Contents [hide]

RS-PWM30PF PWM Solar Charge Controller

CONGRATULATION

You have made an excellent choice by purchasing this high-quality RICH SOLAR PWM solar controller which has been manufactured to solar controller comes with a 2-year warranty. If you require technical support regarding this product, please call 1-800-831-9889 or email support@richsolar.com.Claims to faulty products within the 2-year warranty period will be repaired or replaced free of charge, provided you present valid proof of purchase (keep your receipt).

Version And Ratings

This is a standard version of RICH SOLAR PWM controller 12V 30A Rated for 12V solar panel (Max. 25V) Rated maximum output current of 30A.

WARNING

Risk of explosive gases: working in vicinity of a lead-acid battery is dangerous. Explosive gases develop during normal battery operation. Be certain there is enough ventilation to release the gases.
It is important that each time before using or connecting your solar controller, always read this manual and follow the instruction exactly.

- Make sure to connect the red to the positive on the battery and the black to the negative.
- Please double check before connecting. Connecting to the wrong termi-nals may burn

out the controller.
- Confirm that the power wires are tightened to the correct torque to avoid excessive heating from loose connections.
- Refer to the battery specifications and exercise caution to avoid short-circuiting the battery connections.
- Accidental ‘shorting’ of the terminals or wiring can result in sparks, causing personal injury or a fire hazard. We recommend covering the panel(s) with a soft cloth to block all incoming light during the installation. This will ensure that no damage is caused to the Solar Panel or Battery if the wires are accidentally short circuited.
- Always install a battery fuse on each circuit, including the solar controller.

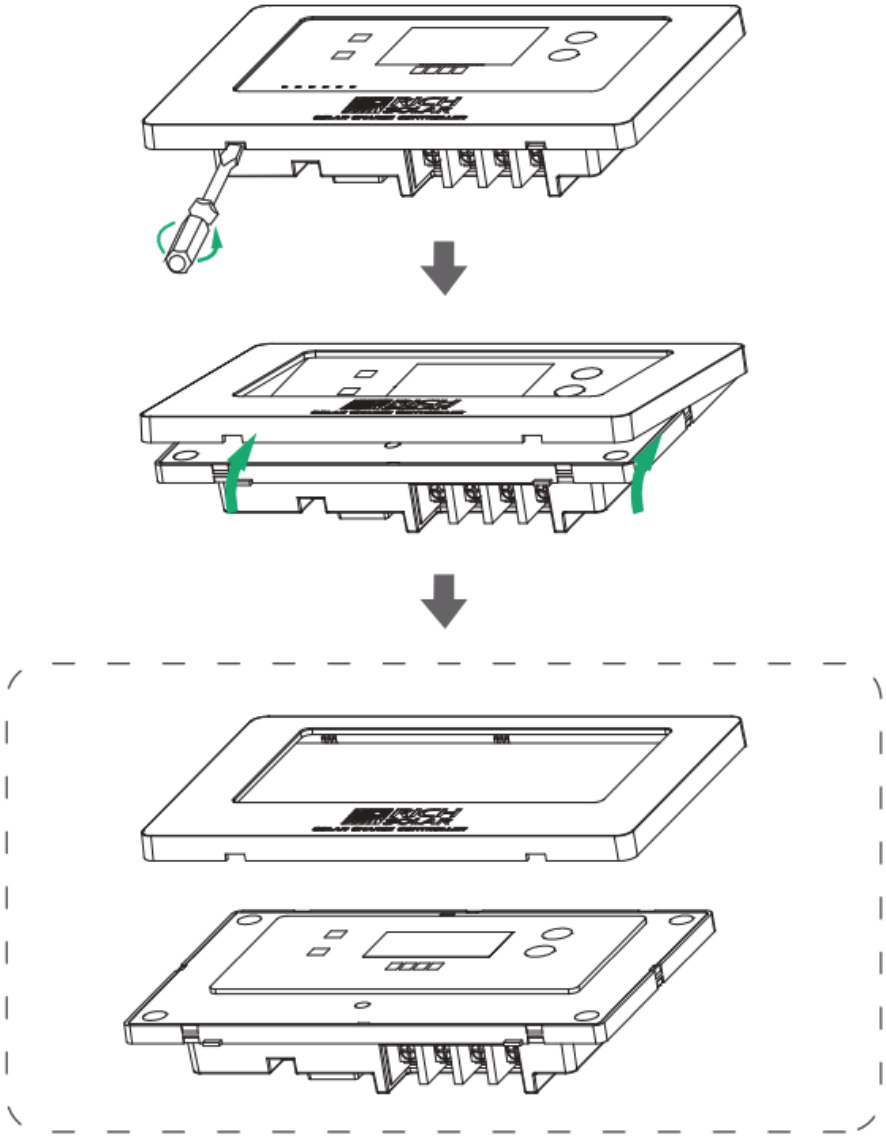
Features And Advantages

- PWM technology, switching control by MOSFET
- Common positive grounding connection
- High efficiency and low power consumption
- Battery type setting and battery condition indication
- Smart charging control
- Charging time management
- LED indication for the battery condition and charging status
- Digital display charging parameters and battery settings
- Automatically activates Lithium battery against BMS protection
- Thermal protection
- Over-voltage protection, short-circuit protection, reverse polarity protection
- No sparks
- The thinnest and compact design
- Corrosion-resistant terminals and connectors
- Conformal coating supplied to the inside board against moisture
- Includes a port for external battery temperature sensor (BTS optional)
- Compatible with most rechargeable lead-acid batteries, including Flooded (WET), AGM, GEL, Calcium and Lithium batteries
- Designed to meet CE standards and comply with EMC and FCC regulations

Installation

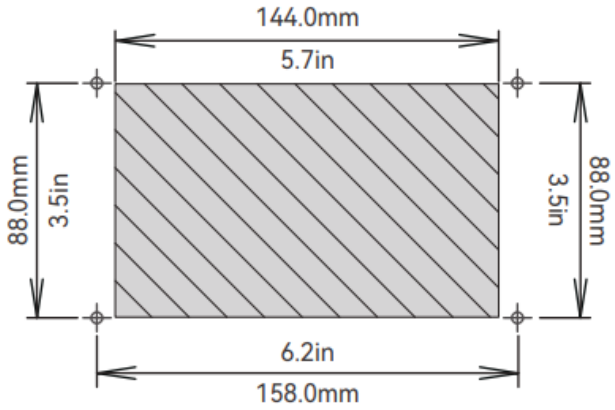
Surface Mount

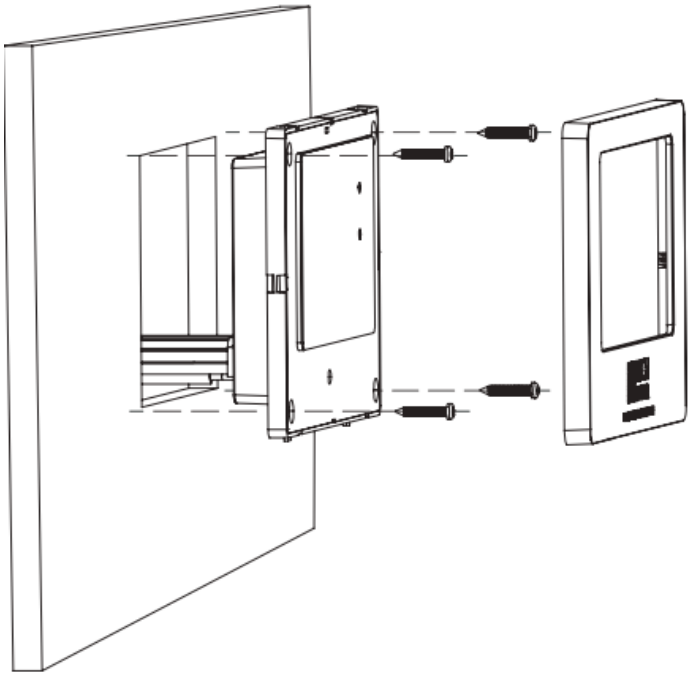
The quickest and easiest way to mount the unit is to remove the front cover and tap screws supplied to secure it to a flat surface.



Flush Mount

Before using this mounting method, make sure there is sufficient depth behind the controller or in the cavity (refer to diagram below).

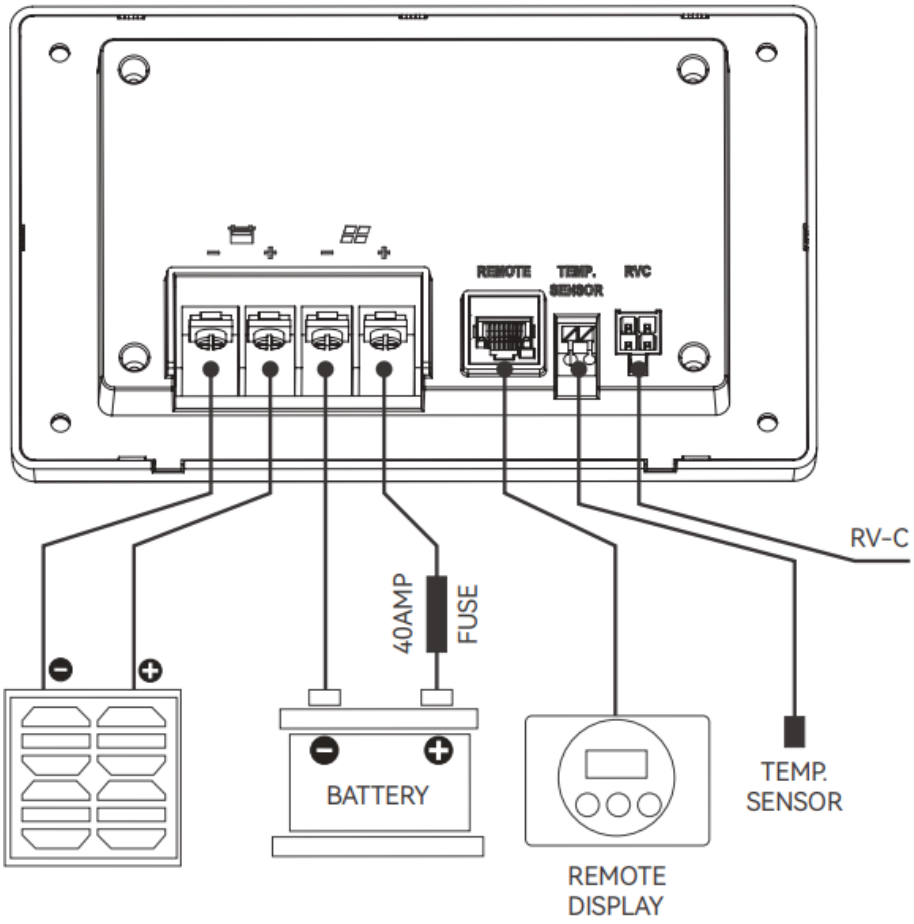




Wiring Connections

The Solar Controller has 4 terminals which are clearly marked ‘Solar’ and ‘Battery’. There is a (12V) and earth (GND) terminal for each circuit. Refer to the wiring diagram below, please cover the solar panel before con- necting cables.

When the connections are completed, the Solar Controller will start working automatically.



Operation – LCD Display

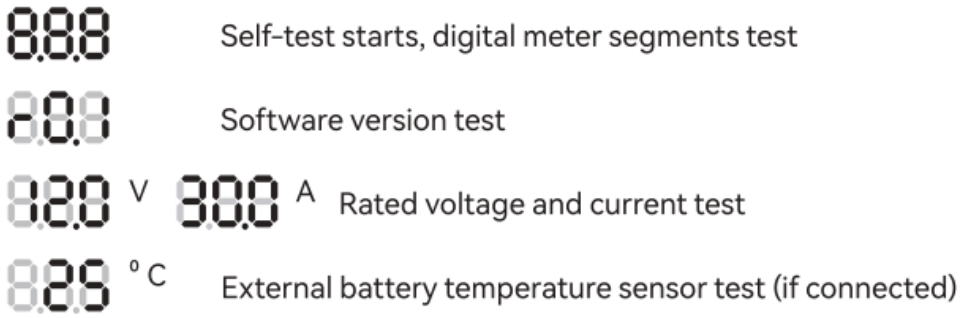
Please check your battery manufacturer's specifications to select correct battery type. The unit provides 6 types of batteries for selection: LiFeP04, LTO, Gel, AGM, WET (conventional lead-acid), and Calcium battery.

Press and hold the BATTERY TYPE BUTTON for 3 seconds to enter battery type selection mode. The selected battery type will be shown on the LCD meter. The default setting is AGM Battery, and the controller will automatically memorize your selection. LiFeP04 battery shown in LCD indicates Lithium Iron Phosphate battery, LFP battery.

LTO battery shown in LCD indicates Lithium Titanate Oxide, Li4Ti5012 battery.

Caution: Incorrect battery type setting may damage your battery.

When the controller powers on, the unit will run self-qualify mode and automatically show below items on LCD before going into charging process:



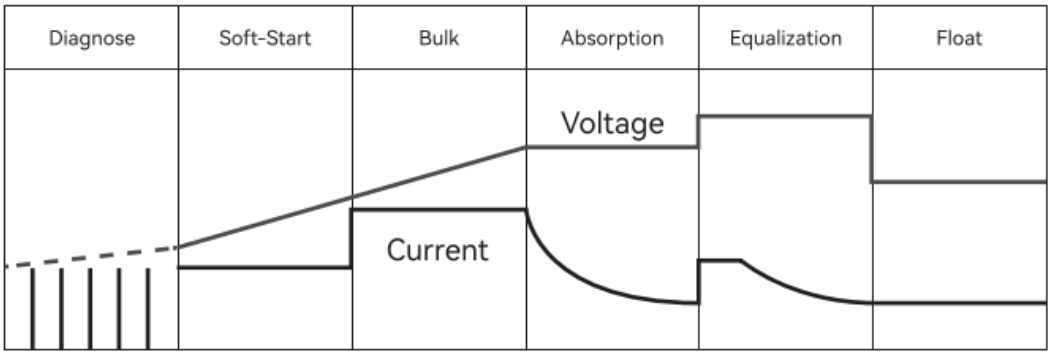
After going into charging process, the LCD displays the charging status as below:
Press **VOLT / AMP BUTTON** in sequence, the LCD will display in turn with Battery Voltage, Charging Current, Charged capacity (Amp-hour) and Battery Temperature (if external temperature sensor connected).

Display in the daytime -

Display during the night-

The VOLT / AMP button can be changed at any time during charging process. The LCD also can be treated as an independent voltage meter or thermometer. A voltage less than 11.5V indicates that the battery is discharged and needs recharging.

Charging Stages



Diagnose: Only for Lithium battery type, subject to the Lithium battery initial voltage then determine if going to Soft-start or Bulk charge; if the Lithium battery is protected by BMS, the controller will automatically send the signal periodically to the battery terminals to activate the BMS against protection.

Soft Charge: When batteries suffer an over-discharge, the controller will softly ramp the battery voltage up to IOV.

Bulk Charge: Maximum current charging until batteries rise to the Absorption level.

Absorption Charge Constant voltage charging occurs when the battery reaches over 85% capacity. For lead-acid batteries, LiFeP04 batteries, and LTO batteries, full charging will complete after the absorption stage. The absorption voltage levels are 14.4V for LiFeP04 batteries and 14.0V for LTO batteries.

Equalizing Charge:

Only for WET or Calcium battery type, when the battery is deeply drained below IOV or every 28 days cycle, it will automatically run this stage to bring the internal cells as an equal state and fully complement the loss of capacity. (LiFeP04, LTO, Gel, and AGM batteries do not run Equalization charge).

Float Mode- Battery is fully charged and maintained at a safe level. A fully charged Lead-acid battery (GEL, AGM, WET and Calcium battery) has a voltage of more than 13.6 Volts; if the lead-acid battery voltage drops to 12.6V at float mode, it will return to Bulk charge; LiFeP04 or LTO battery is set for float voltage at 13.4 Volts; if a LiFeP04 or LTO battery voltage drops to 13.2V at Float mode, they will return to Bulk charge.

LED Indication

LED Indications			
LED Color	RED	BLUE	RED
Soft Start Charging	ON	FLASH	ON
Bulk Charging (Charged Capacity <25%)	ON	ON	ON
Bulk Charging (Charged Capacity <50%)	ON	ON	OFF
Bulk Charging (Charged Capacity <75%)	ON	ON	OFF
Absorption Charging	ON	ON	OFF
Float Charging	ON	OFF	OFF
Solar Weak (At Dawn or Dusk)	FLASH	OFF	
In The Night	OFF	OFF	

			LCD Display	LCD Backlight
ORG	GREEN	GREEN		WHITE
OFF	OFF	OFF	Normal Display	ON
OFF	OFF	OFF		
ON	OFF	OFF		
OFF	ON	OFF		
OFF	ON	OFF		
OFF	OFF	ON		
Subject to Battery Voltage				OFF

LED Indications			
Solar Good, VB < 3V	ON	OFF	FLASH
Solar Good, Battery Reversed	ON	OFF	FLASH
Solar Good, Battery Over-voltage	ON	OFF	FLASH
Solar Off, Battery Over-voltage	OFF	OFF	FLASH
Solar Good, Battery Over 149°F	ON	OFF	
Battery Good, Solar Reverse	FLASH	OFF	
Battery Good, Solar Over-voltage	FLASH	OFF	
Over-temperature Protection	/		

			LCD Display	LCD Backlight
OFF	OFF	OFF	b01	FLASH
OFF	OFF	OFF	b02	FLASH
FLASH	FLASH	OFF	b03	FLASH
FLASH	FLASH	OFF	b03	FLASH
Subject to Battery Voltage			b04	FLASH
			P01	FLASH
			P02	FLASH
			OTP	FLASH

Specifications

1	Electrical Parameters	/		
1-1	Rated solar panel amps	30	Max.	AMP
1-2	Normal input solar cell array voltage	15-22	/	VDC
1-3	Max. solar cell array voltage (output has no load)	25	Max.	VDC
1-4	The controller lowest operating voltage at solar or battery side	8V	Min.	VDC
1-5	Standby current consumption at night	5	Max.	mA
1-6	Maximum voltage drop-Solar panel to battery	0.25	Max.	VDC
2	Charging Characteristics	/		
2-1	Minimum battery starts charging voltage	3	Min	VDC
2-2	Soft start charging voltage	3-10	±0.2	AMP
2-3	Soft start charging current (50% PWM duty)	Up to 15		AMP
2-4	Bulk charging	By the maximum rated current		
2-5	Absorption charging voltage at 25℃ / 77℉	/		
/	--Gel battery	14.1	±0.2	VDC
/	--AGM battery (default setting)	14.4	±0.2	VDC
/	--WET battery	14.7	±0.2	VDC
/	--Calcium battery	14.9	±0.2	VDC
/	--LTO battery	14.0	±0.2	VDC
/	--LFP battery	14.4	±0.2	VDC

2-6	Absorption transits to equalizing or float condition:	/		
/	--Charging current drops to	1.5	±0.1	AMP
/	-- or Absorption charging timer timed out	4	/	Hour
2-7	Equalization charging active (Only for WET or calcium battery)	/		
/	--Battery voltage discharged to less than	10±0.2		
/	--Automatic equalizing charging periodical	28	/	Day
2-8	Equalization charging voltage at 25℃ / 77℉	15.5	±0.2	VDC
2-9	Equalization charging timer timed out	2	/	Hour
2-10	Float voltage (GEL, WET, Calcium, AGM battery) at 25℃ / 77℉	13.6	±0.2	VDC
/	Float voltage for LTO or LFP battery	13.4	±0.2	VDC
/	Restart voltage for LTO or LFP battery	13.2	±0.2	VDC
/	Restart voltage for lead-acid battery	12.6	±0.2	VDC
2-11	Voltage control accuracy	±0.1%	/	/
2-12	Battery temperature compensation coefficient	-24	/	mV/*C
2-13	Temperature compensation range	-20~50℃ / -4~122℉		
3	**Protection**	**/**		
3-1	Against reverse polarity or short circuit at panel or battery	/		
3-2	No reverse current from battery to solar at night	/		
3-3	Over-temperature protection during charging	65℃ / 149℉		

6	Environmental Characteristics	/
6-1	Operating temperature	-25 ~ 50° C / -13 ~ 122° F
6-2	Storage temperature	-40 ~ 85° C / -40 ~ 185° F
6-3	Operating Humidity range	100% no condensation

1-800-831-9889

support@richsolar.com

www.richsolar.com

5550 Jurupa St, Ontario, CA 91761

Documents / Resources

	RICH SOLAR RS-PWM30PF PWM Solar Charge Controller [pdf] User Manual RS-PWM30PF, RS-PWM30PF PWM Solar Charge Controller, PWM Solar Charge Controller, Solar Charge Controller, Charge Controller, Controller

References

- User Manual

RICH SOLAR

charge controller, controller, PWM Solar Charge Controller, RICH SOLAR, RS-PWM30PF, RS-PWM30PF PWM Solar Charge Controller, Solar Charge Controller

Leave a comment

Your email address will not be published. Required fields are marked *

Comment *

Name

Email

Website

Save my name, email, and website in this browser for the next time I comment.

Post Comment

Search:

e.g. whirlpool wrf535swhz

Search