any circuits connected to inverter. Do not operate the inverter when the device is running.

1.1.3 Battery Handing Guide

- Use the battery pack only as directed.
- If the battery is defective, appears cracked, broken, or otherwise damaged, or fails to operate, contact the CSE ESS **hotline** immediately.
- Do not attempt to open, disassemble, repair, tamper, or modify the battery.

The battery is not suitable for users to use by themselves.

• To protect the battery and its components from damage when transporting, handle them with care.



- Do not subject it to any strong force.
- Do not insert foreign objects into any part of the battery pack.
- Do not use cleaning solvents to clean the battery.
- The battery can not be connected directly to the SELV circuit.

1.2 Response to Emergency Situations

The CSE ESS battery is designed with multiple safety strategies to prevent hazards resulting from failures. However, CSE ESS cannot guarantee their absolute safety in uncertain situations.

1.2.1 Leaking Batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, do these actions:

Inhalation: Evacuate the contaminated area and seek medical attention immediately.
Eyes contact: Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.
Skin contact: Wash the affected area thoroughly with soap and water, and seek medical attention immediately.
Ingestion: Induce vomiting as soon as possible, and seek medical attention immediately.

1.2.2 Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is

nearby and does not use water to extinguish the fire.

WARNING

The battery pack may catch fire when heated above 150°

If a fire breaks out where the battery is installed, do these actions:

- 1. Extinguish the fire before the battery catches fire.
- 2. If the battery has caught fire, do not try to extinguish the fire. Evacuate people immediately.

WARNING

If the battery catches fire, it will produce poisonous gases. Do not approach.

1.2.3 Wet Battery

If the battery is wet or submerged in water, do not try to access it. Contact CSE ESS **hotline** or your distributor for technical assistance.



1.2.4 Damaged Battery

If the battery is damaged, please contact CSE ESS **hotline** or your distributor for help as soon as possible, because damaged batteries are dangerous and must be handled with extreme caution. Damaged batteries are not suitable for use and may pose a danger to people or property. If the battery seems to be damaged, return it to CSE ESS or your distributor.

CAUTION

Damaged batteries might export electrolyte or flammable gas, so contact CSE ESS for advice and information immediately and we will deal with it.

1.3 Installers

AIO1-5K-G1 series is suggested being installed by skilled workers or electricians. A skilled worker is defined as a person who has been trained and is a qualified electrician or qualified with all of the following skills and experience:

- Knowledge of the functional principles and operation of on-grid AIO1-5K-G1 series.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices
- Knowledge of and adherence to this manual and all safety precautions and best practices.

1.4 Scrap Battery

For scrap batteries, please deal with local laws or regulations to recycle or scrap.

2 Guidance for Disconnection of System During Shipment

- AIO1-5K-G1 is not suitable for air transport.
- Cartons that have been crushed, punctured, or torn in such a way that contents are revealed shall be set aside in an isolated area and inspected by a skilled person. If the package is deemed not to be shippable, the contents shall be promptly collected, segregated, and either the consignor or consignee contacted.
- A precautionary label should have been affixed to the shipping carton to alert individuals that the batteries in the package are disconnected; otherwise, the battery should not be transported.
- We have conducted comprehensive tests to ensure the equipment distributed around the world is safe for shipping transport. These products shall be handled with care and immediately inspected if visibly damaged. If the carton is visibly damaged, please contact with CSE ESS **customer service** to confirm whether the battery can be used safely or not.

NOTE

The battery module can only be transported in an upright position.



3. Contact Information

To wholeheartedly deliver quality products and excellent service, we have established a 7×24 hours customer service hotline at 021-50809880. Furthermore, our after-sales service headquarters is located in Shanghai:

After-sales Service Headquarters: CSE Energy & Technology Co., Ltd. *After-sales service hotline:* 021-50809880 *After-sales headquarters address:* No. 777, Sizhuan Road, Shanghai, China.

4 Product Introduction 4.1 Technical Specifications

Specification	Al01-3K-G1	AI01-5K-G1/AI01-5K-G1-L		
DC Input(PV)				
Max. Input Power (Wp) @ STC	4500	10000		
Max. Input Voltage (V)	600			
MPPT Voltage Range (V)	120-550			
MPPT Startup Voltage (V)	120			
MPPT Max. Input Current (A)	1;	3.5		
MPPT Max. Short-Circuit Current (A)		15		
No. of MPPT		2		
No. of PV Strings Per MPPT		1		
PV Interface	Μ	C4		
AC (Grid)				
Rated Frequency (Hz)	50	//60		
Rated Power (W)	3000	5000		
Max. Power (VA)	3000 5000			
Rated Current @ 230Vac (A) 13.1		21.7		
Max. Current (A)	13.6	22.7		
Rated Voltage/Range (V)	230/180-280			
Power Factor (cos φ)From 0.8 leading to 0.8 lagging		ng to 0.8 lagging		
Phase Single (L+N+PE)		L+N+PE)		
THDi%	<3%			
AC (Backup)				
Rated Output Power	Ited Output Power 3000 5000			
Peak Output Power (VA)	Peak Output Power (VA) 3600 @10s 6000 @10s			
Rated Output Voltage/Range (V)	230/180-280			
Rated Output Frequency/Range (Hz)	50/60			
Max. Output Current (A)	13.6	22.7		
THDv%	<3%			
	Battery			
Type of Battery LiFePO4		ePO4		
Rated Input Voltage (V)	5	1.2		



Battery Voltage Range (V)	42-58.5		
Max. Charge/Discharge Current (A)	50/50	100/100	
Module Number	1	2	
Energy (kWh)	5.12	10.24	
Max. Efficiency	96.9	00%	
European Efficiency	96%		
Max. Battery Discharge Efficiency	94	%	
	General		
Dimensions (W mm * D mm * H mm)	730*205*932	730*205*1302	
Weight (kg)	85.3	133.8	
Ingress Protection	IP	65	
Noise (dBA)	<2	29	
Over Voltage Category			
I(AC), I (DC)		,11(DC)	
Protection Class			
Pollution Class	PD2 (inside), I	PD3 (Outside)	
Self-consumption at Night (W)	<1	0	
Operating Temperature Range (°C)	-10 to 55 (45 t	o 55 derating)	
Relative Humidity (RH) 0-95%, No		condensation	
Altitude (m)	≤3000		
Istallation Stacked Ground-mounted		und-mounted	
AC Short-circuit Protection	Integ	rated	
Overload Protection	Integ	rated	
Residual Current Detection	Integ	rated	
Battery Reverse Protection	Integ	rated	
Anti-island Protection	Integrate	d(RoCof)	
AC Surge Protection	Integ	rated	
DC Surge Protection	Integ	rated	
DC Over/Under-voltage Protection	Integrated		
AC Over/Under-voltage Protection	Integrated		
AC Over/Under-frequency Protection	Integrated		
Valley Peak Time Setting	Integrated		
Ground Fault Monitoring	Integrated		
PV Circuits of DVC	DVC	C-C	
Battery Circuits of DVC	DVC	С-В	
Control Circuits of DVC	DVC	C-C	
AC Mains/Grid Circuits of DVC	DVC	C-C	
Backup Circuits of DVC	DVC	C-C	
Communication Circuits of DVC	DVC	C-A	



4.2 AIO1-5K-G1 series Diagram



AIO1-5K-G1 series is designed with BACK-UP versions for customer to choose based on the local rules.

<u>N</u>OTE

- Please control the home loads and make sure it's within the "BACK-UP output rating" under BACK-UP mode, otherwise the inverter will shut down with an "overload fault" warning.
- Please confirm with the LOCAL grid operator whether there are any special regulations for grid connection.

4.3 Operation Modes Introduction

AIO1-5K-G1 series normally has the following operation modes based on your configuration and layout conditions.

Working Mode		Designation	Definition
	In the 'Mode Setting' menu,		Excess PV energy powers loads,
	select 'Self-Consume mode'	Moolthy DV Energy	charges battery, then feeds excess
	which prioritizes PV energy for	weaking PV Energy	energy into the grid when PV
Self-Consume Mode	local loads, then battery		energy is abundant.
	charging, and finally feeding		PV energy used for loads first, then
	excess energy into the grid. This	Limited D\/ Dower	battery used for any shortfall, and
	default mode increases		finally grid energy fills remaining
	self-consumption rate and has		gaps.
	various scenarios based on PV		The inverter preferentially uses the
	energy.There has self-Used	No PV Input	battery's electricity to power the
	Discharge Power and self-Used		load, and when the battery is out of



	Charge Power setting.		power, the grid is used to continue working.
		No grid, but have PV and battery	The inverter preferentially uses the PV's electricity to power the load, and charge the battery with excess power, if there is no enough PV, the battery will be used for any shortfall until the battery SOC is below the value which you set in the APP.
	Navigate to 'Mode Setting' and choose 'Peak Load Shift '. This mode allows control of inverter charging and discharging with customized parameters. Charge and discharge frequency: one time or daily Charging start time: 0 to 24 hours Charging end time: 0 to 24 hours Discharge start time: 0 to 24 hours Discharge end time: 0 to 24 hours	During the charging time	If there is sufficient sunlight, it will charge the battery first, and then supply power to the loads, If there is excess power, then feed the power into the grid. If there is not enough sunlight, it will charge he battery from the grid
Peak Load Shift Mode		During the discharging time	If there is sufficient sunlight, the system first powers the loads. If there is insufficient sunlight, the battery supplies the power to the loads first until the battery is consumed to the SOC value, if the load's power demand is less than the battery's capacity, the battery supplies power to the load first and then feeds any excess power into the grid.
Backup Mode	In the 'Mode Setting' menu, choose 'Backup' for faster battery charging with priority on PV energy.	When PV, Grid, Battery is available No PV	When there is sufficient sunlight, the device first charges the battery, if there is still excess, it will supply power to loads, and feeds the power into the grid with excess power. It will get power from grid to charge
VPP Mode	In the 'Mode Setting' menu, choose 'VPP' for power grid dispatch in some countries.		



NOTE

If the anti-reverse function is set to enable, when the system is in Self-consume, Peak load shift, or Backup mode, it will not feed power to the grid.

4.4 Indicators and Ports 4.4.1 Battery (AIO1-P-5.12K-G2)



Object	Description	Object	Description
1	PE	6	Communication Port-OUT
2	Handle	7	PE
3	Communication Port-IN/PCS	8	Power ON/OFF
4	Battery Negative -	9	DC Breaker
5	Battery Positive +		

Description for LED



NOTE

The battery need to be fully charged for at least once in one month to ensure the accurate SOC calculation.



4.4.2 Inverter





Model	AIO1-PCS-3K-G1/AIO1-PCS-5K-G1/AIO1-PCS-5K-G1-L	
Object	Description	
1	DC switch	
2	PE	
3	PV1~PV2 Input	
4	Backup Load Output	
5	Grid Output	
6	Wi-Fi Module	
7	DRM (Demand Response Enabling Device)	
8	Meter Communication Port	
9	BMS Communication Port with Battery	
10	Battery Negative -	
11	Battery Positive +	
12	PE	
13	Battery SOC	
14	PV Light	
15	Grid Light	
16	Inverter Light	

NOTE

DRM terminal is for Australian only as to meet the local requirement that each PCS should connected with a DRED respectively in a dongle ad-hoc scenario.



4.4.3 Indicators

		Item/Color	Green	Green Flash	Red
	O _O	LB Inverter	Running	Diagnostic/Update	Fault
Hybrid Inverter	遼	Grid	Running	Diagnostic/Update	Fault
	•	PV Panel	Running	Diagnostic/Update	Fault
Battery	•	Battery	Running		Fault



SOC indicator shows the valid capacity of battery modules.

Color: Green

Color Status: Solid and Flash

5 Installation Prerequisite 5.1 Packing List

Make sure the products are intact during transportation. If there is any visible damage, such as cracks, please contact your dealer immediately.

Open the package and take out the product, please check the accessories first.

The inverter packing list shown as below.







Back-up Connector*1	PE Cable*1	Inverter Mounting Bracket*1
PV Connector (+)*2	PV Connector (-)*2	Hex Flange Screw*5
		(Alala and a second
Basement*1	Self-tapping Screw*5	Expansion Anchor Bolt*5
Wifi Dongle*1	Meter (Single Phase)*1	Current Transformer (CT)*1
	Y	
L-shaped Mounting Bracket*1	UT Terminal*2	Communication Connector*2
Rubber Cover*2		

The battery packing list shown as below.







5.2 Installation Position

AIO1-5K-G1 is designed for outdoor installation (IP65). Make sure the installation site meets the following conditions:

- Not in direct sunlight.
- Not in areas where highly Flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television antenna or antenna cable.
- Not higher than altitude of about 3000m above sea level.
- Not in environment of precipitation or humidity (>95%).
- Under good ventilation condition.
- The ambient temperature in the range of -10° C to $+55^{\circ}$ C.
- To avoid burning and electric shock, the system should be installed beyond the reach of children.
- Do no install the inverter in a place with corrosives such as corrosive gas and organic solvent, etc.
- Far from heat source (\geq 3m)





The wall hanging the inverter should meet conditions below:

1.Solid brick/concrete, or strength equivalent mounting surface;

2.Inverter must be supported or strengthened if the wall's strength isn't enough (such as wooden wall, the wall covered by thick layer of decoration) Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation.

3.The slope of the wall should be within $~\pm~$ 5° ~ .

4. Make sure the installation position does not shake.





The installation space:





5.3 Tools

To install the system, the following tools are required:

Contraction of the second seco	● ● M3/M5		
Diagonal Pliers	Torque Wrench	Cable Crimper	Wire Stripper
Voltmeter	Heat Gun	Drill	Ruler
Heat Shrink Tubing	Rubber Mallet	Rolling Strip	Marking Pen
DC Wrench			

In order to protect the operator and the installer's safety, please select and use suitable tools and measuring instruments that are certified for precision and accuracy.



5.4 Safety Instruments

When dealing with the battery, the following safety gears should be equipped. Installers must meet the relevant requirements of UL or the domestic legislation and other relevant international standards.



5.5 Unacceptable Installations

Please avoid the following installations, which will damage the system.



5.6 Storage

If the system is not to be installed immediately, or removed from operation and needs to be stored for a long period, please choose an appropriate location to store it. Instructions for storage are:

• The temperature of the system stored is recommended in the range of 59F(15°C) to 113F(45°C).



- Do not expose the system to water.
- The products box should be upright and not stacked upside down when storing the battery box.
- If the battery needs to be stored for over 3 months, the main breaker of the battery is suggested to be disconnected. Otherwise, the battery would discharge at a minimum rate and its capacity will reduce depending on storage time, the battery self-consumption will be less than 5W.
- If the battery will be stored for over 6 months, it is suggested to connect the battery with an inverter and commissioning the system.

6 Installation

NOTE

During transportation, turnover, installation and other operations, you must meet the laws, regulations and relevant standards of the country or region where you are located.

Before installation, move the system to the installation site. To avoid personal injury or equipment damage, pay attention to the following:

1. Assign personnel according to the weight of the device. Otherwise, personnel may be injured if the device exceeds the weight that can be carried by the human body.

2. Wear safety gloves to avoid injury.

3. Ensure that the device is balanced to avoid falling.

6.1 Ensure a Flat Installation Surface

The product is suggested installing on a flat floor within less than 8mm per 2 square meters with a wall behind for support and mounting. If the floor was not that smooth, please adjust the adjustable feet to remain a install flatness. Adjustable feet screwed under the basement together as a spare part is supplied, packaging together with the inverter.

STEP 1: Get the basement out and make it equipped with adjustable feet with screwdriver if they are not screwed together;

STEP 2: Put the basement on a proper installation location;

STEP 3: Put a horizontal ruler on the basement and adjust the feet until the liquids in the ruler keeps still in the middle.





6.2 Install the Battery

STEP 1: Put the battery module (a module) on the basement by aligning the positioning pillars (on the Basement) and holes (on the Battery Module);







STEP 3: Lock the module and the basement together with a locking plate;

STEP 4: Get other modules stacked by align the positioning pillars and holes;

STEP 5: Lock between modules on both sides;



6.3 Install the Inverter

STEP 1: Get the inverter wall mounting bracket and the inverter;

STEP 2: Connect the wall mounting bracket with the fixed battery module by aligning the positioning pillars (Battery Module) and holes (mounting bracket);

STEP 3: Pre-drill positioning;

STEP 4: Drill and fix;

STEP 5: Put the inverter on the mounting bracket;

STEP 6: Lock between the fixed PCS and the battery module with locking plates on both sides;







6.4 Electrical Connection

WARNING

Before electrical connection, turn off the DC switch and AC output switch of the inverter to ensure that the device is powered off. Live operation is strictly prohibited, otherwise, electric shock and other hazards may occur.

1. All operations, cables, and components used during electrical connections must comply with local laws and regulations.

2. If the cable withstands too much tension, the cable may be improperly connected. Reserve a certain length of the cable before connecting it to the inverter port.

CAUTION

When making electrical connections, wear personal protective equipment such as safety shoes, protective gloves, and insulation gloves as required.

1. Only professionals are allowed to perform electrical connection related operations.

2. The cable colors in the figure are for reference only. The cable specifications must comply with local regulations.

CSe

User Manual V4.6

General wiring diagram of system.



Australia and New Zealand wiring diagram of system.



Breakers Recommended:

- 1. Rated Current (back-up):32A
- 2. Rated Current (Grid On): 63A
- 3. Breaking Capacity:> 3kA
- 4. Earth-leakage Sensitivity: 30mA
- 5. Earth-leakage Protection Class: Type A
- 6. Voltex RCB06-1-32U,Clipsal RCBE 232/30S



CAUTION

All switches and RCD devices in the figure are for reference only and the specific installation shall be subject to local regulations!

NOTE

The arrow on the CT points to the power grid, showing as above. If the CT connector is improperly connected, the inverter cannot read the data correctly, so that the relevant working conditions cannot be realized normally. The CT must be installed before all loads.

7 Cable Connection 7.1 Battery Connection

Battery connection



Step1: Confirm the DC rotary switch is off (PCS OFF);

Step2: Confirm the DC breaker switch is down (Battery OFF);

Step3: Connect the communication cables, PE cables and power cables between batteries.





NOTE

Place cover lids over the terminals that do not have any connections.

WARNING

Positive and negative wires are not allowed to reverse.

7.2 PV Connection

Hybrid can be connected in series with 2-strings PV modules for inverter.Select PV modules with excellent function and reliable quality.

Open-circuit voltage of PV connected in series should be less than Max. DC input voltage; operating voltage should be conformed to MPPT voltage range.

Before connecting PV panels/strings to the inverter, please make sure:

1. Use the right PV connectors in the accessory box.

2. The voltage, current, and power ratings of the PV strings are within the allowable range of the inverter. Please refer to the Technical Data Sheet for voltage and current limits

3. Make sure the PV switch of the inverter is in the "OFF" position during wiring.

4. PV strings could not connect to the EARTH conductor.

Step1: Choose the 12 AWG wire to connect with the cold-pressed terminal. Remove 12~15mm of insulation from the end of wire.

Step2: Connect PV cables to PV terminals.





NOTE

PV negative(PV-) on the system side are not grounded as default design. Connect PV- to the ground are strictly forbidden.

7.3 Grid Connection

Step1: Check the grid voltage.

1. Check the grid voltage and compare with the permissive voltage range

(Please refer to technical data).

2. Disconnect the AC breaker from all the phases.

Step2: Grid cables selection

Use the right pin terminal from the accessory box. Press the connectors on cable conductor core tightly.(Remove 10mm of insulation from the end of wire.)

Model	Al01-3K-G1	Al01-5K-G1
Cable	12AWG	10AWG

Step3: Cross the Grid cables through the grid port, Connect cables to Grid terminals.





7.4 Back-up: Load Connection

Inverter has On and Off grid function, the inverter will deliver output power through AC port when the grid is on, and it will deliver output power through back-up port when the grid is off.

Load port: important load.

1). For inverter, the standard PV installation typically consists of the connecting the inverter with both panels and batteries.

2). Hybrid inverters are able to supply overload output as its "Back-Up". For details, please refer to the technical parameters of inverter. And the inverter has self-protection dreading at high ambient temperature.

3). For complicated application, or Special load, please contact after-sales team.

NOTE

In case of discrepancies between wiring mode of local policy and the operation guide above, especially for the wiring of neutral line,grounding, please contact us before any operation!

Step1: Make BACK-UP wires.

Model	Al01-3K-G1	Al01-5K-G1
Cable	12AWG	10AWG

Step2: Put the anti-pull plate on the BACK-UP port of the inverter





Step3: Pass the backup cables through anti-pull cover, the backup terminal in sequence *Step4:* plug back-up terminal into the port and secure the anti-pull plate to the cover using screw M4



WARNING

- Make sure the BACK-UP load power rating is within BACK-UP output rating, otherwise the inverter will shut down with an "over load" warning.
- When an "over load" is appeared, adjust the load power to make sure it is within the BACK-UP output power range, then return the inverter.
- For the nonlinear load, please make sure the inrush power should be within the BACK- UP output power range.
- You have to enable the EPS function by APP, if not, there is no voltage output.



7.5 Wi-Fi Connection

Inverter provides a Wi-Fi port which can collect data from inverter and transmit it to monitoring-website by Wi-Fi.

1. Wi-Fi Connection:

Step1: Plug Wi-Fi into "Wi-Fi" port at the bottom of the inverter.

Step2: Build the connection between the inverter and router.

Step3: Create a user account online. (Please check the Wi-Fi user manual for more details).



NOTE

Dongle lights on after PCS power on if it is properly connected.

7.6 Ground Connection

WARNING

The protective grounding of the shell cannot replace the PGND cable of the AC output outlet. Ensure that the two PGND cables are reliably connected.



7.7 CT&Meter Installation

CSe

CT is short for "current transform", it's used to detect Grid current.

Step1: Get the connector together with RJ45 header in a parts bag then unscrew it;

Step2: Thread the cable through the connector;

Step3: Strip a distance of 12~15mm;

Step4: Rearrange the sequence of color-coated copper wires in the standards of TIA568B;

Step5: Attach the 8 wires inside the cable to 8 pins in RJ45 header and crimp;

Step6: Plug into the data port labeled Meter on the PCS firmly;

Step7: Screw the connector clockwise to fix it on the data port;

Step8: Connect the cables for meter.



Step9: Find the power terminal 1 and 4 (1 for L and 4 for N) on the meter;

Step10: Connect the power terminal with a house power supply terminal correspondingly while the cable for connection between the meter and the grid that should be prepared by your own (Cable: 2.5~4mm2/14AWG); **Step11:** Get the opened CT circle through the grid cable (L) that connecting between the grid terminal on the AIO and the house power supply terminal;



NOTE

If CT is not installed or installed reversely, the functions of "Anti-reflux", "Self-use", "Peak-shift " will not be realized. The direction of the arrow on the CT points from this inverter to the GRID!





7.8 DRM Connection

A Demand Response Enabling Device (DRED) can be connected to the AIO by a plug-in communication port labeled as DRM on the right side of PCS. Wire crimping steps are the same as a normal comm. cable with a connector.

To enable or disable a DRM function, please go to your CSE APP>>Parameter>>Factory Data>>DRM

The hybrid inverter will detect and initiate a response to all supported demand response commands within 2s, and will continue to respond while the mode remains asserted.



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	ľ		

PIN	1	2	3	4
Function Description	1/5	2/6	3/7	4/8

PIN	5	6	7	8
Function Description	0	RefGen	Short	Internal

NOTE

Inverters support only DRM 0.

7.9 Install Protective Cover

Before installing the protective cover, ensure that all installation, cables, and auxiliary devices are properly installed, and then power on and off to check the operation. If the running check passes, turn off the power supply and install the protective cover.





8 Startup Procedure

Step 1: Turn on the battery breaker.





Step 2: Turn on the PV switch.



Step 3: Turn on the grid breaker.

Step 4: If the back-up load is applied, turn on the backup breaker.

Step 5: Configure the WIFI stick.

CAUTION

Make sure the WIFI connected is 2.4GHz, if not, that is not work.

NOTE

If the indicator is green, the system is successfully started.

When the DC or communication cable is improperly connected or the cable quality is poor, the indicator is not on.

9 Shutdown Procedure

Step 1: If the backup load is applied, turn off the backup load first and then turn off the backup breaker.

Step 2: Turn off the grid breaker.

Step 3: Turn off the PV switch.

Step 4: Open the battery breaker covers and turn off the battery breakers.

WARNING

If you need to perform other operations after the power is off, use a multimeter to check whether the power is off or wait at least 5 minutes.



10. Monitoring System 10.1 Software Download

CSE monitoring platform supports both APP and web monitoring. Users can monitor detailed running information like generating capacity, system data, and send command, set parameters.

APP Download	1. Scan the QR Code
ATT Download	2. Go to the Apple store to download

NOTE

The APP is physically bound to the system via a Wifi module installed on the inverter. Before using APP, make sure the WIFI dongle is connected.



10.2 Register Account

If you are distributor					
15:26 BI 50 %	15:27 B and 50 🐲	15:14I SG 🖾 < Owner Register			
Hello, Welcome to	I am the Admin Monitor the operation of all power stations and devices	Phone Number Email			
Solar CSE		Country Australia(+61) -			
	I am an Installer Rapid site start-up, O&M, and	Company Enter company name			
😩 Enter Account	operation monitoring	Company Id Company Identity, like CSE			
Enter password	I am a HomeUser	Account Please input account			
	your site	Password Please input password Q			
Login		Number Enter Phone Number			
		Email Please input Email			
		 There resid and accept the (User registration protocol) There and and accept the (Third party privacy policies such as installers) 			
		Neyister			
		ss			
1. Select <i>Register Now</i>	2. Select I am the Admin	3. Enter your information			
	If you are installer				
15:26 🛢	15:27 🖥 🔐 🚱	15:02			
	Kole Selection	liser Penister			
	Lam the Admin				
Welcome to Solar CSE	Monitor the operation of all power stations and devices.	Country Australia(+61)			
		County Australia (10)			
	I am an Installer Rapid site start-up, O&M, and operation monitoring	Phone Number Email			
Lenter Account					
Enter password	I am a HomeUser Check the running status of devices at your site	Password Enter password			
Login		Phone Enter Phone Number			
Register Now Forgot Password		Captcha Enter captcha Captcha			
Ţ		Email Email Optional			
		 Inversed and accept the (User registration protocol) Inversed and accept the (Third party privacy policies such as installers) 			
		Register			

CSC





10.3 For Distributor/Installer 10.3.1 WIFI Dongle Local Connection

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	Service	< ٩
Hello,	Service	Discovered 6 Device
Welcome to Solar CSE	Alarm Local Cloud	SmartDongle_6055F984E9E8
	Processing Connection Connection	signal: -98
😩 Enter Account	20	SmartDongle_ECDA3BB870EC Connect signal: -96
Enter password	My Client	SmartDongle_ECDA3BB858B8
Login	Heip Center	emertPanela ECDA20087150
Register Now Forgot Password	Operation Manual	signal: -93
		SmartDongle_58CF79DF4960 Connect
		SmartDongle_6055F9855EEC Connect
	Home Manage Service Me	
1. Login your account	2. Tap Service at the bottom of	3. Select the right WIFI device to
	page and select <i>local connection</i>	connect
15:52 Ē ati ♀ ■)	page and select <i>local connection</i>	connect
15:52 8 all ⊽ ■) < Gateway Inverter	page and select <i>local connection</i>	connect
15:52 B ari ♥ ■⊃ < Gateway Inverter I Device Info	page and select <i>local connection</i>	connect
15:52 8 ant ⊂ ■) < Gateway Inverter I Device Info SN Code: ECDA388870EC Eliminate Version: 100	page and select <i>local connection</i>	connect
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15:52 B all C C Cateway Inverter I Device Info SN Code: ECDA388870EC Firmware Version: 1.0.0 Wifi Status: Connected Wifi Name: CSE-SYS1	page and select local connection	connect
15:52 B all C D C Gateway Inverter I Device Info SN Code: ECDA3B8670EC Firmware Version: 1.0.0 Wifi Status: Connected Wifi Name: CSE-SYS1 Service Address: mattiot.solarese.com	page and select local connection	connect
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15:52 8 all ♥ ■ C Gateway Inverter Device Info SN Code: ECDA3BB870EC Firmware Version: 1.0. Wiff Status: Connected Wiff Name: CSE-SYS1 Service Address: metLiot.solarcse.com COMM Status: Online Baud Rate: 115200 Client Identity: LAVO-AIO1-G1 Refresh Time: 09-20 15:52:54	page and select local connection	connect
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15:52 B III TOURCE C Gateway Inverter I Device Info SN Code: ECDA3BB870EC Firmware Version: 1.0. Wifi Status: Onnected Wifi Name: CSE-SYS1 Service Address: metLiot.solarcse.com COMM Status: Online Baud Rate: 115200 Client Identity: LAVO-AIO1-G1 Refresh Time: 09-20 15:52:54 Nove	page and select local connection	connect
15:52 B III IIII Inverter IDevice Info SN Code: ECDA3BB870EC Firmware Version: 1.0.0 Wrif Status: Connected Wrif Status: Connected Wrif Name: CSE-SYS1 Service Address: mgtLict.solarcse.com COMM Status: Online Band Rate: 115200 Client Identity: LAVO-AIO1-01 Refresh Time: 09-20 15:52:54 Image: Settings More Device Settings More A. Select the Network Setting	15:53 8 Image and select local connection 15:53 8 Image and select local connection Image and select local with still Image and select local with still Image and select local with still Image and select local with still Image and select local with still Image and select local with still Image and select local with still Image and select local with still Image and select local with still with still Image and select local with still with still Image and select local with still with	connect



10.3.2 Create Site





location. <i>NMI:</i> Enter the identification number of your electricity meter. (optional input items)		
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C Gateway Inverter	K Network Settings	
Device Info		
SN Code: ECDA3BB870EC	*Wifi SSID Wifi SSID	
Firmware Version: 10.0 Wifi Status: Connected	*Password Will Password	
Wifi Name: CSE-SYS1		
Service Address: mqtt.lot.solarcse.com	Connect To The Network	
COMM Status: Online		
Baud Rate: 115200		
Client Identity: LAVO-AI01-G1		
Refresh Time: 09-20 15:52:54		
Network Settings Refresh Device Settings More		
8. Select the Network Setting	9. Enter your local WIFI info	

CAUTION Make sure the WIFI connected is 2.4GHz, if not, that is not work.

10.3.3 Increasing PCS in Your Site

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Site PCS ⊕	<	K Manage
Q. Site Name/Inverter SN	Home Weather	
All Normal Alarm Offline Unmoni	0 kW >> Pv Power Site Map	
Latest installation date 🔹 🛇		联调实验室-低压一体机 篇 2024-04-09 ● 10.0 kWp=
● Online ♡ … 高压一体机3008		♥ 中国-上海市-松江区
PV Power 0 kW Daily Energy 0.0 kWh Total Energy 632.09 kWh Creation 2024-09-10		ID 531974 Copy UserType Installer-Admin
© 我		Owner Information Username admin@cse
• Online 🗢	0.315 kW > -5.038 kW > -4.722 kW > Battery	Phone Number 8615055406274 📞
实验室10kw分体机 PV Power 0 kW Daily Energy 35.97 kWh	Peak-Load-shift	Installer Information
Total Energy 3335.98 kWh Creation 2024-09-04	Generation Statistics 181.73 kwh 1413.19 kwh 1413.23 kwh	Contact admin@cse Company 科大数能
	Month Year Total	Phone Number +8615055406274 📞 Email cse@qq.com
ZhanoVIP Home	I Electricity Purchase Statistics	Device Info
Home Manage Service Me	Home Device Analysis Battery	*PCS 2 >
1. Select the one of site	2. Select the <i>Manage</i>	3. Select the PCS



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< Device	≝ ⊕	<	Add PCS	
Online		SN Code		
CSEAI015KG12331016		Please input	8	
CSEAIO15KG123 PV Power	0 kW	Connected com	ponent power	
Total Energy	0.0 kWh 1413.23 kWh	Please input	kWp	
Online		*Alias Name		
LAVO-AIO1-G1_CSEAIO15KG12 CSEAIO15KG124	 03070	Please input		
- PV Power Daily Energy	0 kW 0.0 kWh			6
Total Energy	0.0 kWh		Save	l,
	_			
Select the +		5. Enter your ir	formation	

10.3.4 Mode Setting

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Online CSEAIO3AKG12413001 CSEAIO3AKG12413001 PV Power Do00 kW Daily Energy 3.03 kWn Total Energy 294.28 kWn	Conline CSEAI03AK012413001 PV Power Jonergy Jon SkWh Total Energy 294.28 kWh	Device Manage
• Online	• Online	Overview Battery
CSERH310KG12343007 CSERH310KG1243007 CPU Power Daily Energy 0.0 KWh で実施室10Kw分母病	CSERH310K012343007 CSERH310K012343007 PV Power 0 kW Daily Energy 0.0 kWh です 実験室10kw分件乳	PV Grid
Online CSEAI015K012331016 CSEAI015K012331016 ON Drawner	Online CSEAIOTSK012331016 CSEAIOTSK012331018 DV Denase CSEAIOTSK012331018 DV Denase CSEAIOTSK012331018 DV Denase	Load Parameter
1. Select the PCS	2. Select the <i>the one of Site</i>	3. Select the Parameter



16:45 g A October the a Marcia Doctober 10 16:45 g Parameter Mode Setting Mode Setting Meter Setting Diagnostic Info	16:46 8 uit © E) ✓ Mode Setting Ø Power Limited 100 % App Mode Peak-Load-Shift VPP Grid Power 5000 w Please Select I Self-Consume: I Peak-Load-Shift I Backup I Passive: I VPP I Confirm 00 00 2rd Charge End Time 00 00 3rd Charge Start Time 00 00 3rd Charge Ford Time 00 00 3rd Charge Ford Time 00 00	16:46 B All P Mode Setting Power Limited 100 % App Mode Peak-Load-Shift > VPP Grid Power 5000 w VPP Mode Discharge > Charge Time Enable Therd Ist Charge Start Time 16:00 0 Ist Charge Start Time 100 % C 2nd Charge Power Time 0% C 2nd Charge End Time 0.000 C 3rd Charge Start Time 00:00 C 3rd Charge Start Time 0% C 3rd Charge Start Time 0% C C C
4. Select the <i>Mode Setting</i>	5. Select the mode as your needs	<i>Power Limited:</i> AC output power, This function takes precedence over VPP function, except <i>Exp Power</i> <i>Limit En</i>
16:46 B ut P C Mode Setting Power Limited 100 % App Mode Peak-Load-Shift VPP Mode Discharge Charge Time Enable Discharge First Second Thid Ist Charge Start Time 18:00 Ist Charge Start Time Ist Charge Start Time 18:00 Ist Charge Start Time Ist Charge Start Time 00:00 Ist Charge End Time Ist Charge Start Time 00:00 Ist Charge Start Time 00:00 Ist Charge End Time 00:00 Ist Charge End Time 00:00 Ist Charge Start Time Ist Charge Start Time 00:00 Ist Charge Start Time <td>Node VPP App Mode VPP VPP Orid Power 5000 w VPP Mode Discharge Please Select StandBy Charge 0 Discharge 0 Znd Charge End Time 00:00 3rd Charge Start Time 00:00 3rd Charge Power Time % You can set the system to charge or discharge, and then the inverter will</td> <td>18:46 B </td>	Node VPP App Mode VPP VPP Orid Power 5000 w VPP Mode Discharge Please Select StandBy Charge 0 Discharge 0 Znd Charge End Time 00:00 3rd Charge Start Time 00:00 3rd Charge Power Time % You can set the system to charge or discharge, and then the inverter will	18:46 B
power can be set	initiate the corresponding action. Or when the system is scheduled by local grid government, the charge and discharge status will be displayed in this page	Load Shift mode



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K Network Setting	K Network Setting	K Battery Settings
Inverter Safety Code	Inverter Safety Code	Batt Capcity 200 AH
country		Batt Protection High 60 V
Australia	Exp Power Limit En Disable >	O Batt Protection Low 46 V
Austria Belgium	10 mino OBV	Batt Open Voltage 36 V
Brazil	2 2nd Grid OPV 270 V	O Batt Low Voltage 42 V
Denmark	2nd Overvoltage Disconnection 180 ms	Batt DOD 95.%
Finland	Grid OPV 266 V	Batt Charge Current Limit 100 A
Overvoltage Disconnection Time 1000 ms	Overvoltage Disconnection Time 1000 ms	Batt DisCharge Current Limit 100 A
Grid UPV 180 V	Grid UPV 180 V	Max Batt Chg Power from Grid 5250 W
 Undervoltage Disconnect Time 10000 ms 	Undervoltage Disconnect Time 10000 ms	Max Batt Dischg Power to Grid 5250 W
2nd Grid UPV 70.V	2nd Grid UPV 70 V	Batt SOC Set_High 100 %
2nd Undervoltage Disconnection 1600 ms Time	2nd Undervoltage Disconnection 1500 ms	Batt SOC Set_Low 13 %
O 2nd OFP 55 Hz	2nd OFP 55 Hz	Backup Mode SOC Reserve Value 80 %
O 2nd Apply Setting Disconnection time 160 ms	Apply Setting Disconnection time 160 ms	(Apply Setting
Grid OFP 51 Hz	Grid OFP 51 Hz	
Parameter-Network Setting:	Exp Power Limit En:	Batt SOC Set High: Battery cutoff
Set the local standard grid	Enable/Disable	charge SOC
requirements	Exp Power Limit ctrl: Set the power	Batt SOC Set Low: Battery cutoff
	feeds to grid	discharge SOC
	This function takes precedence over	Backup Mode SOC Reserve
	Power Limited function.	<i>Value</i> : Minimum SOC value for
		battery retention in backup mode
14:23 〇 個面本(以下完計)	14-22 🖸 🗴 🕫 🛙 🖉 🕏 👔 🐨	
K Factory Data	< Battery Settings	
SN ATE	Batt Protocol CSE-CAN >	
O PCATE	Batt Capcity 100 AH	
Clean Power Please Select >	Batt Protection High 60 V	
Clean Data Please Select >	O Batt Protection Low 46 V	
Reset Please Select >	O Batt Open Voltage 36 V	
Clean History Record Please Select >	O Batt Low Voltage 42 V	
O InvOnOff Please Select >	Batt DOD 87 %	
BackupEnable Enable	O Batt Charge Current Limit 100 A	
	Batt DisCharge Current Limit 100 A	
	Max Batt Chg Power from Grid 5250 W	
	O Max Batt Dischg Power to Grid 5250 W	
	O Batt SOC Set_High 100 %	
	Batt SOC Set_Low 13 %	
	Backup Mode SOC Reserve 80 %	
Mppy setting		
BackupEnable: Turn on/off if the	Battery capacity: Default parameter	
backup terminal is connected to load	is 100AH. The system is two packs	
or not.	200AH.	



10.3.5 Grid Setting of Inverter

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Site PCS ①	Site PCS	<
Q Inverter Name/SN	Q Inverter Name/SN 🛛	CSEAI015
All Normal Alarm Offline Unmonito	All Normal Alarm Offline Unmonito	• online
9 • 6 • 3 • 1 • 0	<u>9</u> • 6 • 3 • 1 • 0	44.0 % soc
Earliest installation date 👻	Earliest installation date 🔻	
Online CSEAI03AK012413001 CSEAI03AK012413001 PV Power 0.00 kW Daily Inergy 3.03 kWh Total Energy 294.28 kWh Seatese are are.	Conline CostAiO3AK012413001 CSEAIO3AK012413001 Davie Dentry Dower Davie Dentry 3.03 kWh Total Energy 294.28 kWh	Device Manage
Online CSERH310KG12343007	Online CreserH310KG12343007	Overview Battery
CSERH310K612343007 PV Power 0 kW Daily Centgy 0.0 kWh Total Energy 0.0 kWh 考測量tokw分枠机	CSERH310K012343007 PV Power 0 kW Daily Energy 0.0 kWh Total Energy 0.0 kWh	* * PV Grid
Colline Colline CSEAUOISK012331016 CSEAUOISK012331016 DY Downey DY DOWN	Online Online CSEAI015K012331016 SURAINUK012331016 SURAINUK012331016 Oli Annuk Oli An	Load Parameter
Home Manage Service Me	Home Manage Die Me	
Select the PCS	2. Select the <i>the one of Site</i>	3. Select the <i>Parameter</i>
16:45 🖪 🛛 🖬 🗢 🔲	13:25 🔐 😪 🔳)	13:26 all 🕈 🛋
A Parameter A P	Ketwork Setting	K Network Setting
	Inverter Safety Code	Inverter Safety Code
Battery Settings Mode Setting	Australia ~ AS4777_Reg ~	Australia - AS4777_Re
	country	NB_T32004
0 0	Australia	AS4777_Region_A
Network Setting Meter Setting	Austria	G83
	Bergium	C10_11
o o	Diazii	EN50438_DK
Factory Data Diagnostic Info	Finland	G59
		EN50438_NL
	Overveltage Disconnection Time 1000 ms	Discover Discover 200 v
		Time 1000 ms
	C Grid UPV 180 V	Grid UPV 180 V
	 Undervoltage Disconnect Time 10000 ms 	Undervoltage Disconnect Time 10000 ms
	2nd Grid UPV 70 V	
	C 2nd Undervoltage Disconnection 1500 ms	
		Disconnection Time 1500 ms
	2nd 0++ Apply Setting Disconnector time 0 cried 0+P 51+12	2nd Osen 2nd Osen 2nd Overwegening Disconnection time 160 ms
Select the Network Setting	5. Tap the <i>Inverter Safety Code</i>	6. Select the region_A or B or C
	Select the country: Australia	



100mm - 8. 00m		
K Network Setting	14:02 all 🗢 🗈	13:4911 56 E
Inverter Safety Code	C Network Setting	Network Setting
Australia - AS4777_Re	Grid UPV 180 V	Australia ~ AS4777_Re ~
Exp Power Limit En Disable >	2nd Grid UPV 70 V	Reactive Value Please En
O Exp Power Limit ctrl 0 W	2nd Undervoltage 1500 ms	Reactive Mode Capacitive Power Fac >
O 10 mins OPV 255 V	2nd OFP 55 Hz	Safety Mode Ctrl
O 2nd Grid OPV 270 V	2nd Overfrequency Disconnection time 160 ms	Power_RateMod_EN Volt_wattMod_EN
O 2nd Overvoltage Disconnection 180 ms	Grid OFP 51 Hz	Fre_wattMod_EN Fre_BattMod_EN
O Grid OPV 266 V	Over Frequency Disconnect 160 ms	Volt_BatMod_EN DRMx_Mod_EN LVFRT_En
Overvoltage Disconnection 1000 ms	Grid UFP 47 Hz	FeedCtrl_HardLimit_EN
O Grid UPV 180 V	Under Frequency Disconnect 1000 ms	C Exp Power Limit En Disable >
Undervoltage Disconnect Time 10000 ms	2nd Grid UFP 45 Hz	Exp Power Limit ctrl 0 W
2nd Grid UPV 70 V	Disconnection Time 1000 ms	0 10 mins OPV 255 V
2nd Undervoltage 1500 ms Disconnection Time	SOLimit 400 kΩ	O 2nd Grid OPV 270 V
2nd OEP 55 Hz	Apply Setting	2nd Apply Setting 180 ms
Disconnection time 160 ms		O Grid OPV 266 V
7. You can adjust the grid protection	8. You can adjust the grid protection	9. You can set the power quality
setting:	settina:	response modes: select multiple
OBV: Over veltage protection	OEP: Over frequency protection	ontions under the Safaty Mode Ctrl
UPV: Under-voltage protection	UFP: Under-frequency protection	and then click apply setting.
	ISO limit: isolation resistance limit	<i>Power_RateMod_EN</i> : enable the
		limitation of the power output
		according to grid's requirements.
		volt wattMod EN: enable the
		adjustment of the inverter's output
		power in response to grid voltage
		variation.
		Fre_wattMod_EN:enable the
		adjustment of the inverter's output
		power in response to arid frequency
		Fre BatMod EN: enable the
		- diverse at a fithe an annu at an an
		adjustment of the energy storage
		battery's power in response to
		different grid frequency
		volt_BatMod_EN: enable the
		adjustment of the energy storage
		hattery's power in response to
		different grid volto
		DRMX_MOd_EN: enable the DRM 0
		function
		LVFRT_EN: enable low grid voltage
		ride through to keep the inverter still
		working
		Frozontinior EN: anable this
		FIOZENOIIDIECUOII_EN: enable this
		tunction means switching between
		charging and discharging is not







10.3.6 Inverter settings Overview

14:21 etf < • Site PCS Site Name/Inverter SN All Normal Alarm Offline Unmonito 6 • 1	14:22 I C Device Online CSEAIO15KG12331016 CSEAIO15KG12331016	14:22 If ♥ ■) ✓ PCS Detail I Generation Statistics Generated Electricity 1413.23kWh Feed-In Electricity 1585.84kWh
Latest installation date 👻 🛇	PV Power 0 kW Daily Energy 0.0 kWh Total Energy 1413.23 kWh	Load Statistics Load Electricity 239.53kWh
 ● 第Ⅲ第末 ● Online ○ ···· 联调实验室:任任一体机 	Online LAVO-AIO1-01_CSEAIO15K012 CSEAIO15K012403070 PV Power 0.06 kW	Purchased Electricity 533.58kWh I Base Info Model 5k
Construction Construction	Dally Energy 0.0 KWh Total Energy 0.0 KWh	Rated Power 5.0KW Name CSEAI015KG12331016 Site 联络正确的,仍在一体的
Online Construct To the former Construction PV Power Construction Daily Energy S364.024 Wh Creation 2024-03-04		SN Code CSEAIO16K012331016
Home Manago Service Me	Home Device II. È Device Analysis Battery	ARM Version: 0.023 IPV Info PV1 0.0.4 0.0.4
1. Select <i>the one of Site</i>	2. Select the Device and tap one of	3. You can see the PCS Detail;
	PCS	Safety Regulation Code: you can
		see the Country.Grid.Code/Region
		settings.
		DSP version & ARM version: you
		can see the inverter firmware version

10.4 For Home User 10.4.1 Create Site

15:29If 5G 🖾	15:31 .11 56 🚱	15:40 all 56 🖽
test1234 Home 👻 🚥	Supplementary Site Info	< ۹
PV KW	Please input SN code [0] Site Name Please input	Discovered 0 Device
	*Site Capacity Please mput KWp *Country/Region Please Select >	
Please complete the site information first	*Time Zone Please Selact > *Address Please input ♥	"Solar CSE" Would Like to Use Bluetooth Want to turn o your Bluetooth in order to connect the communication sitks for
Cancel Replenish Info	NMI Please input Numeric and alphabetic 10- or 11-bit strings	Don't Allow Allow
1 Generation Statistics	Replenish Info	
kWh KWh kWh Month Year Total		
I Electricity Purchase Statistics		
1. Replenish info	2. Enter your information	3. Allow



15:51 B	15:52 টি ati ⊽ ■⊃ ズ Gateway inverter	15:53 🖁 an 🗢 ■) X Network Settings
Discovered 6 Device SmartDongle_6055F984E9E8 signal: -98 SmartDongle_ECDA3B8870EC signal: -96 SmartDongle_ECDA3B885888	I Device Info SN Code: ECDA388870EC Firmware Version: 1.0.0 Wifi Status: Connected Wifi Name: CSE-SYS1 Service Address: mqtLiot.solarcse.com COMM Status: Colline	*Wifi SSID Wifi SSID *Password Wifi Password Connect.To The Network
signal: -90 SmartDongle_58CF79DF4960 signal: -96	Baud Rate: 115200 Client Identity: LAVO-AI01-61 Refresh Time: 09-20 15:52:54	
SmartDongle_6055F9855EEC Connect	Network Settings Refresh Device Settings More	
Select the right device to connect	5. Select the <i>Network Setting</i>	6. Enter your local WIFI info

10.4.2 Increasing PCS in Your Site

15	5:46		.ıl 5G 國			15:46		.ill 5G 💷
		Device	* 🙂		<	N Code	Add PCS	
 Offli 3013p 	line xcs		·		P	Please input		Ξ
	-	CSEAIO3AKG12413013 PV Power			+C	Connected comp	onent power	
	_	Daily Energy Total Energy	0.0 kWh		P	Please input		kWp
					•A	lias Name		
					P	Please input		
					-		and the second	
							Save	
ŧ		📒 th	ւհ					
Home	0	Device Analysis	Me			_		
Select <i>E</i>	Dev	ice, then	click	+ :	2. Enter	your in	fo	



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User Manual V4.6

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10.4.3 WIFI Dongle Local Connection

1. Home-Local connection 2. Select the right WiFi device to connect 3. Select the Network Setting Image: Image	15:50	15:51 🛚	15:52 🛢 🔐 🔐 🗣 🔳)
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1. Home-Local connection 2. Select the right WiFi device to connect 3. Select the Network Setting Image: Image	Add Site	SmartDongle_ECDA2RP970EC	Wifi Status: Connected
I. Home-Local connection 2. Select the right WiFi device to connect 3. Select the Network Setting I. Home-Local connection 2. Select the right WiFi device to connect 3. Select the Network Setting I. Home-Local connection I. Select the right WiFi device to connect I. Select the right WiFi device to connect I. Home-Local connection I. Select the right WiFi device to connect I. Select the right WiFi device to connect I. Select the right WiFi device to connect I. Select the right WiFi device to connect I. Select the Network Setting I. Select the right WiFi device to connect I. Select the right WiFi device to connect I. Select the Network Setting I. Select MiFi info and the patyork is configured to connect I. Select the right WiFi device to connect I. Select the Network Setting I. Select MiFi info and the patyork is configured to connect I. Select the right WiFi device to connect I. Select the right WiFi device to connect I. Select MiFi info and the patyork is configured to connect I. Select the right WiFi device to connect I. Select the right WiFi device to connect I. Select MiFi info and the patyork is configured to connect I. Select the right wifi device to connect I. Select the right wifi device to connect	Local Connection	signal: -96	Wifi Name: CSE-SYS1
Image: Constraint of the second se		SmartDongle_ECDA3BB858B8	COMM Status: Online
Image: Section setting secting section secting secting section setting section setting section		signal: -90	Baud Rate: 115200
Image: Section of Sectio		SmartDongle_ECDA3BB87158 Connect	Client Identity: LAVO-AIO1-G1
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Image: Description of the set inside of the set insid	0.0 kWh 0.0 kWh 0.0 kWh	signal: -93	Network Settings Refresh
Image:	Month Year Total		Device Settings More
1. Home-Local connection 2. Select the right WiFi device to connect 3. Select the Network Setting 5538 Image: Connect in the image:	Electricity Purchase Statistics		
1. Home-Local connection 2. Select the right WiFi device to connect 3. Select the Network Setting 1553 Image: Connect in the image: Connect image: Conn	Home Device Analysis Me		
1. Home-Local connection 2. Select the right WiFi device to connect 3. Select the Network Setting 1. 100000000000000000000000000000000000			2
Image: second	1. Home-Local connection	2. Select the right WiFi device to	3. Select the Network Setting
15538 100 Network Settings 100 Passed 100 Passed 100 Image: Set 100 Miles 100 4. Enter your local WIFI info and the patwork is configured successfully. 100		connect	
Image: Set in the set	15:53 🖬 🚽 🗢 🗩		
WW 58D WI 500 *Passed WI 500 Image: Second state Second state 4. Enter your local WIFI info and the patwork is configured successfully.	Network Settings		
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	*Wifi SSID Will SSID		
Password With Password Connect for Two Mutuos 4. Enter your local WIFI info and the network is configured successfully.			
Exect to treate A. Enter your local WIFI info and the network is configured successfully	*Password Wifi Password		
4. Enter your local WIFI info and the network is configured successfully.	Connect To The Network		
4. Enter your local WIFI info and the network is configured successfully.			
4. Enter your local WIFI info and the network is configured successfully.			
4. Enter your local WIFI info and the network is configured successfully.			
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network is configured successfully	4. Enter your local WIFI info and the		
	network is configured successfully		



10.4.4 Inverter settings Overview

14:22 대 후 🗉)	15:58 all 56 	
✓ Device	< PCS Detail	
	Purchased Electricity Awit	
• Online ····	I Base Info	
CSEAIO15KG12331016	Rated Power 10 0kW	
Daily Energy 0.0 kWh Total Energy 1413.23 kWh	Name 3013pcs	
Opline ···	Site IK.	
LAVO-AIO1-G1_CSEAIO15KG12	SN Code CSEAIO3AKG12413013 🔞	
CSEAI016KG12403070 PV Power 0.06 kW	Safety Regulation Code: cNB_T32004 🗇	
Daily Energy 0.0 kWh Total Energy 0.0 kWh	Smart Dongle SN: 🖺	
	DSP Version: 1.311	
	ARM Version: 0.015	
	I PV Info	
	PV1 V A W	
	Load Info	
	Load Power W	
Home Device Analysis Battery	V/A/F V A Hz	
	Battery Into Battery State Ready	
1. Select <i>device</i> , then choose the	You can see the PCS Detail:	
and of your page	Sofety Pergulation Code you con	
one of your pcs	Salety Regulation Code: you can	
	see the Country.Grid.Code/Region	
	settings.	
	DSP version & ARM version: you	
	can see the inverter firmware version	

11 Fault Diagnosis and Solutions

No.	Error	Cause	Solutions
1	Relay Err.	 The relay is abnormal or short-circuited. The control circuit is abnormal. The AC cable connection is abnormal, like a virtual connection or short circuit. 	 Disconnect PV input switch and check the AC cable, then reconnect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
2	GFCI Device Err	The sampling of the GFCI CT is abnormal.	Contact the dealer or after-sales service.
3	Fan Err	 The fan power supply is abnormal. Mechanical exception. The fan is aging and damaged. 	Please contact your dealer or after-sale service.
4	Eeprom Err	The internal memory Flash is abnormal.	Please contact your dealer or after-sale service.



5	Lost Com.M<->S Err	Communication internal	Please contact your dealer or after-sale service.
6	ISO Err	The grounding impedance of PV system is below the allowable range.	 Check whether the PV input cables are broken. Check whether the module frames and the metal bracket are securely grounded. Check whether the AC side is properly grounded.
7	Temp.High Err	 The inverter is installed in a place with poor ventilation. The ambient temperature is too high. A fault occurs in the internal fan of the inverter. 	 Check the ventilation and the ambient temperature at the installation point. If the ventilation is poor or the ambient temperature is too high, improve the ventilation and heat dissipation. Contact the dealer or after-sales service if both the ventilation and ambient temperature are normal.
8	Temp.Low Err	 The inverter is installed in a place with poor ventilation. The ambient temperature is too low. 	Please contact your dealer or after-sale service.
9	Bus Volt.High Err	 The PV voltage is too high. The sampling of the BUS voltage is abnormal. 	 Disconnect PV input switch and check the PV voltage, then reconnect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
10	GFCI Err	The input insulation reactance to the ground is below the allowable range when the inverter is operating.	 Check whether the working environment of the inverter meets the requirements. For example, the fault may occur due to high humidity on rainy days. Make sure that the components are properly



			grounded and the AC side is properly grounded.
11	DCI Err	The machine detects that the DC component of the internal output current exceeds the normal range.	Check the components and wiring.
12	HWBus Volt.High Err	The hardware of the BUS circuit is abnormal.	Please contact your dealer or after-sales service.
13	HWPV Curr.High Err	The hardware of the PV circuit is abnormal.	Please contact your dealer or after-sales service.
14	HWInv Curr.High Err	The hardware of the inverter circuit is abnormal.	Please contact your dealer or after-sales service.
15	Inv Short Err	 Short circuit in power grid input. Backup output. The hardware is abnormal. 	 Disconnect PV input switch, check the AC cable and load, then reconnect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
16	Over Load Err	 Overload. Circuit abnormality. 	Please contact your dealer or after-sales service.
17	PV1 Volt.High Err	Excess PV modules are connected in the series, and the open-circuit voltage is higher than the operating voltage.	 Check whether the PV string input voltage is consistent with the value displayed on the LCD. Check whether the PV string voltage meets the maximum input voltage requirements.
18	PV2 Volt.High Err	Same as above.	Check the voltage and contact support if necessary.
19	PV1 Curr.High Err	 Temporary abnormality is caused by environmental factors. Internal components of the inverter are damaged. 	Please contact your dealer or after-sales service.
20	PV2 Curr.High Err	Same as above.	Please contact your dealer or after-sales service.
21	Inv Curr.High Err	 The sampling of the inverter is abnormal. Internal components of the inverter are damaged. Overload. 	Please contact your dealer or after-sales service.



22	Grid Volt.High Warn	The utility grid voltage is out of the allowed range.	 Make sure that the grid voltage is within the allowed range. Make sure that the phase sequence of the AC cables are connected correctly, and the neutral wire and PE cable are connected properly and firmly. Contact the dealer or after-sales service if the grid voltage is within the permissible range.
23	Grid Volt.Low Warn	The utility grid voltage is out of the allowed range.	Same as above.
24	Grid Freq.High Warn	Utility grid exception. (The actual grid frequency change rate does not meet the requirement of the local grid standard.)	 If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. If the problem occurs frequently, check whether the grid frequency is within the permissible range. Contact the local power company if the grid frequency exceeds the permissible range. Contact the dealer or the after-sales service if the grid frequency is within the permissible range.
25	Grid Freq.Low Warn	Utility grid exception.	1. Same as Grid Freq.High Warn.
26	Grid Loss Warn	 Utility grid power fails. The AC cable is disconnected. 	 The alarm is automatically cleared after the grid power supply is restored. Check whether the AC cable is connected. Make sure that the grid
21	Gria voit.10min Warn	voltage in the power grid	1. Wake sure that the grid



		exceeds allowed range for 10 mins.	 voltage is within the allowed range. 2. Make sure that the phase sequence of the AC cables are connected correctly, and the neutral wire and PE cable are connected properly and firmly.
			the after-sales service if the grid voltage is within the permissible range.
28	Over Load Warn	1. Overload 2. Circuit abnormality	 Disconnect PV input switch, check the AC cable and load, then reconnect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
29	Bat Input Short Err	 Battery input short circuit. Circuit abnormality. 	 Disconnect PV input switch, check the battery cable, then reconnect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
30	Bat Volt.High Err	Battery voltage above allowable range.	 Disconnect PV input switch, check the battery, then reconnect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
31	BusSoftTimeOut Err	Inverter is abnormal.	 Disconnect PV input switch, then reconnect 5 minutes later. Please contact your dealer or after-sales service.
32	Lost Com.M<->S Err	Communication internal Inverter is abnormal.	Please contact your dealer or after-sales service.
33	Bus Volt.High Err	1. The PV voltage is too high.	1. Disconnect PV input switch and check the PV



		2. The sampling of the	voltage, then reconnect
		BUS voltage is abnormal.	them 5 minutes later.
			2. Contact the dealer or
			the after-sales service if
			the problem persists.
		1. The judgment results of	
24		the master-slave control	Please contact your dealer
34	BUS VOIT.CONSIS EIT	chip are inconsistent.	or after-sale service.
		2. Chip is abnormal.	
			1. Disconnect PV input
			switch, check the load
			cable and load, then
25	Out has set Fire	Misconnection of power	reconnect them 5 minutes
30	Out insert En	grid to load interface.	later.
			2. Contact the dealer or
			the after-sales service if
			the problem persists.
26	Inv Mayo Err	1. Overload.	Please contact your dealer
50		2. Inverter is abnormal.	or after-sale service.
			Disconnect PV input
		The instantaneous value of	switch, then reconnect 5
37	CHG1 Curr Err	charging current is too	minutes later. Please
		high.	contact your dealer or
			after-sale service.
20		Inverter is abnormal	Please contact your dealer
50			or after-sale service.
		1. The judgment results of	
30	Grid Volt Consis Warn	the master-slave control	Please contact your dealer
		chip are inconsistent.	or after-sale service.
		2. Chip is abnormal.	
		1. The judgment results of	
40	Grid Fred Consis Warn	the master-slave control	Please contact your dealer
	Charroq.conoio main	chip are inconsistent.	or after-sale service.
		2. Chip is abnormal.	
			1. Disconnect PV input
			switch, check the BMS
			communication link, check
		BMS communication link is	communication protocol
41	Bms Com Lost Warn	abnormal	settings, then reconnect
			them 5 minutes later.
			2. Contact the dealer or
			the after-sales service if
			the problem persists.
42	Battery Open Warn	1. The battery is not	1. Disconnect PV input



		reliably connected.	switch, check the battery
		2. The battery voltage is	cable and battery voltage,
		too low.	then reconnect them 5
			minutes later.
			2. Contact the dealer or
			the after-sales service if
			the problem persists.
40	Detter / Ded Were	The battery voltage is too	1. Same as Battery Open
43	Ballery Dod Warn	low.	Warn.
11	Battery Low Warn	The battery voltage is too	Same as Battery Open
44	Dattery Low Warn	low.	Warn.
			1. Disconnect PV input
		1 The PV voltage is too	switch and check the PV
		high	voltage, then reconnect
33	Bus Volt.High Err	2 The sampling of the	them 5 minutes later.
		BUS voltage is abnormal	2. Contact the dealer or
			the after-sales service if
			the problem persists.
		1. The judgment results of	
.34	BUS Volt Consis Err	the master-slave control	Please contact your dealer
		chip are inconsistent.	or after-sale service.
		2. Chip is abnormal.	
			1. Disconnect PV input
			switch, check the load
			cable and load, then
35	Out Insert Err	Misconnection of power	reconnect them 5 minutes
00	Out moort En	grid to load interface.	later.
			2. Contact the dealer or
			the after-sales service if
			the problem persists.
36	Inv Wave Frr	1. Overload.	Please contact your dealer
		2. Inverter is abnormal.	or after-sale service.
			Disconnect PV input
		The instantaneous value of	switch, then reconnect 5
37	CHG1 Curr Err	charging current is too	minutes later. Please
		high.	contact your dealer or
			after-sale service.
38	CHG2 Curr Frr	Inverter is abnormal	Please contact your dealer
			or after-sale service.
		1. The judgment results of	
39	Grid Volt Consis Warn	the master-slave control	Please contact your dealer
		chip are inconsistent.	or after-sale service.
		2. Chip is abnormal.	
40	Grid Freq.Consis Warn	1. The judgment results of	Please contact your dealer



		the master-slave control	or after-sale service.
		chip are inconsistent.	
		2. Chip is abnormal.	
			1. Disconnect PV input
			switch, check the BMS
			communication link, check
		DMC communication link in	communication protocol
41	Bms Com Lost Warn	BINS communication link is	settings, then reconnect
			them 5 minutes later.
			2. Contact the dealer or
			the after-sales service if
			the problem persists.
	Battery Open Warn		1. Disconnect PV input
			switch, check the battery
		1. The battery is not	cable and battery voltage,
12		reliably connected.	then reconnect them 5
42		2. The battery voltage is	minutes later.
		too low.	2. Contact the dealer or
			the after-sales service if
			the problem persists.
43	Battery Dod Warn	The battery voltage is too	1. Same as Battery Open
UT		low.	Warn.
11	Pottony Low Mars	The battery voltage is too	Same as Battery Open
44 Battery Low Warn	low.	Warn.	