



# GENASUN

## GV-4 Manual

Solar Charge Controller with Maximum Power Point Tracking

**For models:** .....

**GV-4-Pb-12V:**

12V Lead-Acid/AGM/Gel/Sealed/Flooded

**GV-4P-Pb-12V:**

12V Lead-Acid/AGM/Gel/Sealed/Flooded

**GV-4-Pb-CV:**

12V Custom Multi-Stage Lead-Acid/AGM/Gel/  
Sealed/Flooded

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[www.genasun.com](http://www.genasun.com)

GENASUN

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GENASUN GV-4(ALL MODELS) MANUAL, REVISION 2.0 | 08.2016

**IMPORTANT SAFETY INSTRUCTIONS | SAVE THESE INSTRUCTIONS**

# Safety Instructions:

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This manual contains important instructions for the GV-4-Pb-12V, GV-4P-Pb-12V, and GV-4-Pb-CV solar charge controller that shall be followed during installation and maintenance.

The GV-4 is intended for charging 12V Lead-Acid, AGM, Gel, Sealed, and Flooded batteries. Consult your battery charging specifications to ensure that the GV-4 is compatible with your chosen batteries.

The GV-4 does not include a fuse. Overcurrent protection suitable for the application must be provided by the user.

**WARNING: EXPLOSION HAZARD. DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED. DO NOT DISCONNECT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS FREE OF IGNITABLE CONCENTRATIONS.**

**ATTENTION: RISQUE D'EXPLOSION. NE PAS CONNECTER NI DÉCONNECTER PAS LORSQU'IL EST SOUS TENSION. NE PAS CONNECTER LE CIRCUIT alors que EST VIVANT OU A MOINS QUE LA ZONE EST LIBRE DE CONCENTRATIONS IGNITAIRES.**

**CAUTION: INTERNAL TEMPERATURE COMPENSATION. RISK OF FIRE, USE WITHIN 0.3 m (1 ft) of BATTERIES.** Lead-acid batteries can create explosive gases. Short circuits can draw thousands of amps from a battery. Carefully read and follow all instructions supplied with the battery. Use only 12V lead-acid batteries with the GV-4-Pb-12V and GV-4-Pb-CV.

**DO NOT SHORT CIRCUIT** the solar array when plugged into the controller. **DO NOT MEASURE SHORT CIRCUIT CURRENT** of the array while connected to the controller. This may damage the controller, and such damage will not be covered under warranty.

Grounding is not necessary for operation and is at the user's discretion. If the GV-4 is to be used with a solar array electrically connected to earth ground, please note the following: **WARNING: THIS UNIT IS NOT PROVIDED WITH A GFDI DEVICE.** Consult Article 690 of the National Electrical Code (or the standards in force at the installation location) to determine whether a GFDI is necessary for your installation.

**WARNING: THIS UNIT IS NOT PROVIDED WITH DISCONNECT DEVICES.** Consult Article 690 of the National Electrical Code (or the standards in force at the installation location) to determine whether a disconnect devices are necessary for your installation.

Use only 12-30 AWG (3.0 mm<sup>2</sup> max) copper conductors suitable for a minimum of 60 degrees C. If operation at high power or at high ambient temperatures is expected, wire with a higher temperature rating may be necessary.

Recommended terminal block tightening torque: 3-5 in-lbs, 0.35-0.55 Nm.

## Inspection & Maintenance

No user-serviceable parts inside.

Inspect the controller at least once per year to ensure proper performance.

- Check for animal or insect damage.
- Inspect for corrosion / water damage.
- Inspect the security of all connections.
- Ensure the solar array does not exceed the maximum input voltage.
- Repair and clean as necessary.

# Installation & System Connections:

- Connections should be made according to Article 690 of the National Electrical Code (NFPA 70) or the standards in force at the installation location.
- Electrical connections may be made in any order; however the sequence below is recommended.

## 1 MOUNTING

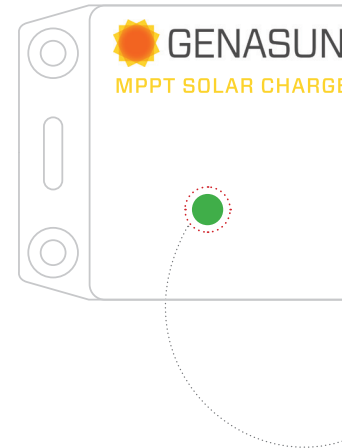
Mount the controller near your battery securely using the holes provided on the enclosure's flanges or with a means appropriate to the application.

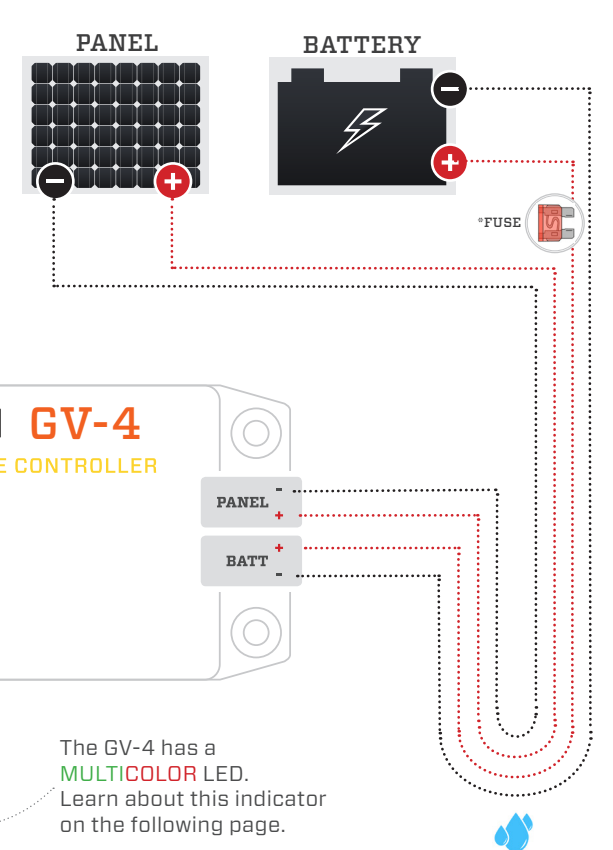
- Mount near the battery (use within 0.3 m (1 ft) of batteries. See Caution, above).
- The GV-4 can be mounted in any orientation on the floor or wall. We recommend a position in which all labels are clearly visible.
- Do not expose to water.
- Do not mount in direct sunlight or near a source of heat.
- Allow adequate airflow around the controller to achieve maximum output capability.
- For outdoor use, the controller must be housed in an enclosure providing protection at least equivalent to NEMA Type 3.




**Note:** Make sure to inspect the controller at least once per year to ensure proper performance. Please see the Inspection & Maintenance section in this guide.

**Note\*:** An additional fuse (not provided) to protect wiring (recommendet 10A, rated for the max battery voltage) must be connected to the battery connection cable, close to the battery pole. The external fuse prevents dangerous situations due to cable short circuits.





The GV-4 has a **MULTICOLOR LED**. Learn about this indicator on the following page.

 **Note:** Drip loop to protect charge controller from water.

## 2 CONNECTING THE SOLAR PANEL

Connect the solar panel to the +PANEL and -PANEL terminals.

- In most applications, the panel should be connected only to the GV-4.
- Never connect the panel negative to the battery negative, as your batteries may be damaged.
- Do not use blocking diodes for single-panel installations. The GV-4 prevents reverse-current flow.
- If multiple panels are being used in parallel, blocking diodes are recommended in series with each panel, unless the panel manufacturer recommends otherwise.
- Solar panel voltage rises in cold weather. Check that the solar panel open circuit voltage (Voc) will remain below the maximum input voltage of the GV-4 at the coldest possible expected temperature.



**Note:** In the GV-4, the positive side of the battery is connected internally to the positive side of the solar panel.

## 3 CONNECTING THE BATTERY

Connect the battery to the +BATT and -BATT terminals.

- A small spark while connecting the battery is ok.
- Any loads should be connected directly to the battery. The GV-4 does not provide protection against over-discharge.



**CAUTION, RISK OF FIRE OR EXPLOSION:** Do not make the final battery connection near lead-acid batteries that have recently been charging.

# Status Indication:

The GV-4 has a **MULTICOLOR** LED

## LED RUN/CHARGE INDICATION

**Standby:** The battery is connected properly and ready to charge when solar panel power is available.

8-10 SEC. BETWEEN GREEN BLINKS 

**Charging (low current, less than 0.15A):**

4-5 SEC. BETWEEN GREEN BLINKS 

**Charging (between 0.15A - 1.5A):**

FAST GREEN BLINKS 

**Charging (high current, more than 1.5A):**

LONGER GREEN BLINKS 

**Charging (current limit):** charging at current limit.

The GV-4 is overloaded and limiting charging current.

LONG, THEN SHORT GREEN BLINKS 


**Battery Charged:** The battery is in the absorption or float charging stage.

SOLID GREEN LED 



## LED ERROR INDICATION

**Overheat:** The controller's internal temperature is too high.

SETS OF 2 RED BLINKS. 

**Overload:** This could be caused by changing the solar panel connections while the controller is operating.

SETS OF 3 RED BLINKS. 

**Battery voltage too low:** The controller cannot begin charging due to low battery voltage. If the nominal battery voltage is correct (12V), charge the battery by some other means before use.

SETS OF 4 RED BLINKS 

**Battery voltage too high:** If the nominal battery voltage is correct (12V), check the functioning of other chargers that may be connected to the system.

SETS OF 5 RED BLINKS. 

**Panel voltage too high:** Only 12V nominal solar panels may be used with this controller.

SETS OF 6 RED BLINKS. 

**Internal Error:** Contact your dealer for assistance.

2 LONG BLINKS, FOLLOWED BY ANY NUMBER OF SHORT BLINKS. 

## Troubleshooting

If the LED Indicator will not light, or displays an indication not listed in this manual:

- Verify correct battery polarity
- Check that there is a solid electrical connection to the battery
- Check that battery voltage appears on the GV-4 battery terminal screw

The GV-4 will not operate without a battery. If the system appears to be overcharging or the GV-4 will not begin charging, ensure that the solar panel is wired only to the GV-4, and in particular that the solar panel negative terminal is not connected to ground (battery negative). If the GV-4 does not appear to be charging, note that the GV-4 waits up to one minute before trying to restart if it has shut down due to lack of power from the solar panel. Check the GV-4 terminal area for evidence of water or mechanical damage.

For more in-depth system troubleshooting, please visit the support area of our website: [www.genasun.com/support/](http://www.genasun.com/support/)

## Specifications:

### GV-4-Pb-12V

|  |       |
|--|-------|
| Maximum Recommended Panel Power:       | 50W   |
| Rated Battery (Output) Current:        | 4A    |
| Nominal Battery Voltage:               | 12V   |
| Max Panel Voltage (Voc):               | 27V   |
| Recommended Max Panel Voc at STC:      | 22V   |
| Minimum Battery Voltage for Operation: | 7.2V  |
| Input Voltage Range:                   | 0-27V |
| Maximum Input Short Circuit Current*:  | 4A    |
| Maximum Input Current**:               | 7A    |

\*Panel Isc. Maximum input power and maximum input voltage requirements must also be respected.

\*\*Maximum current that the controller could draw from an unlimited source.

# Specifications (cont.):

## GV-4-Pb-12V

|                                   |   |
|-----------------------------------|---|
| Charge Profile:                   | Multi-Stage with Temperature Compensation   |
| Absorption Voltage:               | 14.2V                                       |
| Absorption Time:                  | 2 Hours                                     |
| Float Voltage:                    | 13.8V                                       |
| Charging Output Voltage Range:    | 7.2-18V                                     |
| Battery Temperature Compensation: | -28mV/°C                                    |
| Operating Temperature:            | -40°C – 85°C                                |
| Maximum Full Power Ambient:       | 50°C  |
| Electrical Efficiency:            | 96% - 99.85% typical                        |
| Tracking Efficiency:              | 99% typical                                 |
| MPPT Tracking Speed:              | 15Hz  |
| Operating Consumption:            | 0.125mA (125uA)                             |
| Night Consumption:                | 0.9mA (90uA)                                |
| Environmental Protection:         | IP 40, (Terminal Connectors Nickel Plated)  |
| Connection:                       | 4-position terminal block for 12-30AWG wire |
| Weight:                           | 2.8 oz., 80 g                               |
| Dimensions:                       | 4.3 x 2.2 x 0.9", 11 x 5.6 x 2.5 cm         |
| Warranty:                         | 5 years                                     |

Certifications:   