SKU：HCC-20 /40 MPPTN

尺寸：105X142 MM

形式：骑马钉 共 24 页

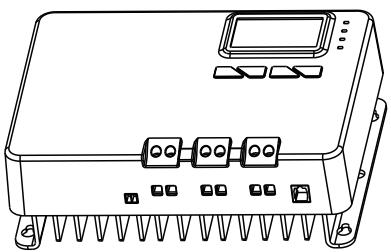
材质：铜版纸128G

HQST
HIGH QUALITY SOLAR TECHNOLOGY

20A/40A MPPT CHARGE CONTROLLER

Model: M2420N SKU: HCC-20MPPTN-US/CA

Model: M2440N SKU: HCC-40MPPTN-US/CA



Download ChargePro app on Apple Store / Google Play Store.

User Guide

The user manual is meant to offer you a brief walkthrough of the device's features.
Please save the user manual for future reference.

Still need help? Please contact us via sales@myhqsolar.com

hqsolarpower.com

WARNINGS AND TOOLS ICON CHART

Icons	Name	Description
	High Voltage	High voltage device. Installation should be performed by an electrician.
	High Temperature	This device will produce heat. Mount device away from other items.
	Environmental Hazard	Electronic Equipment. Do not put in landfill.
	Wire Cutter	A wire cutter is needed for cutting and stripping wires prior to connection.
	Multimeter	A multimeter is needed for testing equipment and verifying polarity of cables.
	Anti-static Glove	Anti-static gloves are recommended to prevent controller damage caused by static electricity.
	Electrical Tape	Electrical tape is recommended to safely insulate spliced or bare wires.
	Screwdriver	A common size screwdriver is needed to attach wires to the controller.

SAFETY TIPS

- Review this manual thoroughly before attempting installation.
- Beware of any nearby electrical equipment that may interfere with installing this device.
- Solar panels can generate high voltages and currents, make sure your solar panels are completely covered from sunlight during installation. It is recommended that installation be performed by a qualified electrician.
- Connecting wires to this device can generate sparks, please wear proper insulation gear while installing this device.
- To avoid damage to the battery or controller, use proper fuses in wiring. Please do not hesitate to contact the professions if you need help with fuse sizing.
- Always keep children away from this device.
- Be certain to use the correct gauge of wire, see below for a table of recommended wire size for various current loads.

Solar Input Current	5A	10A	20A	30A	40A	60A
Wire Cross Section Area (mm²)	1.5	2.5	5	8	10	12
Wire AWG	15	13	10	8	7	6

PRODUCT FEATURES

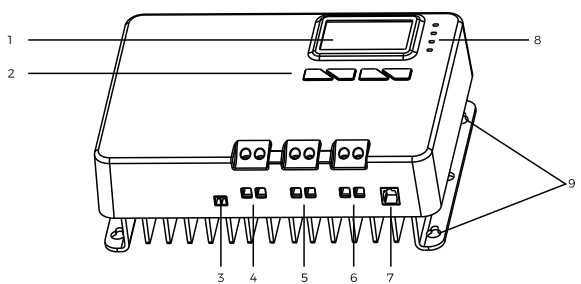
Thank you for choosing our products. This MPPT solar charge controller is a device for solar charge regulation and direct current output load control. This device is mainly used in small and medium sized off-grid solar power systems.

These MPPT charge controllers have features as follows:

- By continuously checking solar panel power output changes, the controllers employ multiple MPPT charge algorithms in combination to boost charging efficiency in different weather and temperature conditions.
- Built-in buffer, allows max 25% exceeding rated power input.
- Charging modes available for most common deep-cycle battery types in the market, including AGM (sealed lead acid batteries), GEL, Flooded, and Lithium.
- Allows mobile phone APP operation for monitoring and parameters settings, with connection of external blue tooth communication module (optional accessory, not in the standard package list).
- Auto recognition of 12V/24V battery system voltage. Lithium battery excluded from this feature.
- Supports recording of system running data including power generated and power utilized for up to 300 days, compatible with monitoring App through IOS and Android.

- We have built-in BT communication module in this controller and we provide APP ChargePro for mobile phone monitoring and operation. You can search “ChargePro” and download the APP at IOS APP Store and Google Play Store.
- Provides multiple load control mode options for light based, time based and manually adjusted scenarios. Low no-load loss.
- Industrial grade design with reverse polarity protection for solar panels, battery and load.

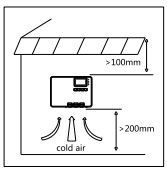
DEVICE DIAGRAM



#	Description
1	LCD Display Screen
2	Function Key ([SET], [UP], [DOWN], [ESC])
3	External Temperature Sensor Terminal
4	Solar Terminals

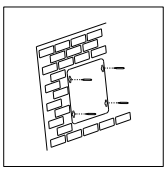
5	Battery Terminals
6	DC Load Terminals
7	RS485 Communication Port
8	LED Indicator (PV, BAT, LOAD, FAULT)
9	Installation Mounting Holes

MOUNTING INSTRUCTION



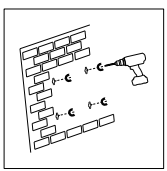
Step 1

Find a cool, dry and weather safe location for installation.



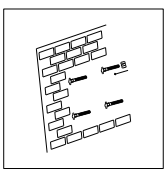
Step 2

Mark the controller's mounting holes on the mounting surface.



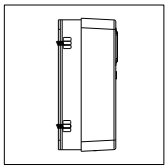
Step 3

Drill holes in the marked mountiong hole location.



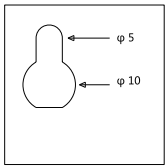
Step 4

Insert pilot screws in the mounting holes.



Step 5

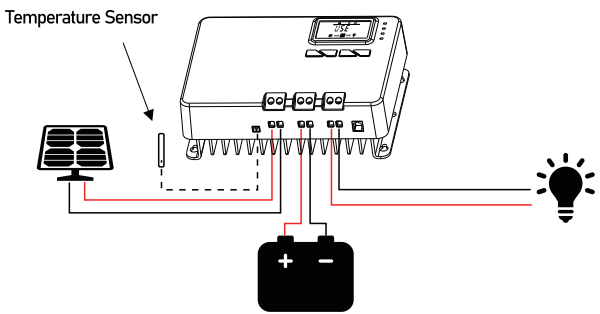
Fasten the controller into the pilot screws.



Step 6

Continue to wire battery.solar DC load and other accessories to the controller

WIRE CONNECTION SEQUENCE



During installation of the controller, please follow the order of connection below:

1. Connect the positive battery wire followed by the negative battery wire.

2. Make sure your solar panels are fully covered to prevent electrical shock.
3. Connect the positive solar array output wire followed by the negative solar array output wire.
4. Connect DC load wires to the DC load output (if applicable).
5. Connect the external temperature sensor to its terminal shown above.
6. Download APP ChargePro and turn on the BT function in the mobile phone. Testing the APP function with the controller.

CONNECTING TO THE CHARGEPRO APP

(iOS/iPadOS)

Download on the App Store

Apple and the Apple logo are registered trademarks of Apple Inc

Download the **ChargePro** app (iOS/iPadOS) to set up your charge controller and monitor real-time data for enhanced charging experience.

(Android)

GET IT ON Google Play

Google Play and the Google Play logo are trademarks of Google LLC

Download the **ChargePro** app (Android) to set up your charge controller for enhanced charging experience

LED LIGHT SIGNAL INTERPRETATION CHART

LED Name	LED Display	Signal Indication
PV	Off	Solar Input Not Charging *PV LED is generally off during nighttime.
	Flash	Detected PV Error-Check Error code
	Steady On	In the Charging
BATTERY	Flash	Detected Battery Error-Check Error code
	Steady On	Battery On

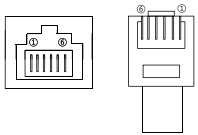
LOAD	Off	Load Off
	Flash	Detected Load Error-Check Error code
	Steady On	DC Load On
FAULT	Off	No Errors
	Steady On	System Error – Check Error Code

Check the Fault light to spot if a system error may be present.

LED FLASH RHYTHM CHART

Flash Status	Indication	Description
Steady On	on / off	LED light on.
Off	on / off	LED light off.
Fast Flash	on / off	LED light blinks at frequency of 2Hz (twice every second).

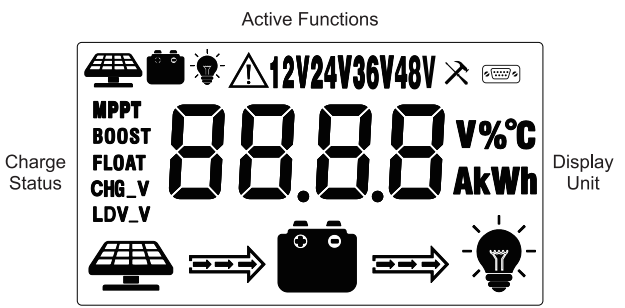
RS485 COMMUNICATION PORT(RJ12)



RS485 PIN					
PIN-1	PIN-2	PIN-3	PIN-4	PIN-5	PIN-6
VDD	VDD	GND	GND	D-	D+

*Support 3.3 V,20mA

LCD DISPLAY INTERFACE OVERVIEW



LCD DISPLAY INTERFACE

Display Section	Display Layout
Charge And Load Status	
Charge Mode & Parameter	
Active Functions	

LCD STATUS INFORMATION

Status Icon	Indication	Status	Description
	Solar Charge Indication	Flowing	Solar Power Charging Battery
		Off	Solar Power Not Charging Battery
	DC Load Indication	Flowing	DC Load Drawing Power
		Off	DC Load Off
MPPT	Charge Mode	Steady On	MPPT Charge Mode
BOOST			Boost Charge Mode
FLOAT			Float Charge Mode
		Off	Not Charging

CHG_V	Voltage Setting	On	Setting Charge Voltage
		Off	Charge Voltage Has Been Set
LDV_V	Over Discharge Volt Settings	On	Setting Charge Voltage
		Off	Charge Voltage Has Been Set
	Solar Icon	Steady On	Daylight Detected
		Off	No Daylight Detected
		Fast Flash	Solar System Over Voltage
	Battery Icon	Steady On	Battery Connected and Functional
		Off	No Battery Connection
		Fast Flash	Battery Over-Discharged
	Load Status	Flash	DC Load Short Circuit or Over-Load
		ON	Load On
		OFF	Load Off

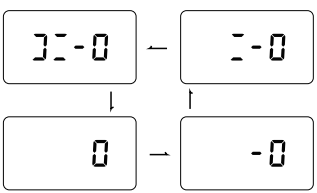
KEY FUNCTIONALITY CHART

Function Key	System Mode	Input	Input Function
	View Mode	Long Press	Enter SET mode
	View Mode	Short Press	View Previous Page
	View Mode	Short Press	View Next Page
	View Mode	Short Press	DC Load On/Off (Manual Control Program Only)

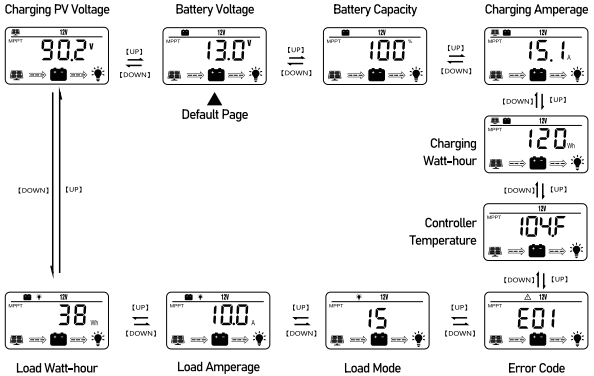
Function Key	System Mode	Input	Input Function
	Set Mode	Long Press	Save Data & Exit SET Mode
		Short Press	Next Setting
	Set Mode	Short Press	Increase Parameter Value
	Set Mode	Short Press	Decrease Parameter Value
	Set Mode	Short Press	Exit SET Mode Without Saving

LCD DISPLAY RULES & CYCLES

Pre start-up display cycle when the MPPT controller turns on, this usually last several seconds while controller detects operating environment.



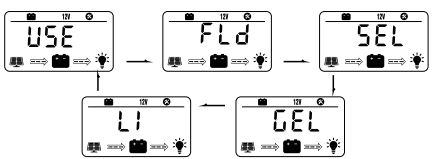
LED Screen Display Cycle



- The battery voltage view will be displayed by default. Use the up and down arrow keys to cycle through different views. The battery voltage view will resume upon 30 seconds of inactivity. The error code view will be displayed when an error is detected. The backlight in the screen will be on for 20 seconds with any button operation.

Setting Battery Mode

- Enter SET mode by pressing the Setting key in any view page other than Load Mode Or Controller Temperature. Use the up and down arrow keys to select battery mode, then long press Setting key to save.



Abbreviations	Battery Types	Description
FLD	Flooded Battery	Auto-recognition with default parameters set for each type of batteries.
SEL	Sealed/AGM Battery	
GEL	Gel Battery	
LI	Lithium Battery	Low temperature protection (Frozen charge forbid) Some parameters can be customized.
Use	Advanced User Mode	Most parameters can be customized.

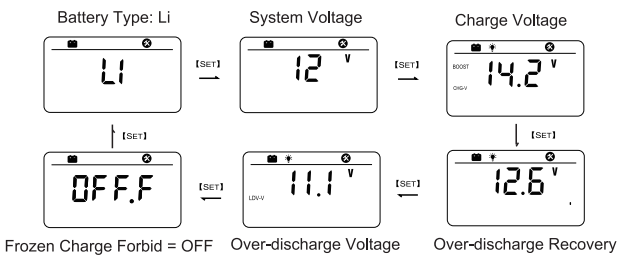
Advanced Battery Settings

Press the Setting key to enter SET mode,Choose LI or Use Mode.

In Lithium or User mode, short press the Setting key again to cycle through each parameter view. Use the up and down arrow key to adjust parameter value, then long press Setting key to save.

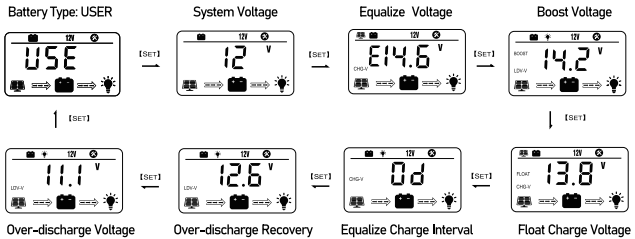
For Battery Type: Li

Low Temperature Protection(Frozen Charge Forbid) .



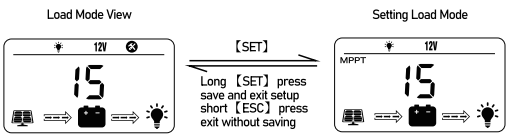
- Frozen Charge Forbid Range = 32±9℉/0±5℃
- Frozen Discharge Forbid Range = 5±9℉/-15±5℃
- When the temperature reaches the protected on/off range, the low-temperature protection will automatically turn on/off after 30 seconds.

For Battery Type: USE



Load Mode Settings

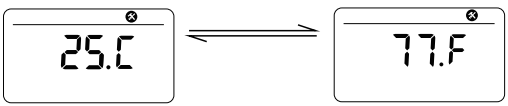
Enter Load SET Mode by pressing the Setting key in Load Mode view only. Use the arrow key to cycle through load modes before long pressing SET to save and exit. Short pressing ESC will exit without saving.



Mode	Definition	Description
0	Daylight Auto-Control	DC load turns on when no daylight is detected.
1~14	Daylight On/Timer Off	DC load turns on when no daylight is detected. DC load turns off according to timer.
15	Manual Mode	DC load turns on/off by pressing the Return key.
16	Testing Mode	DC load turns on and off in a quick succession.
17	Always On	DC load stays on.

Temperature Unit Setting

In the temperature display interface, enter the temperature unit setting mode by long pressing the setting button. You can switch between ℉(Fahrenheit) and ℃(Celsius) by pressing up and down arrow key. Long press the setting button to confirm saving and exit, and short press the ESC key to exit the setting without saving.



ERROR CODE CHART

Code	Error	Description & Quick Troubleshoot
E00	No Error	No action needed.
E01	Battery Over-discharged	Battery voltage is too low. DC load will be turned off until battery re-charges to recovery voltage.
E02	Battery Over-voltage	Battery voltage has exceeded controller limit. Check battery bank voltage for compatibility with controller.
E04	Load Short Circuit	DC load short circuit.
E05	Load Overload	DC load power draw exceeds controller capability. Reduce load size or upgrade to a higher load capacity controller.
E06	Overheating	Controller exceeds operating temperature limit. Ensure the controller is placed in a well-ventilated cool, dry place.
E07	Environmental Overtemperature	The environment temperature sampled by the external temperature probe is too high.
E10	Solar Over-voltage	Solar array voltage exceeds controller rated input voltage. Decrease the voltage of solar panels connected to the controller.
E13	Solar Reverse Polarity	Solar array input wires connected with reverse polarity. Disconnect and re-connect with correct wire polarity.
E14	Battery Reverse Polarity	Battery connection wires connected with reverse polarity. Disconnect and re-connect with correct wire polarity.

*Please contact professions for technical support on additional troubleshooting.

CONTROLLER SPECIFICATION

The variable “n” is adopted as a multiplying factor when calculating parameter voltages, the rule for “n” is listed as: if battery system voltage is 12V, n=1; 24V, n=2;

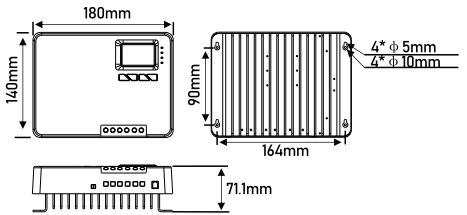
For example, the equalize charge voltage for a 12V FLD (Flooded) battery bank is 14.8V*1=14.8V. The equalizing charge voltage for a 24V FLD (Flooded) battery bank is 14.8V*2=29.6V.

Parameter	Value	
Model	M2420N	M2440N
System Wiring Grounded	Negative Grounded	
Battery System Voltage	12V/24V Auto (FLD/GEL/SLD/USE) Manual (Li/User)	
No-load Loss	12ma (12V), 10ma (24V)	
Max Solar Input Voltage	<100Voc	
Rated Solar Charge Current	20A	40A
Max Solar Input Power	300W/12V 600W/24V	600W/12V 1200W/24V

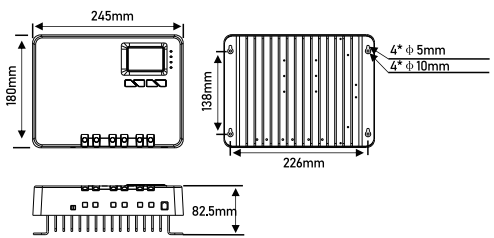
Light Control Voltage	5V*n	
Light Control Delay Time	10s	
Max Load Output Current	20A	
Operating Temperature	-35ºC ~ +45ºC	
IP Protection	IP32	
Net Weight	1.0 kg	2.0 kg
Communication Port	RS485	
Operating Altitude	≤ 3000 meters	
Controller Dimension	7.1*5.5*2.8 inch 180*140*71 mm	9.6*7.1*3.2inch 245*180*82.5 mm

Parameter	Battery Parameters				
Battery Types	FLD	SEL	GEL (default)	USER (adjustable)	LI (adjustable)
Equalize Charge Voltage	14.8V*n	14.6V*n	–	Default	--
Boost Charge Voltage	14.6V*n	14.4V*n	14.2V*n	Default: GEL	Default: 14.2V*n
Float Charge Voltage	13.8V*n			Default: GEL	--
Boost Charge Recovery Voltage	13.2V*n			Default: GEL	--
Over-discharge Recovery Voltage	12.6V*n			Default: GEL	--
Over-discharge Voltage	11.1V*n			Default: GEL	Default: 11.1V*n
AutoTemperature Compensation	-3mV/2V/℃			Default: GEL	--

PRODUCT DIMENSION



Model	M2420N
Product Dimension	180*140*71.1mm
Installation Area Dimension	164*90mm
Installation Hole Size	ϕ 5mm & ϕ 10mm
Connection Socket Size	7.5*10mm



Model	M2440N
Product Dimension	245*180*82.5mm
Installation Area Dimension	226*138mm
Installation Hole Size	ϕ 5mm & ϕ 10mm
Connection Socket Size	7.5*10mm

FCC Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.