



# GENASUN

## GV-Boost Manual

Solar Charge Controllers with Maximum Power Point Tracking

### For models:

GVB-8-Pb-12V:	12V Lead-Acid/AGM/Gel/Sealed/Flooded
GVB-8-Pb-24V:	24V Lead-Acid/AGM/Gel/Sealed/Flooded
GVB-8-Pb-36V:	36V Lead-Acid/AGM/Gel/Sealed/Flooded
GVB-8-Pb-48V:	48V Lead-Acid/AGM/Gel/Sealed/Flooded
GVB-8-Li-*.*.V:	Custom Lithium Variation

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8A Input / 105-350W

GENASUN GV-BOOST(ALL MODELS) MANUAL, REVISION 1.0 | 10.2012

IMPORTANT SAFETY INSTRUCTIONS | SAVE THESE INSTRUCTIONS

# Safety Instructions:

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This manual contains important instructions for the GVB-8-Pb-**\*\*V** and GVB-8-Li-**\*\*.\*V** solar charge controllers that shall be followed during installation and maintenance. Various models of the GVB are available to charge different battery types as follows:

- **GVB-8-Pb-12V:** 12V Lead-Acid/AGM/Gel/Sealed/Flooded
- **GVB-8-Pb-24V:** 24V Lead-Acid/AGM/Gel/Sealed/Flooded
- **GVB-8-Pb-36V:** 36V Lead-Acid/AGM/Gel/Sealed/Flooded
- **GVB-8-Pb-48V:** 48V Lead-Acid/AGM/Gel/Sealed/Flooded
- **GVB-8-Li-**\*\*.\*V**:** Custom Lithium Variation

Consult your battery charging specifications to ensure that the GVB is compatible with your chosen batteries.

Carefully follow these instructions.

**CAUTION for the GVB-8-Pb-**\*\*V****(Lead-Acid Versions Only):

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.

**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 will **DESTROY** the controller, and such damage will not be covered under warranty.

**LITHIUM WARNING:** Take caution when working with lithium systems. Genasun Li controllers use the CC/CV charging profile indicated on the controller. **CHECK** the specifications of the battery pack to ensure that the CV voltage is correct. Further check that the power supplied by the solar array and Genasun controller is within the battery specified design limits.

**LITHIUM BMS WARNING:** Genasun recommends using a lithium battery with a Battery Management System capable of disconnecting the solar charge controller in the event that any cell in the pack is outside of its rated temperature, current, or voltage range. Failure to do so may result in property damage, injury or death. Genasun highly recommends the use of a BMS with cell balancing. Cell balancing is mandatory for lithium-iron phosphate systems.

Use only 10-30 AWG 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.

## Inspection & Maintenance

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.

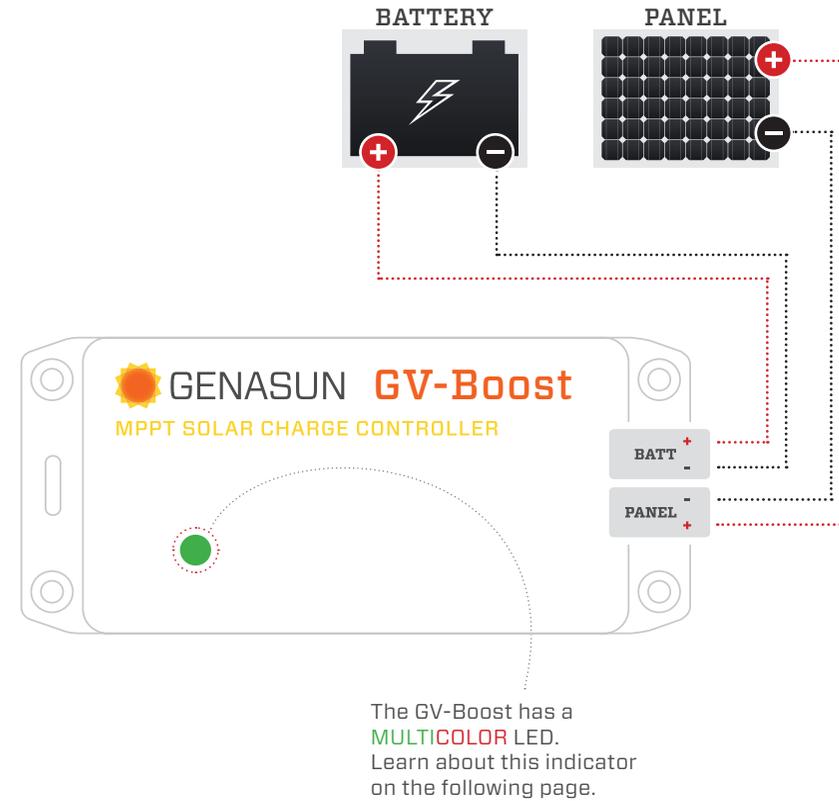
## 1 MOUNTING

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 battery.
- The GV-Boost can be mounted in any orientation.
- Do not expose to water (PLEASE SEE MODEL GVB-WP FOR WATERPROOF VERSION).
- 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:** Do not install this controller in a Golf Cart. Genasun Offers the GVB-WP for Golf Carts and other applications where water resistance is needed.

**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.



## 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 GVB.
- The LED may blink red until a battery is connected.
- Do not use blocking diodes for single-panel installations. The GVB 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 GVB at the coldest possible expected temperature.

## 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-Boost 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-Boost has a **MULTICOLOR LED**

## LED RUN/CHARGE INDICATION

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

2 SEC. BETWEEN BLINKS 

Charging (low current, input current less than -3.5A):

FAST & SHORT BLINKS 

Charging (high current, input current more than -3.5A):

LONGER BLINKS 

Charging (current limit): charging at current limit.

The GVB is overloaded and limiting input current. Check that the solar panel rating is within the GVB's input specifications.

LONG, THEN SHORT BLINKS 

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

SOLID LED 



## LED ERROR INDICATION

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

SETS OF 2 RED BLINKS. 

**Overload:** The GVB has been overloaded.

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

SETS OF 3 RED BLINKS. 

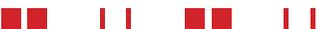
**Battery voltage too low:** The controller cannot begin charging due to low battery voltage. Charge the battery by some other means before use.

SETS OF 4 RED BLINKS 

**Battery voltage too high:** Check that the correct GVB has been selected for the nominal system battery voltage. If the nominal battery voltage is correct, check the functioning of other chargers that may be connected to the system. This error can also be caused by a disconnected battery or blown fuse.

SETS OF 5 RED BLINKS. 

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

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

## Troubleshooting

If the LED indicator does not light with a battery connected, or blinks the over-battery-voltage error, or the controller does not charge, the internal fuse may be blown. Check the fuse inside the GVB by removing the four screws on the bottom of the enclosure. If the fuse is blown, replace it with a 10A fast-acting ATO or ATC fuse rated for the maximum battery voltage.

Automotive-style fuses are typically rated to 32V, and are suitable for the GVB-8-Pb-12V, GVB-8-Pb-24V, and lithium models with a CV voltage up to 31V (i.e., GVB-8-Li-31.0V. For the GVB-8-Pb-36V, GVB-8-Pb-48V, and higher-voltage lithium models, a fuse with a higher voltage rating is required. We recommend Littelfuse part number 142.6185.5102, rated to 58V.

The most common causes of blown fuses are:

- Connecting the GVB to the battery backwards
- Shorting the solar panel input while the GVB is charging. In this case, there may be other internal damage to the controller.

# Specifications:

**GVB-8-Pb-12V**

**GVB-8-Pb-24V**

**GVB-8-Pb-36V**

**GVB-8-Pb-48V**

**GVB-8-Li-\*.\*.V**

Marine Grade:	Yes	Yes
Waterproof:	NO (See Genasun Model GVB-WP)	NO (See Genasun Model GVB-WP)
Connection:	4-position terminal block for 10-30AWG wire	
Weight:	6.5oz., 185g	
Dimensions:	5.5x2.5x1.2", 14x6.5x3.1cm	
Warranty:	5 years	

## Specifications(cont.): **GVB-8-Pb-12V**   **GVB-8-Pb-24V**   **GVB-8-Pb-36V**   **GVB-8-Pb-48V**   **GVB-8-Li-\*\*,.\*V**

Rated Panel (Input) Current:	8A				8A
Minimum Panel Voltage for Charging:	5V				5V
Minimum Battery Voltage for Operation:	9.5V				9.5V
Absolute Maximum Panel Open-Circuit Voltage (Voc):	63V				63V
Charge Profile:	Multi-Stage with Temperature Compensation				CC-CV
Nominal Battery Voltage:	12V	24V	36V	48V	(See specs for closest -Pb equivalent.)
Maximum Recommended Panel Vmp:	13V	26V	41V	43V	
Maximum Recommended Panel Power (8A Panel w/~155mm cells):	105W	210W	325W	350W	
Bulk Voltage:	14.4V	28.8V	43.2V	57.6V	-
Absorption Voltage:	14.2V	28.4V	42.6V	56.8V	-
Absorption Time:	2 Hours				-
Float Voltage (Pb models) or CV Voltage (Li models):	13.8V	27.6V	41.4V	55.2V	**,.*V as specified in part number
Battery Temperature Compensation:	-28mV/°C	-56mV/°C	-84mV/°C	-112mV/°C	-
Electrical Efficiency:	95% - 97% typical	96% - 98% typical	96% - 98% typical	96% - 99% typical	(See specs for closest -Pb equivalent.)
Night Consumption:	7mA	6mA	6mA	5mA	
Tracking Efficiency:	99+% typical				99+% typical
MPPT Tracking Speed:	15Hz				15Hz

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