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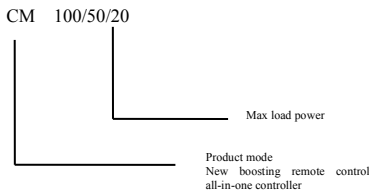
CM series Intelligent Wireless Dimming LED Solar Charge Controller Specification

Main Features:

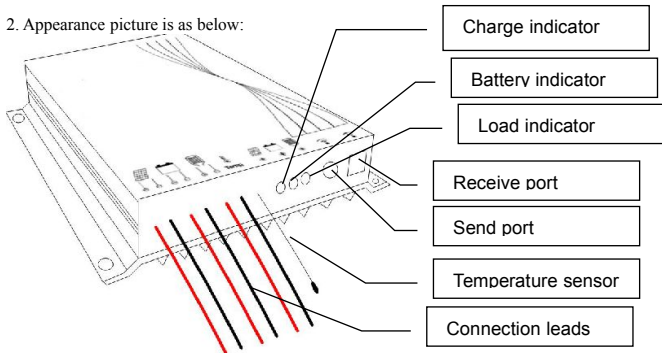
1. New design of wireless remote-control can modify the controller parameter and read the system message according to the hand held device.
2. Digital high precision constant-current control, the maximum efficiency can reach 96%.
3. The working current can be adjusted from 0.15A to 3.3A, the regulating precision is 30mA.
4. High dynamic performances of load insure current output stability even though the battery voltage and load sudden change.
5. 3 section time frame dimming function design, work time can be set range from 0h to 15 hours, power can be set range from 0% to 100%.
6. Intelligent power mode, the load power can be adjust automatically according to the battery power, can extend the maximum working time of the battery.
7. Record the system status, can record at a max 7days and monitor the whole system.
8. The true constant current but not limited the current, insure the current output stability thus decrease LED light failure, increase the LED service life.
9. Metal case, IP68 waterproof degree, can suitable use in all kinds of bad conditions.
10. With modified calculation of charging, the charging efficiency is improved, which lengthen the using time of solar energy.
11. Overheat preventing function, above a certain temperature will decrease the load or close the load.
12. Varies system protection function. Including the battery reverse connection, LED short circuit, open circuit protection and so on.

Installation and Wiring:

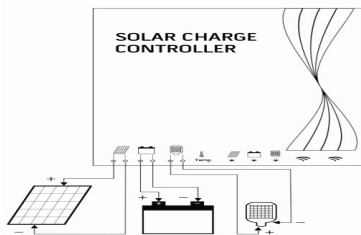
1. Mode identification:



2. Appearance picture is as below:



3. Wiring diagram is as below:



Connection sequence: Please connect the storage battery first, then connect the load, last is the solar panel. Pay attention to the “+” and “-” in case of reverse connection.

LED Connection:

1. The CM Controller is internally installed with constant current source. The max output voltage is 60V. The max amount of LED lights can be connected is 18pcs in series.
2. The CM controller can automatically identify of 12V and 24V system voltage. While connect to LED load, please ensure the number of LED lights in series is appropriate.

Please refer to the recommend as below:

System voltage	The Min No.(n) Of LED lights In series	Output voltage of load (V _{out})	Output power of load (V _{out})
12V	n ≥ 5	V _O ≥ 15V	P _{LED} ≤ 50W
24V	n ≥ 10	V _O ≥ 30V	P _{LED} ≤ 100W

3. Before open the load, Please connect LED light first.

Warning: if the number of LED in series is not appropriate, the controller or the LED load will be damaged.

Status Indication:

LED light	Indications	Status	Functions
	Charging indication	Long-term On	The solar panel voltage is higher than light control voltage
		Long-term Off	The solar panel voltage is lower than light control voltage
		Slow twinkling	Be on charging
		Fast twinkling	Overpressure of system
	Battery indication	Long-term On	Storage battery works normally
		Long-term Off	Storage battery is not connected
		Fast twinkling	Storage battery is excessively discharged
	Load indication	Long-term On	Load is on
		Long-term Off	LED load is in short circuit or open circuit status.
		off	Load is off

Test Mode

Normally the controller is under the light + time control mode, Can use the remote control open the load and the load power will be changed according to the remote control setting during installation or need testing. The test mode will last 1min, after 1min the system will automatically recover to the normal working mode.

Load Working Mode:

Load connect to the CM controller have four working timeframe, each working time and working power can be adjusted arbitrary. Different combination can realize different control mode.

A. Normal Working Mode.

B. Delay Light Time Mode : For example, setting the first time working 4hours,the first power is 0%,system will lighting 4hours later.

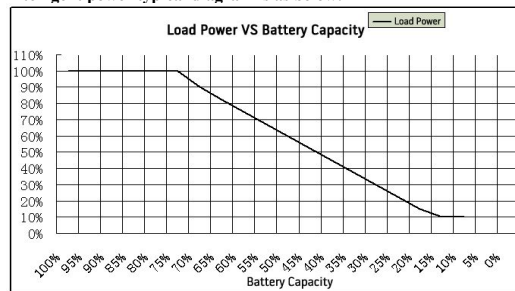
C. Double Time Frame Mode : For example, setting the third time working 4 hours, the third power is 0%, system will be off 4hours after work through the first and second time and then enter the fourth time continue lighting until sunrise.(Remark: this mode do not have the correct function for the night length, different season will show various lighting time in the morning.

Adjust item	Parameter	Default value
The first working time	0hour ~ 15hours	4
The first working power	0% ~ 100%	100%
The second working time	0hour ~ 15hours	0
The second working power	0% ~ 100%	70%
The third working time	0hour ~ 15hours	4
The third working power	0% ~ 100%	50%
The fourth working time	0hour ~ 15hours	0
The fourth working power	0% ~ 100%	30%

LED Intelligent Power Control

While customer open the “Intelligent power” mode, currently the controller will enter to the intelligent power control mode, The LED load power will adjust automatically according to the battery power. The working time and load power preset before is still valid; system will compare with the automatically power and the preset power, and then choose the small one as the load output power. For example: when the battery power is 50%,intelligent power mode calculate the load power is 60%,if now customer preset the load power is 100%,the system will choose 60% as load power. If now customer preset the load power is 20%, the system will choose 20% as load power.

Intelligent power typical diagram is as below:



Read and Modify The Parameter:

CM solar charge controller can setting including the load working time、load working power、light control delay、charging voltage and so on. After setting finish on remote control, aim at the controller and press the “Send” key will set up successfully. Also can read the currently setting parameter of the controller, then check the parameter setting correct or no.

System Status Record:

CM solar charge controller can record the whole system running status, including the running day、over discharge times、full charged time. Also can record the battery's voltage changing conditions in one week which convenient for customer analysis and understanding about the system. Customer can read the running status by remote control, after read successfully; the parameter will be record in the remote control.

Charge-Discharge Control Case:

The parameter of the case is as below:

The setting of the case	Setting value
Working time of first stage	3 hours
Working power of first stage	100%
Working time of second stage	5 hours
Working Power of second stage	70%
Working time of third stage	2 hours
Working power of second stage	50%
Working time in the morning	2 hours
Working power in the morning	30%
Load current	1.74A
Boost charge voltage	14.4V
Float charge voltage	13.8V
Light-operated voltage	8V
Light-operated delay time	5Min

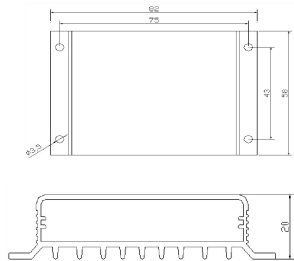
Run Stage Specification:

stage	description
1	Daytime: When the light strengthened, the charging current will increase rapidly, Battery voltage will rise.
2	Daytime: the light changes, the battery voltage is unstable.
3	Daytime: boost charge stage.
4	Daytime: boost charge finished and enter float charge stage.
5	Night: when the solar panel voltage is lower than light-operated voltage, The load will be open after delay. At the first stage, the load power is 100%.
6	Night: at the second stage, the load power is 70%.
7	Night: at the third stage, the load power is 50%.
8	Night: the fourth stage is morning time, the power is 30%. Tip: because of the total setting time(12h) exceeds the night time, The load hasn't been shut, But the light is on over the night.
9	Daytime: The solar panel voltage is higher than light-operated voltage, Close the load after delay. The battery voltage will raise contemporary.

System State Record:

CM series controller can record the operation status of whole system, including operation day, over discharge time, full charged time, etc. It can also record the change of battery voltage weekly, give customer clearer knowledge of the system. Users need to use remote control to read its operation status, when read successfully; the data will be recorded in the remote control.

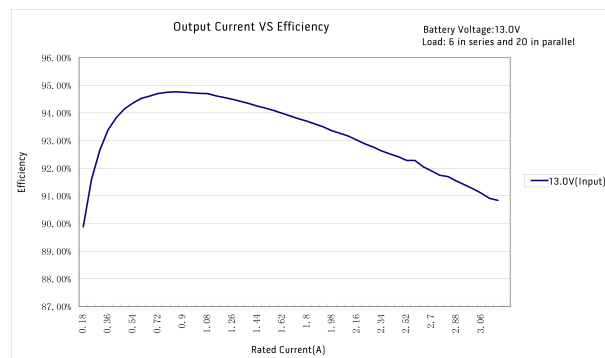
Installation Dimension:



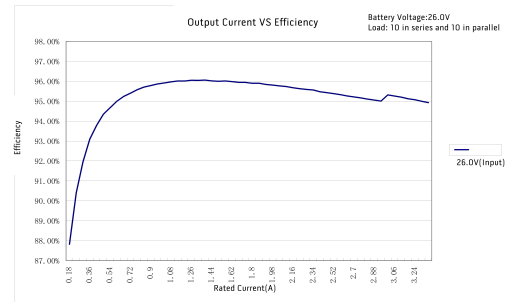
- The size of CM100 is as follows:
Boundary dimension: 82×100×20(mm)
Installation dimension: 86×75(mm)
Installation aperture: 3.5(mm)
- The size of CM50 and CM20:
Boundary dimension: 82×58×20(mm)
Installation dimension: 43×75(mm)
Installation aperture: 3.5(mm)

Typical Efficiency Curve:

1.12V system



2.24V system



The Parameters:

Parameter name	Parameter value			Adjustable	Default value
	CM100	CM50	CM20		
Model	CM100	CM50	CM20		
System voltage	12V/24V	12V/24V	12V		
Output power	50W/12V 100W/24V	30W/12V 50W/24V	20W		
Output current	0.15A ~ 3.3A	0.15A ~ 1.98A	0.15A ~ 1.67A	√	330mA
No-load loss	9mA/12V; 12mA / 24V			9 mA	
Charging current	15A	10A	5A		
Solar input voltage	< 55V		< 30V		
Efficiency of constant current	90% ~ 96%				
Overvoltage protection	16.0V; ×2/24V				
Charging limits voltage	15.5V; ×2/24V				
Equal charging voltage	15.2V; ×2/24V (25℃)				
Equal charging interval	30 days				
Ascending charging voltage	14.2V ~ 15.0V; ×2/24V (25℃)			√	14.4V
Float charging voltage	13.2V ~ 14.0V; ×2/24V (25℃)			√	13.8V
over-discharging recover voltage	12.0V ~ 13.0V; ×2/24V			√	12.6V
over-discharging voltage	9.8V ~ 11.8V; ×2/24V			√	11.0V
Temperature compensation	-4.0mv/℃/2V;				
Current precision	±3% (Load current>300mA)				
Load output voltage	<60V	<60V	<60V		
over-temperature protection	ambient temperature:80℃ (load drop power)				
overheat protection	internal temperature:120℃(Load off)				
light control voltage	5V ~ 11V			√	5V
light control delay	1min ~ 50min			√	1min
Working temperature	-35℃ ~ +65℃;				
Protection level	IP68				
Weight	280g	170g	160g		
Dimension (mm)	100*82*20		58*82*20		

Faults and Solutions

Faults	Solutions
After open circuit of the load, it has no output when reconnect.	Check out if the connection is correct and reliable, wait for 10s until the load is on.
After debugging short circuit of the load, it has no output.	When the load is short circuit, wait for 1min until the load is reopened.
The light of storage battery flashes quickly without any output.	The storage battery has been over discharged, when charging to the return voltage of over discharge, it will self-recovered.
The indicator light of the solar panel is off even if there has sunshine.	Check out if the connection of the solar panel is correct and reliable, or if the solar panel is under sunshine.
The load current hasn't reach to the set value.	Check if the current value has exceeded the rated current of the controller.

Tips: The detail parameters and status please refer to the specification of RMX.