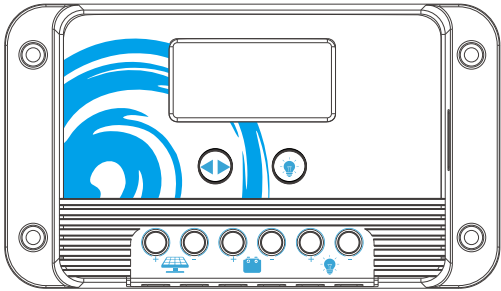


# PWM Charge Controller

## P2410/P2420

### User Manual



#### Warnings and Tools Icon Chart

Icons	Name	Description
	High Voltage	High voltage device. Installation should be performed by an electrician.
	High Temperature	This device will produce heat. Mount device away from other items.
	Environmental Hazard	Electronic Equipment. Do not put in landfill.
	Wire Cutter	A wire cutter is needed for cutting and stripping prior wires to connect.
	Multi-meter	A multi-meter is needed for testing equipment and verifying polarity of cables.
	Anti-static Glove	Anti-static gloves are recommended to prevent controller damage caused by static electricity.
	Electrical Tape	Electrical tape is recommended to safely insulate spliced or bare wires.
	Screwdriver	A common size screwdriver is needed to attach wires to the controller.

#### Product Features

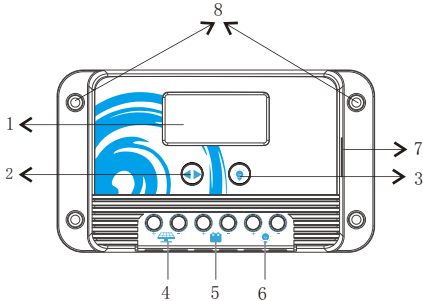
Thanks for using our product. This PWM solar charge controller is typically a device for solar charge regulation and discharge output control, with LCD screen display and

These charge controllers have these features:

- Most types of battery can be supported and selected, like AGM (or other sealed type), GEL, Flooded, and Lithium battery (with various voltage settings), by key setting in the controller.
- Automatic recognition of 12V/24V battery system for AGM/GEL/Flooded battery.
- PWM 3-phases charging: equalize - boost - float (for Flooded, AGM, GEL lead-acid type battery)

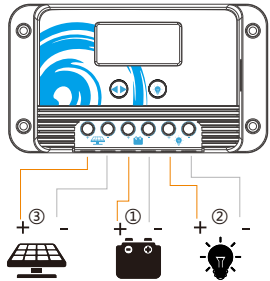
- LCD screen, displaying system working status and setting parameters.
- User-friendly key press operation, simple and easier.
- Extra 5V USB output, suitable for mobile DC load.
- Multiply output control mode selection: light control mode, light + time control mode, test & debug mode, manual mode, and always-on mode.
- Industrial grade design, for better function under extreme environment conditions.
- Full range of electrical protections, like anti-connection in PV and Battery wiring, load

#### Device Diagram



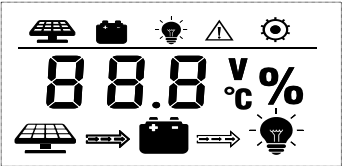
#	Description	#	Description
1	LCD Display Screen	5	Battery Terminals
2	Function Key	6	Load Terminals
3	Load Key	7	5V 1A USB Port
4	Solar Terminals	8	Installation Mounting Holes

#### Wire Connection Sequences



- During installation of your PWM controller, please follow below order of connection:
1. Connect the positive battery wire followed by the negative battery wire.
  2. Make sure your solar panels are fully covered to prevent electrical shock. Connect the positive solar array output wire followed by the negative solar array output wire.
  3. Connect the DC load wiring to the DC load output (if applicable).

#### LCD Display Interface Overview



#### 1.Display Section

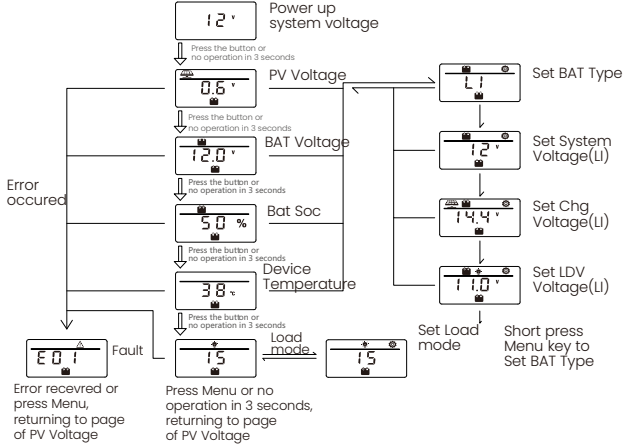
Display Section	Status
Active Functions	
Parameters	88.8%
Charge and Load Status	

#### 2. Solar(PV),Battery & Charge Indications

Status Icon	Indication	Status	Description
	Solar Charge Indication	Steady On	Daylight Detected
		Off	No Daylight Detected
		Flowing	Solar Charging Battery
		Flash	Solar Input Over Voltage
	Battery Indication	Steady On	Battery Connected and Functional
		Off	No Battery Connection
		Slow Flash	Battery Over-Discharged
		Fast Flash	Battery Over-Voltage
	DC Load Indication	Flowing	DC Load On
		Off	DC Load Off
		Flash	Over-Load / Short-Circuit

\* We may modify these specifications without prior notice.

3.Operations



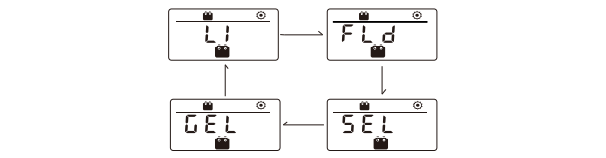
Remarks:  
\*The page will enter to the next one if no operation in 3 seconds  
\*The system will automatically enter to the "error"page when there is an error detected.  
This page will stay still until the user operates in the controller to enter to the other pages.

Key Functionality Chart

Function Key	System Mode	Input	Input Function
	View Mode	Long Press	Enter SET mode
		Short Press	View Next Page
	View Mode	Long Press	N/A
		Short Press	Switch Load On/Off (Manual Control Program Only)
	Set Mode	Long Press	Save Data & Exit SET Mode
		Short Press	Next Setting
	Set Mode	Long Press	N/A
		Short Press	Adjust parameter

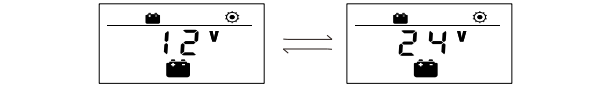
LCD Display Rules & Cycles

1.Battery Type Setting



Abbreviations	Battery Types	Description
FLD	Flooded Battery	Auto-recognition with default parameters set for each type of batteries.
SEL	Sealed/AGM Battery	
GEL	Gel Battery	Customize charge & discharge voltages.
LI	Lithium Battery	

2.System Voltage (For Li battery only)



3. Charge Voltage Settings (For Li battery only)



5. Load Mode Settings



Mode	Definition	Description
0	Daylight Auto-Control	The PV voltage turns on the load when there is no night.
1~14	Daylight On/Timer Off	DC load turns on when there is no night. DC load turns off according to timer. Mode 1 = turn off after 1 hour, etc.
15	Manual Mode	DC load turns on/off by pressing the load key.
16	Testing Mode	DC load turns on and off in a quick succession.
17	Always on	DC Load Stays On.

Error Code Chart

Code	Error	Description & Quick Troubleshoot
E00	No error	No action needed.
E01	Battery Over-discharged	Battery voltage is too low. DC load will be turned off until battery re-charges to recovery voltage.
E02	Battery Over-voltage	Battery voltage has exceeded controller limit. Check battery bank voltage for compatibilt with controller.
E04	Load Short Circuit.	DC load short circuit.
E05	Load Overload	DC load power draw exceeds controller capability. Reduce load size or upgrade to a higher load capacity controller.
E06	Overheating	Controller temperature limit. Ensure the controller is placed in a well-ventilated cool, dry place.
E10	Solar Over-voltage	Solar array voltage exceeds controller rated input voltage. Decrease the voltage of solar panels connected to the controller.

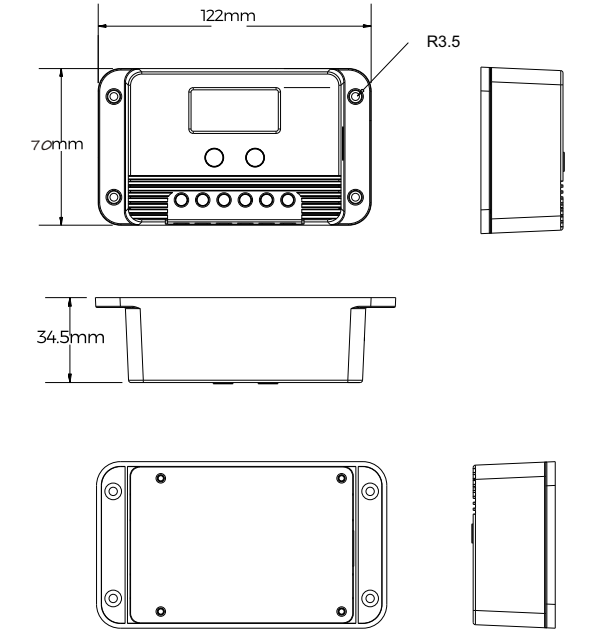
\* Please contact professions for technical support on additional trouble shooting.

Controller Specification

·The variable "n" is adopted as a multiplying factor when calculating parameter voltages, the rule for "n" is listed as: if battery system voltage is 12V, n=1; 24V, n=2  
•For example, the equalize charge voltage for a 12V FLD (Flooded) battery bank is 14.8V\*1=14.8V. •The equalizing charge voltage for a 24V FLD (Flooded) battery bank is 14.8V\*2=29.6V.

Parameter	Value			
Model No.	P2410		P2420	
Battery System Voltage	12V/24V Auto (FLD/GEL/SEL) Manual (Li)			
No-load Loss	8ma (12V), 12ma (24V)			
Max Solar Input Voltage	<55Voc			
Rated Solar Charge Current	10A		20A	
Max Solar Input Power	170W/12V; 340W/24V		340W/12V; 680W/24V	
Light Modes	light control(dusk-to-dawn), light + time control, debug mode, manual control, steady-on mode.			
Light Control Delay Time	10s			
Max Load Output Current	10A		20A	
USB Output	5V1A			
Operating Temperature	-35°C ~ +45°C			
IP Protection	IP32			
Net Weight	0.194 kg		0.196 kg	
Operating Altitude	≤ 3000 meters			
Controller Dimension	122*70*34.5 mm			
Parameter	Battery Parameters			
Battery Types	FLD	SEL	GEL	LI
Equalize Charge Voltage	14.8V*n	14.6V*n	--	--
Boost Charge Voltage	14.6V*n	14.4V*n	14.2V*n	14.2V*n (adjustable)
Float Charge Voltage	13.8V*n			--
Boost Charge Recovery Voltage	13.2V*n			--
Over-discharge Recovery Voltage	12.6V*n			--
Over-discharge Voltage	11.1V*n			11V*n (adjustable)

Product Dimensions



Product Dimension:  
122\*70\*34.5mm  
Installation Hole Size:  
Φ3.5 mm