GENASUN

GV-10 Manual

Solar Charge Controllers with Maximum Power Point Tracking

For models:

GV-10-Pb-12V:	12V Lead-Acid/AGM/Gel/Sealed/Flooded
GV-10-Li-12.5V:	11.1V (3s) Lithium Cobalt/Polymer
GV-10-Li-14.2V:	12.8/13.2V (4s) Lithium Iron Phosphate
GV-10-Li-16.7V:	14.8V (4s) Lithium Cobalt/Polymer

10.5A / 140W

GENASUN GV-10 (ALL MODELS) MANUAL, REVISION 1.0 | 10.2012

IMPORTANT SAFETY INSTRUCTIONS | SAVE THESE INSTRUCTIONS

Safety Instructions:

This manual contains important instructions for the GV-10-Pb-12V and GV-10-Li-**.*V solar charge controllers that shall be followed during installation and maintenance. Various models of the GV-10 are available to charge different battery types as follows:

- **GV-10-Pb-12V:** 12V Lead-Acid/AGM/Gel/Sealed/Flooded
- **GV-10-Li-12.5V:** 11.1V (3s) Lithium Cobalt/Polymer
- **GV-10-Li-14.2V:** 12.8/13.2V (4s) Lithium Iron Phosphate
- **GV-10-Li-16.7V:** 14.8V (4s) Lithium Cobalt/Polymer

Consult your battery charging specifications to ensure that the GV-10 is compatible with your chosen batteries.

Carefully follow these instructions.

CAUTION for the GV-10-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 the GV-10-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 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.

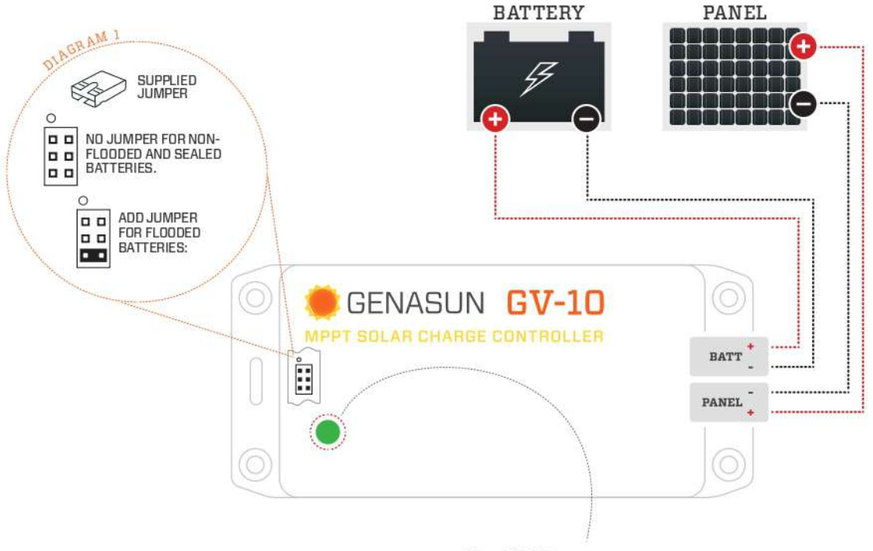
1 SELECTING THE BATTERY TYPE (LEAD-ACID / PB MODEL ONLY)

Your GV-10-Pb-12V controller is supplied set to the "SEALED" charging profile, which is appropriate for most types of sealed lead-acid and gel batteries, as well as some types of AGM batteries. A "FLOODED" setting is available for flooded batteries and other types of AGM batteries. The "FLOODED" setting includes equalization charging. Please consult the specification table at the end of this manual to determine the best setting for your battery type. To change your GV-10 controller to the "FLOODED" setting, unscrew the four screws on the bottom of the controller, remove the top, and install the supplied jumper on the 6 pin connector as shown in diagram 1. Use care when installing the jumper, as incorrect installation can damage the controller. **For sealed batteries, do not install the jumper.**

2 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-10 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.

3 CONNECTING THE SOLAR PANEL

Connect the solar panel to the +PANEL and –PANEL terminals. While connecting the battery first will not damage the GV-10, we recommend connecting the panel first. This eliminates the risk of short-circuiting the panel while the GV-10 is operating, which can cause damage.

- In most applications, the panel should be connected only to the GV-10.
- Do not use blocking diodes for single panel installations; they reduce system performance with no benefit.
- Multiple panels may be connected in parallel up to the maximum power limit of the controller, with a blocking diode used for each panel (unless otherwise recommended by the panel manufacturer). These panels should be the same model and facing the same direction, otherwise we recommend using a separate controller for each panel.
- 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-10 at the coldest possible expected temperature.

Note: In the GV-10, the negative side of the battery is connected internally to the negative side of the solar panel.

4 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-10 does not provide protection against over-discharge.

Status Indication:

The GV-10 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 GREEN BLINKS



Charging (low current, less than ~3.7A):

FAST & SHORT GREEN BLINKS



Charging (high current, more than ~3.7A):

LONGER GREEN BLINKS



Charging (current limit): charging at current limit (10.5A+).

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 does not light, check that there is battery voltage present on the GV-10 battery terminals. The GV-10 will not operate without a battery. If there is battery voltage present, check the fuse inside the GV-10 by removing the four screws on the bottom of the enclosure. If the fuse is blown, replace it with a 20A fast-acting ATO or ATC fuse rated 32V or higher.

The most common causes of blown fuses are:

- Connecting the GV-10 to the battery backwards
- Shorting the solar panel input while the GV-10 is charging
- Connecting the GV-10 battery terminals to a 24V battery

In the latter two cases, there may be other internal damage to the controller.

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Specifications:

	GV-10-Pb-12V		GV-10-Li-**.*V	
Maximum Recommended Panel Power:	140W		GV-10-Li-12.5V	120W
			GV-10-Li-14.2V	140W
			GV-10-Li-16.7V	160W
Rated Battery (Output) Current:	10.5A		10.5A	
Nominal Battery Voltage:	12V		N/A	
Max Panel Voltage (Voc):	34V		34V	
Recommended Max Voc at STC:	27V		27V	
Minimum Battery Voltage for Operation:	8.5V		8.5V	
Charge Profile:	Multi-Stage with Temperature Compensation		CC-CV	
Charging Voltages:	FLOODED Setting	SEALED Setting		
Equalization Voltage:	15.0V	-	-	
Equalization Time:	2 Hours	-	-	
Equalization Interval:	30 Days	-	-	
Bulk Voltage:	14.6V	14.3V	-	
Absorption Voltage:	14.4V	14.1V	-	
Absorption Time:	2.5 Hours		-	
Float Voltage (Pb models) or CV Voltage (Li models):	13.5V	13.7V	GV-10-Li-12.5V	12.5V
			GV-10-Li-14.2V	14.2V
			GV-10-Li-16.7V	16.7V
Battery Temperature Compensation:	-28mV/°C		-	
Operating Temperature:	-40°C – 85°C		-40°C – 85°C	
Electrical Efficiency:	96% - 98% typical		96% - 98% typical	
Tracking Efficiency:	99+% typical		99+% typical	
MPPT Tracking Speed:	15Hz		15Hz	
Night Consumption:	0.9mA (900uA)		0.9mA (900uA)	
Marine Grade:	Yes		Yes	
Connection:	4-position terminal block for 10-30AWG wire		4-position terminal block for 10-30AWG wire	
Weight:	6.5oz., 185g		6.5oz., 185g	
Dimensions:	5.5x2.5x1.2", 14x6.5x3.1cm		5.5x2.5x1.2", 14x6.5x3.1cm	
Warranty:	5 years		5 years	