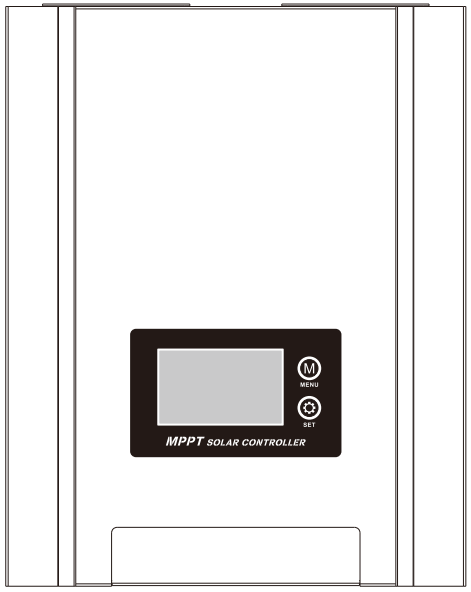
MPPT

Solar Charge Controller



User Manual

Content

⚠ Warning

This is A class inverter. It might cause slightly radio interference in daily life.

And practical measure is required to take under this condition.

1. Description and Product Features

Thank you for choosing MPPT solar charge controller. Based on advanced MPPT algorithm design, the controller adopts graphical LCD dynamic display to present its running status.

With the MPPT algorithm, the controller can quickly track the maximum power point of the PV array; Promptly acquire the maximum energy of solar modules to improve power generation. Users are access to extended application with the adoption of standard modbus RS485 communication port.

Product Features:

- Using DSP digital control technology;
- Advanced MPPT tracking technology;
- Temperature compensation for battery;
- Life of battery is greatly prolonged by scientific battery management and three-stage charging: fast charge, constant charge and float charge;
- Through the LCD display, users can timely and intuitively know about the operation of solar system and battery;
- Every component and fuse is preventing from damage or burn through series of protection(overcharge, overvoltage over-temperature protection, electronic short circuit protection and anti-reverse protection);
- Display and set through LCD screen, complete all settings through one button, intuitive and easy to use.

2. Description of System

The controller is designed for solar DC power supply system, solar DC street lamp system, and small solar power plant system by adopting special- purpose microprocessor to achieve intelligent control.

In addition, the controller protects systems from reverse connection. And it shuts down (charged-full or overcharged) and recovers automatically based on the condition of battery. It also provides detailed indication of charging and errors, and shows the state of battery and loads. It realizes the control of battery by collecting and calculating data of battery and PV allay voltage, charging current as well as temperature of environment. Life of battery is greatly prolonged by three-stage charging control, which makes sure of the best working state of battery.

3. Safety information

CAUTION!

Risk of electric shock.
Each circuit must be individually disconnected and the service person must wait 5 minutes before servicing.

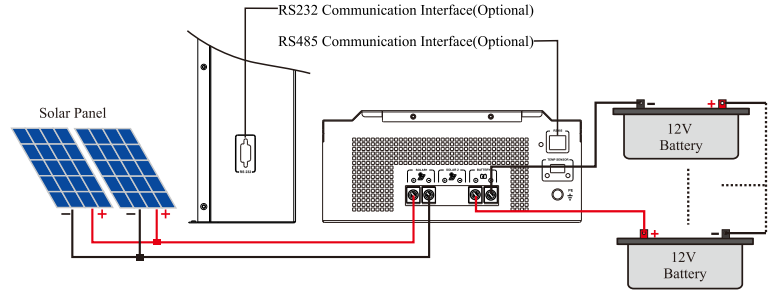
4. Connection and Application

4-1 The controller should be installed firmly as close as possible to be the battery.
4-2 Cable: please use cables matching with the charging current. Calculate the length and strip about 5mm length of insulated leather and connnect the wire to the controller. The cable is supposed to be as short as it can to make sure of less wastage. The system cable is selected for the density of current (≤5A/mm²).
4-3 Connect the battery: Determine the appropriate number of batteries according to the controller's rated battery voltage. Connect the battery cable to a circuit breaker that meets the breaking capacity, and then connect it to the BATTERY terminal of the controller. Please note that the positive and negative poles are not allowed. Reverse connection, otherwise the product may be damaged. If the connection is correct, the LCD display will light up and display the relevant status parameters, otherwise, you need to check whether the connection is correct.
4-4 Connect the solar panels: first connect the PV cable to a circuit breaker that meets the breaking capacity, and then connect it to the PV terminal of the controller. Please note that the positive and negative poles cannot be reversed, otherwise the product may be damaged. If the connection is correct, when there is sunlight, the LCD display will display the relevant status parameters, otherwise, you need to check whether the connection is correct.
4-5 Selection of circuit breaker
a. The circuit breakers on the PV side and the battery side should use DC circuit breakers, and the working voltage of the circuit breaker should be greater than the actual application voltage.
b. When the controller is working, the rated current of the circuit breaker should be approximately 1.5 times the maximum current.

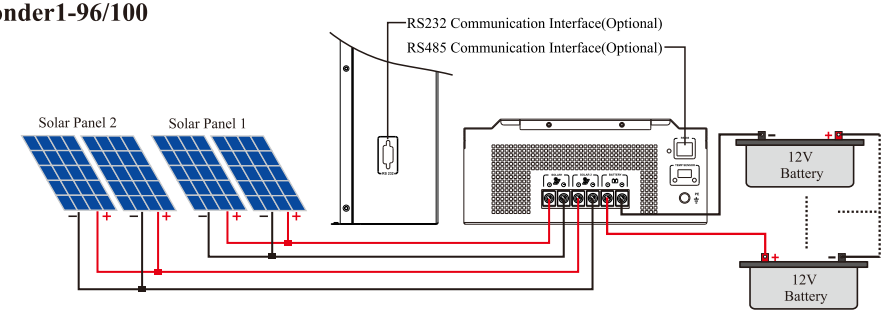
4-6 Controller entry and exit line illustration:
1) Remove the terminal cover

2) Connect solar panels, batteries and DC loads in the order indicated above (Remarks: please refer to the technical parameter table for specific battery voltage and solar panel parameters, this figure is only a wiring schematic diagram.)

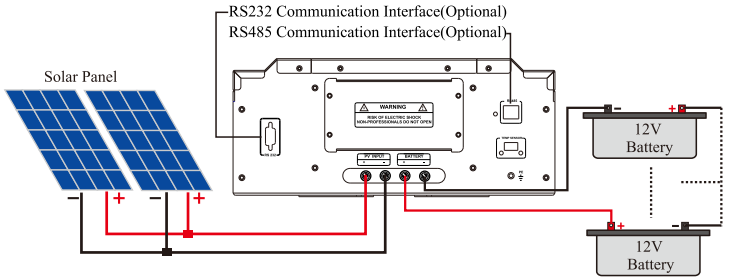
Wonder1-96/50



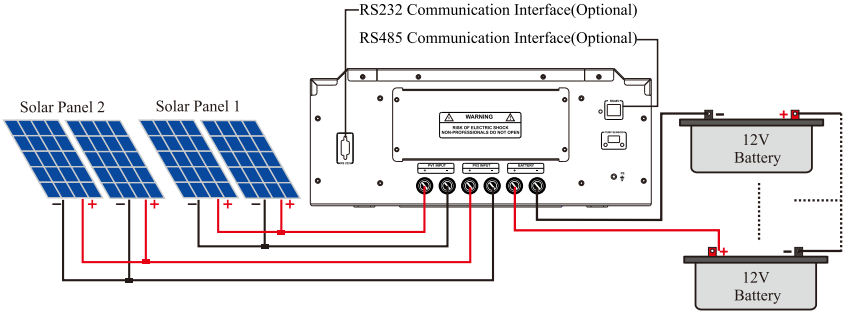
Wonder1-96/100



Wonder1-192&216&240&384/50



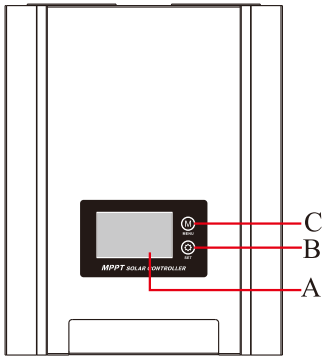
Wonder1-192&216&240&384/100



Note:

- The installation of the solar system components should be followed by battery--PV array;
- Please do not open the air switch or fuse during the connection, and make sure that the positive and negative poles of the parts are connected correctly;
- Sequence of disconnection is as follow: PV array--battery.

5. Description of Panel



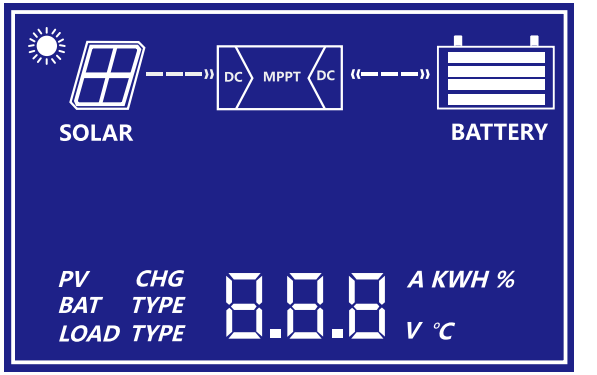
A	LCD Display
B	Menu Button
C	Setting Button

6. Application Instruction

1) Button and operation

Mode	Note
Reset	Press the menu button for 5 seconds to restore factory settings
Browsing mode	Press the SET button on the main screen to view the relevant tun data.
Set the mode	On the main interface, press the setting button to enter the setting mode, then press the menu button to select the item to be modified. After setting, press the setting button to exit the setting mode.

2) Main Interface



3) Description of State

Item	Icon	State
PV allay	SOLAR	Day/sunshine
	SOLAR	Night/no sunshine
Battery	BATTERY	Power and voltage
	BATTERY	Over-discharge

4) Interface

Press the SET key on the main screen to view the relevant operating data.

Display	Description
	Voltage of battery
	PV input voltage
	Charging current
	Percentage of battery capacity
	Working temperature of battery
	Power generated by PV
	Type of battery

5) Set the Charging Parameter

Setting: Long press the set button, BAT TYPE words will flash, and then press the menu button to select the constant charging volatage for the battery  , for example: if the charging voltage is 14.6V, then press the menu button to set the value, then long press the set button to save and exit. Setting will be effective after re-powered on(settable range: 13.8V~14.8V).

7. Specification

Model: Wonder1	96/50	96/100	192/50, 216/50, 240/50,384/50		192/100, 216/100, 240/100,384/100	
Rated current	50A	100A	50A		100A	
Rated System Voltage	96V		192V/216V /240V	384V	192V/216V /240V	384V
Max PV Input Voltage(Voc) (At the lowest ambient temperature)	300V(96V system); 450V(192V/216Vsystem); 500V(240Vsystem); 800V(384Vsystem)					
PV array Max power	5.6KW	5.6KW *2	11.2KW/12.6KW/ 14KW/22.4KW		11.2KW*2/12.6KW*2/ 14KW*2/22.4KW*2	
MPPT Tracking Voltage Range	120V~240V(96V system); 240V/270V~360V(192V/216V system); 300V~400V(240V system); 480V~640V(384V system);					
MPPT route number	1	2	1		2	
Recommended operating voltage range	120V-160V(96Vsystem); 240V-320V(192Vsystem); 270V-320V(216Vsystem); 300V-350V(240Vsystem); 480V-560V(384Vsystem)					
Battery type	Lead acid battery(Battery type base on user charge sepecification)					
Floating voltage	110.4V(96Vsystem)/220.8V(192Vsystem)/248.4V(216Vsystem)/276V(240Vsystem)/441.6V(384Vsystem)					
Charge voltage	113.6V(96Vsystem)/227.2V(192Vsystem)/255.6V(216Vsystem)/284V(240Vsystem)/454.4V(384Vsystem)					
Charging protection voltage	124V(96Vsystem)/248V(192Vsystem)/279V(216Vsystem)/310V(240Vsystem)/496V(384Vsystem)					
Promote recovery voltage	105.6V(96Vsystem)/211.2V(192Vsystem)/237.6V(216Vsystem)/264V(240Vsystem)/422.2V(384Vsystem)					
Temperature compensation	-3mv/℃/2V(25℃is baseline)(Optional)					
Charging mode	MPPT maximum power point tracking					
Charging method	Three stages: constant current(MPPT), constant voltage, floating charge					
Protection	Over-voltage/under-voltage/over-temperature/PV&Battery anti-reverse protection					
Conversion Efficiency	＞98%					
MPPT Tracking Efficiency	＞99%					
Machine dimension(L*W*Hmm)	315*250*108		460*330*140		530*410*162	
Package dimension(L*W*Hmm)	356*296*147(1pc) / 365*305*303(2pc)		509*405*215		598*487*239	
N.W.(kg)	4.5(1pc)	5. 6(1pc)	13.5	15	22.6	26.5
G.W.(kg)	5.2(1pc)	6. 3(1pc)	15	16.5	24.6	28.5
System Parameter						
Display	LCD					
Thermal method	Cooling fan in intelligent control					
Protection level	IP20					
Operating temperature	-10℃~+50℃					
Storage temperature	-20℃~+60℃					
Elevation	<5000m(Derating above 2000m)					
Humidity	5%~95%, No condensation					
Communication	RS232/RS485(Optional)					

Note: All specification is subject to change without prior notice

8. Protection and Troubleshooting

8-1: Protection

【PV array over-current】

If it exceeds the rated power of the controller, the controller will charge at rated power. Therefore when the PV array does not match the parameters, it may not work on the maximum power.

【PV array polarity reversal】

When the polarity of the PV array is reversed, the controller will not be damaged and the controller still works properly after wiring properly.

【Battery over-voltage】

When battery voltage reaches the over-voltage, the controller will automatically stop charging the battery to prevent the battery from overcharging and damage.

【Battery over discharge】

When battery voltage reaches the low voltage, the controller will automatically stop the battery discharge, to prevent the battery over discharge and damage.

【Battery over-temperature】

The controller detects the battery temperature through an extern temperature sensor. When the battery temperature exceeds 65℃ will stop working, less than 55℃ to resume work.

【Controller over-temperature】

The controller detects the internal temperature of the controller through the internal sensor. When the internal temperature exceeds 85℃ will stop working, less than 75℃ to resume work.

【Temperature sensor damage】

When the temperature sensor is short-citcuited or damaged or is not connected, the controller will charge or discharge at 25℃ by default to prevent overcharging or over-discharge of the battery.

【 High voltage surge protection】

This product can protect high-voltage surges with low energy. In areas with frequent lightning, it is recommended to install large-capacity lightning arresters on the PV input terminals.

8-2: Troubleshooting

Code for alarm

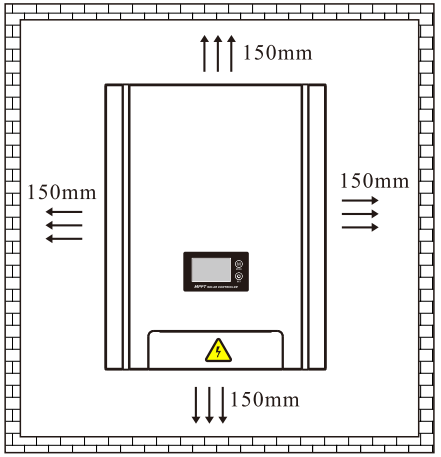
Code for alarm	Reason	Solution
A01	Overheat protection	Please check whether overload and reduce load
A02	Battery high voltage protection	Please disconnect the PV module
A03	Internal saving data error	Internal saving data error
A04	Internal reference voltage error	Please contact the supplier
A14	Battery low voltage protection	Please turn off the load, recharge the battery and reboot inverter
A15	PV input high voltage	Please check if the PV module voltage exceeds the controller specifications
A16	NTC fault	Please contact the supplier
A17	Battery high voltage fault	Please contact the supplier

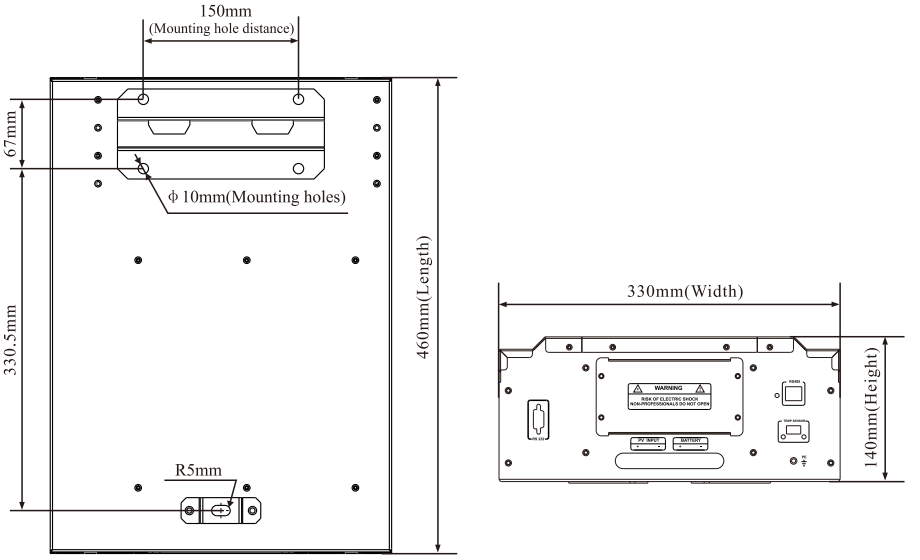
Common troubleshooting

Problem	Possible cause	Solutions
Normal wiring but LCD is off	Battery voltage too low	Charge battery
 A02	Battery over-voltage	Disconnect solar arrays and use multi-meter to check battery voltage
 A14	Battery over-discharged	Controller turn off the output automatically and restrore

9. Installation

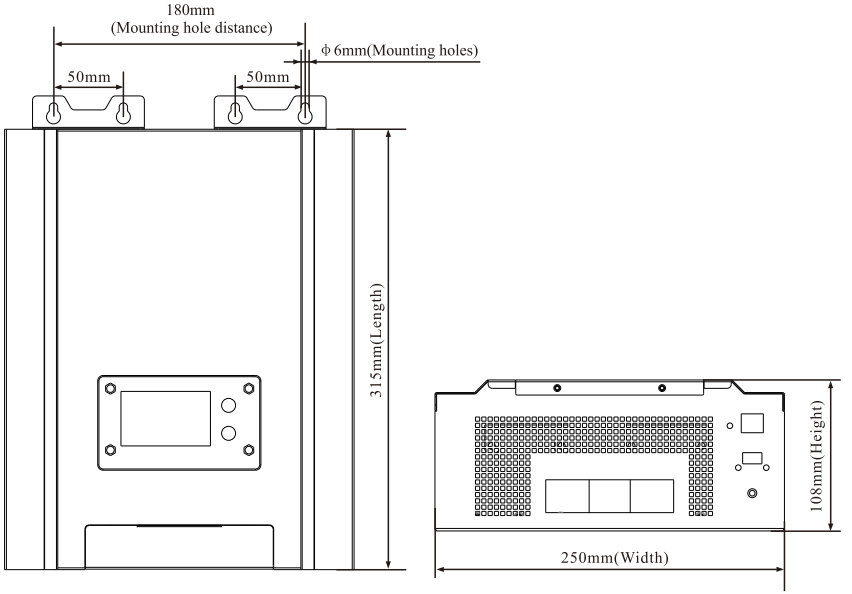
1) Allow 150mm space around the equipment to make the air circulating.



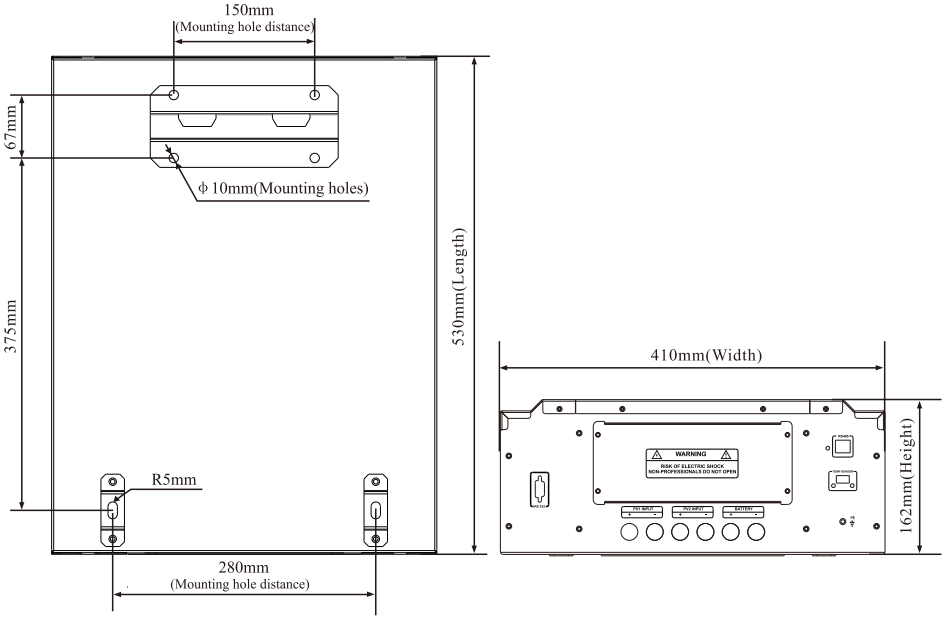


Wonder1-192&216&240&384/50

2) Controller size and installation dimension



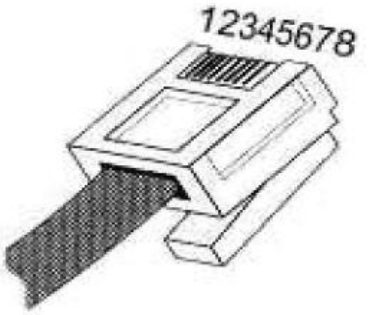
Wonder1-96/50&100



Wonder1-192&216&240&384/100

10. Appendix: 485 Communication Port(Optional)

Definition of pin:

PIN1--------RS485-A	
PIN2--------RS485-B	
PIN3--------NC	
PIN4--------GND	
PIN5--------NC	
PIN6--------NC	
PIN7--------NC	
PIN8--------NC	

Note: refer to as not connect.

Warranty Card

Customer Name: _____ Tel.: _____

Address: _____

Brand: _____ Model: _____

Serial No.: _____ Date of Purchase: _____

Bought From: _____

Invoice Number: _____ Invoice Price: _____

Warranty Instruction

- Please keep this warranty card as proof of maintenance.
- The warranty period is 1 year from the date of purchase.
- During the warranty period, under the condition of normal use and maintenance, if damage caused by the product's own quality, the company will provide free repair and replacement parts after verification.
- The company reserves the right to maintain and interpret all contents.

Free maintain won't be given under the following circumstance:

- The damage caused by the manipulation that hasn't follow the requests of the manual.
- The product has been repaired, modified by technicians other than our company's, and any internal parts of the product have been replaced by users.
- The product number has been altered or product is inconsistent with the warranty card.
- Damage caused by careless use, penetration of water or other substances into the product.
- Damage caused by accident or natural disaster.

Certificate

Name: _____

Model: _____

Inspectors: _____

Date: _____

Products have been tested qualified by standard and permitted to deliver.