Home Energy Storage System
Ultra Series

W5000

Support by
Kowint Energy
Technical Support Department

User Manual

KOWINT ENERGY (SHENZHEN) CO., LTD

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CONTENTS

1. Safety

1.1. Safety Instructions

For safety reasons, installers are responsible for familiarizing themselves with the contents of this manual and all warnings before performing installation.

1.1.1. General Safety Precautions

⚠ **WARNING!**

Please don't crush or impact the battery, and always dispose it according to the safety regulation.

Observe the following precautions:
- Risks of explosion

   Do not subject the battery to strong impacts.　　Do not crush or puncture the battery.
   Do not dispose of the battery in a fire.
- Risks of fire

   Do not expose the battery to temperatures in excess of 55°C. Do not place the battery near a heat source, such as a fireplace. Do not expose the battery to direct sunlight.
   Do not allow the battery connectors to touch conductive objects such as wires.
- Risks of electric shock

   Do not disassemble the battery.
   Do not touch the battery with wet hands.
   Do not expose the battery to moisture or liquids. Keep the battery away from children and animals.
- Risks of damage to the battery

   Do not allow the battery to get in contact with liquids. Do not subject the battery to high pressures.
   Do not place any objects on top of the battery.

⚠ **CAUTION!**

If the battery is not installed within three month since the battery arrived, the battery should be perform the maintenance charge operation, the target is keep the SOC not less than 50% .

1.2. Response to Emergency Situations

1.2.1. Leaking Batteries

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

Accidental inhalation of harmful substances: Evacuate people from the contaminated area and seek medical attention immediately.

Eye contact: Rinse eyes with flowing water for 15 minutes and seek medical attention immediately.

Dermal contact: Wash the affected area thoroughly with soap and water and seek medical attention immediately.

Ingestion: Induce vomiting and seek medical attention immediately.

1.2.2. Fire

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

⚠ **WARNING!**

The battery pack may catch fire when heated above 150°C.

If a fire breaks out at 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 noxious and poisonous gases. Do not approach.

1.2.3. Wet Batteries and Damaged Batteries

If the battery is wet or submerged in water, do not try to access it.

If the battery seems to be damaged, they are not fit for use and may pose a danger to people or property. Please pack the battery in its original container, and then return it to your distributor.

⚠ **CAUTION!**

Damaged batteries may leak electrolyte or produce flammable gas. If you suspect such damage, immediately contact your distributor for advice and support.

1.3. Qualified Installer

⚠️ **WARNING!**

All operations of W5000 relating to electrical connection and installation must be carried out by qualified person.

A skilled worker is defined as a trained and qualified electrician or installer who has all the following skills and experience:

Knowledge of the functional principles and operation of on-grid systems

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

2. Product Introduction

2.1. Product Overview

The Pocket Series product W5000 lithium iron phosphate battery is a new energy storage product. It can be used to support reliable power for various types of equipment and systems. W5000 is especially suitable for application scene of high power, limited installation space, and restricted load-bearing and long cycle life.

Product Dimension: W x H x D= 450mm x 615mm x 180mm

2.2. Product Architecture

2.2.1. Product Overview

Figure 1: Architecture

Figure 2: W5000 front view
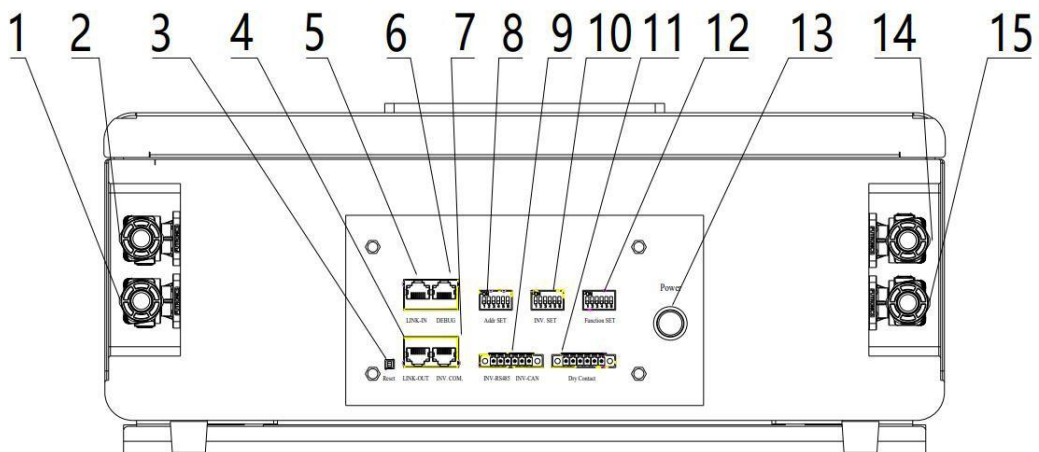
Figure 3: Interface panel

Table 1: Architecture introduce

No.	Items	Instructions
1	-	Power cathode
2	-	Power cathode
3	Reset	BMS Reset
4	LINK-OUT	Multi-device parallel connection
5	LINK-IN	Multi-device parallel connection
6	DEBUG	For Debug tools connection
7	INV.COM.	Communication port with Inverter
8	Addr SET	W5000 ID setting
9	INV-RS485,INV-CAN	Communication port with Inverter
10	INV.SET	For Inverter selecting
11	Dry Contact	For Dry Contact

12	Function SET Dial Switch	Set the role of the battery device
13	Power Button	Energy Storage system manual startup Button
14	+	Power anode
15	+	Power anode

2.3. Benefits

◆ Extreme safety---lithium iron phosphate battery, long battery life;

◆ Compact Size---ultra-thin wall-mounted design;

◆ Outstanding scalability---support 31 parallel machines;

◆ Data Visualization---large screen display, the running status is clear at a glance;

◆ Good controllability --- parallel machine only needs one key to switch ON/OFF;(optional)

◆ Simple maintenance, support cloud monitoring and cloud upgrade (optional);

◆ High compatibility---matching test with mainstream photovoltaic inverter;

◆ Strong adaptability---outdoor design, suitable for installation in outdoor environment;

2.4. Specification

Table 2: product parameters

No	Items		Parameters	
1	Model		W5000-SS/ W5000-SSW	W5000-ST/ W5000-STW
2	Combination Mode		1P15S	1P16S
3	Initial Internal Resistance(mΩ)		<50	
4	Cell Type		LiFePO4	
5	Nominal Capacity (Ah)		100	
6	Nominal Energy (kWh)		4.8	5.12
7	NEC		4.8	5.12
8	Maximum Continuous Discharge Rates (MCDR)(kW)		4.8	5
9	Voltage	Nominal(V)	48	51.2
		Recommend Charging(V)	53.25	56.8
		Max. Charging(V)	54.75	58.4
		Discharge Cut-off(V)	40.5	43.2
10	Current	Standard Charging (A)	50	50
		Max. Charging(A)	95	95
		Standard Discharging (A)	50	50
		Max. Discharging(A)	95	95
11	Weight (Approx.) (Kg)		51	53
12	Dimensions (W*H*D) mm		450*635*180	450*635*180
13	Communication		CAN, RS485, WIFI	
14	Cycle Life		≥6000 times @25℃	
15	Designed Calendar Life		≥10 years	
16	Safety Function		Over-charge, Over-discharge, Over-current, Low/High-temperature, Low-voltage, Short-circuit Protections	
17	Parallel Capability		Maximum 31 units (Recommended 8 units)	
18	Charging Temperature Range(℃)		0~50	
19	Discharging Temperature Range(℃)		-20~50	
20	Best Operating Temperature Range(℃)		15~35	
21	Storage Temperature Range(℃)		-20~55	
22	Best Storage Temperature Range(℃)		0~35	
23	Humidity(@RM)		10% -90% (non-condensing)	
24	Altitude		0~2000m	

3. Installation

3.1.1. Installation Prerequisites

Make sure that the installation location meets the following conditions:

The building is designed to withstand earthquakes.

The location is far away from the sea, to avoid saline water and humid air.

The wall for mounting should be strong enough to bear the weight of W5000 Battery.

There are no flammable or explosive materials nearby.

The ambient environment is shady and cool, and away from heat as well as direct sunlight.

The temperature and humidity stay at a constant level.

There is minimal dust and dirt in the area.

There is no corrosive gases present, including ammonia and acid vapor.

The ambient temperature is within the range from 0°C to 55°C, and the optimal ambient temperature is between 15°C and 35°C.

☞ NOTE！

The W5000 battery is rated at IP55 and thus can be installed outdoors as well as indoors. However, if installed outdoors, do not expose the battery directly to sunlight and moisture.

☞ NOTE！

If the ambient temperature is beyond the operating range, the battery will stop operating to protect itself. The optimal temperature range for the battery to operate is from 15°C to 35°C. Frequent exposure to harsh temperatures may deteriorate the performance and lifetime of the battery.

3.2. Safety Prepare

Installation and maintenance personnel must operate according to applicable federal, state and local regulations as well as the industry standard.

The product installation personnel shall wear safety gears, etc. in order to avoid short circuit and personal injury.
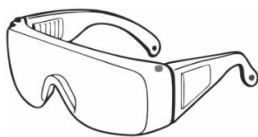
| Safety goggles | Insulated gloves | Safety shoes |

3.3. Required Tools
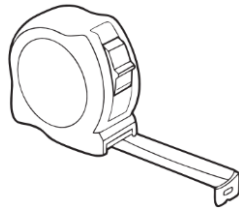
Pencil or Mark Tape measure driller
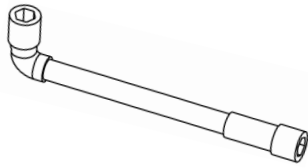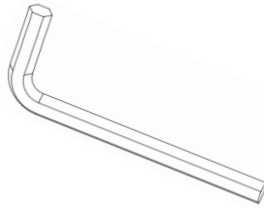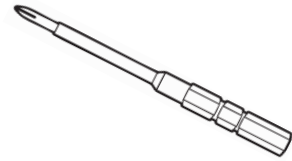
Socket nut wrenchs Hex wrenchs Pillips screwdrivers

3.4. Packaging Inspection

Check the battery packages to find the visible damages, any visible damages, such as cracks, please contact your dealer immediately.

3.5. Open Box

Open the battery package by cutting the packing tape, please check if the battery package and all relevant items are intact.
Check the package items on section 3.6, check the packing list carefully, if there's any item missing, please contact your distributer directly.

3.6. Packing List
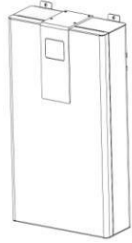
W5000*1

Power Cable 4AWG 1.5m*2
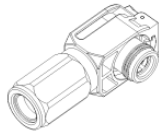
Power Cable Connector*2
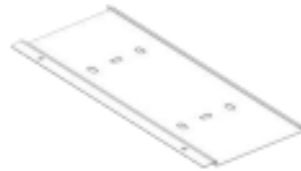
Installation Board*1
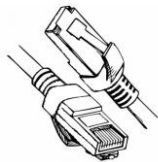
RJ45 Cable 1m(T568B)*2
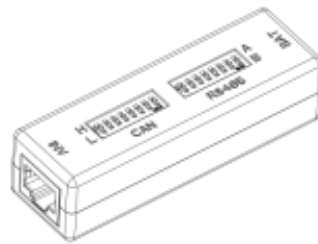
Communication Switch Box*1

Communication Cable* 1

User Manual*1

3.7. Battery Installs Steps

Make sure the wall is enough to withstand the weight of battery.

Note: for easy operation, keep the distance from the installation point to the floor not less than 1500mm.

Step 1: fix the wall bracket on the wall

● Use the wall bracket as a template to mark the position of the 4 holes

● Drill holes with φ10 driller, make sure the holes are deep enough (at least 80mm) for installing and tightening the expansion bolts

● Install the expansion bolts in the wall, and tighten the screws on the bracket by using the screw driller.
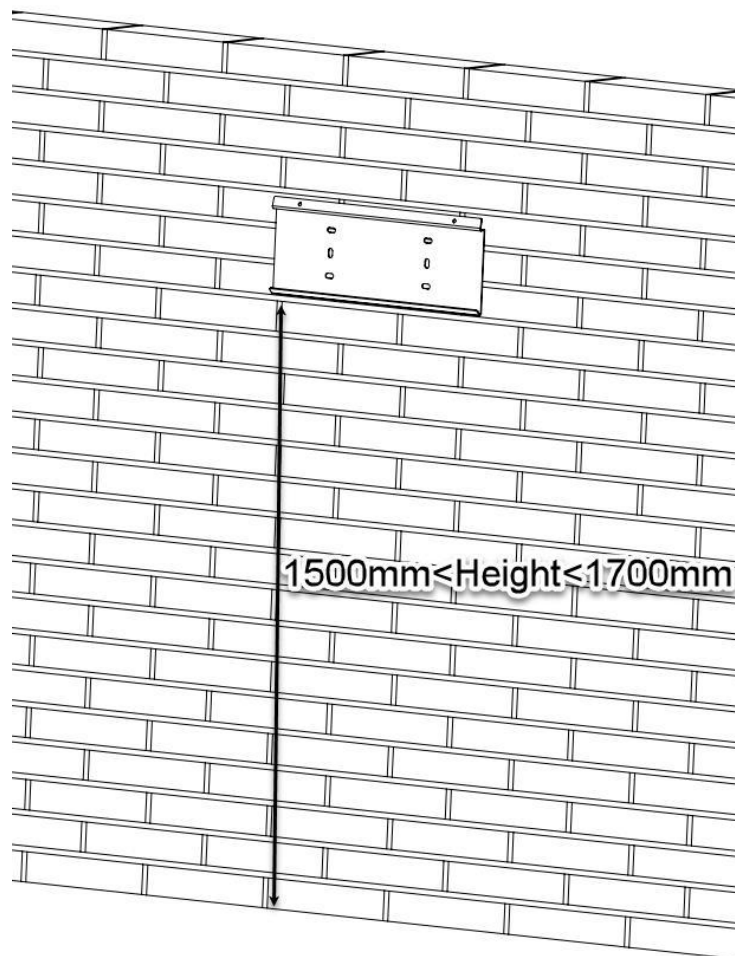
Figure 4: Bracket installation

Step 2: W5000 Dial Switch presetting

Before start the W5000 battery physical installation, please perform the Dial switch setting according to the role of the battery (The Dial switch is on the interface panel which at the bottom of the battery) first.

When the battery is connected in parallel, cascading communication is required. Hardware address configuration is required for both the master Battery and the slave Battery, and the hardware address can be set by the dial switch on the board. The definition of the switch refers to the table below.
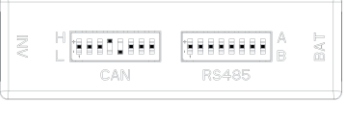
A. Set the Function Set refer to the Function SET reference table.

Table 3: Function SET reference table

The Role of the Device	#1	#2	#3	#4	#5	#6
Single Mode	0	0	0	0	0	0
Parallel Mode Master Battery	0	0	0	0	0	1
Parallel Mode Middle Slave Battery	0	0	0	0	0	0
Parallel Mode Last Slave Battery	0	0	0	0	0	1

B. Set the Addr SET switch refer to the ADDR SET Reference table.

The Address Dial Switch used for Hardware address configure.

ADD Switch: 6 ADD switches, "0"and "1", refer to picture right.
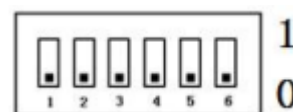
The settings will be active only after restart the battery. When the battery communicates with the inverter, the address of the battery pack must be set to 1, and the address of the parallel slave should be greater than 1.

When the battery is connected in parallel, cascading communication is required. Hardware address configuration is required for both the master battery and the slave battery, and the hardware address can be set by the dial switch on the board. The definition of the switch refers to the table below.

Table 4: Addr SET Dial Switch reference table.
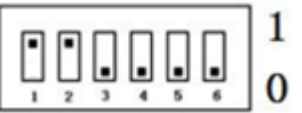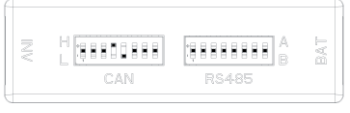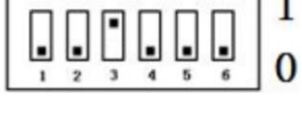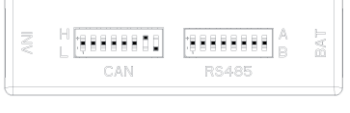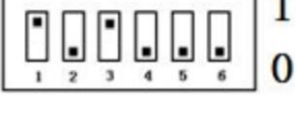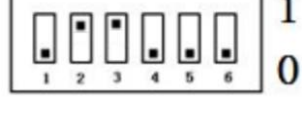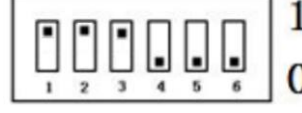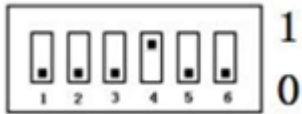
Address Coding	Dial Code Switch Position						Definition
	#1	#2	#3	#4	#5	#6	
1	1	0	0	0	0	0	Set the master battery, and the inverter communicates with the battery at that address
2	0	1	0	0	0	0	Set to the slave battery1
3	1	1	0	0	0	0	Set to the slave battery 2
4	0	0	1	0	0	0	Set to the slave battery 3
5	1	0	1	0	0	0	Set to the slave battery 4
6	0	1	1	0	0	0	Set to the slave battery 5
7	1	1	1	0	0	0	Set to the slave battery 6
8	0	0	0	1	0	0	Set to the slave battery 7
9	1	0	0	1	0	0	Set to the slave battery 8
10	0	1	0	1	0	0	Set to the slave battery 9
11	1	1	0	1	0	0	Set to the slave battery10
12	0	0	1	1	0	0	Set to the slave battery 11
13	1	0	1	1	0	0	Set to the slave battery 12
14	0	1	1	1	0	0	Set to the slave battery 13
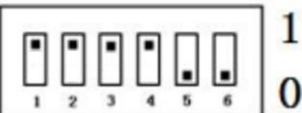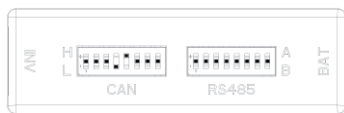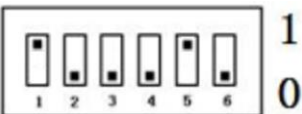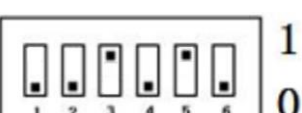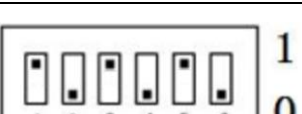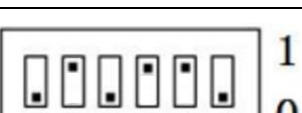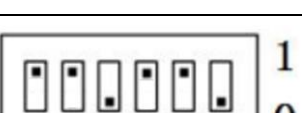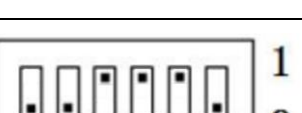
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
29	1	0	1	1	1	0	Set to the slave battery 28
30	0	1	1	1	1	0	Set to the slave battery 29
31	1	1	1	1	1	0	Set to the slave battery 30

C. Set the INV.set switch refer to the INV.set Reference table.

Table 5: INV.set Dial Switch reference table

Brand	Type	ID	INV. set Position	Communication Switch Box Position	Comm Mode
KWT	Low Voltage	1		Reserved	Reserved
Aiswei	Low Voltage	2			CAN
Goodwe	Low Voltage	3			CAN
Victron	Low Voltage	4			CAN
MEGAREVO	Low Voltage	5			CAN
STUDER	Low Voltage	6			CAN
SOFAR	Low Voltage	7			CAN
PHOCOS	Low Voltage	8			RS485

Deye	Low Voltage	10			CAN
Growatt-SPH	Low Voltage	13			CAN
Schneider	Low Voltage	15			CAN
Sol-ark	Low Voltage	17			CAN
Solis	Low Voltage	20			CAN
SerMatec	Low Voltage	21			CAN
MUST	Low Voltage	26			CAN
SMA	Low Voltage	27			CAN
SAJ	Low Voltage	28			CAN

Step 3: Match the battery with the wall bracket

● Lift the battery to the wall bracket

● Hang the battery over the wall bracket, move the battery close to the wall and match it on the wall bracket

Step4: Lock the joint between hanging board and wall bracket with M6 combination screw.
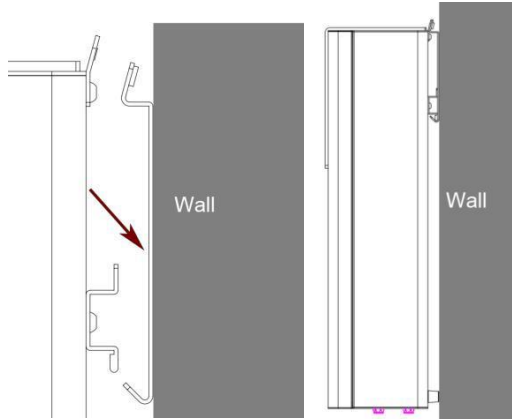

Figure 5: W5000 Mount   Figure 6: W5000 Fixed
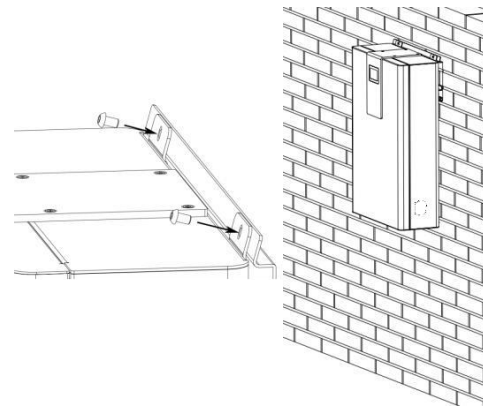
3.8. Cable Connection

3.8.1. Communication Cable Connection

● In Single Mode, connect the communication cable from the INV.COM port to the Inverter's Communication port.

● In Parallel Mode, connect the communication cable from the INV.COM port to the Inverter's Communication port. Connect the communication cable from the first battery's "LINK-OUT" port to the next battery's "LINK-IN" port one by one to create the communication chain, the following diagram show the connection.

Figure 7: parallel communication cable connection

3.8.1.1. LINK-IN Interface
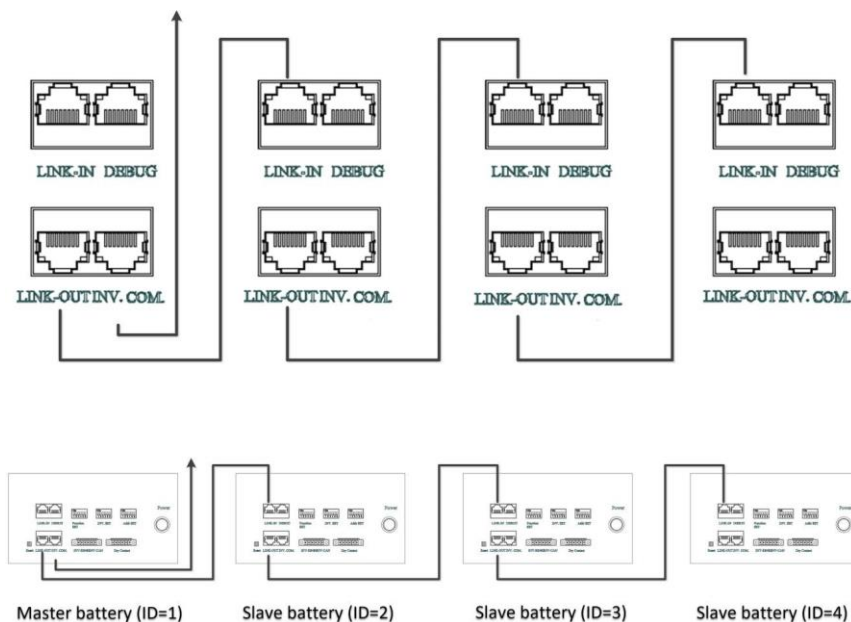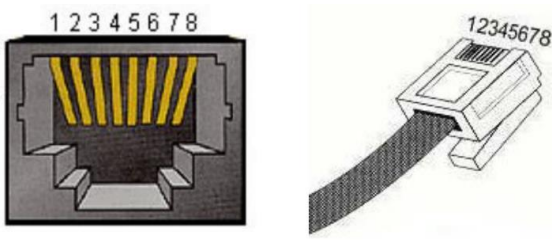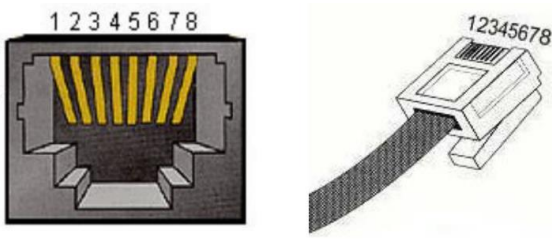
Multi-device parallel connection: RJ45 port, Comply with CAN protocol (baud rate: 500kbps), used for parallel communication between batteries.

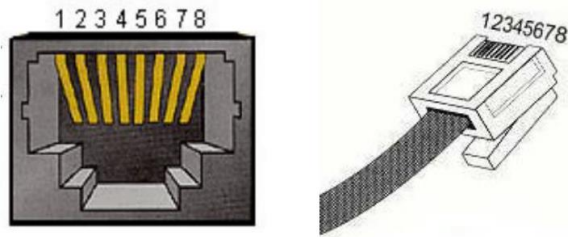| Port Definition	PIN Number	PIN Definition
1 2 3 4 5 6 7 8 12345678	1	CAN1L
	2	CAN1H
	3	CAN1G
	4	GND
	5	PW_OFF SW
	6	CAN1G
	7	XUNZIN-
	8	XUNZIN+

3.8.1.2. LINK-OUT Interface

Multi-device parallel connection: RJ45 port, Comply with CAN protocol (baud rate: 500kbps), used for parallel communication between batteries.

Port Definition	PIN Number	PIN Definition
1 2 3 4 5 6 7 8 12345678	1	CAN1L
	2	CAN1H
	3	CAN1G
	4	PW ON2
	5	PW ON1
	6	CAN1G
	7	XUNZOUT-
	8	XUNZOUT+

3.8.1.3. Invert COMM---Communication with Inverter (RS485 & CAN) Interface

Device supply Inverter communication connection: RS485 & CAN Interface. CAN/RS485 communication port: (RJ45 port) follow CAN protocol and RS485 protocol, for output batteries information, the battery uses this interface to communicate with external inverters, PCS, and other devices.

Port Definition		PIN Number	PIN Definition
		1	RS485_B
		2	RS485_A
		3	RS485-GND
		4	CAN-GND
		5	CAN-GND
		6	RS485-GND
		7	CAN_H
		8	CAN_L

3.8.2. Communication Switch Connection

Dial Switch Definition		Area Number	Area Definition
		1	INV COM
		2	BAT COM
		3	CAN DIP switch
		4	RS485 DIP switch

- The communication DIP switch is applied for both CAN and RS485 communication protocol of various inverter band. Each DIP switch has three level. Before any start-up, set CAN & RS485 DIP switch to NC, the middle of CAN high & low and RS485 A & B. If any update or conflict description of inverter PIN order and Kowint battery's, please contact Kowint FAE for further help.

3.8.3. Power Connection

Before connect the power cable, make sure the inverter and all of the batteries in Power OFF status.

1. Connect the power cables between Inverter and W5000 system

The default length of power cables are 1.5 meters, if the actual installation environment needs longer power cable, the customer can use the power connectors in the packing list to made the longer power cables.
- Use the screw driver to uninstall the cable connect terminal cover on the Left and right side of the W5000.

● Connect the power cable to the Inverter according to the figure.
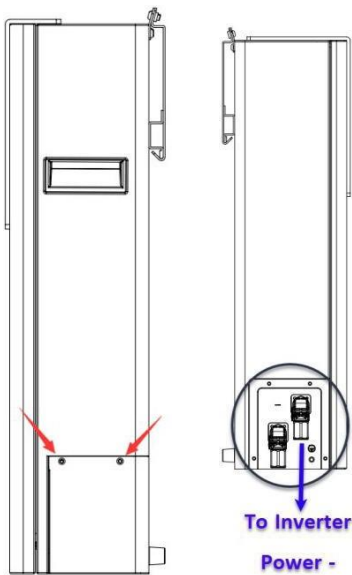

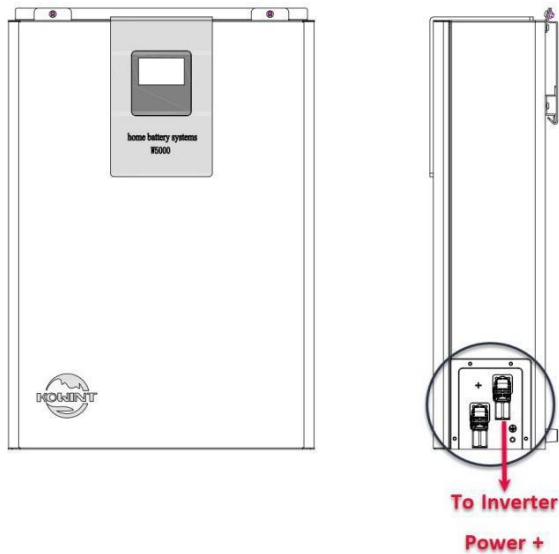*Figure 8: Remove the cover*   *Figure 9: Power cable connection.*

2: Connect the parallel power cable between the batteries.

● In Single mode, connect the Positive cable (Orange) & Negative cable(Black) to the inverter's Positive Pole & Negative Pole.

● In Parallel mode, connect the power cable's one by one as following diagram.
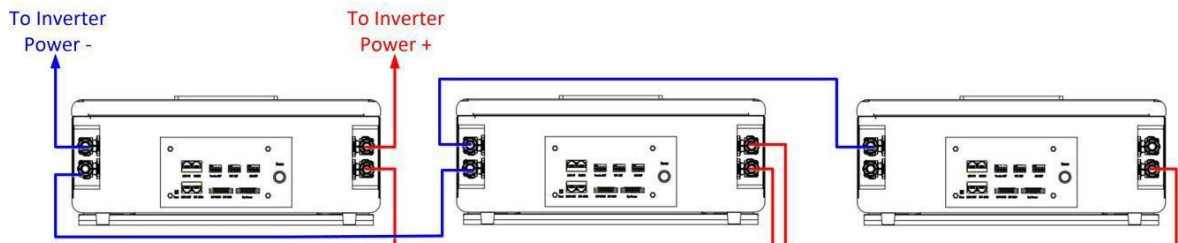

Figure 10: parallel power cable connection

● Install the interface cover and tight the screws, and complete the cable connection

3.8.4. Ground Wire Connection

● Remove the cable interface cover with the screwdriver.

● Connect the ground wire to the Ground terminal on the interface panel, tight the Screw with the Screwdriver. And connect the other side to the grounding.

Note: The terminal point for GND connection is on the side of grooves as shown below:
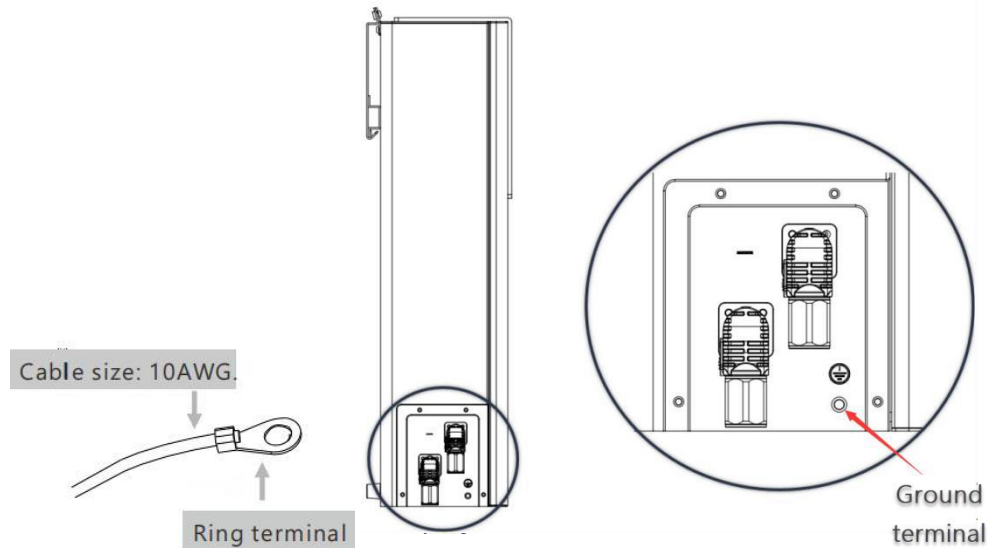
Figure 11: Grounding cable connection

4. Commissioning

4.1. Commissioning Steps

After all the battery packs are installed, follow these steps to put it into operation.

● Verify the batteries communication cable connection is correct.

● Verify the batteries power connection is correct.

● Verify the batteries Dial switch setting is correct.

● If there is a circuit breaker between the inverter and the battery, close it first. If the inverter has a key switch, turn it on first. Press the power button on the master battery's right side to turn ON all the batteries.

● Check the Battery's screen to confirm the batteries working normal.
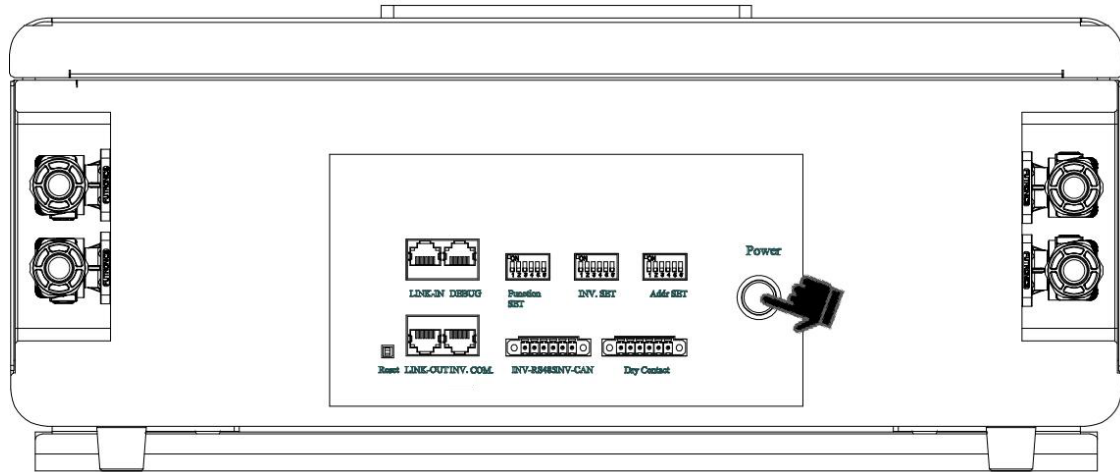
● Power ON the Inverter.

Figure 12: Power ON operation

4.2. WIFI Configuration

Antenna connection port is recommended to fasten tight before WIFI configuration, since the antenna is critical for a communication receive in and send out quality. For details, please refer to the figure below.

Step 1: Download the Kowint APP on phone
Search the keyword "Kowint" from AppStore on iphone or Google play on Android phone, download APP and finish installation. Once the APP install success, user can see the "Kowint" APP logo shown on the right. If users fail to upgrade the latest APP version or to install the APP on phone, please contact Kowint technical support for advice.

Step 2: Create APP user account
Click Create Account button and type in account and password, then scan the QR code provided by the installer, finally click the Create Account button shown in the picture on the right and type in the account and password you just created to log in.

Step 3: Create AP for APP parameter settings
Prepare a new or existed WIFI from a hotspot, router or other telecommunication equipment that generates a specialized wireless network functioned as an AP (internet access is not mandatory).
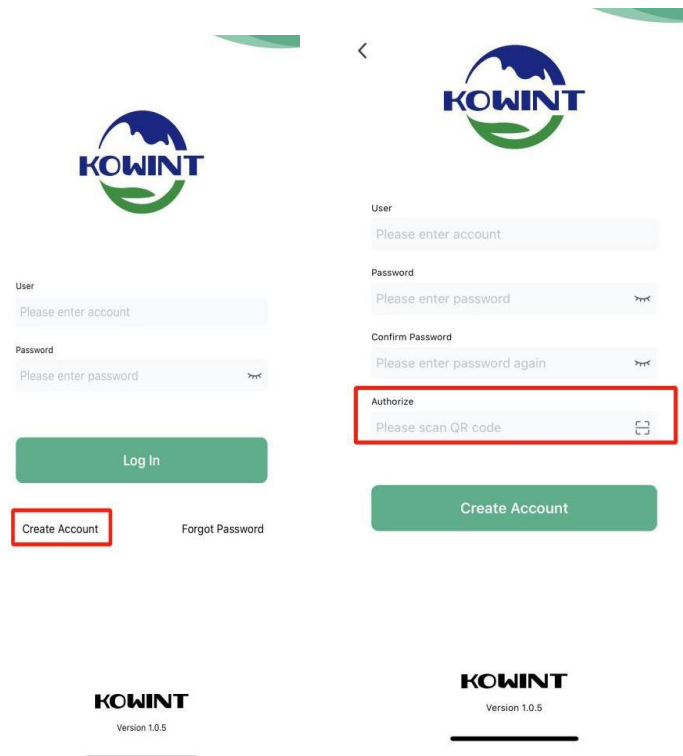
Figure 13: Kowint APP create account

Step 4: Inverter Set dial code setting before AP connection

Click the phone APP Toolbox – Network on screen, and confirm to connect while the inverter setting dial switch set as code 63 (Invert. Set dial 111111) as the figure shown below. Also, users need to turn on GPS location information in order to use a nearby WIFI list.
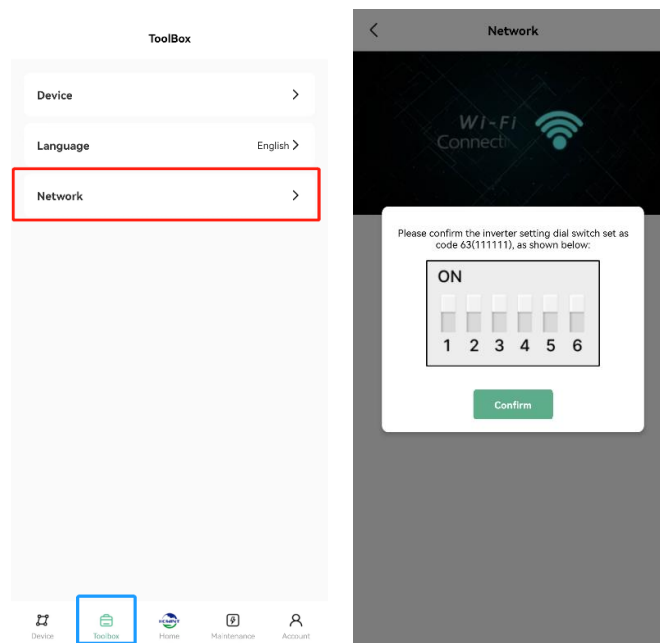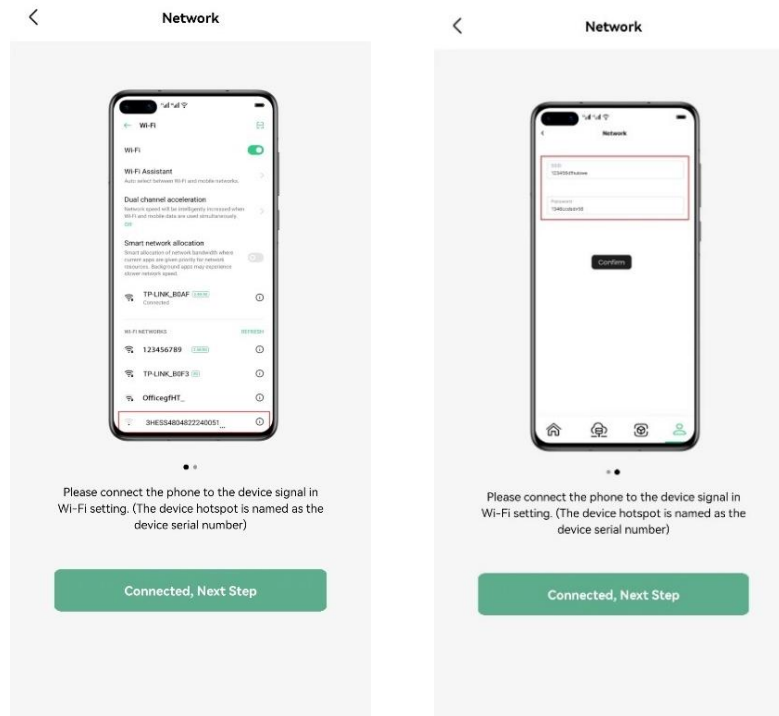

Figure 14: Kowint APP network

Step 5: Pairs WIFI SSID & Password from battery product

Find the battery SSID that includes the battery SN code shows on the product information label. Normally,

the default password is 12345678. If users have trouble to connect the product WIFI, please contact Kowint FAE for further help.

Figure 15: Kowint APP network pairs

Step 6: Send Private WIFI SSID & Password to battery product on APP

Type the private Wi-Fi name in SSID and type in the password of user's private Wi-Fi, after this step, click confirm. If it returns to the main interface after clicked confirm, it will indicate that Wi-Fi get configured successfully (send once only). Please be aware that WIFI SSID and password setting is not recommended to use special signal @, #, $ etc.

Step 7: Check the current situation of added devices

Select the device in the HOME interface to view the corresponding current data of the device.
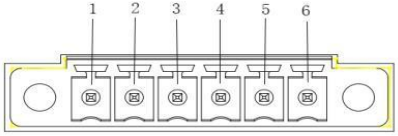
5. APPENDEX

5.1. Reset Button

When BMS is in a dormant state, press the key (3-6S) to release, the protective board is activated, and the LCD indicator lights successively.
When BMS is activated, press the button (3-6S) to release, the protective board is dormant, and the LCD indicator lights down
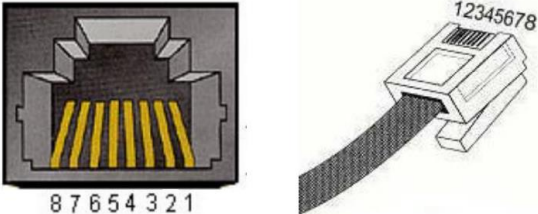
5.2. Dry Contact

The Dry Contact port provided 2 Way output Dry contact signal

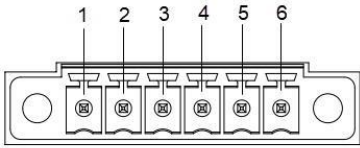| Port Definition	PIN number	PIN Definition
	1	DRY1-NO
	2	DRY1-COM
	3	DRY1-NC
	4	DRY2-NO
	5	DRY2-COM
	6	DRY2-NC

5.3. DEBUG Interface

The W5000 device supply CAN communication connection, the port: (RJ45 port) comply with CAN protocol (baud rate: 500kbps), for manufacturers or professional engineers debugging or service.

Port Definition	PIN number	PIN Definition
	1	IN CANL
	2	IN CANH
	3	GND
	4	CAN1G
	5	CAN1G
	6	GND
	7	CAN1H
	8	CAN1L

5.4. INV-RS485 & INV-CAN Communication Interface

The INV-RS485 & INV-CAN communication interface supply the additional inverter

communication ports.

Port Definition	PIN number	PIN Definition
	1	RS485-B
	2	RS485-A
	3	RS485-GND
	4	CANL
	5	CANH
	6	CAN-GND

5.5. Space Requirement & Office Layout

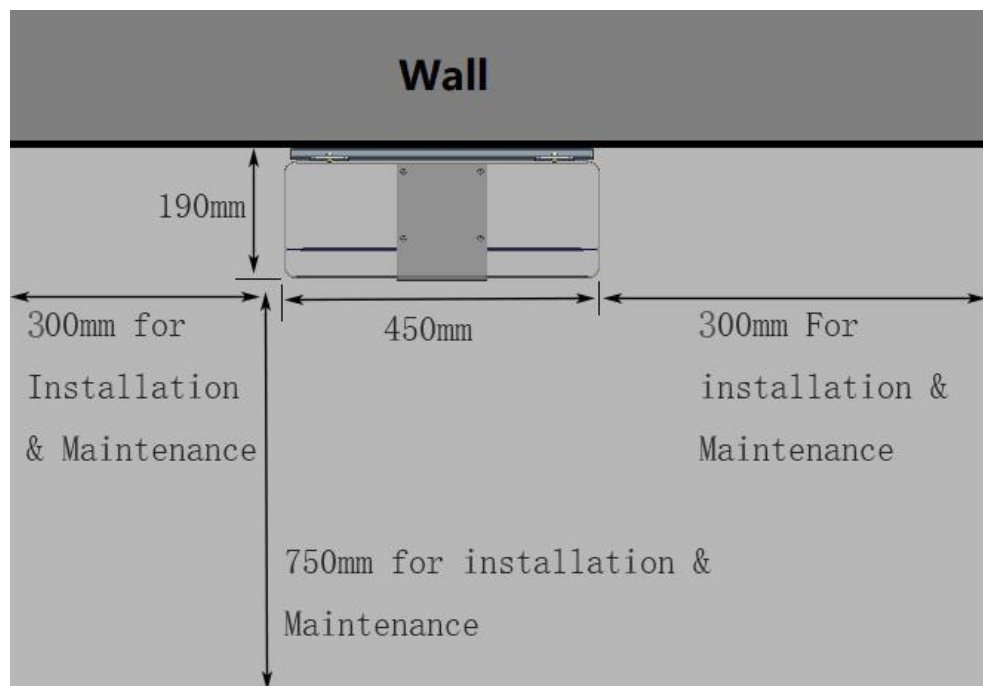The W5000 series product is wall mounted installed, it requires the following minimum site footprint:

Figure 16: Kowint APP network pairs

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