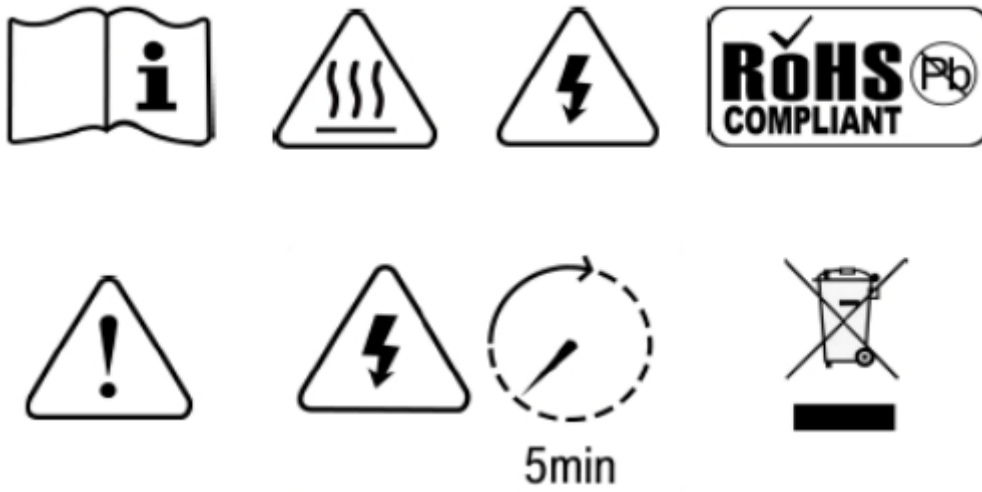


Kinergier Pro Series Inverter Charger

A4.0



WARNING: HIGH VOLTAGE INSIDE

CAUTION: THE DC FUSE MUST HAVE BEEN TURNED OFF BEFORE SERVICING

MADE IN CHINA

Disclaimer

Unless specially agreed in writing, TBB Power Co.,Ltd

- Take no warranty as to the accuracy, sufficiency of suitability of any technical or other information provided in this manual or other documentation.
- Assumes no responsibility or liability for loss or damage, whether direct, indirect, consequential or incidental, which might arise out of the use of such information.
- TBB offer standard warranty with its products, taking no responsibility for direct or indirect loss due to equipment failure.

About this Manual

This manual describes our product features and provides procedure of installations. This manual is for anyone intending to install our equipment.

General Instruction

Thanks for choosing our products and this manual were suitable for Kinergier Pro Inverter Charger. This chapter contains important safety and operation instructions. Read and keep this User Guide well for later reference.

The Kinergier Pro Inverter Charger needs to be installed by professionals and please pay attention to the following points prior to installation:

Please check the input voltage or voltage of battery is same to the nominal input voltage of this inverter.

- Please connect positive terminal “+” of battery to “+” input of the inverter.
- Please connect negative terminal “-” of battery to “-” input of the inverter.
- Please use the shortest cable to connect and ensure the secure connection.
- While connecting, please secure the connection and avoid short cut between positive terminal and negative terminal of battery, which will cause damage of battery.
- Inverter will have high voltage inside. Only authorized electrician can open the case.
- The inverter WAS NOT designed to use in any life retaining equipment.

Contents

1. General Safety Instruction	1
1.1 Safety instruction.....	1
1.2 General precaution.....	1
1.3 Precaution regarding battery operation	1
2. Instruction	2
2.1 Brief Instruction.....	2
2.1.1 General Description	2
2.1.2 Naming Rules	2
2.2 Structure	3
2.2.1 Front.....	3
2.2.2 Control panel	3
2.2.3 Connection compartment.....	5
2.2.4 Dimension.....	6
2.3 Function	7
2.3.1 DC Couple and AC Coupled PV System.....	7
2.3.2 Parallel and Three phase.....	7
2.3.3 Power control and Power assist.....	7
2.3.4 System working mode	7
2.3.5 Built-in load management	7
2.3.6 Powerful and Reliable Inverter.....	7
2.3.7 Professional Battery Charger.....	8
2.3.8 Transfer	10
2.3.9 Protect function.....	10
2.3.10 Communication	11
3. Installation and Wiring.....	12
4. Configuration	13
4.1 Check before Operation.....	13
4.2 Power ON Test.....	13
4.3 Power OFF	13
4.4 Setup Wizard	14

5. Operation.....	15
5.1 Menu introduction	15
5.2 Initial interface.....	16
5.3 Main Menu.....	16
5.4 Tier one menu - Information query interface.....	17
5.5 Tier one menu - configuration interface.....	19
5.5.1 General operation instruction.....	19
5.5.2 Parameter set.....	21
5.6 User control.....	30
5.6.1 ACin Logic	30
5.6.2 Relay Function.....	32
5.6.3 AGS Driver	33
5.6.4 ACout2 Logic.....	35
5.6.5 Screen Set.....	36
5.6.6 Date & Time.....	36
5.6.7 Trigger Command.....	36
6. FAQ.....	37
6.1 Error code	37
6.1.1 Inverter Error	37
6.1.2 MPPT Error.....	38
6.1.3 BMS Error.....	38
6.2 Warning code.....	39
6.2.1 Inverter Warning	39
6.2.2 MPPT Warning	40
6.2.3 BMS Warning.....	41
6.2.4 BGK Warning.....	41
7. Specification	42

1. General Safety Instruction

1.1 Safety instruction

As dangerous voltages and high temperature exist within the Kinergier Pro Inverter Charger, only qualified and authorized maintenance personnel are permitted to open and repair it. Please make sure Kinergier Pro Inverter Charger is turned off before opening and repairing it.

This manual contains information concerning the installation and operation of the Kinergier Pro Inverter Charger. All relevant parts of the manual should be read prior to commencing the installation. Please follow the local stipulation meantime.

Any operation against safety requirement or against design, manufacture, safety standard are out of the manufacturer warranty.

1.2 General precaution

- DO NOT expose to dust, rain, snow or liquids of any type. It is designed for indoor use. DO NOT block off ventilation, otherwise the Kinergier Pro Inverter Charger would be overheating.
- To avoid fire and electric shock, make sure all cables selected with right gauge and being connected well. Smaller diameter and broken cable are not allowed to use.
- Please do not put any inflammable goods near to inverter.
- NEVER place unit directly above batteries because gases from a battery will corrode and damage Kinergier Pro Inverter Charger.
- DO NOT place battery over Kinergier Pro Inverter Charger.

1.3 Precaution regarding battery operation

- Use plenty of fresh water to clean in case battery acid contacts skin, clothing, or eyes and consult with doctor as soon as possible.
- The battery may generate flammable gas during charging. NEVER smoke or allow a spark or flame in vicinity of battery.
- DO NOT put the metal tool on the battery because spark and short circuit might lead to explosion.
- REMOVE all personal metal items such as rings, bracelets, necklaces, and watches while working with batteries. Batteries can cause high enough short-circuit current to make metal melt, and could cause severe burns.

2. Instruction

2.1 Brief Instruction

2.1.1 General Description

Kinergier Pro is the new generation inverter charger designed for various type of off grid system including AC Coupled PV System, DC Coupled PV System and generator hybrid system. It can provide UPS class switching speed and capability to support parallel as well as composing three phase system.

Kinergier Pro delivers high reliability, performance and industry leading efficiency for mission critical application. Its distinguishing surge capability makes it capable to power most demanding appliances, such as air conditioner, water pump, washing machine, freezer etc.

With the function of power assist & power control, it can be used to work with a limited AC source such as generator or limited grid. Kinergier Pro can automatically adjust its charging current to avoid grid or generator to be overloaded. In case of temporary peak power appears, it can work as a supplement source to generator or grid.

2.1.2 Naming Rules

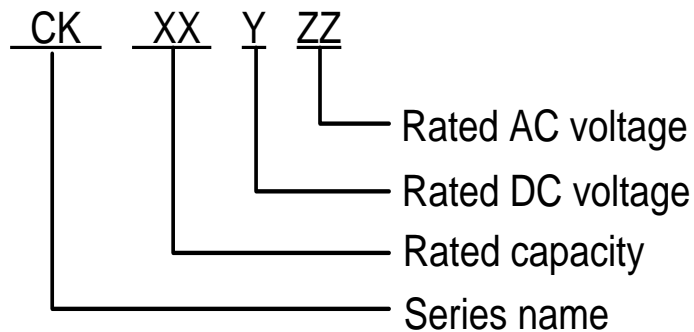


figure	explanation	
CK	series name	
3.0	Represent rated capacity	3000W
4.0		4000W
5.0		5000W
6.0		6000W
8.0		8000W
M	Represent rated DC voltage	24VDC
S		48VDC
--	Represent rated AC voltage	230VAC

Naming example : CK8.0S

Kinergier Pro Inverter Charger

Rated capacity : 8000W

Rated dc voltage : 48V

2.2 Structure

2.2.1 Front

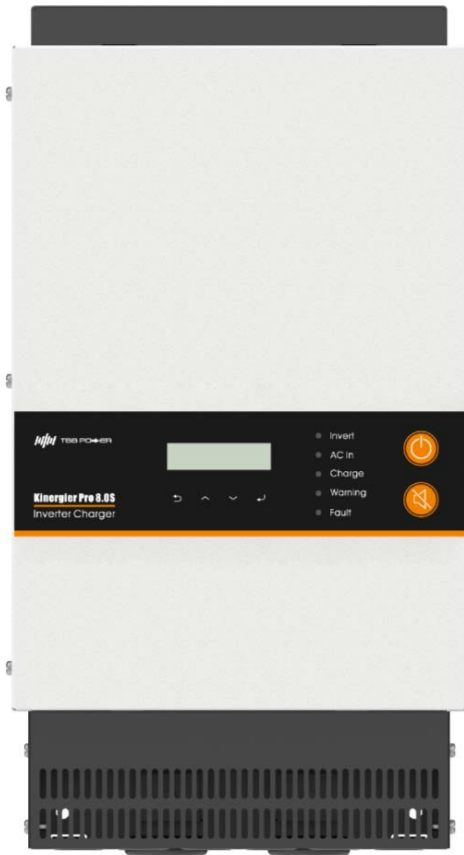


Figure 2-1 Inverter Charger structure in front view

2.2.2 Control panel

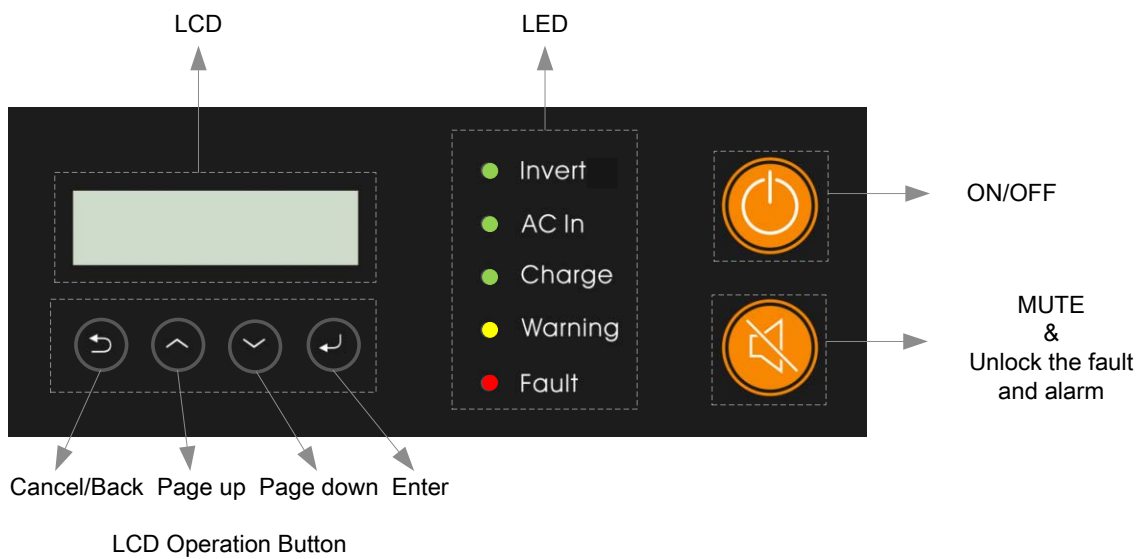


Figure 2-2 Inverter Charger control buttons

Table 2-1 Control Buttons





Button	Function
	<ul style="list-style-type: none"> ➤ Cancel the selection. ➤ Display the previous level of menu.
	<ul style="list-style-type: none"> ➤ Display the previous page. ➤ Increase the value of the selected item. ➤ Press the button for more than 2 seconds to scroll the page up.
	<ul style="list-style-type: none"> ➤ Display the next page. ➤ Decrease the value of the selected item. ➤ Press the button for more than 2 seconds to scroll the page down.
	<ul style="list-style-type: none"> ➤ Enter into this menu, displaying the next level. ➤ Select and confirm the selection of a menu item.

Table 2-2 LED directive function

LED	Function
Invert	<ul style="list-style-type: none"> ➤ It will illuminate when CK is inverting.
AC In	<ul style="list-style-type: none"> ➤ It will flash when CK detect any input, mains or generator.
Charge	<ul style="list-style-type: none"> ➤ It will flash when CK is in float charging. ➤ It will illuminate when CK is in bulk or absorption charging.
Warning	<ul style="list-style-type: none"> ➤ It will flash when CK have warning.
Fault	<ul style="list-style-type: none"> ➤ It will flash when CK have error.

2.2.3 Connection compartment

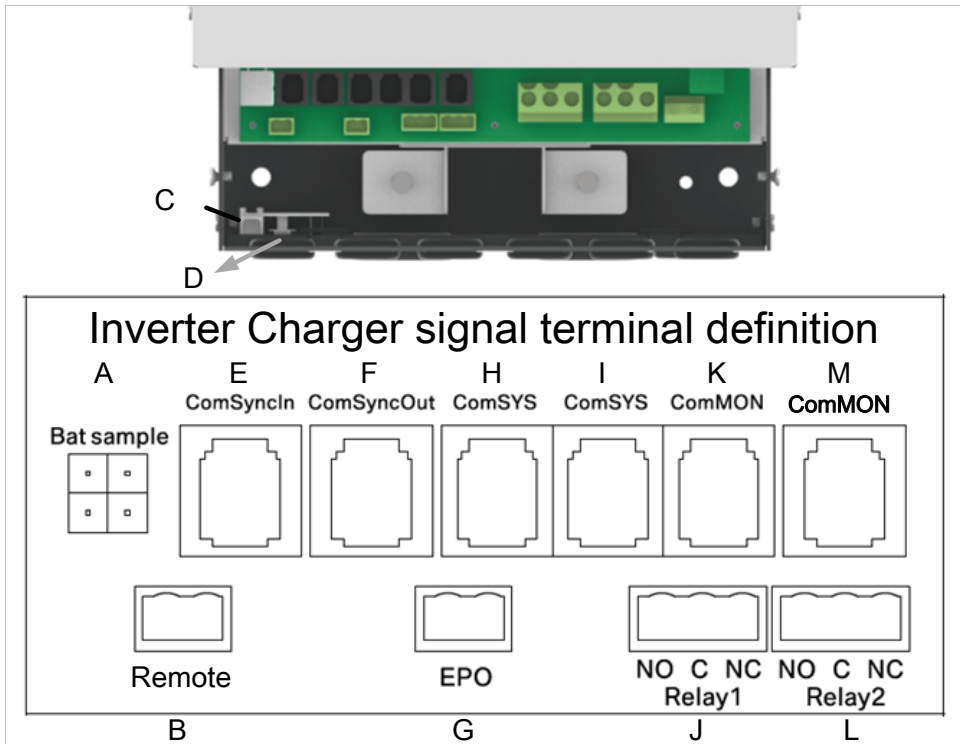


Figure 2-3 Signal terminal

Table 2-3 Signal terminal introduction

No.	Silk-screen	Definition
A	Bat Sample	Battery temperature and voltage sample.
B	Remote	Dry contact input control, remote ON/OFF control.
C	Com MON	Connected to the connector K by default.
D	WCM	Connected to the Kinergy data logging stick.
E	Com Sync In	Parallel synchronous communication input(CAN) .
F	Com Sync Out	Parallel synchronous communication output(CAN) .
G	EPO	Dry contact input control, emergency power off.
H	Com SYS	System communication(RS485), connected to SP or BGK.
I	Com SYS	System communication(RS485), connected to SP or BGK.
J	Relay1 (NO,C,NC)	Dry contact output control 1(NO,C,NC) .
K	Com MON	Connected to connector C by default.
L	Relay2 (NO,C,NC)	Dry contact output control 2(NO,C,NC) .
M	Com MON	RS485 port for external monitor such as MCK, SNMP etc.

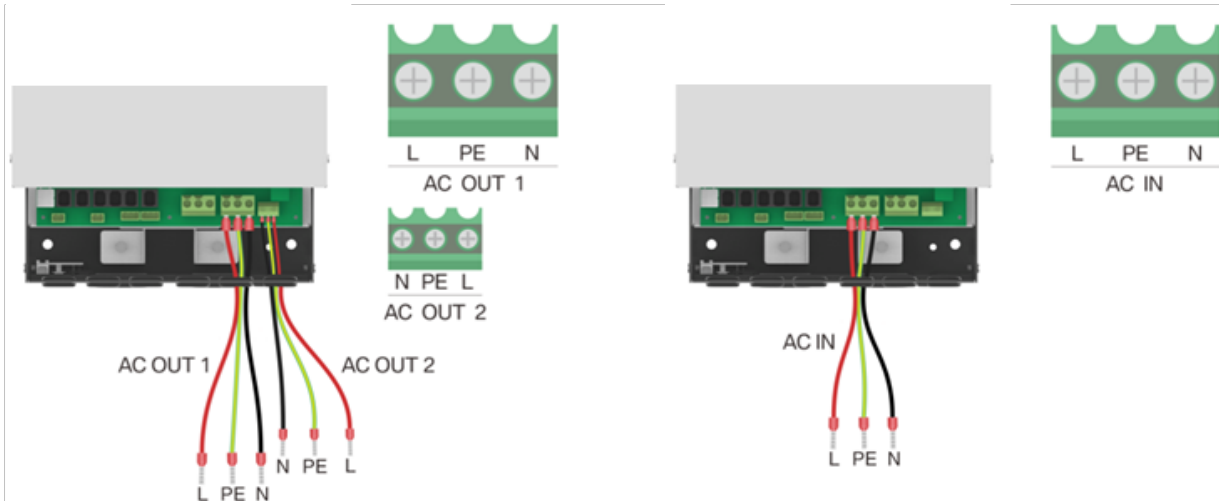


Figure 2-4 Power terminal

2.2.4 Dimension

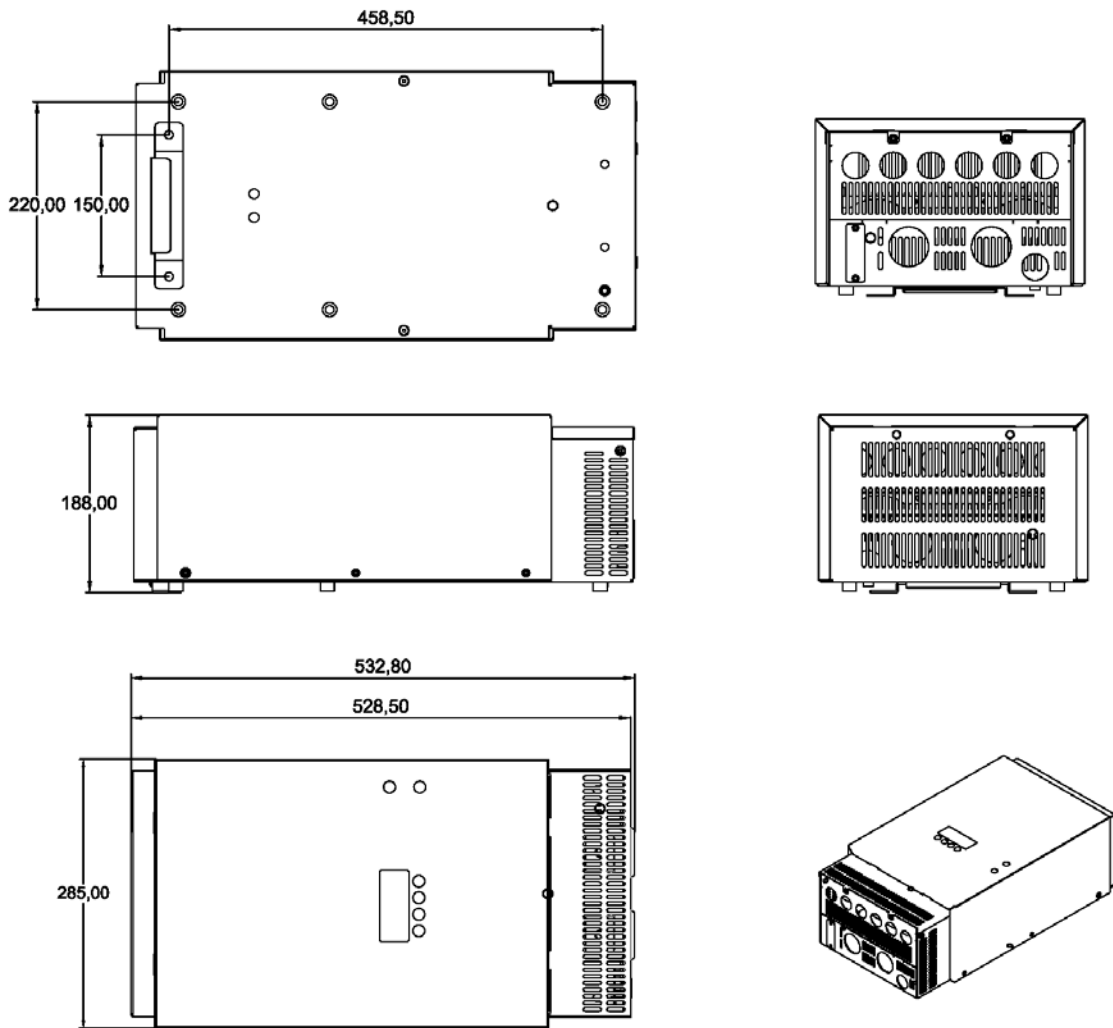


Figure 2-5 Dimension of Inverter Charger

(CK4.0M,CK5.0M,CK4.0S,CK5.0S,CK6.0S,CK8.0S)

2.3 Function

2.3.1 DC Couple and AC Coupled PV System

Using Kinergier Pro together with Solar Max MPPT and PV inverter from TBB Power, you can compose both DC Coupled PV System and AC Coupled PV System. Featuring greater flexibility, AC Coupled PV System can achieve higher system power and is much more suitable for commercial project. Please refer to 5.5.2.1 for explanation in details.

It is recommended to use IG series PV inverter from TBB Power to compose AC Coupled PV System. In case you want to use third party PV inverter, please consult with TBB Power sales.

2.3.2 Parallel and Three phase

Two or more units can be connected in parallel to compose a single-phase parallel system or a three-phase parallel system, which is convenient for system expansion or to construct a micro-grid system. For single phase system, max three units can be connected in parallel. For three phase system, max 9 units can be connected in together.

2.3.3 Power control and Power assist

Kinergier Pro offers an unique feature of power control & power assist, which is very useful upon you have a limited grid supply or working with generator. Kinergier Pro will take control of energy flow automatically, using extra power to charge the battery or inverting as the supplement to the grid or generator. With this feature, you can avoid tripping of shore power MCB or generator oversize.

2.3.4 System working mode

Kinergier Pro offers powerful functions for user to program for different systems, such as power backup, solar hybrid, ESS, ESS with peak tariff shaving etc. Please refer to the chapter 5.6.1 for details.

2.3.5 Built-in load management

There are two outputs built-in Kinergier Pro. AC output 1 is used to connect critical loads which will be backed up with battery connected. AC OUT2 is the secondary outputs and you can configure it with different functions, such as grid only, base on specific time zone or specific battery voltage or SOC. Please refer to the chapter 5.6.4 for details.

2.3.6 Powerful and Reliable Inverter

High performance pure sine wave

Kinergier Pro is a pure sine wave inverter generating a near perfect sinusoidal AC wave power output that is very similar or even better to what you can get from your utility grid. Pure sine wave can guarantee the correct function of sensitive equipment (computer, laser printer, TV etc.). Also, your home appliances will work smoother, cooler and more efficient, such as fridge, microwave and power tools.

High surge power capability

Provided with outstanding surge power capability and low frequency transformer, Kinergier Pro is

suitable for heavy inductive loads like fridge, coffee maker, microwave, power tools, air conditioner, etc.

Battery low voltage protect

Kinergier Pro provides configurable battery low voltage protection.

2.3.7 Professional Battery Charger

Multi stage sophisticated charging algorithm for lead acid battery

Fitted with multistage charging algorithm (bulk-absorption-float-recycle), the built-in charger of Kinergier Pro is designed to charge battery quickly and fully. Microprocessor controlled charging algorithm with variable absorption charging timer could guarantee the optimal charging for batteries of different discharged state.

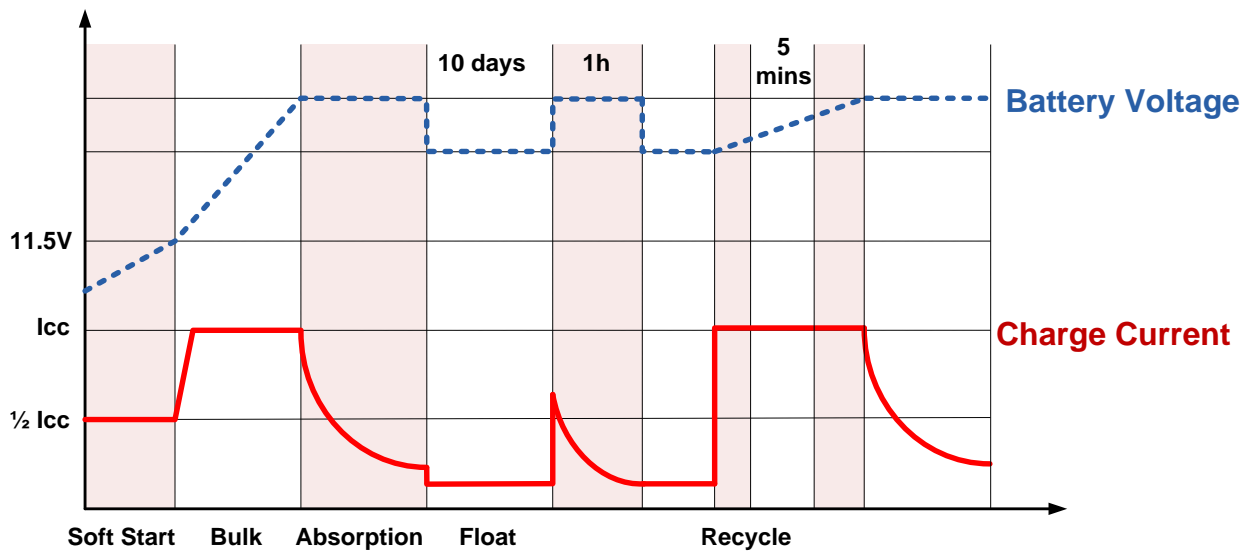


Figure 2-6 Multi stage sophisticated charging algorithm for lead acid battery

Float charging and recycle charging program guarantee your battery getting proper maintenance in case of long time connected and less aging in case of long time connected with no use.

Battery Sample Cable (Temperature and voltage)

Battery temperature is a key factor in correct charging for lead acid battery, the charging formula must be adjusted (automatically and in real time) according to the actual battery temperature to ensure that battery are fully charged but not overcharged or undercharged. All charging voltages recommended by battery manufacture are in fact ONLY applied at 20°C-25°C.

The Bat sample cable (battery temperature and voltage sensor) supplied with Kinergier Pro measures the temperature of battery and automatically makes adjustments at real time to properly charge your batteries at compensation rate of $-4\text{mV}/^\circ\text{C}/\text{cell}$. In case of Bat sample cable is not available, Kinergier Pro will use 25°C as default setting. This feature is especially recommended for sealed batteries and/or when important fluctuations of battery temperature are expected.

Multi battery chemical available

Kinergier Pro offers premium charging algorithm for commonly encountered lead acid battery chemicals including AGM, GEL, Flooded, lead-carbon and Lithium battery which you can set through LCD interface and TBB Link software.

Lithium Battery Compatible

Kinergier Pro has built-in communication compatible with for Super L lithium battery from TBB.

Manual Equalization



It is strongly recommended to read this section carefully before you start the EQ charging and don't leave battery unattended while performing desulfuration.



Always check if your battery supplier recommended EQ charging. Only start when it is suitable.



If battery type was set at AGM, GEL or Lead-Carbon, this charging profile can't be triggered on.

Over a period of time, the cells in a flooded battery can develop uneven chemical states. This will result in a weak cell which in turn can reduce the overall capacity of battery. To improve the life and performance of flooded battery, Kinergier Pro includes a manual equalization program that can be used, if recommended by battery manufacturer. You can initiate the desulfuration program manually. Once you trigger on the equalization program, Kinergier Pro will perform equalization charging.

After 30 minutes, it will quit EQ and enter into float charge.

- Check electrolyte level and refill battery with distilled water if necessary.
- If you want to come to normal charging, you need stop equalization charging and switch off the unit.
- Switch on the unit again, then you will have your equipment back to normal charging.



During equalization, the battery generates potentially flammable gases. Follow all the battery safety precautions listed in this guide. Ventilate the area around the battery thoroughly and ensure that there are no sources of flame or sparks in the vicinity.



Turn off or disconnect all loads on the battery during equalization. The voltage applied to the battery during equalization may be above the safe levels for some loads.

Frequency:

Maximum once a month, for heavily used battery, you may wish to equalize your battery. For battery with light service only need to be equalized every 2-3 months.

Important:

- Equalization can damage your batteries if it is not performed properly. Always check battery fluid before and after equalization. Fill batteries only with distilled water.
- Always check the equalization switch is set back to OFF after each time's equalization.

- Battery manufactures' recommendations on equalization vary. Always follow the battery manufacturer's instructions so batteries can be properly equalized. As a guide, a heavily used battery may require equalization once a month while a battery in light duty service, only needs equalizing once every 2 to 4 months.
- Battery type: as a protection, equalization charging can be performed if and only if you set the battery to be traction, Flooded /OPzS batteries. If you choose AGM, GEL or Lead-Carbon, EQ charging can't be performed.

2.3.8 Transfer

Uninterrupted AC power

In case of voltage/frequency/waveform of AC input match the minimum quality, the voltage will be switched directly to AC output. Kinergier Pro Inverter Charger will work as a battery charger and load will be powered by AC input. You will have the same voltage both at the output and AC input.

In case of AC input failure or exceeding the maximum AC input current set by the user, Kinergier Pro Inverter Charger will initiate a quick switching to inverter, which will guarantee an undisturbed power. Upon AC input resume or match the quality, it will switch back again. Due to its ultra quick transfer design, as quick as 0ms, Kinergier Pro Inverter Charger could be used as an UPS.

Ground Relay

The neutral output of Kinergier Pro Inverter Charger is automatically connected to earth upon no external AC sources is available. Once external AC sources is available, the ground relay will open. You can disable this feature through TBB Link.

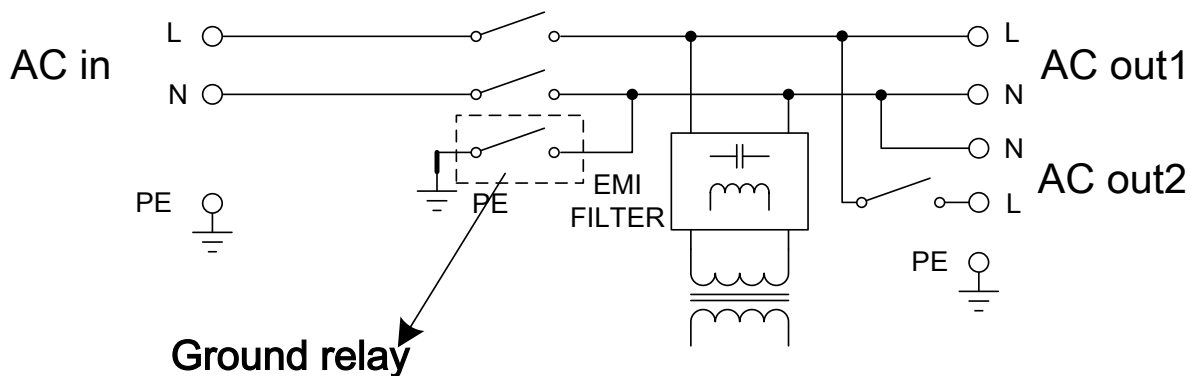


Figure 2-7 Ground Relay Schematic

2.3.9 Protect function

The Kinergier Pro Inverter Charger is equipped with a series of complete hardware and software protection functions to ensure its stable and reliable operation.

Overload protection

When overload protection is triggered on, it will restart automatically after 60s. And after three consecutive overload shutdown protections, the equipment will not restart automatically. At this time, the user needs to manually restart it.

Over temperature protection

When the internal temperature is too high, Kinergier Pro will enter into the over-temperature protection. After the internal temperature returns to normal, it can automatically resume normal operation.

Short circuit protection

The equipment will automatically shut down when the AC output is shorted and needs to be manually activated.

Battery over temperature protection

During the charging, the equipment will continuously monitor the battery temperature. When the battery temperature is too high, the equipment will automatically reduce the charging current. When the battery is severely heated, the charger will automatically turn off to protect the battery.

Battery low voltage protection

To prevent the permanent damage caused by the over discharge of battery, the equipment will automatically cut off the output according to the low voltage protection point set by the user.

2.3.10 Communication

Dry contact input

Kinergier Pro is equipped with two dry contact inputs for remote on/off and EPO control.

Dry contact output

Kinergier Pro is equipped with two NO/NC relay type dry contact outputs, the user can set specific functions through the LCD. Below is the default setting.

- Relay1: The relay is closed when the battery is under voltage.
- Relya2: The relay is closed when a fault or overload occurs.

RS485

Equipped with two RS485 interfaces.

CAN

Equipped with a CAN interface.

3. Installation and Wiring

Please refer to "Quick Installation Guide".



Keep away from fire, avoid direct sunlight and rain; do not store flammable, explosive or corrosive gases or liquids in the working environment. Don't install in a working environment with metal conductive dust.

- Please install the equipment in a location of dry, clean, cool with good ventilation.
- Operating temperature: $-20\sim 65^{\circ}\text{C}$
- Storage temperature: $-40\sim 70^{\circ}\text{C}$
- Cooling: Force fan
- Relative humidity in operation: 95% without condensation.

4. Configuration

4.1 Check before Operation

Please check before operation according to the following.

- Inverter is installed correctly and steady.
- Reasonable cable layout to meet customer requirements.
- Make sure the grounding is reliable.
- Make sure the ground wire is properly connected and firm and reliable.
- Double check the battery breaker is OFF.
- Make sure the cables are properly connected, firm and reliable.
- Reasonable installation space, clean and tidy environment, no construction residue.

4.2 Power ON Test



Make sure the battery voltage is within the permissible range before turning ON the breaker.

Please follow the following instruction step by step.

- Step 1: Turn on the circuit breaker between the battery and the inverter.
- Step 2: Press the On/Off button to turn on the inverter to enter self diagnostic.
- Step 3: Set the parameters following the setup wizard.
- Step 4: Press the On/Off button again to turn on the inverter.
- Step 5: Observe the LED light to make sure the inverter is running normally.

(refer to Tab 2-2 LED directive function)

4.3 Power OFF



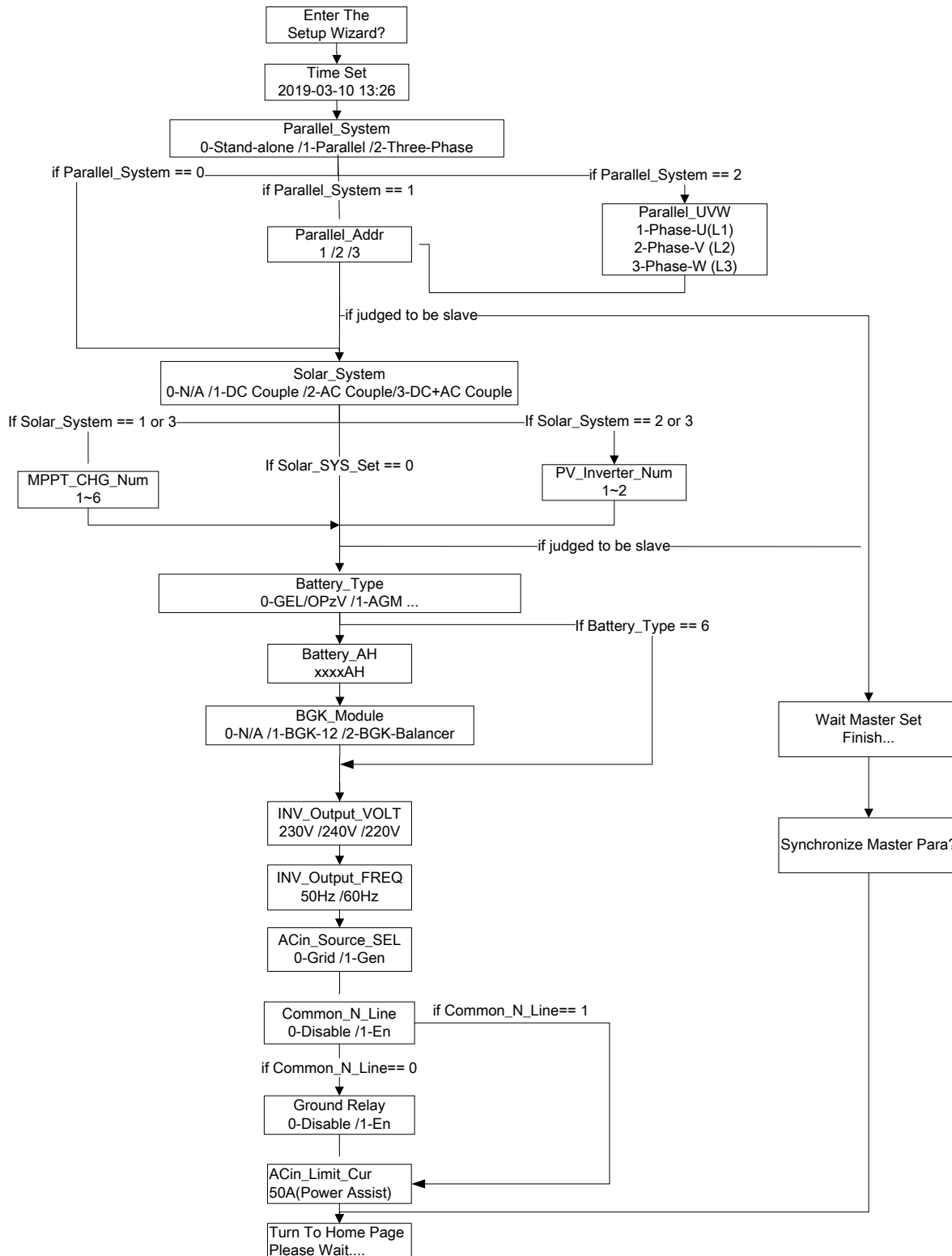
After the inverter is power OFF, there is still residual power and heat in the chassis, which may lead to electric shock or burn. Therefore, after the MPPT charger is powered off for 5 minutes, you should wear protective gloves before removing the MPPT charger.

- Method 1: Press the On/Off button about 2secs to turn off the output of inverter. Afterwards, you can press and hold the On/Off for 5secs, after hearing consecutive beep, you can permanently shut down the inverter.
- Method 2: Press and hold the On/Off for 5secs, after hearing consecutive beep, you can permanently shut down the inverter straight away.

4.4 Setup Wizard

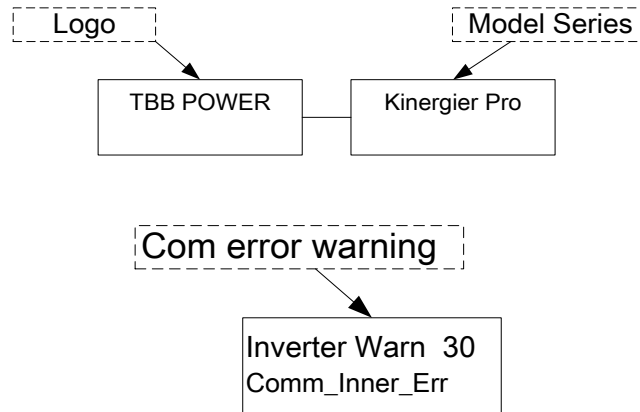
For the purpose of a quick configuration, upon turning on Kinerger Pro for the first time or after restoring the factory settings, the equipment will enter the setup wizard automatically covering all basic setting you need to perform.

Please refer to 5.5.2 for detailed explanation for each parameter.



5.2 Initial interface

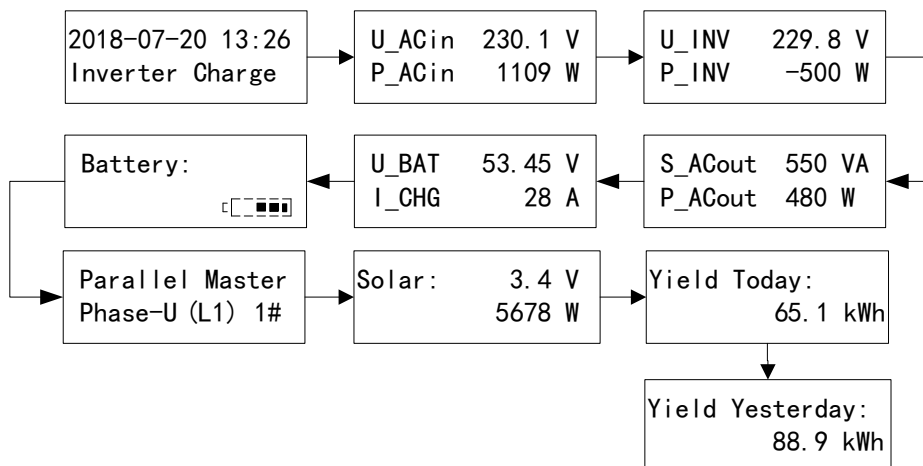
Once the inverter is powered on, the following screen will display manufacturer name and model number. In case of communication failure between LCD and inverter, there will be a alarm displayed as well.



5.3 Main Menu

The LCD main menu is a real-time information interface displaying data of the equipment. The default interval time is 5S, and the time can be set manually. When pressing <UP> and <Down> to turn the pages, it will stay on the chosen page for 30S and the time can be set manually.

In the parallel system or three phase system with the common battery pack, the battery's parameters are only displayed on the master inverter.

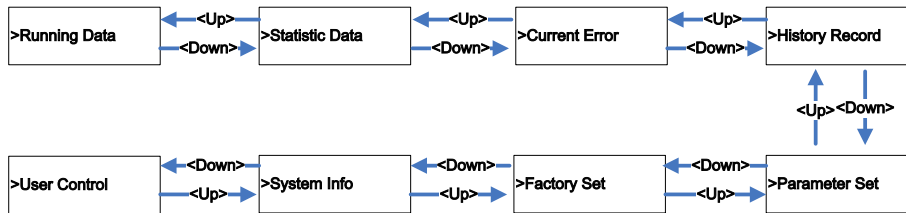


5.4 Tier one menu - Information query interface

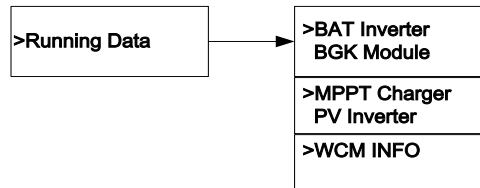
After pressing <Enter> button, you will approach Tier One Menu. Scroll to find your specific screen, then press <Enter> button, you can enter Tier Two Menu and then Tier Three Menu. Press <Back> button, you can return to the previous menu.

Among Tier one menu, there are three categories: information query, configuration and control.

Tier one menu



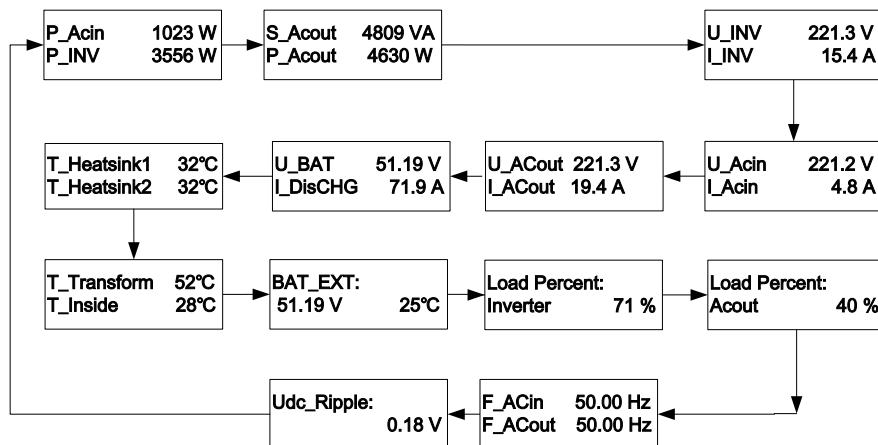
Select **Running Data** page, press <Enter> button you can approach all the active running data of Kinergier Pro. Upon other equipment was linked to the Kinergier Pro, such as IG PV inverter, Solar Mate MPPT or Battery Guard BGK module, you can read the data through this screen



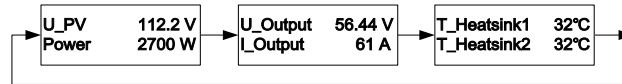
as well.

After selecting **BAT Inverter**, press <Enter> button you can approach all the active running data of Kinergier Pro inverter. Through pressing <UP> and <Down> button, you can go through the current data of Kinergier Pro inverter.

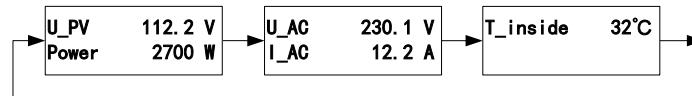
>Running Data



Select **MPPT**, press <Enter> button you can approach all the active running data of Solar Mate MPPT. Please notice, this data will be only available upon you install Solar Mate MPPT from TBB Power.

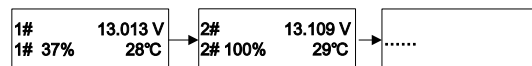


Select **PV inverter**, press <Enter> button you can approach all the active running data of IG PV inverter. Please notice, this data will be only available upon you install IG PV inverter from TBB Power.

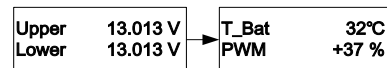


Select **BGK**, press <Enter> button you can approach all the active running data of BGK battery guard. Through pressing <UP> and <Down> button, you can go through the current data for each battery cell and the working status of each BGK module.

BGK-12



BGK-Balancer:

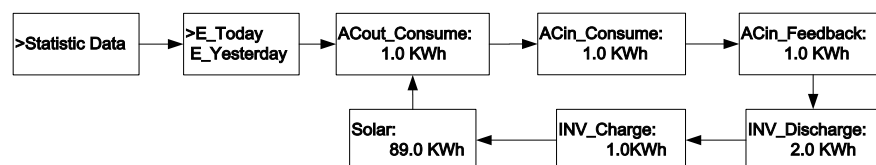


WCM INFO:



>Statistic Data

Enter this page, you can check the statistic data of today and yesterday, including consumption KWh, AC charging KWh, PV Charging KWh, Battery Charging/Discharging KWh etc. In the parallel system or three phase system with the common battery pack, the battery's parameters are only displayed on the master inverter.



>Current Error

Enter this page, you can check the active alarm and error. Press <UP> and <Down> to scroll through the pages. For detailed explanation of the error code, please refer to the Chapter 6.

	<p>>Current Error → INV Err U_Bus_LV 102 → INV Warn NTC_TX_Fault 006 → MPPT 1# Warn T_BAT_OT 206</p> <p>Displayed when there is no fault:</p> <p>>Current Error → 0 error 0 warning</p>
<p>>History Record</p>	<p>Enter this page, through pressing <UP> and <Down> button, you can review the history record including events and alarms. Holding the <UP> and <Down>, it will enter auto scrolling. If you want to check details for specific alarm, you can press <Enter></p> <p>>History Record → 2019-04-23 02:00 Inverter Charge → 2019-04-23 01:09 MPPT 1# Warn 220 → 2019-04-22 15:31 INV Err 109</p> <p>2019-04-22 15:31 INV Err 109 → INV Err 109 Output_ShortCut</p>
<p>>System Info</p>	<p>Enter this page, you can check the manufacturing data of this Kinergier Pro inverter including serial number, software version, and firmware version, etc.</p> <p>>System Info</p> <ul style="list-style-type: none"> >Model → Kinergier Pro >Serial Number → CG0800000001 >Software Ver → Software V1.0 → Theta4010 00 00.0001 >Firmware Ver → Firmware V1.0 >Hardware Ver → Hardware Ver V1.0

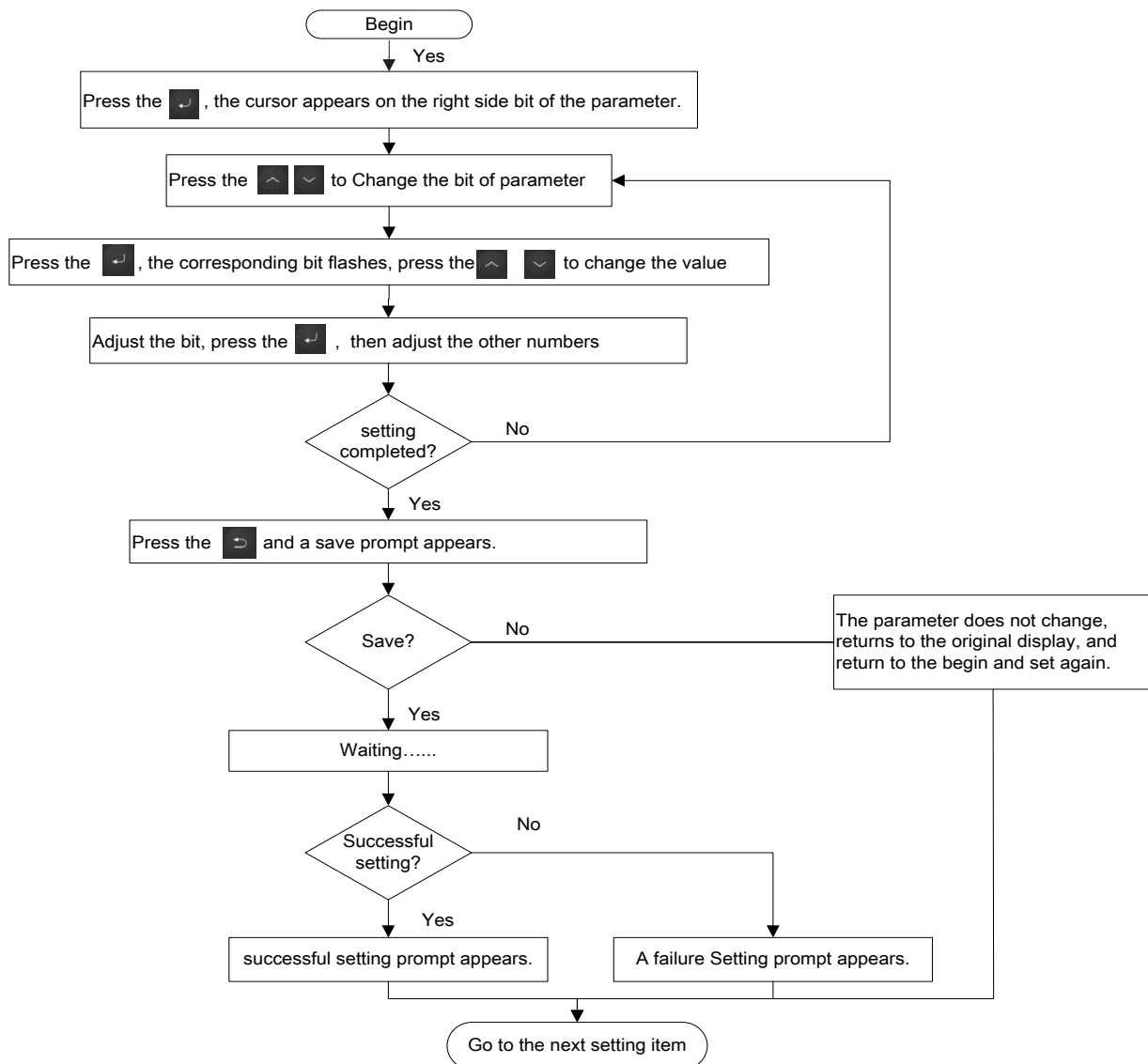
5.5 Tier one menu - configuration interface

5.5.1 General operation instruction

Kinergier Pro offers unlimited possibility for users to program the inverter and system for different configurations, systems and applications. The configuration can be done by combination of four switches on the front panel or through TBB Link software supplied by TBB Power.

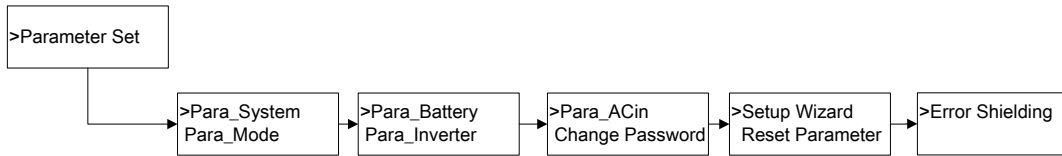
The following chapters explain how to configure the parameters through combination of switches.

- Scroll to the “Parameter Set” screen and press “Enter” to confirm.
- This menu was protected by password. The default password is “1000” and it can be changed by clients.
- Choose the screen for the parameters you want to set.
- Combined four buttons, you can achieve all configurations in this chapter. Please find the following functions of each button during configuration.
 1. Press <UP> and <DOWN> button to choose specific number you want to program.
 2. Press <Enter> button to activate the entering.
 3. Press <UP> and <Down> button to choose digit you want to put.
 4. Press <Enter> button to confirm this digit.
 5. After enter all four digits, please press <Back> button and <Enter> button to confirm.



5.5.2 Parameter set

A password is required when entering the parameter setting interface. The default is '1000' and it can be changed. This menu contains the following sub-menus for settings:



5.5.2.1 Para_System – system parameter setting

There are total three sub-menus including **Parallel_System**, **Solar_System** and **BMS_System**.

“**Parallel System**” sub-menu offers you all the parameters you need to configure when you are using Kinergier Pro to compose a single phase parallel system or three phase systems.

- When you are composing a single phase system, max 3 units of Kinergier Pro can be connected together.
- When you are composing a three phase system, max 9 units of Kinergier Pro can be connected together with 3 units on each phase.

Parallel_System:

	Item	Setting range	Description
Parallel System	Parallel_System	0-Stand-alone 1-Parallel 2-Three-phase	Set the unit's in a stand alone or parallel or three phase system. Default: 0-Stand-alone
	Parallel_UVW	1-U(L1) 2-V(L2) 3-W(L3)	Set the unit's phase Default: 1-U(L1)
	Parallel_Address	1~3	Can not set in a stand alone system. Default: 1
	Redundant_Mode	0- Disable 1- Enable	This function is designed for a power backup system ONLY. After enabling this function, once the master inverter fails in a parallel system, a new master inverter will be appointed without system failure. Default: 0- Disable

Solar System sub-menu offers the approach to compose DC Couple or AC Coupled PV Systems using Kinergier Pro.

- When you are composing the DC Coupled PV System, all the parameters you configure with Kinergier Pro will be updated automatically with Solar Mate MPPT.
- For parallel system, only the Master unit need to be configured.

Solar System:

	Item	Setting range	Description
Solar System	Solar_System	0-N/A 1-DC Couple 2-AC Couple 3-DC+AC Couple	Select Solar system you are intending to compose. DC Coupled PV System: using Solar mate series MPPT Charger. AC Coupled PV System: using IG series PV Inverter Default: 0-N/A
	MPPT_CHG_Num	1~6	Number of Solar Mate MPPT connected.(Only applicable for DC Coupled PV System) Default: 1
	PV_Inverter_Num	1~2	Number of IG PV inverter connected. (Only applicable for AC Coupled PV System) Default: 1
	FREQ_Drop Set---> Drop_Start_FREQ	50.1~51.0Hz (@50Hz) 60.1~61.0Hz (@60Hz)	Drop Start Freq: When the frequency reaches this set value, the PV inverter starts to derate. Default: 50.85Hz
	FREQ_Drop Set---> Drop_Stop_FREQ	51.1~53.5Hz (@50Hz) 61.1~63.5Hz (@60Hz)	Drop Stop Freq: When the frequency reaches this set value, the PV inverter derates to the minimum power. Default: 53.05Hz
	FREQ_Drop Set---> Disconnect_FREQ	51.5~54.5Hz (@50Hz) 61.5~64.5Hz (@60Hz)	Disconnect Freq: When the frequency reaches this set value, the PV inverter has no output. Default: 54.15Hz

BGK System sub-menu offers the approach to compose the BGK parameter.


- If you choose the relevant BGK you installed, Kinergier Pro will trigger on the function of BGK.
- For battery bank composed by 2V cells, you need BGK Master and BGK-02.

BGK_System:

	Item	Setting range	Description
BGK_System	BGK_Module	0-N/A 1-BGK-12 2-BGK-Balancer	For 24Vdc system, please set 2. For 48Vdc system, please set 1. Default: 0-N/A
	BGK_Restart	Trigger BGK to Restart	The BGK-12's address can be reset.

5.5.2.2 Para_Mode
Para_Mode:

	Item	Setting range	Description
Para_Mode	Common_N_Line	0-Disable 1-Enable	Input and output Neutral line setting. Disable: The input and output Neutral lines are isolated. – normally used for Grid connection Enable: Input and output Neutral lines are connected. – normally used for Generator connection Default: 0-Disable
	Ground_Relay	0-Disable 1-Enable	The neutral output of inverter is automatically connected to earth upon no external AC sources is available. Disable: Neutral grounding is disable Enable: Neutral grounding is enable Default: 1-Enable
	Bypass_Supply_EN	0-Disable 1-Enable	Allow bypass to power the load in case the inverter fails or the battery reaches underdischarged. Disable: Bypass output is disable Enable: Bypass output is enable Default: 1-Enable
	Silent_Mode_EN	0-Disable 1-Enable	To mute the inverter buzzer sound once the inverter fails to run or alarm occurs. Disable: Buzzer silent mode is disable Enable: Buzzer silent mode is enable Default: 0-Disable
	N2G_U_DET_EN	0-Disable 1-Enable	Voltage detection between Neutral and Ground. Disable: Disable the voltage detection Enable: Enable the voltage detection Default: 1-Enable

		 <p>With this function enabled, it can be used to detect reverse polarity of L and N input. Or, it can be used to detect if there is proper grounding of your grid input.</p> <p>When the input reverse polarity or bad grounding occurs, an alarm will be triggered on at the inverter.</p>
Main_Switch_SEL	0-Default 1-Mobile 2-REGO System	Main Switch Control Mode Default: Inverter will be controlled through membrane switch at front panel. Mobile : It is designed for mobile application. An external remote panel MCK can be purchased from TBB Power to control the inverter working either at normal mode or charger only mode. REGO : It is designed for REGO system. Inverter can be controlled by communication in the REGO System. Default: 0-Default
EPO_Function_EN	0-Disable 1-Enable	Whether to enable the EPO Function Disable: Disable the EPO Function Enable: External signal will turn off the inverter, displaying fault by LED and LCD. Default: 1-Enable
Remote_Ctrl_EN	0-Disable 1-Enable	Whether to allow the remote console (such as the APP or PC) for the parameter settings.. Disable: Remote Ctrl mode is disable. Enable: Remote Ctrl mode is enable. Default: 1-Enable
IDC_Optimize_EN	0-Disable 1-Enable	Optimize the charge current, reduce the current ripple. Default: 0-Disable
Remote_Update	0-Disable 1-Enable	Enable ComMon(external communication) firmware remote upgrading, which will give user firmware upgrading right. Default: 0-Disable
Err_Auto_Reset	0-Disable 1-Enable	Enable the auto reset when the error has been solved. Default: 1-Enable
1P_In_3P_Out_EN	0- Disable 1- Enable	Single Phase input and Three phase output system mode Default: 0- Disable

5.5.2.3 Para_Battery

With this menu, you can configure comprehensive parameters related with battery and battery charging. There are three sub-menus including **Basic Set**, **Advanced Set** and **EQ Control and Setting** which are only applicable for flooded and traction battery.

Basic Set

	Item	Setting range	Description
Basic Setting	Battery_Type	0-GEL/ OPzV 1-AGM 2-Lead-Carbon 3-Flooded 4-Traction 5-Customerize 6-TBB SUPER-L	Set the following Battery Type chart. Default: 0-GEL/ OPzV
	Battery_AH	50~5000AH	Set the battery capacity (not applicable to TBB SUPER-L lithium battery) Default: 200AH

Battery type Description

The following parameters are based on the 12Vdc battery.

No	Battery Type	Absorption Charging Voltage	Float Charging Voltage	Charge rate	Max allowed Charge rate	EQ charging voltage
		Default	Default	Default		
0	GEL/OpzV	14.1V	13.7V	0.15C	0.25C	N/A
1	AGM	14.4V	13.5V	0.15C	0.25C	N/A
2	Lead-Carbon	14.1V	13.5V	0.2C	0.5C	N/A
3	Flooded	14.7V	13.5V	0.15C	0.25C	Enable (15.5V)
4	Traction	15.2V	13.5V	0.15C	0.25C	Enable (16.2V)
5	Customerize	14.2V (12/24V Battery)	14.0V (12/24V Battery)	0.3C	1.0C	N/A
		13.3V (48V Battery)	13.1V (48V Battery)			
6	TBB SUPER-L	BMS taking control of the charging parameters				

Advanced Set

The following parameter are based on the 12Vdc battery. If you are using 2Vdc battery to compose the battery bank, please multiply your intended voltage by 6 to enter each value.

	Item	Setting range	Description
Advanced set	SYS_CHG_MaxCur	5~900A	Allowed maximum charging current of the battery bank. Note: there is a default current according to the battery type and the size you choose, and it can be adjusted as well. Default: 30A
	DisCHG_MaxCur	5~2700A	Allowed maximum discharging current of the battery bank. Default: 300A
	U_Absorp_CHG	This value will be affected when you change the battery type.	The absorption charging voltage (voltage mentioned here refers to the voltage of 12Vdc battery) Note: This value will be affected when the battery type is changed.
	U_Float_CHG	This value will be affected when you change the battery type..	The float charging voltage (voltage mentioned here refers to the voltage of 12Vdc battery) Note: This value will be affected when the battery type is changed.
	LV_PRO_Recover	11.0~14.0V	Undervoltage protection recovery value. (voltage mentioned here refers to the voltage of 12Vdc battery) Default: 13.0V
	BAT_LV_WARN	10.0~13.0V	Undervoltage warning for a single battery. (voltage mentioned here refers to the voltage of 12Vdc battery) Default: 11V
	BAT_LV_Protect	9.5~12.5V	Undervoltage protection for a single battery. (voltage mentioned here refers to the voltage of 12Vdc battery) Default: 10.5V
	U_DisCHG_End	9V~11V	Ultimate undervoltage protection for a single-cell battery. (voltage mentioned here refers to the voltage of 12Vdc battery) Note: the status consumption power will be 0mA once it triggers on this protection. With Solar Mate MPPT, the inverter can be triggered on automatically once the sun resumes next day.

		Default: 9.9V
Min_Bulk_Time	10~600min	Minimum Bulk time. Default: 30min
Max_Absorp_Time	1~120h	Maximum absorption time. Note: the allowed max time varies according to battery type selected. Default: 8h
Auto_CHG_Cycle	8~960h	Absorption cycle time. Default: 240h
CHG_T_Compensate	0-Disable 1-Enable	Enable the charging temperature compensation. Default: 1-Enable
CHG_TEMP_Coef	0~-30mV/°C	Charging temperature compensation coefficient. (voltage mentioned here refers to the voltage of 12Vdc battery) Default: -18mV/°C
BAT_OT_WARN_Gate	25~65°C	Battery over temperature warn gate Default: 55°C
SOC_Low_Warning	6~80%	Can be set in TBB SUPER-L mode. The inverter will trigger a warning when the SOC is under the setting value Default: 20%
SOC_Low_Protect	5~40%	Can be set in TBB SUPER-L mode. The inverter will trigger a warning when the SOC is under the setting value Default: 10%
SOC_CHG_Enough	30~99%	Can be set in TBB SUPER-L mode. The inverter will stop charging once reaching this value and will switch to the inverter mode. Default: 80%
Mask_OV_Warn	0-Disable 1-Enable	Can be set in TBB SUPER-L mode. The warning will be hidden when the BMS is over voltage. Default: 1-Enable
Lower_CHG_Volt	24V: 0~1.0V 48V: 0~2.0V	Can be set in TBB SUPER-L mode. The charging voltage can be reduced. Default: 0V
Float_CHG_EN	0- Disable 1- Enable	It can be set in TBB SUPER-L mode. When the BMS issues a 0A charging current command, the floating charging current remains 2A. Default: 1-Enable

EQ Ctrl_Set (This function is only applicable for the flooded battery and traction battery.)

	Item	Setting range	Description
EQ Ctrl_Set	EQ_Command	0-OFF 1-ON	EQ charging Switch When choosing 1, you can turn on the EQ charging and it will automatically quit after performing the EQ charging. it can be manually shut down at any time after choosing 0. Default: 0-OFF
	EQ_Voltage	15.5~16.3V	User can change the EQ voltage for flooded and traction battery. Default: 15.5V(Flooded) 16.2V(Traction)
	EQ_Sustain_Time	30~90min	User can change the EQ timer for flooded and traction battery. Default: 30min

5.5.2.4 Para_Inverter
Para_Inverter:

You can configure the output of the inverter through this menu.

	Item	Setting range	Description
Para_Inverter	INV_Output_VOLT	200~240V	Inverter output voltage RMS. Default: 230V
	INV_Output_FREQ	50/60Hz	Rated AC frequency. Default: 50Hz

5.5.2.5 Para_ACin:

This menu is for setting the AC input parameters of the inverter.

	Item	Setting range	Description
Para_ACin	ACin_Source_SEL	0-Grid 1-Generator	Select the ACin Source. When "1-Generator" is selected, the parameter "Common N" is Enabled and "GND connect" is Disabled. Default: 0-Grid
	ACin_U_Max	240~265V @230Vac Model 120~140V @120Vac Model	Maximum AC in input voltage Default: 265V@230Vac Model 140V@120Vac Model
	ACin_U_Min	145~200V @230Vac	Minimum AC in input voltage Default:

		120~140V @120Vac	175V@230Vac Model 85V@120Vac Model
	ACin_F_Max	51~59Hz @50Hz 61~69Hz @60Hz	Maximum AC in input frequency Default: 55Hz
	ACin_F_Min	41~49Hz @50Hz 51~59Hz @60Hz	Minimum AC in input frequency Default: 45Hz
	Harmonic_Adapt	0-Normal 1-Weak AC Input	AC input harmonic adaptation mode. Note: When the AC in input harmonic is too large and the inverter cannot track its phase, select '1-Weak AC Input' to enable the inverter a greater chance to track the phase of the AC input. Please refer to the specifications for transfer time after this setting. Default: 0-Normal
	ACin_Limit_Cur (PowerAssist)	5~50A	The allowed maximum current for the AC in input. Note: Once set up, the inverter will only use the extra power to charge the battery. And, once the input current of ACin reaches this set value, the excess energy required by the load will be taken from the battery. Default: Depend on model
	AC_Connect_Delay	20~990s	Delayed connection time after detecting a qualified grid. Default: 20s

5.5.2.6 Change Password

Through this menu, you can change the password.

5.5.2.7 Setup Wizard

Setup wizard is a quick configuration process for all basic setup. Please refer to the chapter 4.4 for detail.

5.5.2.8 Reset Parameter

With this menu, you can restore the factory setting of Kinergier Pro inverter.

5.5.2.9 Error Shielding

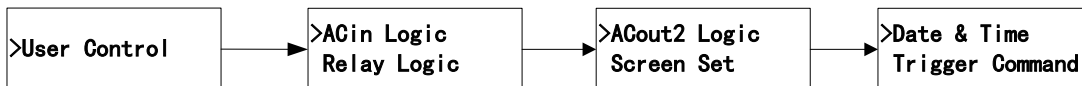
With this menu, you can hide some alarms which you do not bother to see.

	Item	Setting range	Description
Error Shielding	ACin_LV Warn	0-Display 1-Shield	Whether to hide the ACin_LV Warning. For the UPS application, it is recommended to enable this alarm. Default: 1-Shield
	MPPT Offline	0-Display 1-Shield	Whether to hide the offline warning of Solar Mate MPPT. Default: 0-Display
	PV_INV Offline	0-Display 1-Shield	Whether to hide the offline warning of IG PV inverter. Default: 1-Shield

5.6 User control

Using this menu, user can configure some working logic for this Kinergier Pro inverter. This feature is only applicable for the Master unit.

- ACin Logic
- Relay Logic
- ACout 2 Logic

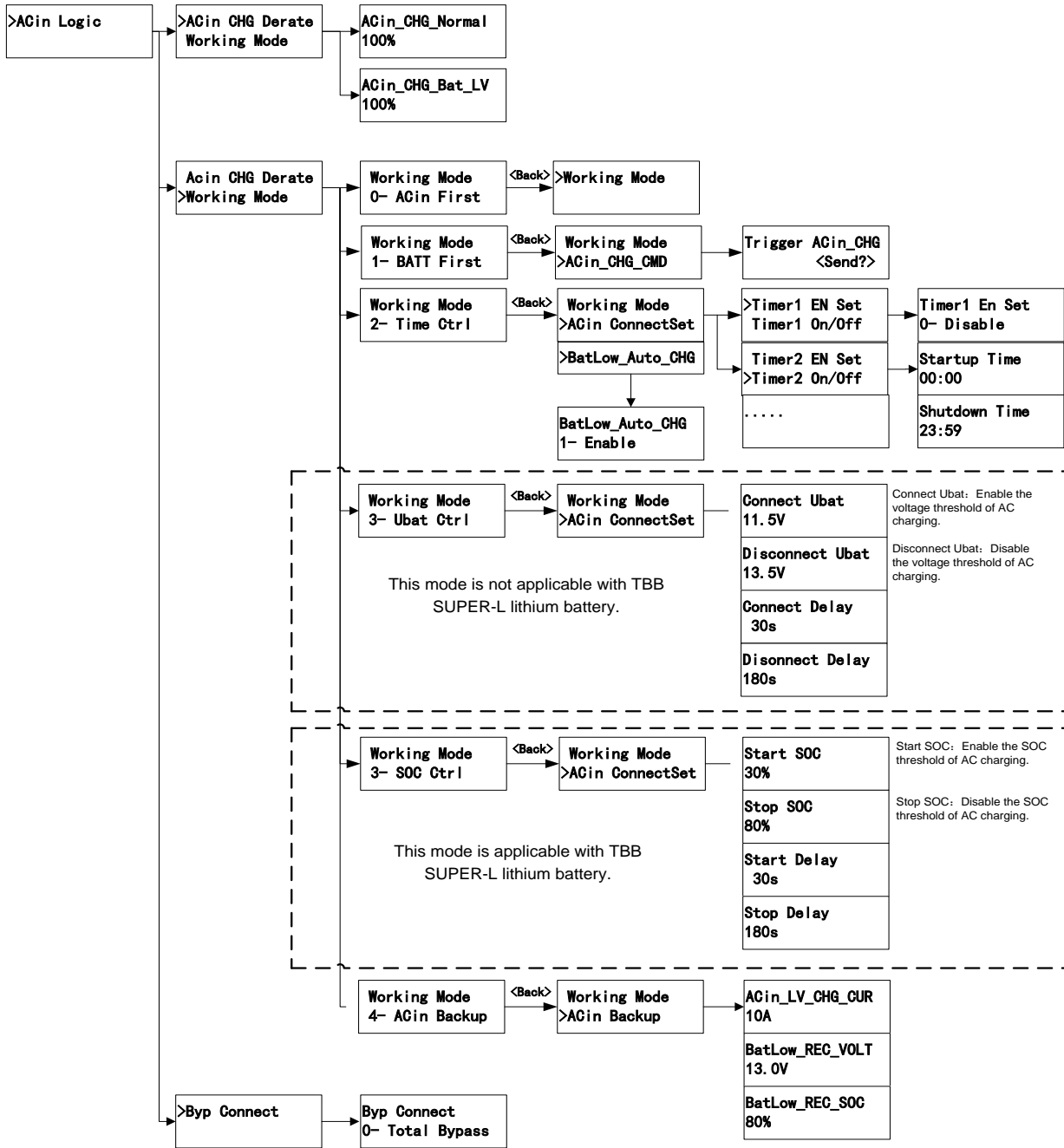


5.6.1 ACin Logic

With this menu, you could set up the working logic for Kinergier Pro working at different applications.

Item	Setting range	Description
ACin_CHG_Derate	ACin_CHG_Normal	This setting is designed for users to configure the charging current of the inverter in AC charging. Default: 100%
	ACin_CHG_BAT_LV	This setting is designed for user to configure the charging current of the inverter in battery low voltage. Default: 100%
Working Mode	0-ACin First 1- BATT First 2-Time Ctrl 3-Ubat / SOC Ctrl 4-ACin Backup	0- ACinFirst: Under this mode, the grid will supply load first and charge the battery at the same time. Kinergier Pro will switch to battery only when the grid fails. 1- BATT First:

		<p>Under this mode, the load will be powered by PV and battery. Only when the battery reaches discharged warning level, Kinergier Pro will take AC in (grid or generator) to charge the battery. Once battery reaches absorption stage or lithium battery BMS sending signal, Kinergier Pro will stop charging and use battery to power the load.</p> <p>2-Time Ctrl: Kinergier Pro offers Time Ctrl mode as an advanced control mode through offering three timers for user to configure. Within the time zone set up, Kinergier Pro will work in the AC In First Mode. Beyond the time zone, Kinergier Pro will work at BATT First mode. Meantime, upon battery discharged under Batt First Time zone, you can flexibly choose whether to let Kinergier Pro enter AC in the first mode. This mode can be used in area where they have peak/off peak tariff policy.</p> <p>3-Ubat Ctrl: This is an advanced mode base on BATT First. Under this mode, some energy can be reserved as backup power in case of grid failure. Users can set the battery voltage to take the grid to charge the battery and the battery voltage that he want to disconnect the grid.</p> <p>SOC Ctrl: This is the mode with same function as Ubat_Ctrl mode, but designed for TBB SUPER-L lithium battery only. Under this mode, users can program the SOC percentage to enter charging or exist charging.</p> <p>Default: 0-ACin First</p>
Byp Connect	0- Total Bypass 1- Bypass Assist	<p>Set the bypass logic:</p> <p>0- Total Bypass: When the battery power is sufficient and no error occurs, power the loads with the battery only.</p> <p>1- Bypass Assist</p> <p>If the ACin is normal, the load is powered by the DC power first. When the battery power is insufficient to supply power to the load or an overload occurs, the bypass is used as an assist power to supply the loads.</p> <p>Default: 1- Bypass Assist</p>



5.6.2 Relay Function

With this menu, you could set up the function of dry contact output relay built-in Kinergier Pro.

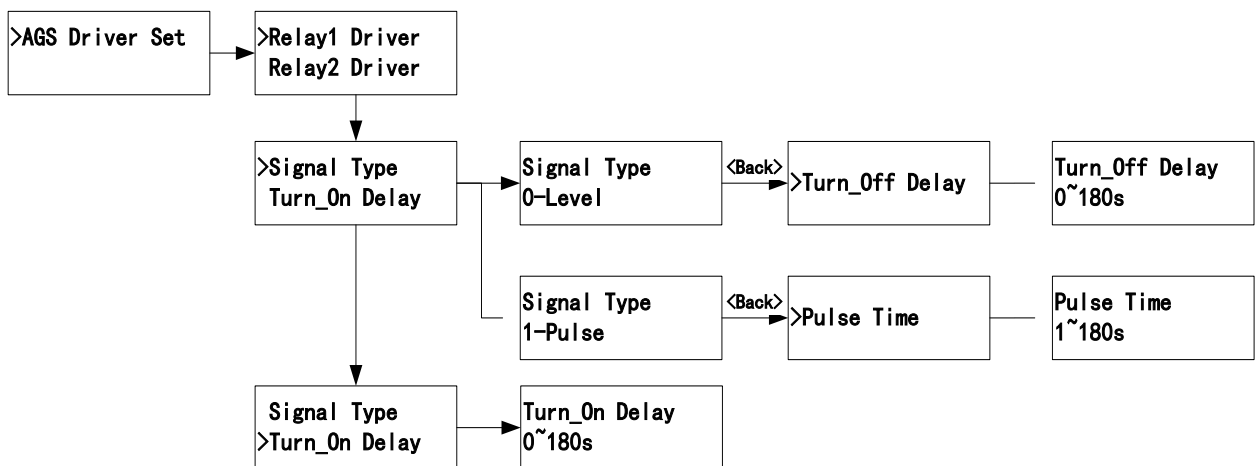
Item	Setting range	Description
Relay Function --> Function Mode	0-Default	1: The dry contact relay 1 is defined as the alarm for the battery low voltage. 2: The dry contact relay 2 is defined as the alarm for the inverter overloaded.
	1-User Define	The two dry contact relays can be programmed with following functions respectively. 0-Ubat Low

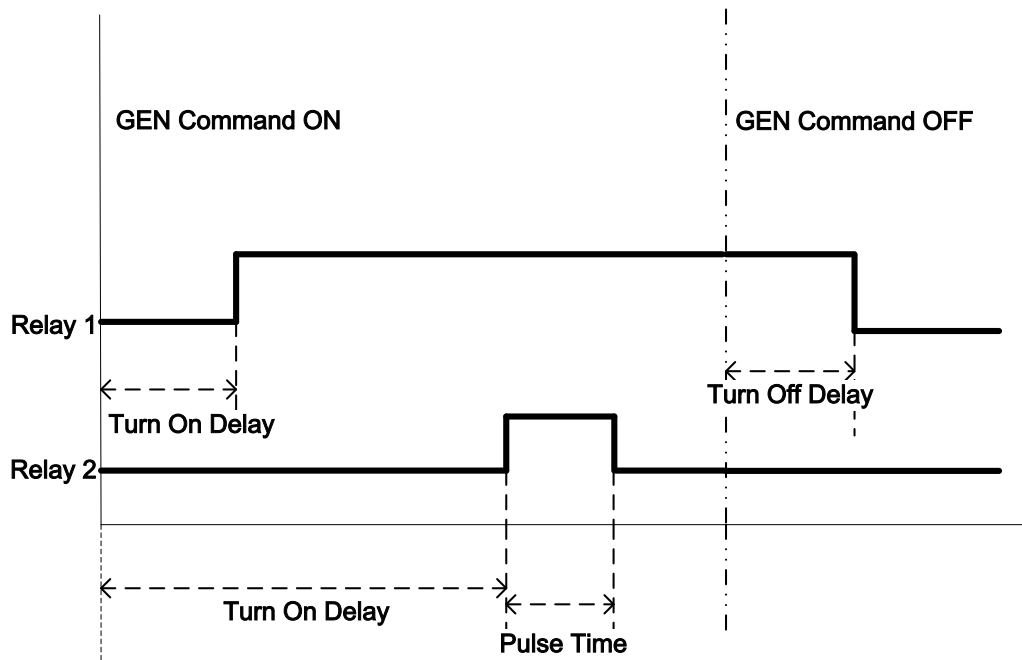
		1-OverLoad/OT 2-INV Fault 3-ACin Error 4-ACin Charging 5-ACin Ready 6-ACin Voltage 7-Fan Running 8- MPPT/ACin CHG 9- PV Voltage 10- BMS Alarm 11-SOC Normal
	2-AGS Driver	Both relay 1 and 2 will perform as AGS driver. Please refer to 5.6.3 for explanation in details.
Relay1 Define		Display if Function Mode is '1-User Define'
Relay2 Define		Display if Function Mode is '1-User Define'
AGS Logic		Display if Function Mode is '2-AGS Driver '

5.6.3 AGS Driver

With this menu, relay 1 and relay 2 will be programmed to control the start and stop of generator. Please find the following chart with detailed definition.

AGS Driver Set Table



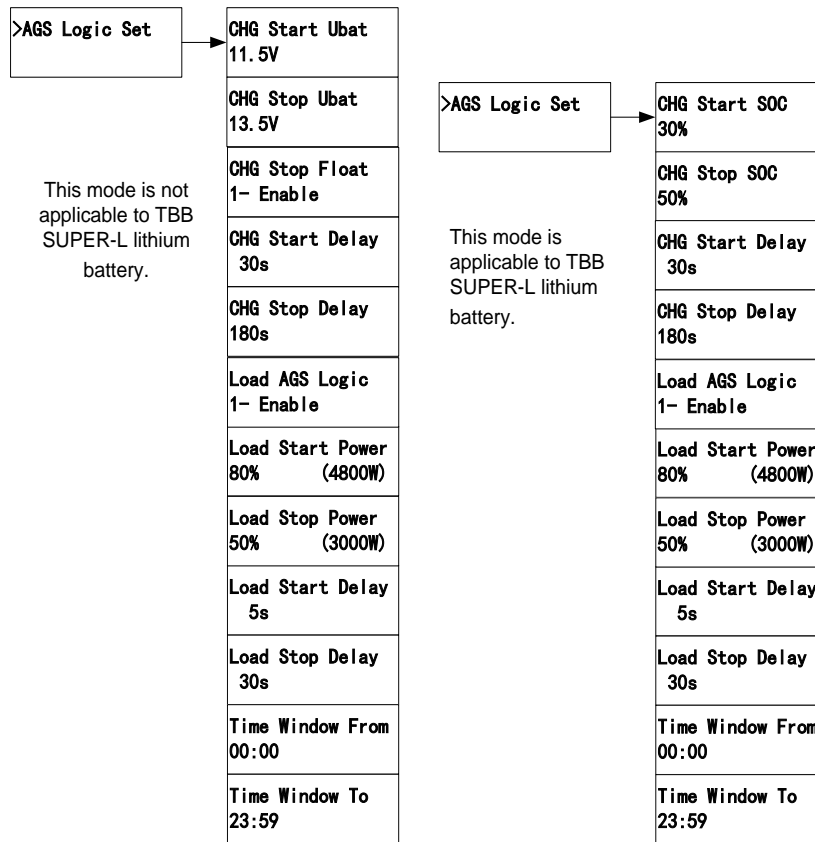


Item	Setting range	Description
AGS Driver Set	See ' AGS Driver Set Table '	Set the Relay1 and Relay2 to Generator Control See Relay1 and Relay2 parameter setting
Min Run Time	180~1800s	Minium time of generator running Default: 180s
Interval Time	30~1800s	Minium interval time of generator start Default: 30s
AGS Logic Set	See ' AGS Logic Set Diagram '	Generator control (start/stop) logic
AGSCHG Trigger /AGS Stop Trigger		(1/2) When the AGS logic is off, it displays the manual triggering of the AGS start interface, and it will enter the AGS charging logic after it is triggered. (2/2) When the AGS logic is on, it displays manual triggering of the AGS stop interface, and it will exit the AGS logic after it is triggered.

AGS Driver Set Table: Relay1 and Relay2 parameter setting

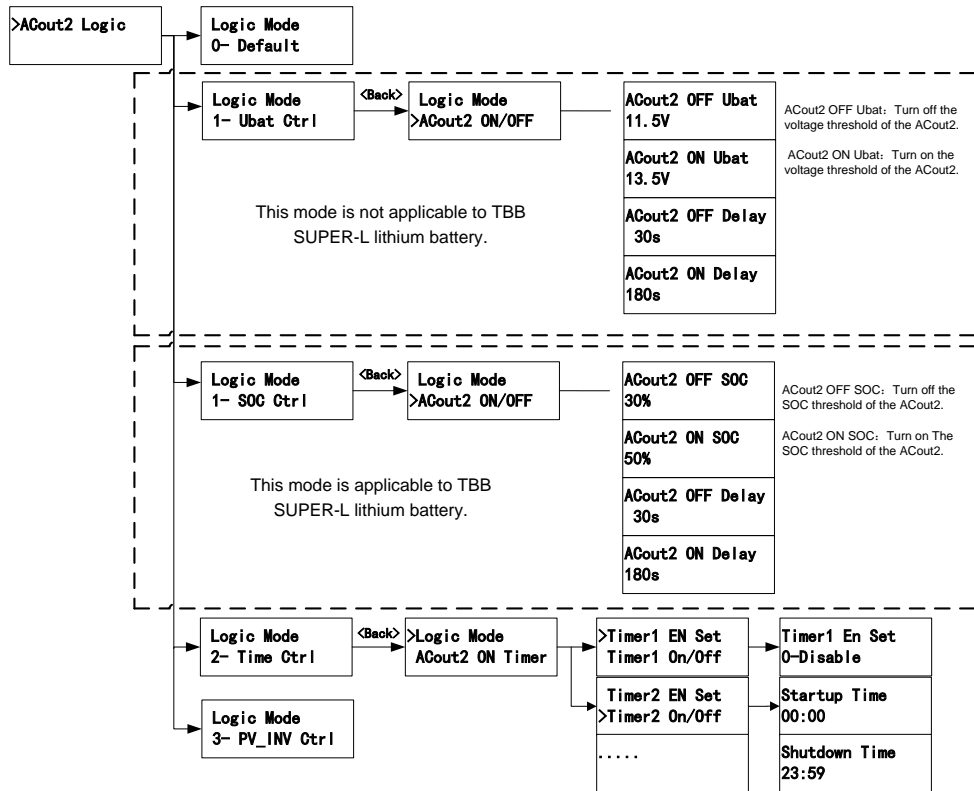
Item	Setting range	Description
Signal Type	0-Level 1-Pulse	0-Level: Relay will operate in the Level Mode 1-Pulse: Relay will operate in the Pulse Mode Default: 0-Level
Turn On Delay	0~180s	Turn ON after the Delay time when receiving the turn on command. Default: 0s
Turn Off Delay	0~180s	Turn OFF after the Delay time when receiving the turn off command. Default: 0s
Pulse Time	1~180s	Pulse Time Default: 1s

AGS Logic Set Diagram



5.6.4 ACout2 Logic

Item	Setting range	Description
ACout2 Logic -->Logic Mode	0-Default 1- Ubat / SOC Ctrl 2-Time Ctrl 3-PV_INV Ctrl	0-Default: ACout2 relay is turned on only when it is powered by the grid. 1-Ubat Ctrl: Control ACout2 relay according to battery voltage. 1-SOC Ctrl: Control ACout2 relay according to battery SOC. 2-Time Ctrl: Timing control on the ACout 2. . 3-PV_INV Ctrl: There is such option when AC couple mode has been selected. After that option is set, the oversized PV inverter can be connected to AC Output 2 to improve the AC Coupled PV System applicability. The capacity of PV inverter connected on the AC output 2 should not be larger than the capacity of the battery inverter.



5.6.5 Screen Set

Backlight_KeepOn	Enable the backlight fixed lighting function 0-Disable 1-Enable Default: 0-Disable
Page_Interval	To set automatic page turning time to display the real-time information, 3~30s. Default: 5s

5.6.6 Date & Time

Set the current Date & Time.

5.6.7 Trigger Command

Fault Unlock	Unlock the fault, and the inverter can be restarted.
Fan Dedusting	Clear energy calculation data.
BAT Dischg Test	
Parameter Sync	In a parallel or three phase system, the slave inverter can use the function to synchronize its parameters with that of the master inverter.

6. FAQ

6.1 Error code

6.1.1 Inverter Error

No.	Error Code	Description	Solution
101	U_Bus_OV	DC bus is over voltage	Check the battery voltage.
102	U_Bus_LV	DC bus is under voltage	Check the battery connection and voltage.
103	U_Bus_HW_Pro	Hardware protection against DC bus over voltage	Check the battery voltage and the charger output voltage
104	PSU_Fault	Auxiliary power supply is abnormal	Restart the inverter. Contact your installer if it still exists.
105	T_HS_OT	Heat sink's temperature is too high	Check and assure inverter has good ventilation
106	T_TX_OT	Transformer's temperature is too high	Too high ambient temperature.
107	Sam_HD_Fault	Sampling is abnormal	Restart the inverter. Contact your installer if it still exists.
108	EEPROM_Fail	ROM is abnormal	
109	Output_ShortCut	Output short circuit	Check if there is a short circuit at loads.
110	Output_OverLoad	Output over load	Reduce the loads.
111	CoolSys_Err	Cooling system is abnormal	Checking if fan is working properly.
112	U_BAT_Low_Deep	Battery is severely under voltage	Connect to a valid grid or generator. Restart the inverter and charge the battery.
114	Instant_OC_Soft	Instantaneous over current	Check if there is a short circuit at loads.
115	EPO	Emergency stop	Check the EPO Dry Input.
116	Rly_Err	Relay is abnormal	Restart the inverter. Contact your installer if it still exists.

6.1.2 MPPT Error

No.	Error Code	Description	Solution
301	U_Bus_OV	DC bus is over voltage	Check the PV input voltage.
302	U_BAT_OV	DC bus is under voltage	Check the battery voltage.
304	Buck_ShortCut	Buck short circuit	Check if there is a short circuit at the MPPT output.
305	I_Buck1_OC	Buck 1 is over current	Check the MPPT output connection. Restart the equipment, contact the installer if the error still exists.
306	I_Buck2_OC	Buck 2 is over current	
307	T_Board_OT	Control Board's temperature is too high	Check fan ventilation.
308	T_HS_OT	Heat sink's temperature is too high	Too high ambient temperature.
309	PSU_LV	Auxiliary power supply is abnormal	Restart the MPPT. Contact your installer if the error still exists.
310	PSU_LV_HD	Auxiliary power supply is abnormal(hardware)	
311	Sam_HD_Fault	Sampling is abnormal	
312	EEPROM_Fail	ROM is abnormal	
313	EPO	Emergency stop	Check the EPO Dry Input.

6.1.3 BMS Error

No.	Error Code	Description
040	Module_OV	There is over-voltage protection on the Lithium battery module.
041	Module_UV	There is under-voltage protection on the Lithium battery module.
042	Module_OT	Lithium battery module's temperature is too high.
043	Module_UT	Lithium battery module's temperature is too low.
044	Discharge_OC	Lithium battery module's discharge current is over normal value.
045	Charge_OC	Lithium battery module's charge current is over normal value.
046	Module_INT_Err	Lithium Battery Module fails.

6.2 Warning code

6.2.1 Inverter Warning

No.	Warning Code	Description	Solution
001	U_BAT_OV	Battery is over-voltage	Check the battery voltage.
002	U_BAT_LV	Battery is under-voltage	Check the battery voltage.
003	U_BAT_LV_Fault	Battery is under-voltage protection	Check the battery voltage.
004	Overload	Overload warning	Reduce the load.
005	NTC_HS_Fault	Heat sink NTC fails	Power off the inverter and check the internal NTC connection. Contact your installer if the fault still exists.
006	NTC_TX_Fault	Transformer NTC fails	
007	T_BAT_OT	Battery temperature is too high	Check battery sensor connection; Check battery temperature; Check battery connection
008	Fan_Fault	Fan is abnormal	1.Check whether the fan is blocked.
			2.Open the case, check the fan connection. Contact your installer if the fault still exists.
009	ParConnect_Err	Parallel connect is abnormal	Check the connection of parallel communication cable.
010	ParComm_Err	CAN communication is abnormal	Check the parallel parameter setting.
011	Par_ID_Conflict	Parallel address conflicts	Check the parallel parameter setting (ID address)
012	Para_Conflict	Parameters do not match	Check the parameter setting or trigger Parameter Sync.
013	Par_SyncTimeOut	Synchronization is overtime	
014	ModeSet_Mismatch	The system mode and parameter setting do not match	Check the parameter setting (Lithium battery, AC Couple)
015	Out_Circuit_Err	The AC output of the Parallel system or three-phase system is abnormal	Check the output wire connection
016	Comm_HMI_Err	Internal communication of LCD is abnormal	Open the case, check the LCD wire connection. Contact your installer if the fault still exists.
020	ACin_OV	AC input is over-voltage	Check the AC input voltage and connection
021	ACin_LV	AC input is under-voltage	
022	ACin_OF	AC input is over-frequency	
023	ACin_LF	AC input is under-frequency	

024	ACin_PhaseErr	AC input phase sequence is abnormal	
025	U_NEU_2_GND_Err	The voltage between N and GND is abnormal	1.Check the ACin L-N connection. 2.Check the GND connection.
030	Comm_Inner_Err	Communication between the inverter and DSP is abnormal	Open the case, check all the inner connection. Contact your installer if the fault still exists.
031	Model_Detect_Err	Software and hardware matching error	Restart the inverter. Contact your installer if the fault still exists.

6.2.2 MPPT Warning

No.	Warning Code	Description	Solution
201	U_BAT_OV	Battery is over voltage	Check the battery voltage and connection
203	Cur_Limit	MPPT current limitation alarm	Check if there is a short cuit at the output
204	BAT_UnConnect	The MPPT is not connected to the battery	Check the battery connection.
205	NTC_HS_Fault	Heat sink NTC fails	Power off the inverter and check the internal NTC connection. Contact your installer if the fault still exists.
206	T_BAT_OT	Battery temperature is too high	Check battery sensor connection; Check battery temperature; Check battery connection
207	Fan_Fault	Fan is abnormal	1.Check whether the fan is blocked. 2.Open the case, check the fan connection. Contact your installer if the fault still exists.
209	Comm_Sys_Err	Communication Between MPPT and Inverter is abnormal, at DC Coupled PV System	Check the connection of communication cable.
210	Comm_HMI_Err	Internal communication of LCD is abnormal	Open the case, check the LCD wire connection. Contact your installer if the fault still exists.
213	U_BAT_LV_Protect	Battery is under voltage protection	Check the rated_Volt set of the MPPT.
214	NTC_Board_Fault	Internal NTC fail (SP)	Check battery sensor connection; Check battery temperature; Check battery connection
215	I_Load_OC_Fault	Load output over current (SP)	Check load
220	MPPT Comm Offline	Communication is offline	Check the communication connection with inverter, at DC Coupled PV System
430	IG Comm Offline	Communication is offline	Check the communication connection with inverter, at AC Coupled PV system

6.2.3 BMS Warning

No.	Warning Code	Description
050	Module_HV	Lithium battery module is over voltage.
051	Module_LV	Lithium battery module is under voltage.
052	Module_HT	Lithium battery module's temperature is too high.
053	Module_LT	Lithium battery module's temperature is too low.
054	Discharge_HC	Lithium battery module's discharge current is over normal value.
055	Charge_HC	Lithium battery module's charge current is over normal value.
056	INT_Comm Fail	Communication with inverter is abnormal.
057	EXT_Comm Fail	Communication among Lithium modules is abnormal.
058	SOC_Low	Lithium module's SOC is too low.

6.2.4 BGK Warning

No.	Warning Code	Description
601	U_BAT_OV	Battery over voltage alarm.
602	U_BAT_LV	Battery under voltage alarm.
603	U_BAT_Unbalance	Individual Battery Block/Cell Voltage unbalance.
605	Module_T_BAT_OT	Battery low temperature.
606	Module_NTC_Fault	NTC fails
607	Module_MisMatch	Battery Cell voltage does not match.
608	Module_Init_Err	Communication address error.
609	Module_Comm_Err	Communication error with inverter.
610	Module_INT_Err	Communication error among BGK modules.
611	SYS_Init Timeout	System initialization error.

7. Specification

Model	CK4.0M	CK5.0M	CK4.0S	CK5.0S	CK6.0S	CK8.0S
Power Assist	Yes					
AC inputs	Input voltage range:175~265 VAC, Input frequency:45~65Hz					
AC input Current	50A (transfer switch)					
Inverter						
Nominal battery voltage	24VDC			48VDC		
Input voltage range	21~34VDC			42~68VDC		
Output	Voltage: 220/230/240 VAC \pm 2%, Frequency: 50/60 Hz \pm 0.1%					
Harmonic distortion	<2%					
Power factor	1.0					
Cont. output power at 25°C	4000VA	5000VA	4000VA	5000VA	6000VA	8000VA
Peak power (30min)	4000W	5000W	4000W	5000W	6000W	8000W
Cont. output power at 25°C	3600W	4500W	3200W	4000W	4800W	6500W
Peak power	8000W	10000W	8000W	10000W	12000W	16000W
Cont. output power at 40°C	2800W	3600W	2800W	3600W	4200W	5600W
Maximum efficiency	94%			96%		
Zero load power	18W	23W	17W	19W	20W	26W
Charger						
Charge voltage 'absorption'	28.8VDC			57.6VDC		
Charge voltage 'float'	27.6VDC			55.2VDC		
Battery types	AGM / GEL / OPZV / Lead-Carbon / Li-ion / Flooded / TBB SUPER-L					
Battery Charge current	120A	150A	55A	70A	80A	110A
Temperature compensation	Yes					
General data						
AC Out Current	AC Out1 Current :50A, AC Out2 Current :32A					
Transfer time	<2ms(<15ms when WeakGrid Mode)					
Remote on-off	Yes					
Programmable relay	2x					
Protection	a) output short circuit, b) overload, c) battery voltage over voltage d) battery voltage under voltage, e)over temperature, f) Fan block g) input voltage out of range, h) input voltage ripple too high					
CAN Bus communication port	For parallel and three phase operation, remote monitoring and system integration					
General purpose com. Port	CAN,RS485 (Bluetooth,GPRS,WLAN optional)					
Operating temperature range	-20 to +65°C					
Storage temperature range	-40 to +70°C					
Relative humidity in operation	95% without condensation					
Altitude	2000m					
Mechanical Data						
Dimension	532.8*285*188mm					
Net Weight	33kg	36kg	30kg	33kg	35kg	40kg
Cooling	Forced fan					
Protection index	IP20					
Standards						
Safety	EN-IEC 62477-1					
EMC	EN61000-6-2,EN61000-6-4,EN61000-3-11,EN61000-3-12					

TBB POWER Co.,Ltd.

Web : www.tbbpower.com

Tel : +86-592-5212299

Fax : +86-592-5796070

Email : service@tbbpower.com