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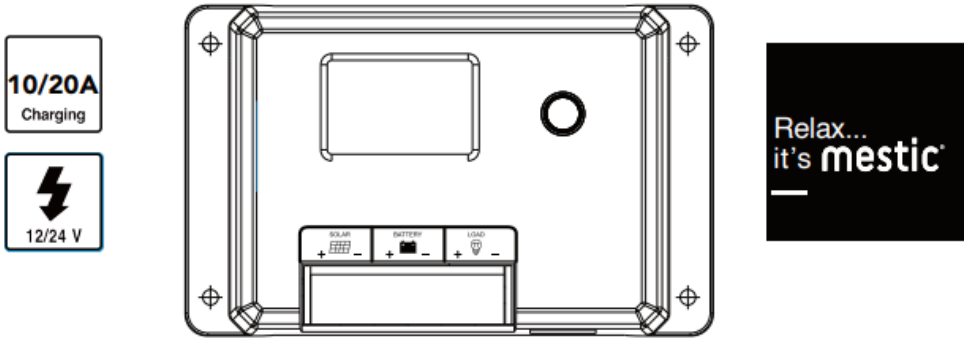
Mestic PWM MSC-2010/-2020 Solar Charge Controller

Specifications

- Model: MSC-2010/-2020
- Charge Controller Type: PWM Solar Charge Controller
- Maximum Current: 10/20A
- Output: USB dual-port output (maximum 2A)

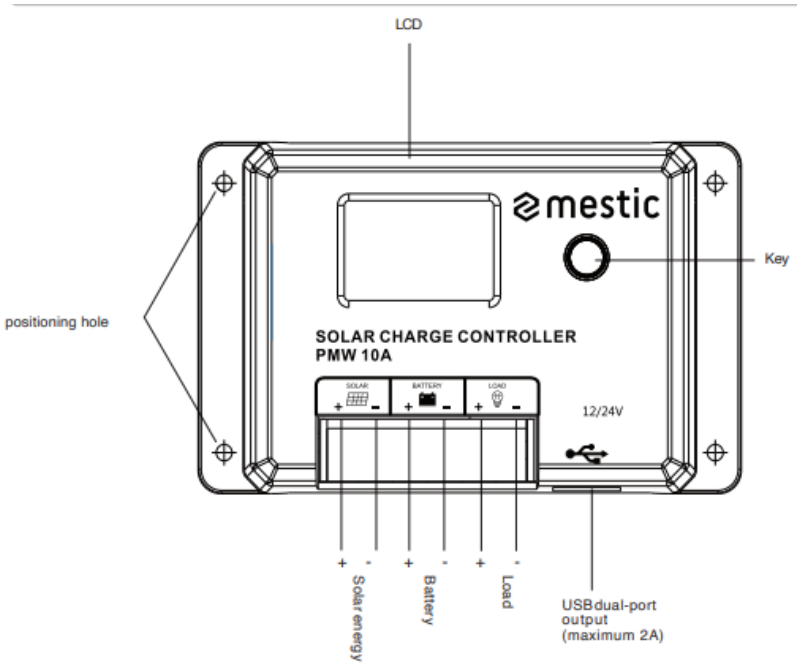


Product Introduction

- Products adopt a 32-bit high-speed main control chip and a large-screen LCD, with adjustable charging and discharging parameters.
- It supports five battery types as custom, sealed lead-acid (factory default), gel lead-acid, flooded (open-cell) lead-acid, and lithium battery (default lithium iron phosphate).
- USB dual-port output is provided, and the maximum current can reach 2A, which supports high-current charging of iPhone,iPad, Android mobile phones, and other devices.
- Automatic identification of lead-acid battery 12V/24V system voltage.
- The complete multi-stage PWM charging management can be set to off-load charging for better support of voltage-sensitive loads.

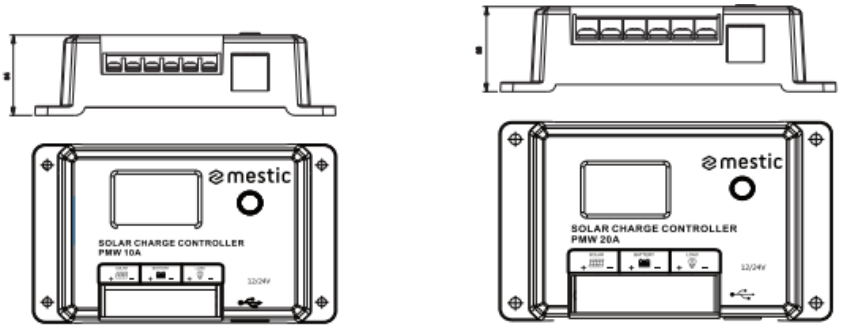
- Rich load working modes are easy to use in various DC loads.
- Protective functions, including built-in reverse polarity protection, open circuit protection, high temperature protection, and overcurrent/short circuit protection(can be set) are self-recovery type without damage to thecontroller.
- The dual MOS anti-backflow circuit is equipped with ultra-low heat generation. The lithium battery activation function is provided.
- The user-friendly browsing design and dynamic interface are convenient and intuitive for operation.

Panel Diagram



Installation Instructions and Precautions

1. The controller should be installed firmly, and the dimensions are as follows: MSC-2010 Overall dimension: 120*75*34mm Mounting dimension: 108.5*57.5mm MSC-2020 Overall dimension: 134*85*36mm Mounting dimension: 121*70mm
2. Mounting hole diameter: 3.5mm



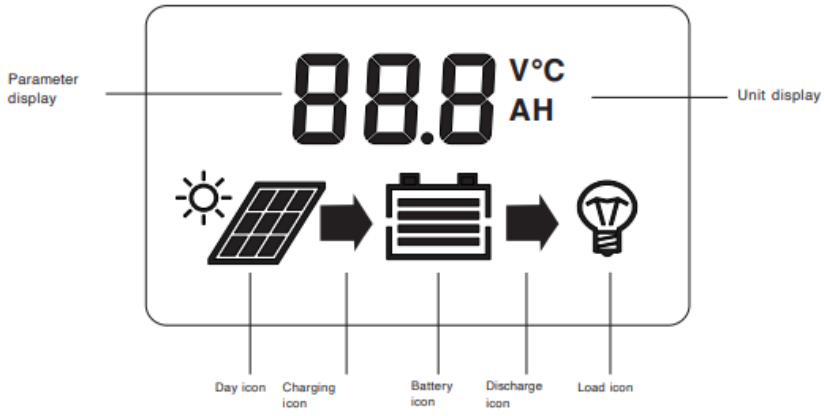
Operation instructions:

1. The first step is to connect the battery: if the connection is correct, the controller screen will light up; otherwise,pleasecheck whether the connection is correct and stable.
2. The second step is to connect the solar panel: if there is strong enough sunlight (the voltage of the panel is higher than the voltage of the battery), the sun icon on the LCD screen will light up, otherwise,pleasecheck whether the connection is correct and stable.
3. The third step is to connect the load: connect the load cable to the load output terminal of the controller, and the current should not exceed the rated current of the controller.
4. The controller will generate heat during operation, and it isrecommended to install it in a ventilated and heat-dissipating environment.
5. Select cables with sufficient capacitance to avoid excessive oscillations on the line and misjudgment by the controller.
6. A common positive electrode design is applied in the controller. If grounding is required, please ground the positive electrode.
7. It isimportant to fully charge the battery frequently.The interval should be at least once a month,otherwise,it will suffer permanent damage.The battery can only be fully charged when more energy entersthe battery than used by the load. Usersshould keep thisin mind when configuring the system.
8. Please check whether each wiring terminal of the controller is locked; otherwise, the terminal will be vulnerable when the current is excessive.

State icon

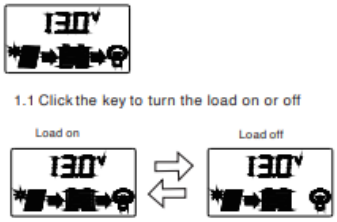
LCD icon	Content	State
	Day or charging	Normal on
	Night identification	OFF
	No load	Arrow off
	On load	Normal on
	Battery status normal	Full on
	Over-voltage	
	Over-discharge	Full on

LCD Schematic Diagram



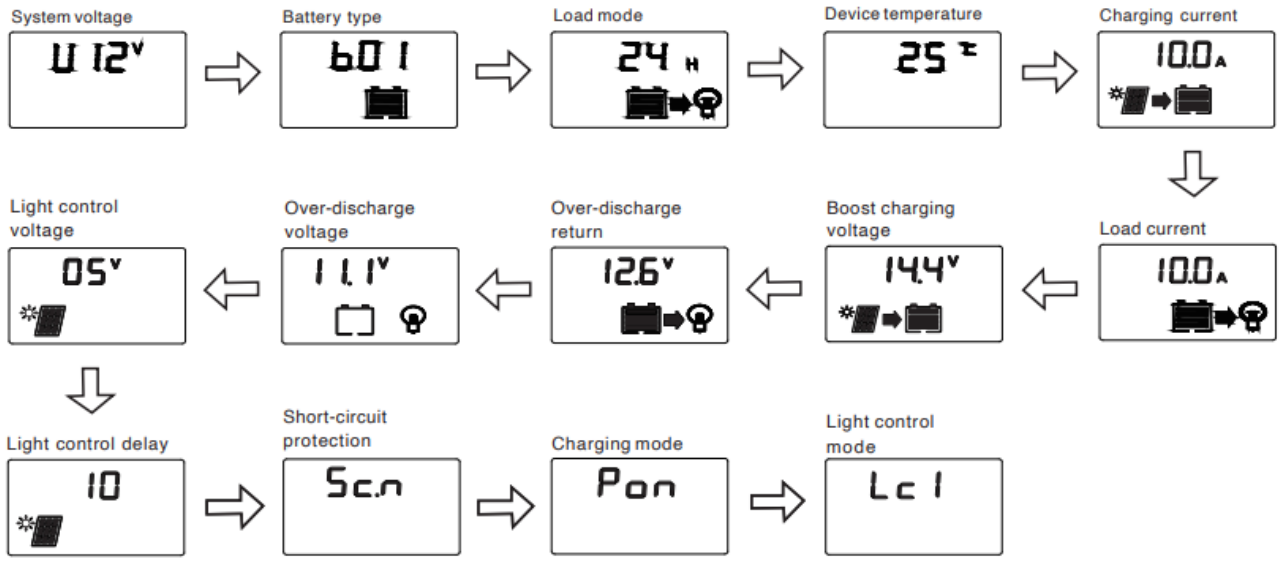
LCD Screen Browsing Menu

1. Main page



2. Menu interface

- Hold down the key for 2s to enter the parameter menu.
- Short press to switch the parameter menu (asshown in the figure below); hold down for 2sto enter the parameter setting page (parameter flashes, short press to adjust the parameter, hold down for 2s to confirm the parameter, and exit the adjustment).
- It will automatically exit the setting mode after 5s without button operation and enter the real-time data page. At the same time, after completing the last parameter setting, short-press to return to the main page of real-time data.



Note: The setting of boost charging voltage is applicable only in b04 and b07.When the battery voltage rises to this set voltage, PWM charging will be started. During normal charging, the arrow remains lit, and after entering the float charging, the arrow turns to flash slowly. Recommended to keep the default value.

Controller Reboot and Factory Data Reset

1. Hold down the key for more than 10 seconds until F01 is displayed on the screen to restart the controller.
2. Hold down the key for more than 20 seconds until the screen displays F02 to restore the factory default parameters.

Battery Type Setting

On the main interface of real-time data, hold down the key for 2s to enter the parameter setting menu. Short press to switch to the “Battery Type” setting menu, hold down the key for 2s to enter the setting interface, and the parameters will flash. Short press to adjust the parameters, hold down the key for 2s, or keep 5s without key operation to confirm the parameters and exit the adjustment mode. See “Table E” for controller battery types.

Note: After changing the battery type and system voltage, the controller needs to be powered
On again, otherwise it will operate according to the battery type and system voltage before

setting.

Table EBattery type and display code table

Character display code	Battery type	Remarks
b01	Sealed lead-acid battery	Factory default
b02	Gel lead-acid battery	
b03	Flooded lead-acid battery	
b04	Ternary lithium battery	
b07	Lithium iron phosphate battery	

Load-related Parameter Settings

Load operating modes

1. Light control mode (00H): The load is turned on or off by the light control signal.
2. Time control mode (01H-23H): The load is turned on by the light control signal and turned off after a delay.

   Lc1 means that the load works at night, Lc2 means that the load works during the day, and the light control has priority over the time control to turn off the load.Lc3 means that the load works at night, Lc4 means that the load works during the day, and the time control has priority over the light control to turn off the load. For example, if set to 16h, while the length of night/day is only 12h, then Lc1/2 will only operate for 12h, while Lc3/4 will operate the set value of 16h; the default is Lc1 state.
3. Normal on mode (24h): supply power to the load for 24 hours.
4. C2A mode: the load works for 2 hours a day, stops for 15 minutes, and keeps this mode circulating..
5. C2d mode: the load works every 2 hours during the daytime, stops for 15 minutes, and keeps this mode circulating.
6. C2d mode: the load works every 2 hours at night, stops for 15 minutes, and keeps this mode circulating.

   Note: No matter which load working mode is set, when the battery is discharged to the low voltage disconnect voltage, the controller will forcibly turn off the load. When the controller is active, the load will remain off.

Display	Mode
00H	Light control mode
01H-23H	Time control mode
24H	Normal on mode (factory default)
C2A	The load operates for 2 hours a day and stops for 15 minutes
C2d	The load operates for 2 hours in the daytime and stops for 15 minutes
C2n	The load operates for 2 hours at night and stops for 15 minutes

Light control voltage

In the light or time control mode, when the controller detects that the photovoltaic panel (PV panel) voltage is less than this set value, it will turn on the load after a delay; otherwise, it will turn off the load. At night, if the ambient light around the solar panel is too bright, which makes the output voltage of the solar panel become high, it will cause the controller to automatically turn off the load. It can be solved by adjusting this value. Setting Recommendations: It is recommended to keep the default value.

Light control delay

When the controller detects that the voltage of the PV panel is lower than the set threshold, it will turn on the load after a delay. This time value can be used to prevent the lights from being turned off because of misjudgment caused by car lights or lightning interference at night. Setting Recommendations: It is recommended to keep the default value.

Special Function Settings

1. Short-circuit protection setting: Sc. n means short-circuit protection on; Sc. F means short-circuit protection off, please turn off the short-circuit protection function for equipment with an excessive starting current. The default mode is on.
2. PWM charging setting (only applicable in b04, b07): Pon means PWM charging mode; PoF means disconnected charging mode, it is recommended to use disconnected charging mode for voltage-sensitive loads.The default mode is on.

Error Code Table

Display code	Related problem
E0	No error
E1	Battery over-discharge
E2	Battery over-voltage
E4	Load short-circuit
E5	Load overload
E6	Controller internal overtemperature
E10	Solar panel overvoltage

Common Problems and Solutions

Phenomenon	Common problems and solutions
LCD screen does not light up	Pleasecheck whether the connection of battery is correct
LCD screen does not display completely or not update	Pleasecheck whether the connection of battery is correct
The battery panel icon does not light up with sunlight	Pleasecheck whether the connection of the photovoltaic cell iscorrect and the contact isreliable;whether the voltage of the battery board is lessthan the battery voltage
Others	Check whether the wiring is reliable and whether the system voltage identification is correct

Tableau des paramètres techniques

Model		MSC-2010	MSC-2020
Rated current	Charge	10A	20A
	Load	10A	20A
Rated power		12V/150W 24V/300W	12V/300W 24V/600W
System voltage		12V/24V/U--(automatic identification)	
No-load loss		<7mA/12V; <10mA/24V	
Maximum PV input voltage		Start the protection and stop charging when the voltage is above 55V. Continue to charge when the voltage isbelow 50V.	
Maximum allowable voltageat thebattery end		<32V	
Battery type		b01(SLD) x2/24V	b02(GEL) x2/24V
Over-voltage protection		16.0V	16.0V
Equalizing charging voltage		14.6V	-
Boost charging voltage		14.4V	14.2V
Float charge voltage		13.8V	13.8V
Charging reconnect voltage		13.2V	13.2V
Over-discharge reconnect voltage		12.6V	12.6V
Over-discharge voltage		11.1V	11.1V
Equalizing charging time		2H	-
Boost charging time		2H	
Charging method		PWM charging isthe default mode, and b04/b07 canbe setto pulse charging	
USBoutput		5V/2A	
Operating temperature		-35°Cto 60°C;	
Altitude		≤3000m	
Protection grade		IP32	
Net weight		130g	180g
Protection function		solar panel short-circuit protection; battery panel and battery reverse connection protection	
		Over-temperature protection, load overload protection, and short-circuit protection	
Product dimensions		120*75*34	134*85*36

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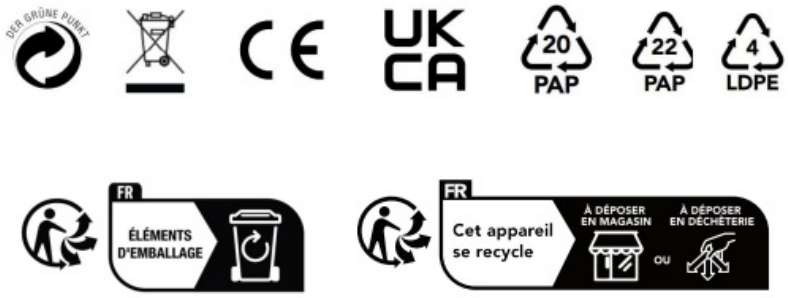


Protection of the environment

 This symbol attached to the product means that it is an appliance whose disposal is subject to the directive on waste from electrical and electronic equipment (WEEE). This appliance may not in any way be treated as household waste and must be subject to a specific type of removal for this type of waste. Recycling and recovery systems are available in your area (waste removal) and by distributors. By taking your appliance to its end of life to a recycling facility, you will contribute to environmental conservation and prevent any harm to your health.

FAQS

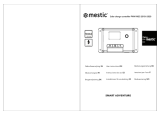
Q: How do I reset the controller to factory settings?

A: To reset the controller to factory settings, press and hold the key for more than 20 seconds until ‘F02’ appears on the screen.

Q: What is the recommended installation location for the solar charge controller?

A: Install the controller in a well-ventilated area away from direct sunlight and humidity to ensure optimal performance and longevity.

Documents / Resources

	Mestic PWM MSC-2010/-2020 Solar Charge Controller [pdf] Instruction Manual MSC-2010, MSC-2020, PWM MSC-2010-2020 Solar Charge Controller, PWM MSC-2010-2020, Solar Charge Controller, Charge Controller, Controller

References

- User Manual

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charge controller, controller, mestic, MSC-2010, MSC-2020, PWM MSC-2010-2020, PWM MSC-2010-2020 Solar Charge Controller, Solar Charge Controller

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