Safety Instructions:

This manual contains important instructions for the GV-5-Pb-12V and GV-5-Li-**.*V solar charge controllers that shall be followed during installation and maintenance. Various models of the GV-5 are available to charge different battery types as follows:

- **GV-5-Pb-12V:** 12V Lead-Acid/AGM/Gel/Sealed/Flooded
- **GV-5-Li-10.7V (-SP):** 9.6/9.9V (3s) Lithium Iron Phosphate
- **GV-5-Li-12.5V:** 11.1V (3s) Lithium Cobalt/Polymer
- **GV-5-Li-14.2V:** 12.8/13.2V (4s) Lithium Iron Phosphate
- **GV-5-Li-16.7V:** 14.8V (4s) Lithium Cobalt/Polymer

Consult your battery charging specifications to ensure that the GV-5 is compatible with your chosen batteries.

The GV-5 does not include a fuse. Overcurrent protection suitable for the application must be provided by the user.

CAUTION for the GV-5-Pb-12V (Lead-Acid Version 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. Use only 12V lead-acid batteries with GV-5-Pb-12V.

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 12-30 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.

Grounding is not necessary for operation and is at the user's discretion. If the GV-5 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.

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:

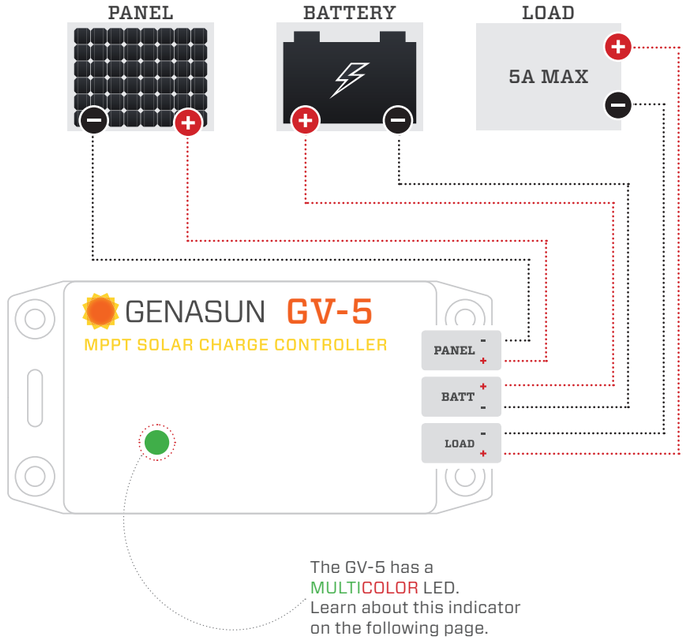
- Connections should be made according to Article 690 of the National Electrical Code (NFPA 70) or the standards in force at the installation location.
- Electrical connections may be made in any order; however the sequence below is recommended.

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 battery.
- The GV-5 can be mounted in any orientation.
- 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.



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-5.
- Never connect the panel negative to the battery negative, as your batteries may be damaged. In the GV-5, the positive side of the battery is connected internally to the positive side of the solar panel.
- Do not use blocking diodes for single-panel installations. The GV-5 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-5 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.

4 CONNECTING THE LOAD

Connect the load(s) to the +LOAD and –LOAD terminals.

- The load draw should not exceed 5A continuous.
- Larger loads should be connected directly to the battery. The GV-5 will not be able to provide protection against over-discharge (Low Voltage Disconnect) in this case.

Status Indication:

The GV-5 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 0.3A):

4-5 SEC. BETWEEN GREEN BLINKS

Charging (between 0.3A - 3A):

FAST GREEN BLINKS

Charging (high current, more than 3A):

LONGER GREEN BLINKS

Charging (current limit): charging at current limit. The GV-5 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.

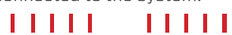
SETS OF 3 RED BLINKS.

Battery voltage too low: The controller cannot begin MPPT charging due to low battery voltage. If the nominal battery voltage is correct (12V), wait for the GV-5's trickle function to bring the battery voltage up, or charge the battery by some other means.

SETS OF 4 RED BLINKS

Battery voltage too high: If the nominal battery voltage is correct, check the functioning of the BMS (lithium systems) and any 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.

Specifications:

	GV-5-Pb-12V	GV-5-Li-**.*V	
Maximum Recommended Panel Power:	65W	GV-5-Li-10.7V	50W
		GV-5-Li-10.7V-SP	20W
		GV-5-Li-12.5V	55W
		GV5-Li-14.2V	65W
		GV5-Li-16.7V	75W
Rated Battery (Output) Current:	5A	5A (-SP model: 2A)	
Nominal Battery Voltage:	12V	N/A	
Max Panel Voltage (Voc):	27V	27V	
Recommended Max Voc at STC:	22V	22V	
Minimum Battery Voltage for Normal Operation:	7.2V	7.2V	
Trickle Charge to Recover Dead (0V) Battery:	Yes	Yes	
Input Voltage Range:	0-27V	0-27V	
Recommended Maximum Input Short Circuit Current (for Solar Use):	5A	5A (-SP model: 2A)	
Continuous Rated Load Current:	5A	5A	
Maximum Input Current *:	9A	9A	
Charge Profile:	Multi-Stage with Temperature Compensation	CC-CV	
Absorption Voltage:	14.2V	-	
Absorption Time:	2 hours	-	

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

Specifications (cont.):

	GV-5-Pb-12V	GV-5-Li-**.*V	
Float Voltage (Pb models) or CV Voltage (Li models):	13.8V	GV-5-Li-10.7V (-SP)	10.7V
		GV-5-Li-12.5V	12.5V
		GV5-Li-14.2V	14.2V
		GV5-Li-16.7V	16.7V
Load (LVD) Disconnect/Reconnect Voltage:	11.4/12.5 V	GV-5-Li-10.7V (-SP)	8.2/9.0 V
		GV-5-Li-12.5V	9.3/10.5 V
		GV5-Li-14.2V	11.0/12.0 V
		GV5-Li-16.7V	12.4/14.0 V
Battery Temperature Compensation:	-28mV/°C	–	
Operating Temperature:	-40°C – 85°C	-40°C – 85°C	
Maximum Full Power Ambient:	50°C	50°C	
Electrical Efficiency:	96% - 99.85% typical	94% - 99.85% typical	
Tracking Efficiency:	99+% typical	99+% typical	
MPPT Tracking Speed:	15Hz	15Hz	
Operating Consumption:	0.150mA (150uA)	0.150mA (150uA)	
Night Consumption:	0.125mA (125uA)	0.125mA (125uA)	
Marine Grade:	Yes	Yes	
Connection:	6-position terminal block for 12-30AWG wire	6-position terminal block for 12-30AWG wire	
Weight:	2.8 oz., 80 g	2.8 oz., 80 g	
Dimensions:	4.3 x 2.2 x 0.9", 11 x 5.6 x 2.5 cm	4.3 x 2.2 x 0.9", 11 x 5.6 x 2.5 cm	
Warranty:	10 years	10 years	