LC POWER

USER MANUAL

LCCD-A1

Solar Controller+LED Driver+Built-in Timer

20120314 **VERSION 1**

Please read the instructions carefully and thoroughly before using the product. It comes with a number of outstanding features, such as:

- Build-in LED driver, maximum output voltage up to 70V, maximum efficiency up to 96%.
- Automatic recognition of system voltage 12/24 V
- Protection degree:IP68 -- in1.5m water depth 72hours
- External high precision temperature sensor, high precision temperature compensation.
- Advanced four stage charging (main, boost, equalization, float) effectively prolong the battery life.
- 4 stages PWM dimming function.
- Professional LED driver chip, with little current ripple, which extends the LED span life.
- Built-in intelligent learning function easily realizing automatically lights on in the morning.
- With electricity protection data-saving function.
- Complete protections on reverse polarity (battery or solar panel), over-charge, over-discharge, over load, short circuit, TVS lightening;
- Imported good-quality components contributing to high reliability;

Installation

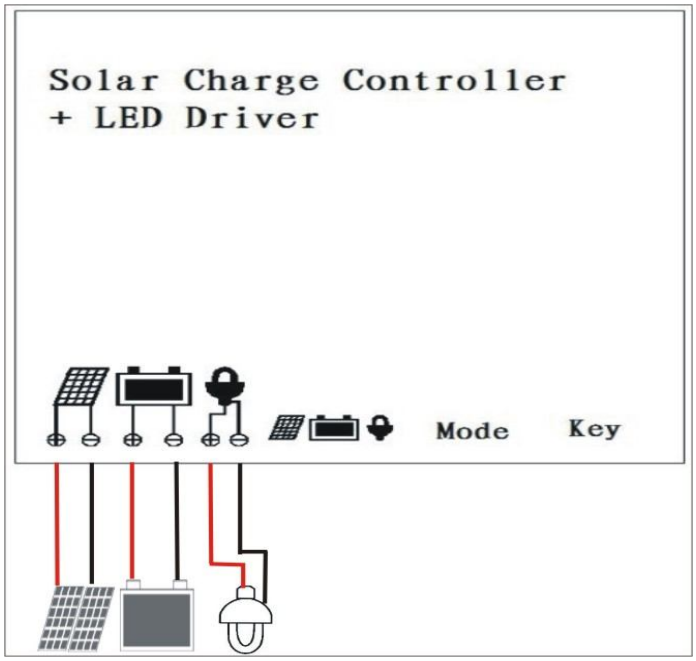
Attentions

- The solar panel voltage may exceed human body safety voltage when wiring 24V system. So it is better to shade the solar panel and use insulating tools;
- Output voltage of load may exceed human body safe voltage; please connect LED before load open during installation.
- Battery may permanent damage if short circuit, one fuse recommended between battery and controller;
- Good ventilation area recommended for heat dissipation;
- Make sure the wire length between battery and controller is as short as possible

- Recommended minimum wire size: 2.5mm²;
- Controller be with Reverse Current Protection by MOSFET which inspects the current direction regularly;

Installation steps & connection diagram

- Firstly connect load with controller and then wire battery and solar panel to controller respectively; please pay attention to the distinction of negative and positive; After connecting the battery, controller will automatically recognize system voltage and display on the nixie tube. (“12” stands for 12V system, “24” stands for 24V system.)

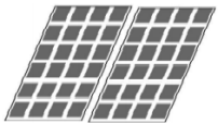


Accepted LED load

User should make sure the LED load can meet following standards

	12V system	**24V system**
LED driver output voltage range	16V~70V	32V~70V
Recommended series LED lamp qty.	5~20PCS	10~20PCS
LED load max. power	30W	60W

LED display

Symbol	Equipment	Status	Description
	battery	on	battery working
		off	no battery connected
		slow flash	low voltage
		quick flash	over voltage
	solar panel	on	daytime
		off	nighttime
		slow flash	charging
		quick flash	over tempreture, stop charging
	load	off	load off
		on	load work with 100% power
		flash for 3 times	load work with 75% power
		flash for 2 times	load work with 50% power
		flash 1 time	load work with 25% power

Remark: *Slow flash frequency is about 2 times/s, quick flash frequency is about 2 times/s.*

Output mode

The controller can automatically detect day/night through testing the open circuit voltage of the solar panel, no setting of a clock is required. It gets the dawn light start time through learning to daytime and nighttime in different area or season.

There are 4 output modes available:

- Light control “on” and time control “off” (1-4.): Load starts working when controller detects night and stop working as set time (the load stops working if controller detects “daytime” no matter the set time is achieved or not);

- Morning Mode (4~5): The load would be turned on automatically in the morning, the output power is adjustable.

- Manual mode (6): can switch output performance manually no matter daytime or night; the power is adjustable.

- Debug mode (): used for debugging and installation;

Remark: *if the battery is over charge or discharge, the controller will cut off the load not matter under which mode.*

Image on tens digit	Model	Image on unit digit	Parameter
	Load work with 100% power		Work period (0~14hours)
	Load work with 75% power		Work period (0~14hours)
	Load work with 50% power		Work period (0~14hours)
	The fourth period of time		Work period (0~14hours)
	Morning mode		1 dawn light power 25% 2 dawn light power 50% 3 dawn light power 75% 4 dawn light power 100%
	Manual mode		0 load off 1 load work with 25% power 2 load work with 50% power 3 load work with 75% power 4 load work with 100% power
	Demo model		

Remark: *the dot behind units digit on nixie tube stands for 10; (eg. 3. Stands for 13)*

Keys and settings

Skip Press: press the button within 2 seconds

Confirm Press: press the button within 2 to 4 seconds.

Configure Press: press the button over 4 seconds

Browse Mode: nixie tube tens digit is “on” (except ⊏).

Setting mode: nixie tube unit digit is twinkling.

Configure mode: nixie tube tens digit is showing symbol “⊏ ”

1. Under browse mode, user can “Skip Press” to view status of each output mode. When it goes to the expected output mode(1-5), “Confirm Press” to enter setting mode, nixie tube unit digit would flash; “skip press” to chose the expected output mode parameter; “confirm press” to confirm and exit the setting mode.

2. Under browse mode and nixie tube tens digit showing “6”, “confirm press” to enter manual output mode, nixie tube unit digit would flash, “skip press” to chose the expected output power. When you want to exit the manual mode, “confirm press” to enter browse mode.

3. Under browse mode and nixie tube tens digit showing (1-5), “configure press” to enter configure mode,. When you want to exit the configure mode, “configure press” or wait for 3 minutes to enter browse mode.

Technical data

System voltage	12/24 V auto recognition
Max. charge/load current	10A
Output current	300mA~3300mA
Float Charge	13.8V/27.6V(25℃)
Main Charge	14.4/28.8 V (25 °C), 30 min. (daily)
Boost charge	14.4/28.8 V (25℃), 2 hActivation: battery voltage < 12V/24V
Equlization charge	14.8/29.6V
Deep discharge protection:Cut-off voltage	11V/22V
Deep discharge protection:Reconnect voltage	12V/24V
Overvoltage protection	16V/32V
Max. panel voltage	55V
Temperature compensation	-4mV/℃·2V
Self consumption	5 ~ 10mA
Day/night detect voltage	Day:>9V; night: <7V
Day/night detect delay	3min
Working temperature	-40~+50℃
Maximum above sea level	4000m
Size	82x59x20mm
Weight	160g
Protection degree	IP68(1.5m, 72h)

Remark:

1. *The two voltage levels before/after the slash are valid for 12V and 24V systems respectively.*

2. *only solar panel or load can full load running if environment temperature is over 55 ℃*

Common problems & Solutions

Phenomenon	Problem	Solution
Battery indicator off	Battery working problem	Make sure the wiring between controller and battery is correct.
Battery indicator slowly flash, without output	Battery under over discharge protection	Charge to recover voltage
Battery indicator quick flash, without output	Battery under overvoltage protection	Cut off output for protecting load, auto working after recovering voltage
Solar indicator “off” in daytime	Solar panel wiring problem	Make sure the wiring between controller and solar panel is correct.
Solar indicator “on” in nighttime, without load output	System cannot detect night	System detects “night” when solar voltage drops less than 7V; Solar indicator be “off” and with load output; make sure solar panel not shone by light if no output 3 min. later.
Solar indicator quick flash	No charging	Over temperature, solar charging “off” system auto recovered when temperature return to normality.
Others	-	Check the wiring

SUBJECT TO CHANGE WITHOUT NOTICE

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MADE IN CHINA

SHENZHEN LICHUANG POWER CO., LTD