

# Solar charge controller User Manual

## I Functional characteristics:

- 12v/24v Auto working voltage,you also can choose the voltage of 36v/48v/60v/96v as well as lithium battery.
- Working current covers:1A,2A,5A,10A,15A,22A,30A,45A,60A,80A,100A
- Three-level overload protection,short-circuit protection
- Have the charging ,discharge,reverse connect protection function,repair the system in fault will be back to the work of the state,not causing damage to any component,will not burned the fuse
- Solar panels at night the charging protection
- Detailed report of the module,damage warning,charging quantity instructions,shows the battery storage state and load,all function by pressing a button,easy to use,the function is strong
- The user function setting,power off permanent preservation
- Support for multiple work mode:light control,light control+delay,light control+control half power,general(photovoltaic power generation),debug mode>manual control mode
- Adopted tandem type PWM charge control to improve efficiency and prolong battery using time
- Storage battery temperature compensation function
- Characteristics of the battery discharge rate correction
- Extend the port for connecting rain or water detectors,inverters or other external devices
- Day/night mode intelligent recognition,not because the car lights and other light by interference
- Lightning protection and anti-static design
- You can also choose a full-sealed waterproof shell,waterproof performance
- SMT production process,gold-plated PCB,industrial-grade chips,advanced technology,quality assurance

## II Operation interface

### 1.Interface illustration

- AUX(CTRL):Expand communication ports
- TC:Analog quantity input(temperature compensation input)
- S+/S-:Connect solar panels
- B+/B-:Connect battery
- L+/L-:Connect load
- S1:Control/Settings button
- DS1:Mode display window
- SC:Charging status indicator
- BS:Battery status indicator
- LS:Load status indicator
- A1:Short block,forcing the battery type

## 2.State indications:

First enter the system power self-test program,after completion of the work program

SC:

- Off:When the photoelectric is not connected or not enough light,charging loop is closed
- On:Light enough,not completely full of electric battery,the battery recharging
- Flicker:Light enough,storage battery has full of electricity,charging loop is closed

BS:

- Red flicker:storage battery low-voltage protection is on,load output is closed forcefully
- Red on:The battery power is low,prohibiting the start load,but maintain the status of the original load output
- Orange on:Battery power,medium,allowed to start the load output
- Green on:Battery is fully charged ,allowing the start-load output
- Green flicker:The battery is already full:allowed to start the load output,forced to shut down the charging circuit

LS:

- Off:load is closed
- On:load start-up
- Flicker slowly:Load current is too large,such as persistent current reaches the preset time after the protection status
- Flicker quickly:Short circuit protection overload protection is activated,the output is forced to close ,the system will start again after delay 30s load,such as overload or short circuit fault has ruled,and enter the normal operating state

## III Use instructions:

1.Load open conditions:when the electricity quantity of the storage battery is medium or above,(BS orange light is on),the load is allowed to be started;but once the load is started,the storage battery can work till its electricity is low(BS red light is on),and when the electricity decreases to the end discharge voltage(BS red light flickers)it will cut off the output forcefully to protect the battery.

2.Start overload protection:When the load start-up,load indicator LS always lit

- If the load current exceeds 1.2times the rated current controller,LS will flicker slowly,if the sustained overload lasts for 30 seconds(some products are 10 seconds)or the load current is 1.5times larger than the rate current of the controller for more than 1 second,overload protection is started,LS will flicker quickly an the load is cut off forcefull.If it has the necessary conditions for the start of the load,the controller will restart the load after 30 seconds until the bug is disposed of
- When there is a debug on the load or the load side ,the controller will cut off the output immediately and LS flicker quickly.30 seconds later,system will restart self-test and try to restart the load according to the preinstalled logics until the debug is disposed of

3.Setting method

Press on the setting button an continue for 3 seconds,release it when the model indicator(DS1) starts to flicker,enter into the pattern setting state.and press the button to change the patterns until you get the pattern you need:5 seconds later,(DS1) stops flickering,the set data is written into NVM and the set data can be saved in an outage.If you do not press any button,(DS1) will go out automatically after 5 seconds and enter into the standby state to save power.when it is in the

standby state, Standby system to normal according to the preset logic, they can always press the button to activate (DS1) and the display window to observe the set value

#### 4. Pattern description

- Manual-Hand(H): used to manually control the output of the load state, under this pattern, in its non-set state (DS1 does not flicker), you will start the load or close it every time you press on the setting button, (DS1) the on or out of the decimal point indicates the output state of the setting, the load indicator indicates the actual output state of the load (under the influence of under voltage, overload, short circuit of the battery, the load output is not exactly the same with the set output state), same here in after
- Pure charger pattern(0): this pattern will close the load output but the charging logic is still effective; if load is connected to the storage battery directly, it will still get power output, Attention: the way of connecting the load directly onto the storage battery disposes of the monitoring of product, the system will lose the over-discharge protection and short-circuit and overload protection
- Pure light control pattern(L): when the night is coming, the illumination intensity decreases to the starting point, Product will postpone 10 seconds to confirm and switch to the night pattern and start the load immediately, when the morning is coming, the illumination intensity increases to the starting point, the controller postpone 1 minute to confirm the day pattern and load stops working
- Light and delay pattern(1-9, 0-3): the start process is same with the that of the pure light control pattern, Load will stop working when it works for the set time, the time setting is shown in the chart below
- Common system controller pattern ( C ) : This pattern is shielded light control, time control functions, the output of delay-related functions, load will keep outputting before the storage battery start the low-voltage protection. Conventional charge-discharge controller, for example, for photovoltaic power generation system.
- Debugging pattern(D): used for debugging the system, similar with the pure light control pattern but shield the postponement (10s/1 min) of day/night pattern switch and retain all the other functions. No light signal is connected to the load, the light signal with a shutdown load, this will facilitate the examination of the correctness of the system installation when debugging the installation

#### IV. Working pattern setting chart;

Mode code	Working mode
0	Pure charger mode
1	Light control and delay, closed in 1 hours
2	Light control and delay, closed in 2 hours
3	Light control and delay, closed in 3 hours
4	Light control and delay, closed in 4 hours
5	Light control and delay, closed in 5 hours
6	Light control and delay, closed in 6 hours
7	Light control and delay, closed in 7 hours
8	Light control and delay, closed in 8 hours

9	Light control and delay,closed in 9 hours
0.	Light control and delay,closed in 10 hours
1.	Light control and delay,closed in 11 hours
2.	Light control and delay,closed in 12 hours
3.	Light control and delay,closed in 13 hours
H or H.	Manual mode,the decimal point load to start
C	Solar power system controller(common)
L	Pure light control
D	Debug mode

## V.Technical indicators:

Model	HT-PS10	HT-PS20	HT-PS30	HT-PS40
Charging current(max)	10A	20A	30A	40A
Load current(max)	10A	20A	30A	40A
The system voltage	<input type="checkbox"/> 24V/12V(AUTO); <input type="checkbox"/> 36V; <input type="checkbox"/> 48V; <input type="checkbox"/> 60V <input type="checkbox"/> 12V(Lithium iron battery); <input type="checkbox"/> 36V(Lithium iron battery)			
Overload,short circuit protection	Greater than 1.2 times the rated current of 10 seconds or greater than 1.5 times the rated current for 1 second overload start. Greater than 2.9 times the rated current,short circuit protection action,reaction time 5-8Us.			
Soft start time	0.8s (PWM=0-100%)			
No-load loss	8-22mA (Indicator light when)			
Charging circuit resistance	6-18mR			
Discharge circuit resistance	3-9mR			
Overpressure protection	14.8V @ 12V,29.6V@24V Other working voltage by analogy,the same below			
Enhance the charging voltage	14.5V @ 12V Hold up time;10min(Only called when there is over-discharge)			
Float charging voltage	13.75V @ 12V Hold up time;Until reduced the charge to return the voltage			
Undervoltage voltage	10.6V @ 12V			
Over-discharge voltage	10.5V @ 12V The discharge rate compensation for amendments to the initial over-discharge voltage,lower than this voltage load forced to close			
Over discharge voltage	11.7V @ 12V Higher voltage when the load allowed to start			
Control mode	Charge for the PWM pulse width modulation			
Night-time	60S,Light is below the threshold for a continuous period 60S.the system			

recognition time	state into the night mode
Daytime recognition time	10S,The light above the threshold for when the 10S,the system state into day mode
Day and night to identify the voltage	2.2V @12V Other operating voltage in proportion to automatically adjust
Day and night window voltage	0.5V @12V Other operating voltage in proportion to automatically adjust
Temperature compensation	-5mv/°C/2v Upgrade,direct charge,floating charge to return to the voltage compensation
Operating Temperature	Industrial grade -35°C-+55°C(suffix I)