

# MPPT(Maximum Power Point Tracking) Solar Charge Controller

## MPPT-10/ MPPT20 User's manual

**Feature:** The most important feature of this controller is intelligent tracking input voltage from solar panel, which could let solar panel always working at Maximum Power Point of V-A curve. Compared with normal solar charge controller, this MPPT controller could increase 10%-30% electrical power using efficiency from solar panel.

**Function:** This MPPT controller is not only have above mentioned special function, at the same time including completely Protecting and Controlling functions:

- Overcharge protection
- Over discharge protection
- Battery Reverse Current Protection
- Overloading Protection
- Short Circuit Protection
- Reverse Polarity Connection Protection

**Schematic Diagram:** Picture 2 shows typical 12V battery solar charge system V-A curve.

**Normal Solar Charge Controller:** Solar Panel works at point A state, the solar panel working voltage is a little higher than battery voltage.

Charge Voltage:  $U_A=13.2V$

Charge Current:  $I_A=9.8A$

Charge Power:  $P_A=13.2*9.8=129.36w$

Area in drawing: ①+③

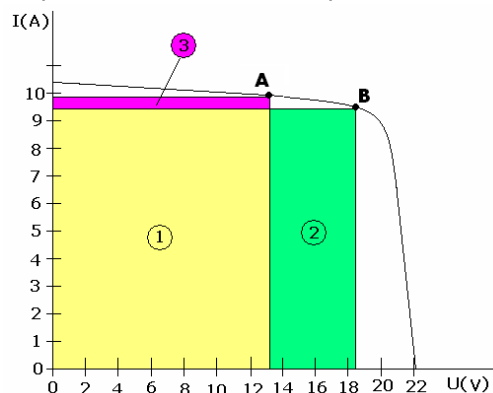
**MPPT Solar Charge Controller:** Solar Panel works at point B state, the solar panel working voltage much higher than battery voltage.

Charge Voltage:  $U_B=18.4V$ ,

Charge Current:  $I_B=9.3A$

Charge Power:  $P_B=18.4*9.3=171.12w$

Area in drawing: ①+②



Picture 2

**Comparison:** The power B is more than power A..

$$\Delta P / P_A = (P_B - P_A) / P_A = 32.3\%$$

As a result of different manufacture of solar panels, different solar illumination intensity, different temperature, different efficiency of solar charge controller and so on. The effective power increase rate is 10-30%.

**Form a complete set:**

**Solar Panel:** 12V solar system should use 40pcs cells laminated solar panel. The maximum

power point voltage is over 18V. 24V solar system should use 2pcs above mentioned solar panels. 48V solar system should use 4pcs above mentioned solar panels.

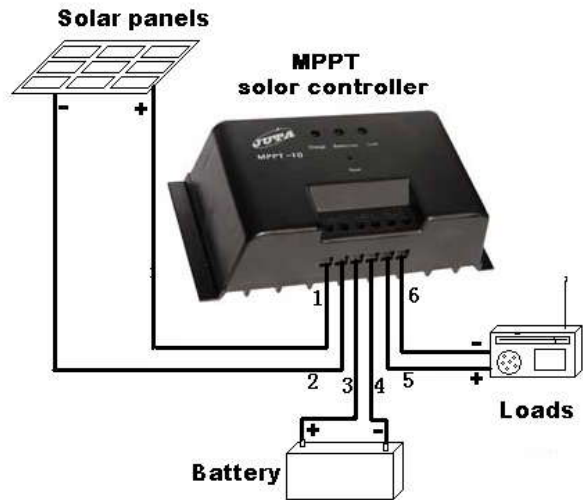
**Conductor:** The cable between solar panel with MPPT solar charge controller should be better calculated by 1Ampere per 1mm<sup>2</sup>.

**Solar Charge Controller:** We have 12V, 24V and 48V three kinds of MPPT solar charge controllers with 10A, 20A, (other specifications could be designed as customer special request). Fit for power of solar panels:

MPPT-20—200Wp (12V) , 40—400Wp (24V) , 80-800Wp (48V).

**Connection: (As Picture 3 according to below process)**

1. Connected the “+”, “-” poles of the battery to the controller (3, 4 from left) firmly and correctly. At this time the LOAD green LED is bright. If the LOAD green LED is not bright, it is indicate there is battery reverse polarity connection. **Only LOAD green LED is bright, we could continue next step operation.**
2. Connected the “+”, “-” poles of the solar panel to the controller (1,2 from the left) firmly and correctly.
3. Connected the “+”, “-” poles of the LOAD to the controller (5,6 from the left) firmly and correctly.



**Picture 3**

**Simply Measure Method:** For 12V system, measure the input voltage from solar panel with multimeter (terminal 1, 2 of controller), it is normal if the voltage of solar panel more than battery voltage 0.5-6V. Generally, the higher input voltage, the better charge efficiency. For 24v and 48V system, the input voltage will be much more higher than battery voltage

(Note: It is normal phenomenon the controller can not find Maximum Power Point within 10 minutes from system start.)

**Indicator: (Picture 1)**

1. Load indicator, green, bright indicate there is output, Load could work, “off” indicate there is not output, and Load can not work.
2. Low Voltage Indicator, red; bright indicate the voltage of the battery is low. Load could not normal working. This is normal phenomenon. When the battery voltage recover to 12.6V or (25.2v), the Load will be automatically working, at this time the indicator is off.
3. Charge Indicator, red, bright indicate the battery need to charge, flickering means float charging, off means charge has stop.

**RESET Button:** Please notice the rated current of your controller, if there is short circuit or

overload happened, the MPPT controller will close output. (Load indicator off, Low voltage indicator off.)

If you need the MPPT controller recover work, please check the reasons and clear out the fault firstly. Then put a small stick such as toothpick, ball-pen tip inside the RESET hole, and press RESET button will be OK.

## Technical Data

Model	MPPT-10	MPPT-20
Rated voltage	DC: 12V / 24V / 48V	
Max current	10A	15A, 20A,
No load loss	$\leq 8\text{mA}/12\text{V} / 24\text{V} \quad \leq 30\text{mA}/48\text{V}$	
Voltage drop	$\leq 300\text{mV}$	
Max voltage of solar panel	$23\text{V}/12\text{V}, 23\text{V} \times 2/24\text{V}, 23\text{Vg} \times 4/48\text{V}$	
Full charge cut	$14\text{V}/12\text{V}, \times 2/24\text{V}, \times 4/48\text{V} (25^{\circ}\text{C})$	
Low voltage cut	$10.5\text{V}/12\text{V}, \times 2/24\text{V}, \times 4/48\text{V}$	
Reconnected voltage	$12.6\text{V}/12\text{V}, \times 2/24\text{V}, \times 4/48\text{V}$	
Temperature compensation	$-3\text{mV}/\text{cell.}^{\circ}\text{C}$	
Efficiency	$95\% \sim 97\%$	
Wire area	$1 \sim 2\text{A}/\text{m m}^2$	
Electrical power using efficiency	Can increase 10~30%	
Net Weight	0.55Kg	0.65Kg
Dimension	$188 \times 93 \times 55\text{mm}$	$188 \times 118 \times 55\text{mm}$

### Attention:

1. Please check the rated voltage of the solar panel, battery, and load are all the same with 12V or 24V or 48V.
2. Please pay attention to connection, do not connect the “+” “-” poles of solar panels and loads wrong.( Wrong connection will be burn your MPPT controller)
3. Battery must be connected earlier than solar panels and load. When take off the system, Solar Panels must be take down first, then cut off battery.
4. The rated current of solar panel and load must be less than MPPT controller's rated current.