

使用说明书 XMYK32

安全使用建议

- 1.本控制器为 12V/24V 控制器，首次安装时，请确保电池有足够的电压，以便控制器能够识别为正确的电池类型。
- 2.将控制器尽量靠近电池安装，以避免电线过长造成压降，影响正常电压判断。
- 3.本控制器适用于 12/24V 铅酸电池，锂离子电池，磷酸铁锂电池，请注意在菜单选择对应电池类型。
- 4.本控制器只能使用光伏板作为充电源，请勿使用直流电源作为充电源。
- 5.本控制器运行的时候会发热，请注意将控制器安装在平整，通风良好的表面。

产品特点

- 1.采用 32 位高速主控芯片。
- 2.大屏幕 LCD 显示，充放电参数可调。
- 3.完整的多阶段 PWM 充电管理。
- 4.内置反接保护，开路保护，高温保护，过流/短路保护（可选），均为自恢复型，不损伤控制器。
- 5.双 MOS 防倒灌电路，超低发热量。
- 6.具备锂电池激活功能。

系统连接

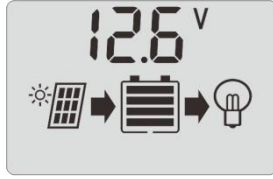


- 1.将蓄电池正负极按图示接入控制器，注意不要反接。
 - 2.将负载正负极按图示接入控制器，注意不要反接。
 - 3.将太阳能板按图示接入控制器，注意不要反接。
- 注意：请严格按照以上顺序进行接入，否则可能会损坏控制器。拆卸顺序与接线顺序相反。**

按键功能

- 功能 1：当电池电压正常时，单击按键可打开或者关闭负载。
- 功能 2：长按按键 2s 进入菜单，在需要更改设置的菜单上，长按按键 2s 使数字闪烁，再单击调整设置值，然后再长按 2s 使数字停止闪烁，即设置完成。
- 功能 3：长按按键 10s 以上直至屏幕显示 F01，可重新启动控制器。
- 功能 4：长按按键 20s 以上直至屏幕显示 F02，可恢复出厂设置。

显示界面/参数设置



主显示界面

U12V
菜单 1

系统电压类型选择界面。出厂默认的电池电压类型为 12V，即界面显示为 U12V，如需要使用 24V，应该将其设置为 U24V。

设置方法：长按 2s 以上，直至数字闪烁，再短按调节，调整完成后再次长按 2s 直至数字不再闪烁，设置完成。

U12V
菜单 1

电池类型设置
B01=通用铅酸电池（出厂默认）
B02=3 串 3.7V 锂离子电池组 11.1V
B03=4 串 3.2V 磷酸铁锂电池组 12.8V
B04=免维护铅酸电池 /B05=胶体电池 / B06=开口电池
设置建议：如果您不知道您所用的铅酸电池类型，请选择 B01。
B01、B03 为 2 阶段充电方式，B04-B06 为多阶段充电方式。
设置方法：同上。

U12V
菜单 1

负载工作模式调节界面
[24H]-24 小时对负载一直供电。
[00H]-光控模式。负载受光控信号打开或者关闭。
[1~23H]-时控模式。负载受光控信号打开，延时 1~23H 后关闭。
[C2A]-负载全天工作 2 小时，停止 15 分钟，一直循环。
[C2d]-负载在白天每天工作 2 小时，停止 15 分钟，一直循环。
[C2n]-负载在晚上每工作 2 小时，停止 15 分钟，一直循环。

注意：无论设置何种负载工作模式，当电池放电至低压切断电压后，控制器均会强制关闭负载。 设置方式：同上。

25℃
菜单 4

显示当前控制器温度。

12A
菜单 5

显示太阳能板发电电流。部分型号不具备此功能。

12A
菜单 6

显示负载端放电电流。部分型号不具备此功能。

13.7V
菜单 7

充电电压-调节界面（仅对 B01,B02,B03 生效）
当电池电压上升到此设定电压时，会启用 PWM 维持恒压充电。
正常充电中，箭头为常亮，进入浮充后，箭头为慢闪。
设置建议：建议保持默认值。 设置方式：同上。

12.0V
菜单 8

低压恢复电压-调节界面（LVR）
当控制器因为低压切断负载后，待电池电压再次回升至该设定电压才接通负载。
设置建议：建议保持默认值。 设置方式：同上。

10.7V
菜单 9

低压切断电压-调节界面(LVD)
当电池电压低于此电压时，控制器将自动切断负载输出。
设置建议：建议保持默认值。 设置方式：同上。

04V
菜单 10

光控开灯/关灯阈值（光伏板电压）
在光控或时控模式下，当控制器检测到光伏板电压小于此设置值的时候，就会延时后打开负载，反之关闭负载。在晚上，如果太阳能板周围的环境光线太亮会导致太阳能板输出电压变高，从而使得控制器自动关闭负载，此时可以通过该值进行一定程度的调整。
设置建议：建议保持默认值。 设置方式：同上。

10
菜单 11

光控开关灯延时时间值（单位：秒）
当控制器检测到光伏板电压低于设置阈值时，再延时打开负载，此时时间值可用于防止夜间汽车车灯或者雷电干扰导致误判断而关灯。**设置建议：建议保持默认值。** 设置方式：同上。

SCn
菜单 12

短路保护设置 部分型号不具备此功能。
某些感性或者容性负载在启动瞬间会有较大电流，可能会触发控制器的短路保护而导致输出关闭，此时用户可将短路保护功能关闭。
SC.F 为关闭，SC.n 为开启，默认为开启状态。设置方式：同上。

Pon
菜单 13

PWM 充电设置（仅对 B01,B02,B03 生效）
PWM 有可能让系统产生噪音和干扰，特别是当使用带有 BMS 的锂电池时，PWM 充电可能触发 BMS 保护，导致系统失效。因此，客户可以选择关闭 PWM，在该模式下，电池电压一旦被充至预设电压（界面 7），控制器立刻停止充电，待电池电压回落后再，再重新开启充电。PoF 为关闭，Pon 为开启，默认为开启状态。
设置建议：建议保持默认值。 设置方式：同上。

Lc1
菜单 14

负载光控模式设置。Lc1 表示负载晚上工作，Lc2 表示负载白天工作，且光控优先于时控关闭负载。Lc3 表示负载晚上工作，Lc4 表示负载白天工作，且时控优先于光控关闭负载。例：如设置 16H 但是夜晚/白天长度只有 12 小时，此时 Lc1/2 只会运行 12 小时，而 Lc3/4 会运行设置值 16 小时。默认为 Lc1 状态。设置方式：同上。

异常界面

E01

蓄电池低压状态。当电池电压过放到低于 LVD 时，控制器会切断负载输出，待电池电压恢复至 LVR 以后，控制器会自动开启负载。单击按键强制恢复。

E02

蓄电池高压状态。当电池由于某些原因超过 HVD 的时候，控制器会切断负载输出，待电池电压恢复至 HVR 以后，控制器会自动开启负载。单击按键强制恢复。

E03

负载过流状态。负载电流超过额定电流值，如 60s 内电流不恢复至安全值内，则会转入短路保护状态。单击按键强制恢复。

E04

负载短路状态。负载端出现短路保护，负载立刻关闭，10s 后控制器将会自动重新打开负载。部分型号不具备此功能。

E05

高温异常界面。当控制器温度超过 80℃时，会进入停机，此时不充电也不放电，等待温度回落到 70℃再恢复工作。

E06

太阳能板过压保护。当太阳能板电压超过 50V 的时候，控制器会停止充电以便保护内部电路，当电压降低至 45V 的时候恢复充电。

常见问题及回答

问：为什么我的光伏板接上去以后不会显示充电？
答：检查光伏板接线是否正确，有无反接，光伏板电压是否高于电池电压，光伏板是否有遮挡物导致电压下降，正常情况下，12V 电池请使用额定电压为 18V 的光伏板。

问：为什么我的充电电流很小？
答：光伏板功率越大，太阳越强烈，充电电流越大，反之，不正确的光伏板电压，异物遮挡，阴影遮挡等都会造成电流降低，另外，当电池电压较高时，会进入浮充状态，此时充电电流也会越来越小。

问：为什么我的负载不会亮？
答：造成负载不打开的原因可能包括，负载工作模式设置不正确，比如设置了光控却向负载为什么白天没打开，电池电量不足导致控制器切断负载，或者负载线头没接好，断开，负载烧坏等。

问：我的用电时间不够长怎么办？
答：如果每日光伏板的发电量比负载的用电量少则会造成入不敷出的情况，建议增加光伏板，以应对极端雨天天气，另外可增加电池容量，也可以减小负载瓦数或者工作时间来平衡整个系统。

问：为什么充满的电池用一下就没电了？
答：电池接近报废，可做简单测试，如电池放电后，使用光伏板或者电源充电，很快电压就回升，再断开充电，带负载后又很快下跌，则表明蓄电池性能已经下降，此时应更换新电池。

规格表

系统电压	12V/24V 自适应	48V
额定电流	10~30A	
最高输入电压	<50V	<100V
USB 输出	5V/2A	
待机电流	<15mA@12V	
工作温度	-20~+60℃	
尺寸/重量	138*85*30mm /150g	

充放电电压参数表

电池类型	B01	B02	B03	B04	B05	B06
通用铅酸	锂电	铁锂	免维护	胶体	开口	
高压保护 HVD	16V	16V	16V	16V	16V	16V
高压恢复 HVR	15V	15V	15V	15V	15V	15V
直充（提升充）	13.7V	12.3V	14.0V	14.4V	14.2V	14.6V
均衡充	-	-	-	14.6V	-	14.8V
浮充	13.7V	12.3V	14.0V	13.7V	13.7V	13.7V
充电返回电压	13V	12V	13V	13V	13V	13V
低压恢复 LVR	12.0V	10.5V	12.0V	12.6V	12.6V	12.6V
低压切断 LVD	10.7V	9.5V	11.2V	10.7V	10.7V	10.7V

- 1.以上电压仅对应 12V 系统，如使用 24/48V 系统，请 X 2/4。
 - 2.当且仅当 LVD 发生时，B04 与 B06 才会进入均衡充。
- *产品规格如有更改，恕不另行通知。

MANUAL v3.0

SAFETY INSTRUCTIONS

1. **Make sure your battery has enough voltage** for the controller to recognize the battery type before first installation.
2. The battery cable should be as short as possible to minimize loss.
3. The regulator is only suitable for lead-acid, lithium ions and LiFePO4 battery.
4. The charge regulator is only suitable for regulating solar modules. **Never connect another charging source to the charge regulator.**

PRODUCT FEATURES

1. Build-in industrial micro controller.
2. Large LCD display, all adjustable parameter.
3. PWM charge management.
4. Build-in short-circuit protection, open-circuit protection, reverse protection, over-load protection.
5. Dual mosfet Reverse current protection, low heat production.
6. This control can work with 0V battery.

SYSTEM CONNECTION



1. Connect the battery to the charge regulator - plus and minus.
2. Connect the solar module to the regulator - plus and minus.
3. Connect the consumer to the charge regulator - plus and minus.

The reverse order applies when deinstalling!
An improper sequence order can damage the controller!

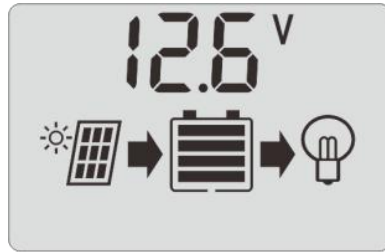
KEY FUNCTION

Function 1: when the battery voltage is normal, click the key to turn the load on or off.
Function 2: press and hold the key for 2s to enter the menu. On the menu where you need to change the setting, press and hold the key for 2s to make the number blink, then click to adjust the setting value, and then press and hold the key for 2s to stop the number blinking, that is to say, the setting is completed.

Function 3: long press the key for more than 10s until F01 is displayed on the screen to restart the controller.

Function 4: press and hold the key for more than 20s until F02 is displayed on the screen to restore the factory settings.

DISPLAY



NO.1

System voltage type selection interface. The factory default battery voltage type is 12V, i.e. the interface is displayed as u12v. If 24V is needed, it should be set as u24v.

Setting method: long press for more than 2S until the number flashes, then short press for adjustment, and then long press for 2S until the number no longer flashes after adjustment.



NO.2

Battery type
B01=General lead-acid(default)
B02=3S X 3.7V 11.1V lithium ion Battery
B03=4S X 3.2V 12.8V LiFePO4 Battery
B04=AGM / B05=GEL / B06=Flooded
Advise: choose B01 if you don't know your lead-acid battery type.

B01-B03 has 2-stage charging process.
B04-B06 has multi-stage charging process.

Setting: hold left key until number flash, click [+/-] to adjust, and hold left key again until number stop flashing, the setting is saved.



NO.3

Load output timer control

[24H] -output turn on all the time.

[0H] -output turn on only during Dusk to Dawn(D2D).

[1~23H] -output turn on after sunset and turn off after

1~23H. Attn: no matter which is selected, output will turn off when battery is in a LVD condition.

Setting method: same as above one.



NO.4

controller's body temperature display, if the controller gets too hot during running, it will automatic shut down and wait for the temperature to drop to normal level, and then it will work again.



NO.5

Charging ampere display, (only for some model)



NO.6

Discharging ampere display, (only for some model)



NO.7

Charge voltage setting (only for B01, B02, B03)
Different battery types have different maximum charging voltage. Consult your battery supplier for more information. Default setting is recommended. The setting is the same as above.



NO.8

Low voltage re-connect (LVR) setting

When a low voltage disconnect happens, the controller will wait until the voltage raises more than this voltage, then it will re-connect the load again.

Default setting is recommended. The setting is the same as above.



NO.9

Low voltage disconnect (LVD) setting.

When battery voltage is lower than this voltage, the controller will cut off the output automatically. Default setting is recommended. The setting is the same as above.



NO.10

D2D trigger value (solar panel voltage)

When the work mode is D2D or Timer, the controller will detect the solar panel voltage to decide whether its day or night, so to decide to enable load output or not. The higher this value is, the earlier it enables the load output. Default setting is recommended. The setting is the same as above.



NO.11

D2D trigger delay value (Second)

When the controller detect the solar panel voltage is lower than trigger value, it will delay for 10S and detect again to make sure night falls, then enable the load output. Some car light or thunder lighting will confuse the controller and make it think its daytime, using this delay can prevent interference. Default setting is recommended. The setting is the same as above.



NO.12

Short-circuit protection setting, (only for some model)

Some inductive or capacitive consumer will trigger the short-circuit protection during start up, therefore, you can disable the SC-protection manually.

SC.F=OFF, SC.n=ON, the default is ON. Default setting is recommended. The setting is the same as above.



NO.13

PWM charging enable (only for B01, B02, B03)

PWM could generate noise and interference which will trigger a high voltage protection in a Li-Battery BMS system. Therefore, to avoid this happen, you can choose to disable the PWM charging. The controller will charge the battery until setting voltage (Menu NO.3), then it will fully stop charging, when battery voltage drop, it will re-charge again. P.oN=PWM ON. P.oF=PWM OFF. Default setting is P.oN. The setting is the same as above.



NO.14

Output mode control.

Normally a LED light connected to the output terminal will work only after sunset, therefore, LC1 can be selected. But some load equipment requires to work only after sunrise, for example, a camera or a pump, therefore, you can choose LC2. LC1 and LC2 are logically opposite on D2D control.

If you have set a timer (1-23H) control, for example 16H, but in reality the night / day is only 12Hour. LC1/2 means output work only 12H (any sunset or sunrise will stop the countdown), but LC3/LC4 will work 16H (ignore any sunset or sunrise and countdown until setting hours)

Default setting is LC1. The setting is the same as above.

UNUSUAL DISPLAY



Battery low voltage warning.

To prevent damage of the battery, Output automatic disconnect when battery voltage drop below LVD voltage and automatic re-connect if raise above LVR voltage. Press button to ignore for one time and force to work again.



Battery high voltage warning.

To prevent damage of the load equipment, Output automatic disconnect when battery voltage raise above HVD voltage and automatic re-connect if drop below HVR voltage. Press button to ignore for one time and force to work again.



Output over current warning, (only for some model)

Load current exceed rated current, if it does not resume within 60 seconds, it will turn into E04 warning. Press button to ignore for one time and force to work again.



Output short-circuit warning, (only for some model)
Output automatic disable when there is a short-circuit and will resume after 10 seconds.
Press button to ignore for one time and force to work again.



High temperature warning.
When the temperature of the controller exceeds 80°C, it will enter stand-by mode and stop charging or discharging until the temperature falls to 70°C.
Press button to ignore for one time and force to work again.



PV over-voltage warning.
In order to protect the internal circuit, Charging automatic stop when PV voltage exceed 50V and automatic recover when voltage drop below 45V. (for 12V/24V system)

FAQ

Q: why the controller is not showing charging when I connect the solar panel?
A: please carefully check the solar panel wires are connected correctly, and there is no reverse. The PV voltage should be higher than the voltage of the battery, any sewage or shadow on the PV will cause the voltage drop. Please use a 18V PV to charge a 12V battery under normal circumstances.

Q: why is my charging current very small?

A: use more solar panel and stronger sun light will increase the charging current, otherwise, using the wrong PV voltage or sewage and shadow on the PV will reduce the charging current. In addition, when the battery voltage is high it will enter float charging mode, also the charging current will become smaller.

Q: why my consumer is off?

It could be wrong working mode, like setting the work mode to D2D, but you are asking why my consumer is off during the daytime. Or battery is not enough and a low-voltage disconnect has happened. Or your consumer is broken, to check that, you can directly connect your consumer to the battery to see if it is working, please carefully check the wires and so.

Q: the solar power stored is not enough to supply the consumer

A: if the power generated by the solar panel is less than the consumer used, the consumer will have to get the power from the battery storage. And day by day, it will cause a LVD finally at some moment. Please use more solar panel and add more battery capacity to prevent cloudy or rainy day, or you can reduce the watt of the consumer or working time to balance the system.

Q: why my battery runs out of power very quickly after it is fully charged?

A: your battery could have been used for a very long time, and after few hundred of cycling, its dying. A dying battery will not have the capacity to keep the electricity. Run a simple test like this: when you charge your battery, the voltage raise very quickly, and when you discharge it again, it drops very quickly, this means you should change your battery.

TECHNICAL PARAMETER

System Voltage	12V/24V auto			48V		
MAX. PV input	<50V			<100V		
Rated current	10A	20A	30A	10A	20A	30A
USB output	5V/2A					
Charge control	PWM					
Standby lost	<15mA@12V			<10mA@LVD		
Working temp.	-20~+60 °C					
Size/Weight	138*85*30mm /150g					

VOLTAGE PARAMETER

Battery type	B01 General Lead acid	B02 Li-ion	B03 LiFePO4	B04 sealed	B05 GEL	B06 Flooded
HVD	16V	16V	16V	16V	16V	16V
HVR	15V	15V	15V	15V	15V	15V
Bulk(Absorption)	13.7V	12.3V	14.0V	14.4V	14.2V	14.6V
Equalize	-	-	-	14.6V	-	14.8V
Float	13.7V	12.3V	14.0V	13.7V	13.7V	13.7V
Charge return	13V	12V	13V	13V	13V	13V
LVR	12.0V	10.5V	12.0V	12.6V	12.6V	12.6V
LVD	10.7V	9.5V	11.2V	10.7V	10.7V	10.7V

*all voltage X2, X4 while using 24V /48V system.

*Product specifications are subject to change without prior notice.