

Morningstar SunSaver (Gen 3) Upgrade Overview

August 3, 2012

Legacy Design

- Same Size Controller
- Same Amp and Voltage Ratings
- Same Mounting Plates
- Same Easy Battery Selection
- Same Rugged Terminals
- Same Hazardous Location Rating
- Same Competitive Price!

New Features

- Full Electronic Protections
- 4 Stage Battery Charging
- Self-Diagnostic to detect critical Faults
- Multi-Color Status LED
- 3 LED Battery Charge Level
- Dead Battery Recovery
- Telecom mode for sensitive loads
- 15V max charge limit for sensitive loads
- New UL 1741 and CSA C22.2 No. 107.1-01 certification

Full Electronic Protections

- Solar/ Load Overload
- Solar/ Load Short Circuit
- PV/ Battery/ Load Reverse Polarity
- Damaged Battery Temperature Sensor
- High Temperature & High Voltage Disconnect

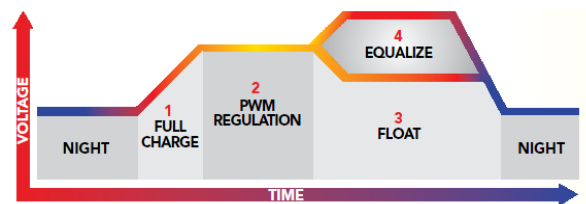
All faults are electronic and reset automatically when resolved.
(the SunSaver does not require any internal fuses)

4 Stage Battery Charging

The New SunSaver Gen 3 Charge Controller offers two additional charging stages for optimal battery charging.

- Bulk
- Absorption
- **Equalization (flooded)**
- **Float Stage**

The automatic float stage is beneficial for systems that transmit occasionally as it keeps batteries topped off for extended periods of time without risk of overcharging.



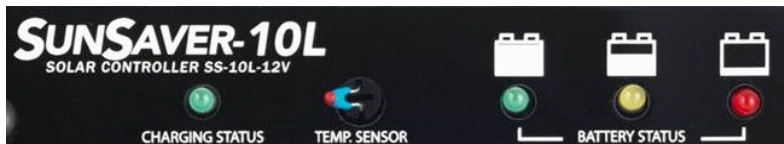
Self-Diagnostic to detect critical faults

The SS Generation 3 includes a multi-color status LED as well as 3 Battery LED's. Together these can indicate up to 13 possible error conditions. When the controller is functioning properly it is clearly indicated by the status LED as green.

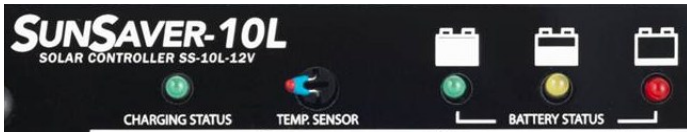
Previous Generation SunSaver (Gen 2)



New Generation SunSaver (Gen 3)



Multi-Color Status LED



Color	Indication	Operating State
None	Off (with heartbeat)	Night
Green	On Solid (with heartbeat)	Charging
Red	Flashing	Error
Red	On Solid (with heartbeat2)	Critical Error

3 LED Battery Charge Levels

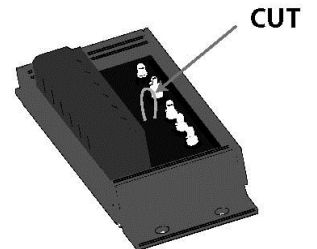
SOC LED	Indication	Battery Status	Load Status
Green	Fast Flashing (2 Flash / sec)	Full Battery: Equalize Charge	Load On
Green	Med. Flashing (1 Flash / sec)	Full Battery: Absorption Charge	Load On
Green	Slow Flashing (1 Flash / 2 sec)	Full Battery: Float Charge	Load On
Green	On solid	Battery Nearly Full	Load On
Yellow	On solid	Battery Half Full	Load On
Red	Flashing (1 Flash / sec)	Battery Low	LVD Warning (Load On)
Red	On solid	Battery Empty	LVD (Load Off)
None	No LEDs On	Battery Missing	Load Off

Dead Battery Recovery

With no LVD the battery can discharge and cause the system to go down. Even the controller does not have adequate power if the battery is less than 8V. The SunSaver Gen 3 can recover from this state unattended. With Dead battery recovery, the SunSaver Generation 3 can temporarily power itself from the PV panel until the battery is charged to a usable level. At that point it resumes normal operation.

Telecom mode for sensitive loads

Morningstar's patented PWM Charge Regulation is the recommended charge mode. However, for extremely sensitive loads or older analog equipment, the telecom mode can provide additional compatibility in case of interference discovered in the field. This is implemented by cutting a wire loop jumper inside the unit.



15V max charge limit for sensitive loads

Many RTU's operate in the 10-15VDC range. However in cold temperatures, lead acid batteries may be charged higher than 15V. The SS Gen 3 automatically limits charging to 15.0V in order to provide correct voltage for the RTU and prevent drop outs or resets.



New UL 1741 and CSA C22.2 No. 107.1-01 certification

In addition to the already extensive list of certifications for Hazardous Location requirements, the SunSaver (Gen 3) now includes full CSA C22.2 No. 107.1-01 certification when the included wire terminal cover is used. This is the same high standard of certification required for residential solar systems in the latest 2011 NEC and for Solar PV power conversion equipment and DC charge controllers in CSA C22.2.

New SunSaver (Gen 3) with cover



Morningstar's latest version of the SunSaver provides the legacy features the industrial industry has demanded for years. With new and improved features, it continues to redefine what customers expect from a solar charge controller. It provides not only superior battery charging that you expect from a Morningstar product, but features that increase overall site reliability.