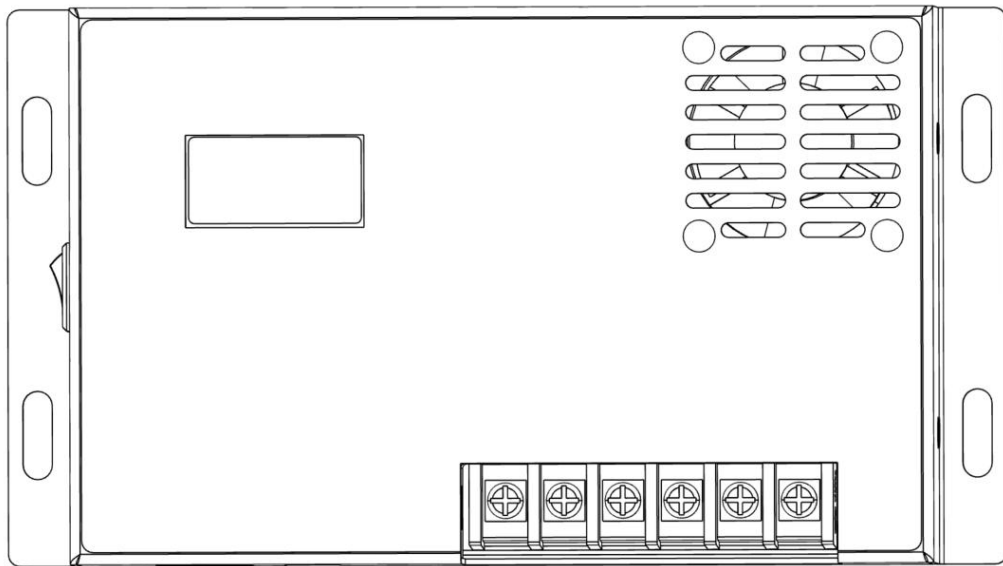


MPPT Solar Charger Controller User Manual

M24HB MODEL

Suitable for 12/24V platform batteries (ternary, lithium iron phosphate, lead-acid, custom types) Buck



Manual Version: V1.0 Subject to change without notice. Contact sales for the latest electronic documentation.

Thank you so much for choosing our products!

Safety Instructions

-  1、 As the operating voltage of this controller exceeds the safe voltage for human contact, please thoroughly read the manual and complete safety operation training before operating this controller.
-  2、 The internal components of the controller do not require maintenance or repair. Users should not disassemble or repair them.
-  3、 Please install the controller indoors to avoid exposing components to the outside and to prevent water from entering the interior.
-  4、 Please install the controller in a well-ventilated and cool place, as the heat sink will get very hot during operation.
-  5、 It is recommended to install a suitable fuse or circuit breaker outside the controller.
-  6、 When installing and adjusting the controller wiring, please disconnect the photovoltaic array connection and the fuses or circuit breakers near the battery terminals first.
-  7、 After installation, check that all wiring is properly connected to avoid loose connections that could cause heat buildup and pose a hazard.



Warning: This indicates that the operation is dangerous. Safety precautions must be taken before proceeding.



Note: This indicates that the operation is destructive.



Tip: This indicates suggestions and tips for the operator.

Table of contents

1、 Product Introduction	错误！未定义书签。
1.1、 Product Overview	4
1.2、 Product Features	4
1.3、 Interface Description	5
1.4、 Introduction to MPPT Technology	6
2、 Technical parameters	7
3、 DIP switch and power on/off instructions	8
4、 TTL and RS485 communication, external 12V output, interface pin definitions	8
5、 Fan temperature control	8
6、 Frequently Asked Questions and Solutions	9
7、 Display Interface Introduction	9
8、 Product installation	11
8.1、 Installation precautions	11
8.2、 Installation steps	11
9、 Protective function	12
10、 system maintenance	12
11、 Product size diagram	12
12、 communication protocol	13
12.1、 Basic communication configuration	13
12.2、 Information address	13
13、 Attachment Details Table	15
13.1、 menu	15
13.2、 fault table	15
14、 System Wiring Diagram	15

1. Product Introduction

1.1 Product Overview

The M24HBcontroller adopts industry-leading MPPT (Maximum Power Point Tracking) technology to achieve maximum energy tracking from solar panels, allowing it to Under various conditions, it can quickly and accurately track the maximum power point of the solar cell, obtaining the maximum energy of the solar panel in real time, significantly improving the efficiency.

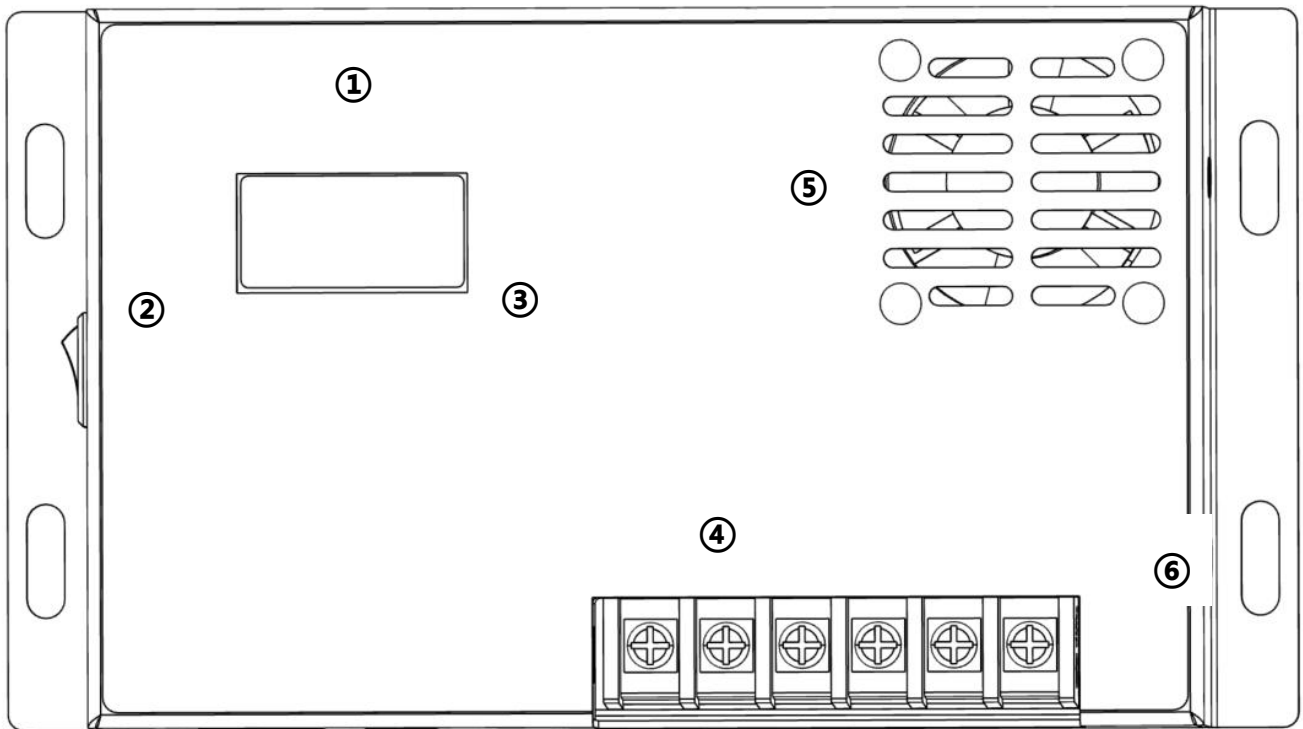
The energy utilization efficiency of solar energy systems. It is widely used in off-grid photovoltaic systems, managing the operation of solar panels, batteries, and loads, and is the core control component of off-grid photovoltaic systems. The controller has a complete software and hardware fault detection and protection function, which can minimize the damage to product components caused by installation errors and system failures.

1.2 Product Features

- It adopts MPPT (Maximum Power Point Tracking) technology, with an MPPT tracking efficiency of up to 99.9%.
- It supports simultaneous full-power charging and discharging.
- It supports various types of batteries, including sealed, gel, open, lithium, and custom types.
- It supports activation of lithium and lead-acid batteries.
- It supports charging current settings.
- It supports full charge settings.
- Supports temperature compensation function.
- Supports parallel charging.
- Supports multiple load operating modes.
- Supports starting capacitive and inductive loads.
- Supports saving historical data.
- Supports RS485 communication with standard Modbus protocol, with fixed baud rate.
- Supports TTL communication with standard Modbus protocol, with fixed baud rate.
- Supports Bluetooth and Ethernet communication functions (optional).
- Equipped with comprehensive protection mechanisms for over-voltage, over-current, overload, over-temperature, and short-circuit during charging and discharging.
- Uses high-quality aluminum heat sinks, air cooling, and high-temperature derating to ensure reliable and efficient operation in various working environments.

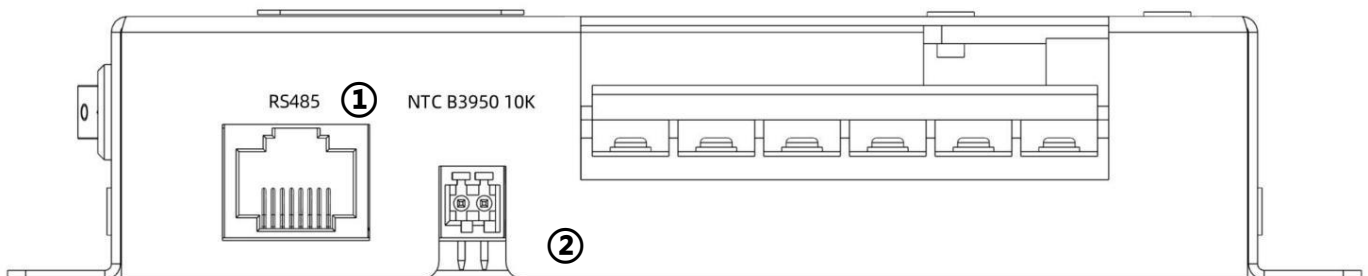
1.3 Appearance and Interface Description

Front Interface Introduction



Serial number	Function description	Remarks
①	Battery type selection, Chinese-English switching, interface switch DIP switch	See the DIP switch section for details.
②	Start button	Side boat-shaped switch
③	Display screen interface	
④	Load interface; battery interface; photovoltaic input interface	Interface KF2EDGR
⑤	Fan outlet	Blockage prohibited
⑥	Ground screw hole position	

Side Socket Outlet Introduction



Serial number	Function description	Remarks
①	RS485 communication interface	See other sections for interface pin definitions.
②	Battery temperature monitoring interface, external NTC B3950 10K temperature sensing resistor	No connection No battery temperature monitoring

1.4 Introduction to Maximum Power Point Tracking Technology

The M24HB series Maximum Power Point Tracking (MPPT) system is a type of An advanced charging technology that adjusts the operating state of the electrical module, allowing solar cells to output more electrical energy. Due to the solar energy The nonlinear characteristics of the pool array have a maximum power point on its curve, which cannot be maintained by traditional controller PWM charging technology. Charging the battery at this point, therefore it is not possible to obtain the maximum energy from the solar panel, but the solar panel with MPPT control technology The controller can continuously track the maximum power point of the array to obtain the maximum energy for charging the battery. In a 12V system For example, because the peak voltage (V_{pp}) of the solar cell is around 18V, while the battery voltage is about 12V, generally During charging, the voltage of the solar panel is around 12V, and it does not fully utilize its maximum power.

The MPPT controller can overcome this issue by adjusting the input voltage and current of the solar panels in real-time, maximizing the input power. The purpose of the value. Compared to traditional PWM controllers, MPPT controllers can harness the maximum power of solar cells, thus being able to provide For greater charging current, generally speaking, MPPT controllers can improve energy utilization by 20% to 30% compared to PWM controllers.

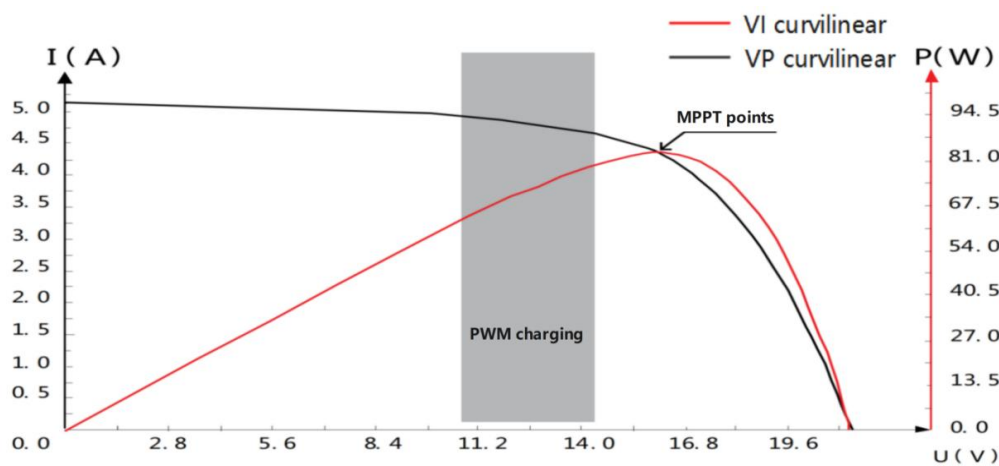


Figure 1-2 Battery panel output characteristic curve

Due to differences in ambient temperature and light conditions, the maximum power point often changes. Our company's MPPT controller can adjust parameters in real time according to different conditions to keep the system close to the maximum operating point at all times. The entire process is fully automatic and does not require any adjustment by the user

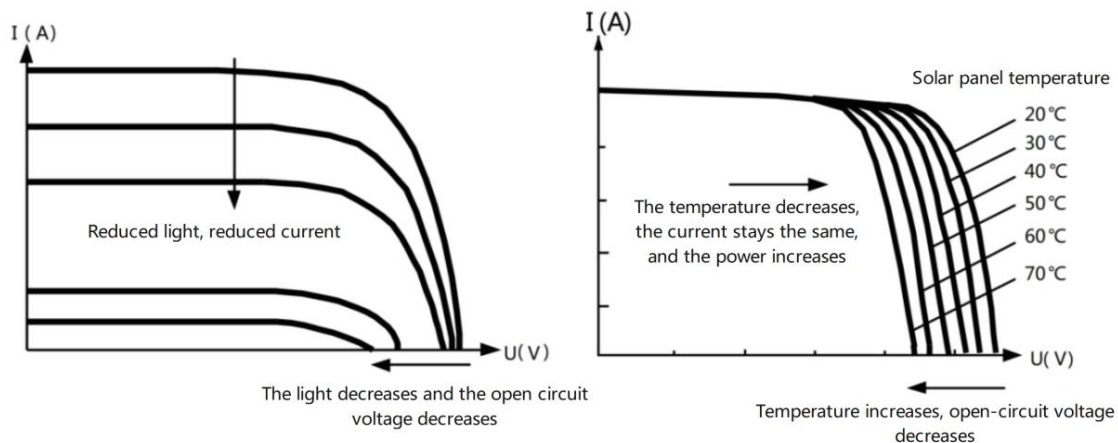


Figure 1-3 Relationship between battery panel Output characteristics and light intensity

Figure 1-4 Relationship between battery panel output characteristics and temperature

2. Technical specifications

Product model	M24HB	
static power consumption	≤30mA	
Battery type	Ternary/Lithium iron phosphate/Lead-acid/Gel/Other batteries (users can configure independently according to the host computer).	
battery voltage	12V	24V
system mode	BUCK	
Rated battery charging current	20A	
Maximum PV input current	18A	
Maximum solar panel power	300W	600W
PV open-circuit voltage	56V	56V
Recommended PV power-point voltage (Vmp)	16V~36V(Recommendation)	24V~42V(Recommendation)
Maximum withstand pressure of the system	63V(±2%) Overvoltage will damage the system	
MPPT tracking efficiency	>99.9%	
MPPT tracking rate	<1ms	
Charging conversion efficiency	>96%	
Rated load current	20A	
Load working mode	Manual and automatic modes (users can configure independently based on the host computer settings).	
Charging working mode	Activation / Trickle / Constant Current / Constant Voltage	
Adjustable battery charging temperature control	√	
Temperature protection	√	
Battery activation	√	
Load overload/short-circuit protection	√	
TTL communication	√	
RS485 communication	√	
External 12V power supply (<300mA)	√	
OLED display	√	
Supports SOC display	√	
Charging power can be adjusted	√	
Battery model and number of series can be configured	√	
Bluetooth supported (external expansion optional).	√	
Ethernet supported (external expansion optional)	√	
Set autosave	√	
Baud Rate Support Types	800/9600/14400/19200/38400/56000/57600/115200 default9600(Replacement requires host computer configuration)	
Backlight function	Default backlight always on (backlight time adjustable, set to 0 for always on)	
Backlight function	Protection is provided for PV over-voltage, PV reverse connection, PV short circuit, nighttime reverse charging, input power limit, over-temperature, load short circuit, load overload, battery over-voltage/over-discharge, and battery reverse connection (When activating the function, reverse connection is strictly prohibited)	

Operating ambient temperature range	-35°C~65°C (Power will not be reduced below 45°C under good ventilation conditions)	
Protection level	IP32	
Cooling method	Natural heat dissipation, air cooling	
size	L94.5xW170xH34mm	
weight	0.55kg	
Lithium iron phosphate batteries support	4 cell	8 cell
Ternary lithium batteries support	3 cell	6 cell
Lead-acid/gel battery support	1 cell	2 cell
Other batteries	Users can set the under-voltage and over-voltage thresholds themselves (via the host computer, within the range of 9.0V to 30.0V)	

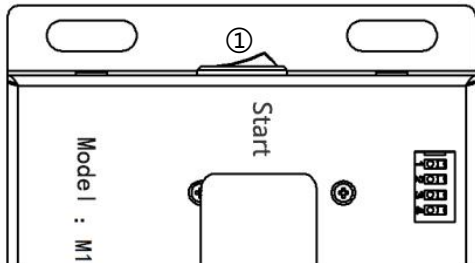
3. Dip switch and power on/off instructions

3.1 Dip switch usage instructions (please select the battery type carefully from the front)

Dip switch selection (ON:1) (switch up is 1, down is 0)					Type	Overvoltage protection	Under-voltage protection	Full charge return	Load recovery
1	2	3	4	5					
0	1	0	1	X	Ternary lithium	Over-voltage	Under-voltage	Full charge return	Load recovery
					3 串	12.6V	9.0V	12.3V	9.6V
		1	0	X	Lithium iron phosphate	Over-voltage	Under-voltage	Full charge return	Load recovery
					4 串	14.4	11.2V	13.6V	12.4V
		1	1	X	Lead Acid	Over-voltage	Under-voltage	Full charge return	Load recovery
					1 串	14.4	10.5V	13.4V	11.5V
1	0	0	0	X	gel battery	Over-voltage	Under-voltage	Full charge return	Load recovery
					1 串	13.8	10.5V	13.2V	11.5V
		0	1	X	三元	Over-voltage	Under-voltage	Full charge return	Load recovery
					6 串	25.2V	18.0V	24.6V	19.2V
		1	0	X	Lithium iron phosphate	Over-voltage	Under-voltage	Full charge return	Load recovery
					8 串	28.8	22.4V	27.2V	24.8V
0	0	1	1	X	Lead Acid	Over-voltage	Under-voltage	Full charge return	Load recovery
					2 串	28.8V	21.0V	26.8V	23.0V
		0	0	X	gel battery	Over-voltage	Under-voltage	Full charge return	Load recovery
0	0				2 串	27.6	21.0V	26.4V	23.0V
		0	0	X	Customize	Over-voltage	Under-voltage	Full charge return	Load recovery
					Customize	User Settings	User Settings	User Settings	User Settings

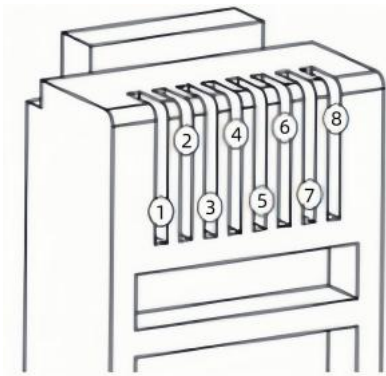
X	X	X	X	0	Do not activate the battery
X	X	X	X	1	Automatic battery activation (set the battery to activate; do not reverse the battery polarity)

3.2 Device startup switch usage instructions



① To start the device, switch left is off, right is on

4. TTL communication, RS485 communication, external 12V output interface pin



Serial Number	Definition
①	485-A
②	485-B
③	12V
④	GND
⑤	Unused
⑥	Unused
⑦	TTL-TXD
⑧	TTL-RXD

Note: The 12V supply can provide a maximum current of 300mA; exceeding this may damage the interface.

5. Fan Temperature Control

Serial Number	Fan Startup Logic Diagram
During PV Charging	
Start when the PV is not charged, with discharge load current	

Six-stage current charging	
Custom Settings	Resolve the load switching on and Resolve the self-discharge of a fully charged battery Users can reasonably set this parameter according to the characteristics of their batteries to better protect the reliability of the battery and the system.

6、Common Problems and Solutions

Phenomenon	Handling Method
Indicator light and LCD screen not lit	Check if the connections between the battery and solar panel are correct.
Solar panel has voltage, but no voltage output at the battery terminal.	Disconnect the battery and check if there is voltage in the battery. If there is no voltage, activate the battery in the system settings. (The battery is in an activated state, and the system does not support reverse connection protection for the battery.)
Modifications to battery type and series cannot be made during MPPT operation.	Changing the battery type will alter the over-voltage and under-voltage protection points!
The charging power does not reach the rated value.	The system uses current limiting and constant temperature control; Check if the system has reset the charging power;
The load cannot start some loads.	The short-circuit load time can be set through the upper computer to accommodate different external loads.
Other issues or difficult-to-solve anomalies.	Go to the settings interface to initiate a factory reset. After setting the factory defaults, reconfigure the relevant parameters according to the system configuration. Proceed with caution!
No response when the battery is connected.	1、 Whether the fuse is damaged, it needs to be replaced, or contact the manufacturer for repair.
The fan does not turn.	1、 Check if there are any foreign objects blocking the fan, and clean the air duct regularly. 2、 If the fan still does not turn after cleaning, please contact customer service for fan replacement.

7、Display Interface Introduction

7.1 System Startup Display Interface

	① Power-on status display
	② The system is in a charging state (charging, discharging, protection).
	③ Battery SOC display
	④ Displays photovoltaic voltage value
	⑤ Displays the magnitude of photovoltaic charging current.
	⑥ Displays the photovoltaic charging power.
	⑦ Load startup status display
	⑧ Load output current display
	⑨ Load output power display
	⑩ Displays battery voltage.
	⑪ Battery temperature display (not displayed if NTC is not connected).
	⑫ Displays battery selection options (ternary lithium, lithium iron phosphate, lead-acid, other).

7.2 System Startup Display Interface

	① Indicates the current status is off
	② Indicates the current battery type selected is ternary
	③ Displays battery state of charge (SOC)
	④ Displays photovoltaic voltage value
	⑤ Displays battery voltage value
	⑥ Current battery overvoltage protection setpoint
	⑦ Current battery undervoltage protection setpoint
	⑧ Displays daily power generation
	⑨ Displays historical power generation

8、Product Installation

8.1 Installation Precautions

- When installing batteries, great care must be taken. Protective goggles should be worn when installing open lead-acid batteries. If contact with battery acid occurs, please rinse with clean water immediately.
- Avoid placing metal objects near the battery to prevent short circuits.
- When charging the battery, acidic gases may be generated, so ensure that the surrounding environment is well-ventilated.

- The battery may produce flammable gases; please keep away from sparks.
 - Avoid direct sunlight and rainwater infiltration during outdoor installation.
 - The virtual connection points and corroded wires can cause significant heat, melting the wire insulation, burning surrounding materials, and even leading to fires. Therefore, it is essential to ensure that all connections are tightened and the wires are secure. It is best to secure everything with zip ties to avoid the connectors becoming loose due to the wires shaking during mobile applications.
 - When connecting the system, the output voltage of the components may exceed the safe voltage for the human body. When operating, be sure to use insulated tools and ensure that your hands are dry.
 - The battery terminal on the controller can be connected to a single battery or a group of batteries. The subsequent instructions in the manual are for use with a single battery, but Also applicable to a system of batteries.
 - Please follow the safety recommendations of the battery manufacturer.
 - Ground the controller's grounding terminal.
- During installation, reverse connection of the battery is prohibited, as it can cause irreversible damage.

8.2 Installation Steps

The wiring and installation methods must comply with national and local electrical code requirements. The wiring specifications must be selected according to the rated current, generally chosen at 5A/mm².

Step 1: Choose the Installation Location

Avoid installing the controller in direct sunlight, high temperatures, and areas prone to water ingress, and ensure good ventilation around the controller.

Step 2: Secure the Hanging Screws

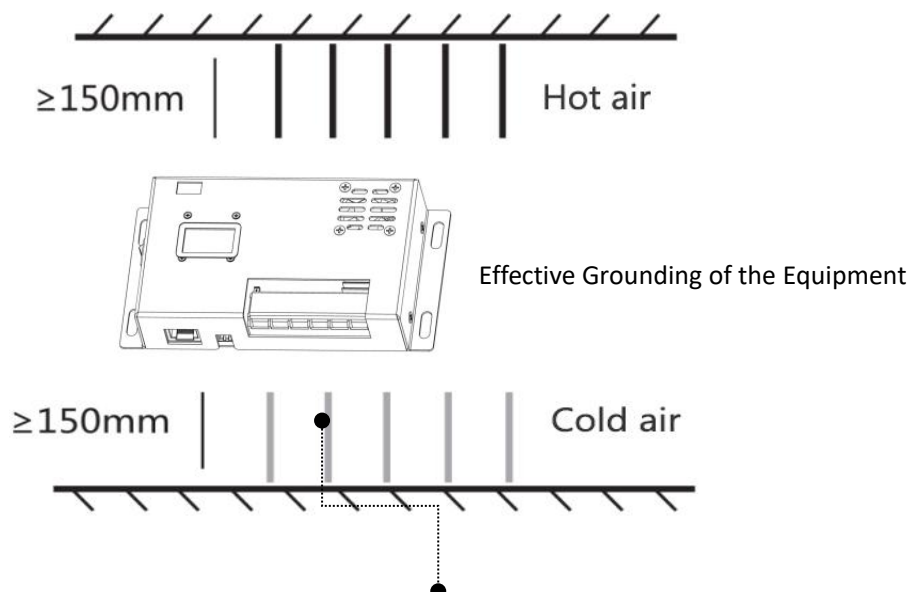
Mark the installation location according to the controller's installation dimensions, drill two appropriately sized mounting holes at the marked points, and secure the screws in both mounting holes.

Step 3: Fixing the Controller

Align the controller's fixing holes with the two pre-fixed screws and hang it up, then secure the two screws at the bottom.

Step 4: Fixing the Ground Wire

Lock one wire to the side screws of the controller, and connect the other end effectively to the ground (a metal block can be tied for burial) to allow leakage, static electricity, and lightning current to be directed into the ground.



9、Protection Functions

- Overtemperature Protection of the Equipment

When the internal temperature of the controller exceeds the set value, it will automatically reduce the charging power or even shut down during charging, thereby further slowing the rise in internal temperature.

- Overtemperature Protection of the Battery

The battery overtemperature protection requires an external temperature sampling sensor for the battery. When it detects that the battery temperature is too high, it will stop charging, and when the battery temperature decreases to

When the temperature is 5 degrees lower than the set value, it will automatically resume charging after 2 seconds.

- Input Overpower Protection

When the power of the solar panel exceeds the rated power, the controller will limit the charging power within the rated power range to prevent excessive current from damaging the controller.

The device enters current-limiting charging.

- Photovoltaic input voltage is too high

If the input voltage of the photovoltaic array is too high, the controller will automatically disconnect the photovoltaic input.

- Photovoltaic Input Reverse Connection Protection

When the polarity of the photovoltaic array is reversed, the controller will not be damaged and will continue to operate normally after correcting the wiring error.

- Nighttime Anti-Reverse Charge Protection

Prevent the battery from discharging through the solar panel at night. Special note: There is no reverse connection protection function for the battery.

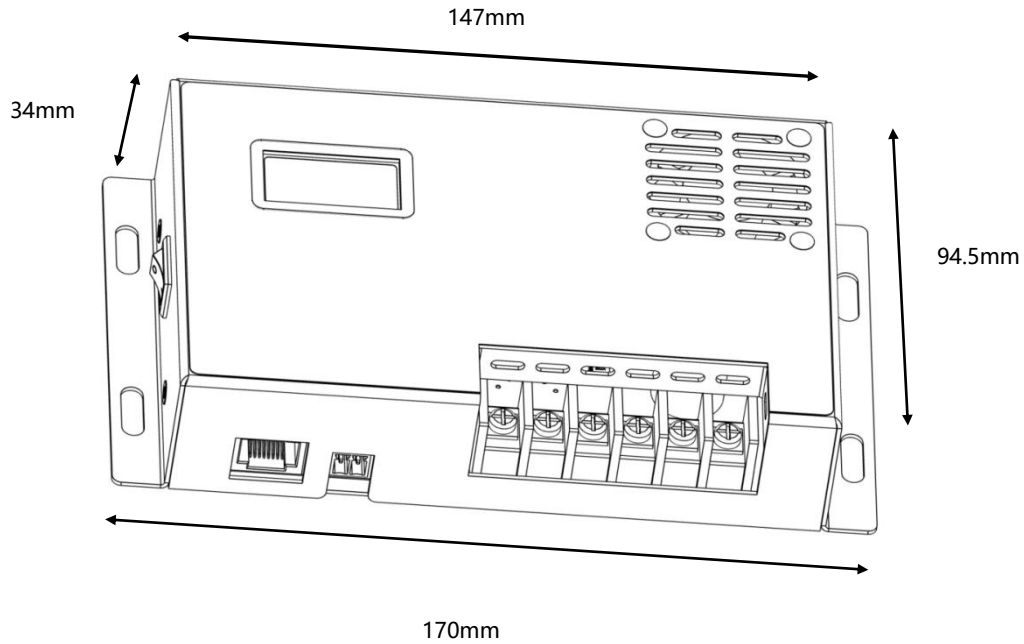
10、System Maintenance

To ensure that the controller maintains optimal performance over time, it is recommended to regularly check the following items.

- When abnormal faults or error messages are detected, corrective measures should be taken promptly.
- Check for signs of corrosion, insulation damage, high temperature, burning/discoloration, and deformation of the casing at the terminal connections, and carry out repairs or replacements as needed.
- If any exposed, damaged, or deteriorating insulation wires are found, they should be repaired or replaced promptly.
- If dirt, nesting insects, or corrosion are present, they should be cleaned up in a timely manner.

Warning: Risk of electric shock! Ensure that all power sources to the controller are disconnected before performing the above checks or operations! Non-professionals should not operate without authorization.

11、Product size diagram



12、Communication Protocol

12.1 Basic Communication Configuration

Transmission mode	RTU	Protocol Standards/Function Codes	0x02 Read one or more input states	Bit-wise read
baud rate	The default is 9600bps	This communication protocol is based on the standard MODBUS protocol. The master requests data from the slave in a loop, and the slave receives the request command and responds with response data.	0x03 Read Holding Register	Read by 16-bit word
Check bit	No verification		0x04 Read a register	Read by 16-bit word
Data bits	8bit		0x05 Write a coil state	Write by position
Stop bit	1bit		0x06 Write a holding register	Write in 16-character format
Frame interval	Not less than 3.5 bytes of time		0x10 Write to multiple holding registers	Write in 16-character format
Frame length	200 bytes		When the communication module detects an error other than a CRC code error, it must send information back to the host, with the highest bit of the function code set to 1; 01 Illegal function code, 02 Illegal data address, 03 Illegal data value, 04 Service failure.	
Maximum slave response time	350 bytes of time			
Minimum host polling interval	400 bytes of time			

12.2 Information address

Register address table, read corresponding function code 0x03, set corresponding function code 0x06. The addresses in the table below are the same as those in the actual information frame, so no offset or other conversion is needed.

Address (Decimal)	Meaning	Bytes	Read/Write	Example	Explanation
40000	Device Model	2	R	52482	M24HB
40001	Software Version	2	R	10	V1. 2
40002	Hardware Version	2	R	10	V1. 0
40003	Maximum Power Support	2	R	600	600W
40004	Maximum Input and Output Current	2	R	2020	PV: 20A, BAT: 20A
40005	Photovoltaic Step-down Heat Sink Temperature	2	R	25	Current system temperature: 25 degrees Celsius
40006	PV NTC status	2	R	0	0~7
40007	BAT NTC status	2	R	0	0~7
40008	Reserved	2	R	Not used	Reserved
40009	Reserved	2	R	Not used	Reserved
40010	Charging phase	2	R	3	1 Activation 2.Trickle 3. Constant Current 4.Constant Voltage
40011	Charging status	2	R	1	0: Not charging, 1: Charging
40012	Fully charged status	2	R	1	0: Not fully charged, 1: Fully charged
40013	Current Load Status	2	R	1	1 Starting up, 0 Shutting down
40014	BUCK heat sink temperature	2	R	50	50℃
40015	Reserved	2	R	Not used	Reserved
40016	Reserved	2	R	Not used	Reserved
40017	Reserved	2	R	Not used	Reserved
40018	Reserved	2	R	Not used	Reserved
40019	Reserved	2	R	Not used	Reserved
40020	PV input voltage	2	R	4550	45. 5V (Accuracy0. 01V)
40021	PV input current	2	R	111	1. 11A (Accuracy0. 01A)
40022	PV input power	2	R	256	256W (Accuracy1W)
40023	PV heat sink temperature	2	R	20	20℃ (Accuracy1℃)
40024	PV fault codes	2	R	0	See Fault Table 1
40025	Battery output voltage	2	R	2412	24. 12V (Accuracy0. 01V)
40026	Battery output current	2	R	0	None (see load current)
40027	Battery output power	2	R	0	None (see load current)
40028	Battery heat sink temperature	2	R	25	25℃ (Accuracy1℃)
40029	Battery fault codes	2	R	See Fault Table 2	See Fault Table 2
40030	Load output current	2	R	18	1. 8A
40031	Load output power	2	R	125	125W
40032	Fan startup status	2	R	0	0: Off 1: On
40033	Highest historical system charging (Wh)	2	R	H+L (unit WH)	Total historical electricity generation (Wh)

40034	Lowest historical system charging (Wh)	2	R		
40035	Current SOC value	2	R	982	98, 2%
40036	Reserved	2	R	Not used	Reserved
40037	Today's power generation	2	R	855	855WH
40038	MPPT working mode	2	R	0	See Function Table 2
40039	Remote load switch	2	R/W	0	1: Load On; 0: Load Off
40040	Maximum PV input voltage setting	2	R	560	56. 0V
40041	Minimum PV input voltage setting	2	R	20	20. 0V
40042	User-Defined Maximum Charging Power	2	R/W	200	200W (Limits Maximum Photovoltaic Power)
40043	Recharge hysteresis when the battery is fully charged	2	R	2380	23. 8V (Recharge hysteresis voltage)
40044	PV Stop Working Temperature Setting	2	R/W	70	70℃
40045	Current PV fan start temperature	2	R	40	Fan starts at 40℃
40046	Device address	2	R/W	01	Postal address: 01H
40047	Maximum battery charging voltage setting	2	R	2520	25. 2V
40048	Minimum battery discharge voltage setting	2	R	1740	17. 4V
40049	Current battery under-voltage hysteresis	2	R	2170	21. 7V(load recovery voltage)
40050	Current battery discharge high temperature setting	2	R/W	60	>60℃ stop load output
40051	Current battery discharge low temperature setting	2	R/W	-10	<-10℃ stop load output
40052	Current battery charging high temperature setting	2	R/W	45	>45℃ stop charging the battery
40053	Current battery charging low temperature setting	2	R/W	0	<0 stop charging the battery
40054	Reserved	2	R/W	Not used	Reserved
40055	Set battery type	2	R	0	0: Ternary lithium; see Table 1
40056	Set number of battery cells	2	R	7	7-cell ternary lithium
40057	Power on	2	R	1	0: Disable power generation, 1: Start power generation
40058	Battery Activate settings	2	R	0	0: Disable activation (default), 1: Activate
40059	Baud rate	2	R/W	0	1: 9600 (default) 0~8
40060	Backlight duration	2	R/W	60	The M24HB is not supported
40061	Screen lock	2	R/W	0	The M24HB is not supported
40062	Reserved	2	R/W	Not used	Reserved
40063	User-defined battery overvoltage threshold	2	R/W	2520	25. 2V
40064	User-defined battery undervoltage threshold	2	R/W	1740	17. 4V
40065	User-defined load short-circuit duration	2	R/W	500	500*20 (us)
40066	Reserved	2	R/W	Not used	Reserved
40067	Reserved	2	R/W	Not used	Reserved
40068	Load shutdown hysteresis voltage setting	2	R/W	1000	1000 mV (set voltage difference for load discharge recovery)
40069	Full-charge recharge voltage difference setting	2	R/W	1000	1000 mV (set voltage difference for charge recovery)
40070	Reserved	2	R/W	Not used	Reserved

13、Detailed Attachment Table

13.1 Function Menu

Table 1 (Decimal)		
NMC Battery	Lithium-ion batteries	0
LFP Battery	Lithium iron phosphate batteries	1
PAB Battery	Lead-acid batteries	2
GEL Battery	Gel batteries	3
OTH Battery	Other batteries	5
ERR	Incorrect configuration	8

13.2 Fault List

Fault Table 1 (Decimal)					
OV	Solar panel overvoltage	1	SC	Solar panel short circuit	128
UV	Solar panel undervoltage	2			
OT	System overtemperature	4			
TF	Temperature sensor fault	8			
OC	Solar panel overcurrent	16			
OP	Solar panel overpower	32			
SF	Current sensor fault	64			

Function Table II (Decimal)		
MPPT->BAT	Charging from solar panel to battery	0

Fault Table 2 (Decimal)					
OV	Battery overvoltage	1	SF	Battery current sensor fault	128
UV	Battery undervoltage	2	SC	Battery short circuit	256
OT	Battery overtemperature	4	LOC1	Load stage 1 overcurrent	512
UT	Battery low temperature	8	LOC2	Load stage 2 overcurrent	1024
TF	Temperature sensor fault	16	LSC	Load short circuit	2048
OC	Battery overcurrent	32	LSF	Load current sensor fault	5096
OP	Battery overload	64	PF	Battery configuration error	10192
DPF	Charging DIP switch fault code	20384			

14、Application wiring diagram

