

# GS-PWM-165W series Solar Intelligent Charging Controller

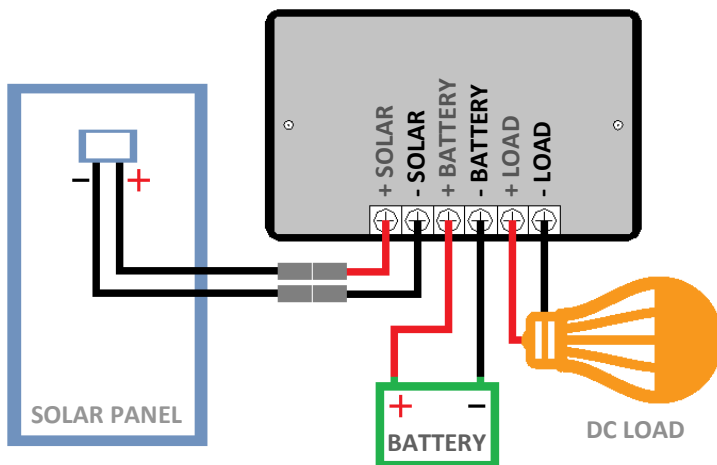
## Operation Manual

### I. Main features

- Automatically Identifies 12V or 24V battery banks
- LED indicates the working status of the battery and load
- Dual USB outputs with a maximum load current of up to 1.2A
- LCD screen shows charging current, discharge current and battery bank capacity
- Advanced ternary form charging algorithm equalizes the charge to the battery once per week to prevent imbalance and vulcanization, which extends the battery lifespan
- Manual load control button
- Various protective features cover: Over charging, over discharging, overload, short circuit, reverse polarity, & TVS lightning

### II. Installation and wiring

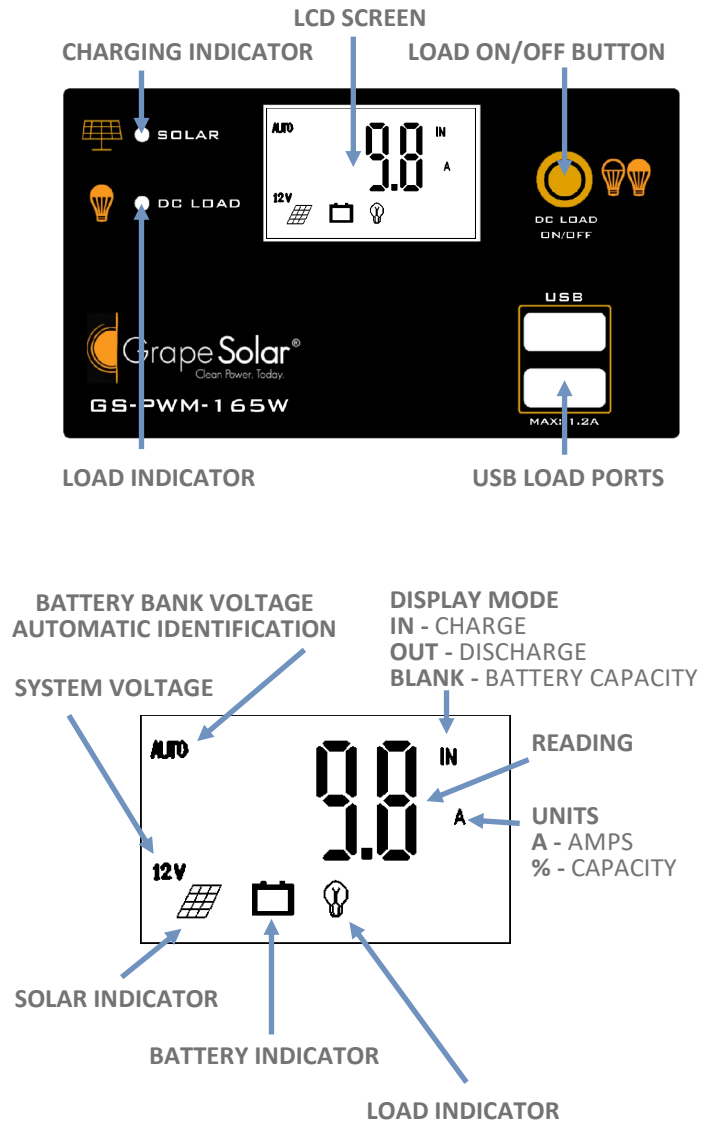
1. Connect the battery bank first. When the battery is connected the charge controller will automatically recognize the battery bank voltage. If used on a 12V system, "12" will be shown on LCD screen. If used on a 24V system, "24" will be shown.
2. Connect the solar panel array second. If the connection is correct, the solar indicator LED will illuminate. If the LED does not turn on check the connection.
3. Connecting the load (optional) last. Connect the DC load wires to the controller's load output terminals. This feature is for DC loads only and is not meant for inverters. Wiring diagram is as follows:






### III. Suggestions for use

1. When the battery is overly discharged, disconnect any USB load. Otherwise, the USB load will discharge the battery bank even further which can lead to damaged batteries.
2. Install the controller in a ventilated environment where there can be airflow to allow for proper cooling.
3. The temperature compensation function uses the ambient temperature and performs best when the battery bank is nearby.
4. 10AWG cable is recommend on runs under 25 feet. For longer runs, contact Grape Solar Technical Support for guidance.
5. Grounding is not necessary but can be accomplished through any of the three negative outputs.

### IV. Status indications

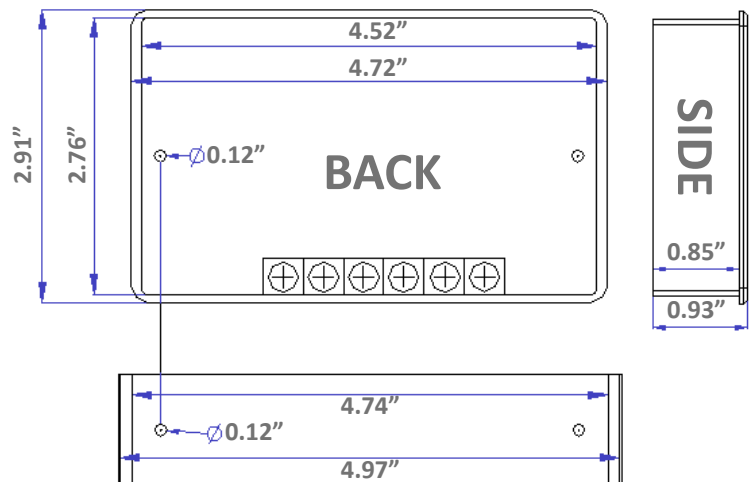


Indicator	Status	Function
 <b>Solar</b>	ON	Solar Charging
	OFF	No Solar Detected
 <b>Load</b>	ON	Load Activated
	OFF	No Load Detected
	Slow Blinking	Overload Protection Engaged
	Fast Blinking	Short Circuit Protection Engaged
 <b>Battery</b>	ON	Normal Battery Operation
	OFF	Battery Disconnected
	Slow Blinking	Over Discharge or Over Voltage

### V. Electrical Specifications

	12V	24V
System voltage	12V/24V Auto Detection	
System current	10A	
No-load loss	< 12mA	
Solar energy input voltage	< 27V	< 55V
Overvoltage protection	17.0V	34.0V
Equal charging voltage	14.6V, 1h	29.2V, 1h
Ascending charging voltage	14.4V (25°C), 2h	28.8V (25°C), 2h
Float charging voltage	13.8V (25°C)	27.6V (25°C)
Charging recovery voltage	13.2V (25°C)	26.4V (25°C)
over-discharging recovery voltage	12.5V	25.0V
Under voltage	12.0V	24.0V
Over-discharging voltage	11.1V	22.2V
USB load cut-off voltage	10.6V	21.2V
Total USB load rated current	1.2A	
Temperature compensation	-4.0mV/°C/2V ;	
Overload protection	1.25 times of rated current: 30s;	
Short Circuit protection	≥1.5 times of rated current	
Working temperature	-20°C to +50°C	
Protection level	IP30	
Weight	140g(10A)	
Dimensions	120×74×23.6(mm); (L×W×H)	

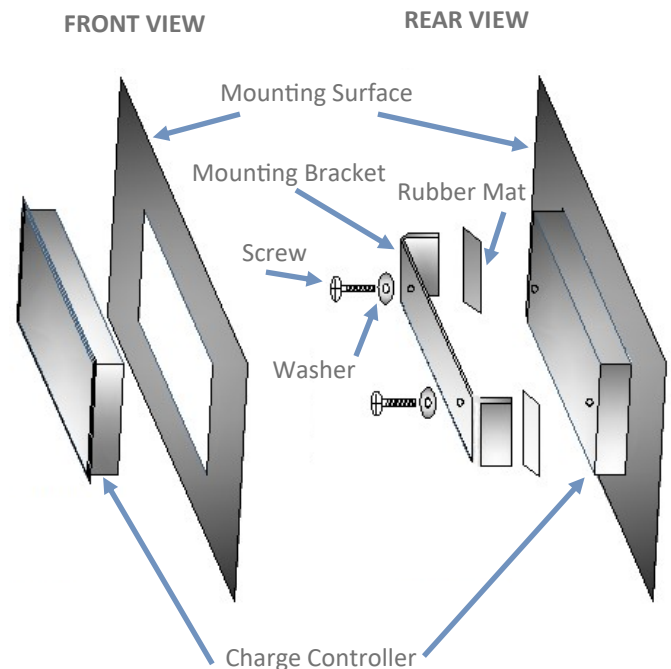
### VI. Mechanical Specifications



Overall dimension: 4.72×2.91×0.93(inches), 120×74×23.6(mm)  
 Installation dimension: 4.53×2.76(inches), 115×70(mm)  
 Installation hole diameter: 0.11(inches), 3.0(mm)

### VII. Installation and Setting

1. Use the back of the charge controller to trace a pattern on the mounting surface.
2. Cut a hole in the mounting surface to match the trace pattern.
3. Insert the back of the charge controller through the front of the hole in the mounting surface.
4. Lock the charge controller to the mounting surface from behind using the mounting bracket, screws, washers and rubber mats.
5. After installation, press the button to turn on or turn off the load.
6. If the controller overloads or short circuits, turn off the load and check that is not malfunctioning before turning it on again. Press and hold for the LOAD ON/OFF button for 2 seconds to reset the load protection.
7. If there is an over voltage or over discharge, the load will be turned off. It will be activated after the system voltage returns to normal.



### VIII. Warranty

One year limited warranty on workmanship and materials