

LCD display unit

User manual



User Manual

User Cyber-LCD series_NC

ISO9001:2015

Subject to change without notice!

一、Product safety instructions

- Thank you for choosing our LCD unit. Please read the instructions carefully before using the product.
- Please keep this product manual for future reference.
- When receiving the product, please check whether the goods are damaged during transportation. If any problem is found, please contact our company immediately.
- Please read all instructions and precautions in the manual before installation to ensure that the product can work properly.
- Do not place this product in the environment of rain, exposure, dust, vibration, corrosion and strong electromagnetic interference.
- Prevent water from entering the product.
- Do not open the shell of this product for maintenance.

二、technical parameter

Project	LCD01	LCD01-BT
Model	Products with RS485 communication function	Products with RS485 communication function
Input power	8~65V(Power supply for controller communication interface)	8~65V(Power supply for controller communication interface)
Power waste	7-14mA	10-17mA
LCD backlight	Have	Have
Bluetooth communication	Not	Have
Work environment	-20°C ~ +65°C	-20°C ~ +65°C
Storage environment	-20°C ~ +80°C	-20°C ~ +80°C
Overall dimensions	114*114*27.8mm	114*114*27.8mm
Net weight	114g	116g

3.1 Product features

Cyber-LCD is an external liquid crystal display unit, which can be compatible with Bluetooth communication and all the controllers with 485 interface in our company.

Main features:

- Without external connection, the controller can directly supply power to the LCD display unit through the network cable
- Large screen multi-function LCD display with clear display, displaying the operation data and working status of the connected equipment in real time in digital, graphic and text forms
- With 485 communication, Can match all the controllers with 485 interface in our company
- Convenient operation, intuitive, convenient and fast operation with keys
- Connect the real-time display of equipment fault information and voice control alarm.
- Adopt Bluetooth 4.0 and BLE technology, with fast communication and strong anti-interference ability (only applicable to products with Bluetooth)
- Mobile APP is supported to view data in real time (only applicable to products with Bluetooth)

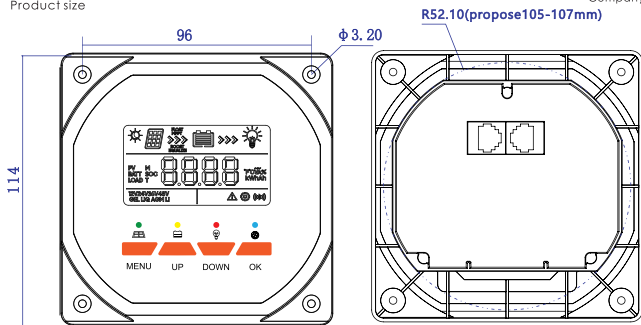
3.2 Major function

Through LCD display and function key operation, it can monitor the operation data and working status of a single connection controller in real time, browse and modify the charging and discharging control parameters, set the load control parameters, and restore the factory default parameters.

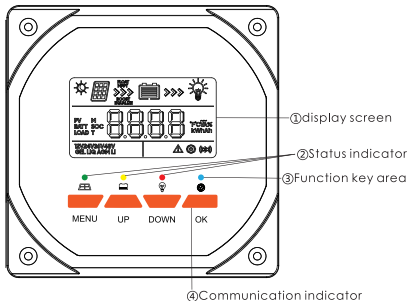
四、Product size and appearance

Product size

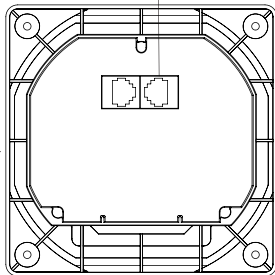
Company: mm



Product appearance



⑤ RJ45 communication and power interface



五、Installation instructions

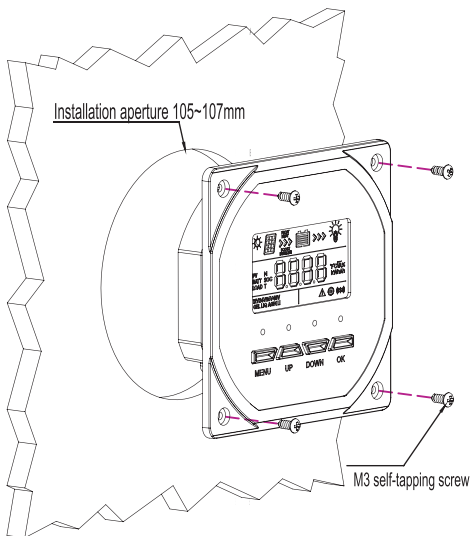
Panel installation

Step 1: locate and open holes according to the panel installation size (refer to the product appearance drawing)

Step 2: install 4 M3 * 8 self-tapping screws into the screw hole

Step 3: drive the screw installed in the screw hole into the hole

Note: During installation, it is necessary to fully consider the plugging space of the communication cable and whether the cable length is appropriate



六、Operation and display

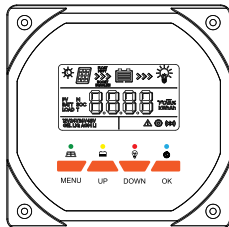
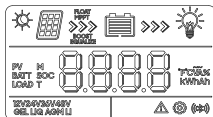
6.1 Key operation

Key	Explanation
MENU	In the settable item, long press MENU to enter the setting, short press to return (exit without saving)
UP	Flip up or increase the value
DOWN	Flip down or decrease the value
OK	Confirm

Pattern	Operation
Browse mode	Short press UP/DOWN key
Static display	Press the MENU+OK key for 1 second at the same time, and the LCD screen will lock the current display and no longer scroll, Short press the UP/DOWN key to continue browsing the interface; Press the MENU+OK key again for 1 second, and the LCD screen will unlock Restart scrolling display except locking
Setting mode	The display interface appears  the icon indicates that the current parameter can be set. Press and hold the MENU key for 1 second to enter the setting mode, Here  The icon flashes, press the UP/DOWN key to change the parameters, and press the OK key to save and exit after setting . In the setting mode, you can directly press the MENU key to exit without saving, or automatically exit without operation for more than 30 seconds
Load switch	When the controller works in the street light mode, press and hold the MENU key for 3 seconds to turn on the load, Press and hold the MENU key again or the load will be switched off after 1 minute

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
																	
S	T	U	V	W	X	Y	Z	0	1	2	3	4	5	6	7	8	9
																	

6.2 Operation interface



6.2.1 Status Introduction

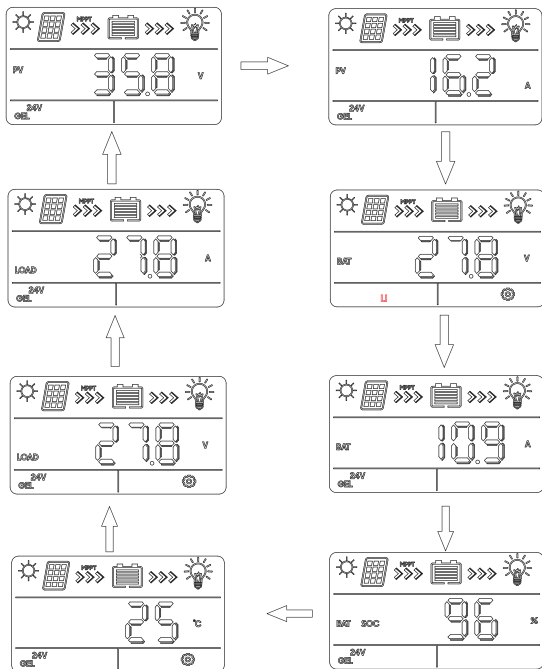
Name	Lcon	State
PV		Day, not charged
		Charging
		night
	PV V A Ah	Display the voltage, current and charging ampere-hours of the solar panel
	PV T Ah	Total charging ampere-hours of solar panel
BATT		Battery capacity
		Respectively represent the battery: low voltage protection, power 1~20%, power 21~40% Power: 41~60%, 61~80%, 81~100%
	BATT V	Display battery voltage (set overcharge protection voltage for lithium battery)
	BATT A	Display battery current
	BATT SOC %	Current battery capacity
	25	Ambient temperature
	BATT T GEL	Battery type (settable)
LOAD	LOAD V	Load voltage (low-voltage protection voltage can be set)
	LOAD A Ah	Load current, discharge ampere-hours of the day
	LOAD T	Accumulated discharge ampere-hours of load
	LOAD M USE	Load working mode (settable)

6.2.1 Status Introduction

Name	Lcon	State
LOAD		Load on, discharging
		Load off
Other settings		Clear Bluetooth device password
Status indication		Fault indication
		Settable
		Bluetooth connectivity
Other instructions	12V24V36V48V GEL Li AGM Li	System voltage and battery type
	°CVA% kWhAh	Unit symbol
	FLOAT BOOST MPPT EQUALIZE	Respectively represents the four-stage charging mode
	> >> >>>	Cycle display indicates charging or discharging

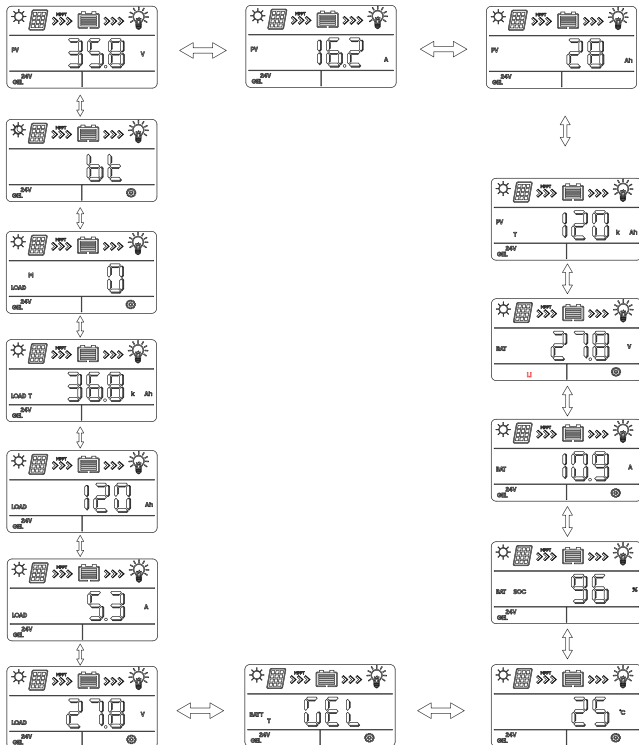
The photovoltaic array charging ampere-hours and load discharge ampere-hours are reset after power failure.

6.2.2 Automatic cycle display content

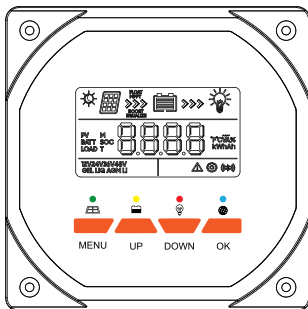


The above figure only represents the working diagram, not the actual working state

6.2.3 Press the UP/DOWN key to browse the contents displayed on the interface



The above figure only represents the working diagram, not the actual working state.



6.2.4 Fault indication

Fault	Lcon	Fault information description
Short circuit protection	  E1	Load off, fault icon display, load icon flashing, LCD display E1
Overcurrent protection	  E2	Load off, fault icon display, load icon flashing, LCD display E2
Battery low voltage protection	  E3	The battery is empty, the fault icon is displayed, the outer frame of the battery icon flashes, and the LCD displays E3
Battery overvoltage protection	  E4	The battery is full, the fault icon is displayed, the battery icon flashes, and the LCD displays E4
Over temperature protection	  E5	Turn off the charge and discharge, the fault icon is displayed, the icon °C flashes, and the LCD displays E5
Communication failure	 E6	Communication fault, fault icon display, LCD display E6
The controller is not correct Identify system voltage		The controller does not correctly recognize the system voltage

6.3 Parameter setting

The display interface appears. ☼ icon represents that the current parameter can be set. Press and hold the MENU key for 1 second to enter Set mode, at this time ☼ icon flashes, press the UP/DOWN key to change the parameters, and press the OK key to save and exit after setting.

In the setting mode, you can directly press the MENU key to exit without saving, or automatically exit without operation for more than 30 seconds

6.3.1 Overcharge protection voltage (lithium battery)



The battery type is set to lithium battery, with LCD display interface

As shown in the left figure, press and hold the MENU key for 1 second, and the icon flashes, Lithium battery overcharge protection voltage can be set. Overcharge protection voltage setting range:

10.0~17.0V (14.4V default)/10.0~32.0V (14.4V default)/10.0~64.0V (29.4V default)

The above overcharge protection voltage range is determined according to the specific model of the controller.

The controller automatically calculates the overcharge recovery voltage and overcharge recovery voltage according to the set overcharge protection voltage
Complex voltage $\approx 0.97 * \text{overcharge protection voltage}$.

If the battery type is set to non-lithium battery, the current interface has no ☼ Icon.

6.3.2 Low voltage protection and recovery voltage



1. When the LCD screen displays the interface shown in the left figure, press and hold the MENU key for 1 second, and the icon flashes Set low voltage protection voltage. When the battery type is lithium battery, the setting range of low voltage recovery point is: 9.0~16.0V (default 10.6V) / 9.0~30.0V (default 10.6V) / 9.0~60.0V (default 21.0V)

The above low-voltage protection voltage range is determined according to the specific model of the controller.

The controller automatically calculates the low-voltage recovery voltage according to the set low-voltage protection voltage,

Low voltage recovery voltage $\approx 1.11 * \text{low voltage protection voltage}$

2. When the battery type is liquid, colloid or AGM battery, the low voltage protection mode of the controller is battery voltage control.

Battery voltage control low voltage protection setting range:

10.8~11.8V/21.6~23.6V/32.4~35.4V/43.2~47.2V (default 11.2/22.4/33.6/44.8V)

6.3.3 Charging current

The default low voltage recovery voltage of the controller is higher than the low voltage protection voltage 0.8V/1.6V/2.4V/3.2V,

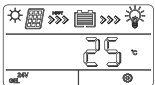


If you want to reduce the low voltage recovery voltage, please lower the low voltage protection voltage value first.

When the LCD screen displays the interface shown in the left figure, press and hold the MENU key for 1 second, the gear icon flashes. The charging current of the controller can be set. Press the OK key briefly to save and exit.

The setting range is 0~100A, which is determined according to the specific model of the controller.

6.3.4 Temperature unit



When the LCD screen displays the interface shown in the left figure, press and hold the MENU key for 1 second, the gear icon flashes.

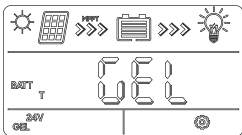
Temperature unit can be changed. Press OK to save and exit.

Celsius symbol (°C), Fahrenheit symbol (°F), temperature display after switching temperature unit value is automatically adjusted according to the unit.

6.3.5 Battery type

When the LCD screen displays the interface shown below, press and hold the MENU key for 1 second, and the gear icon flashes, battery type can be set, including lithium battery, AGM, colloid or liquid battery, Press the OK key to save and exit.

Interface display	Battery type
GEL	Gel battery (default)
LIQ	Liquid battery
AGM	AGM Battery
LI	lithium battery



1.Charging voltage parameters (liquid, colloid, AGM)

When the battery type is liquid, colloid or AGM, the voltage parameters of forced charge, balanced charge and floating charge can be obtained through mobile phone APP Rs485 or We Chat applet settings, the setting parameter range is as follows. The following voltage parameters are all 25 /12V system parameters, 24/48V system automatically multiplies by 2/4.

Charging stage	Boost charge	Equal charge	Floating charge
Charging voltage range	14.0~14.8V	14.0~15.0V	13.0~14.5V
Default charging voltage	14.5V	14.8V	13.7V

2.Charging voltage parameters (lithium battery)

When the battery type is lithium battery, the lithium overcharge protection and overcharge recovery voltage can be set by pressing the key (see 6.3.1 Setting Options for details).It can also be set through mobile APP, RS485 or WeChat applet.

 **Note: The minimum and maximum voltage difference between lithium battery overcharge protection and overcharge recovery is 0.2V and 1.5V, and the mobile phone APP is not supported hold parameters beyond this range.**

Warning: The accuracy of the lithium-ion battery protection board installed in the system shall not be greater than 0.2V. If it is greater than 0.2VIf the system is abnormal, we will not assume any responsibility.

 **Overcharge protection voltage:**10.0~17.0V (default: 14.4V)/10.0~32.0V
(default: 14.4V)/20.0~64.0V (default: 29.4V)

Overcharge recovery voltage: 9.2~16.8V (default: 14.0V)/9.2~31.8V
(default: 14.0) /18.2~63.8V (default: 28.7)

The overcharge protection and overcharge recovery voltage can be set according to customer requirements.

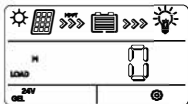
(The nominal voltage of a single ternary lithium battery is 3.7V, and the full charge is 4.2V; Single lithium iron phosphate battery nominal 3.2V,Full 3.6V meter)

Low voltage protection and low voltage recovery voltage can be set according to customer requirements.

(The minimum voltage of a single lithium ternary battery is 3V; the minimum voltage of a single lithium iron phosphate battery is 2.7V)

6.3.6 Load mode

When the LCD screen displays the interface shown below, press and hold the MENU key for 1 second,  icon flashes to set the load working mode. Press the OK key to save and exit.



Interface display	Load operation mode
	Universal controller, 24H output (default)
I	Dusk to Dawn mode (D2D)
23456789	Fixed lighting duration (2~9 hours)
USE	Manual mode (default: load on)

1.Universal controller (24H output)

When the controller is set to the 24H output mode, no matter the charging or discharging state, the load end has output (except the protection state).

2.Street light mode

When the load mode is set to fixed light duration or D2D, the light control can be set through mobile phone APP, RS485 or We Chat applet and light-controlled delay. The load can be turned on or off through the test function during the daytime charging process.

2.1Dusk/Dawn Detect Voltage

The controller can automatically identify the day and night by measuring the open-circuit voltage of the solar panel. According to different regions and different Solar panel, users can set different light control point voltage (critical voltage in day and night) by themselves, which can only be adjusted through 485/Bluetooth

The voltage setting range of optical control point is 3.0~10V (lithium battery, default: 8.0V)

The setting range of optical control point voltage is 3.0~10V/6.0~20V/12~40V (liquid/colloid/AGM, default: 8.0/16.0/32.0V)

2.2Optical control delay

When the night comes, when the battery panel voltage reaches the set light control point, the lighting time at night can be delayed by setting different light control delay, which can only be adjusted through 485/Bluetooth.

The setting range of optical control delay is 0~30 minutes (default setting: 0 minutes)

2.3Test function

During charging, press and hold the MENU key for 3 seconds to turn on the load.

Press and hold the MENU key again or the load will be turned off after 1 minute.

If the controller works in 24H output mode, the test function will not work

3.Manual mode

- ① When it is set to manual mode, the default load is on after the controller works. Short press the MENU key to turn off the load, and short press the MENU key again to turn on the load.
- ② Change the default switch state of the load in manual mode through the mobile phone APP, RS485 or We Chat applet, and also turn on or off the output of the load end of the current controller.



1. When the load is turned on, when the controller is turned off due to low voltage protection, overcurrent protection, short circuit protection or over-tem perature protection, the load out put end automatically opens after recovering from the protection state.

2. When the controller is under low voltage protection, overcurrent protection, short circuit protection or overtem perature protection, short press the MENU key in manual mode, and the load cannot be turned on, but the key status will still work. After the protection is restored, it will operate according to the new status.

6.3.5 Clear Bluetooth device password



When the LCD screen displays the interface shown in the left figure, press and hold the MENU key for 1 second,  icon flashes, and short press the OK key Clear the Bluetooth device password set through mobile phone APP.

 **Bluetooth** For the device password, please refer to the Bluetooth APP instructions.

6.4 LED indicator light

 ● **Solar Panel Indicator**

 ● **Load end indicator**

 ● **Battery end indicator**

 ● **Communication indicator**

LED	State	Function
Green LED (Solar terminal)	On	The solar panel is connected normally, but not charged
	flash(0.1/0.1s)	MPPT charging
	twinkle(0.5/0.5s)	Forced or balanced charging
	Slow flash(0.5/2s)	Floating charge
Yellow LED (Battery terminal)	On	Normal power
	Off	Overvoltage protection
	flash(0.1/0.1s)	Low voltage protection
	Slow flash(0.5/2s)	Low battery
Red LED (Load end)	On	Load on
	Off	Load off

LED	State	Function
Red LED (Load end)	flash(0.1/0.1s)	Short circuit and overcurrent protection
	Slow flash(0.5/2s)	Over temperature protection
Blue LED (485)	On	Communicating
	Off	Communication not connected or communication failure

6.5 Buzzer

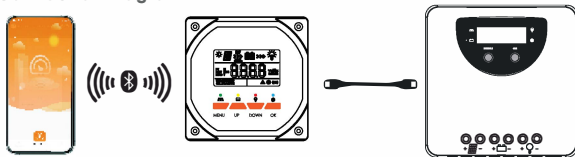
In case of failure, the buzzer will give 5S/5S alarm, and the button operation will stop; If the fault is not eliminated after pressing the key, the alarm will continue after 30s.

6.6 Backlight

The back light of key operation is bright, and it will be closed after 30s without operation.

七、Bluetooth description

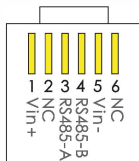
7.1 Connection diagram



Note: Special connecting line is required for connecting line!

Rj11 interface is defined as follows:

Pin number	definition
1	Vin+
2	NC
3	RS485-A
4	RS485-B
5	Vin-
6	NC



Rj11 Interface

7.2 For Bluetooth operation instructions, please refer to the Solar Life Mobile APP User Manual!

