

## genZ & Morningstar

### Introduction:

With over four million sold since 1993, Morningstar is recognized as the expert in charging technology throughout the solar industry. As solar-plus-storage becomes more prevalent in mainstream installations, battery chemistries are becoming more advanced—and battery makers are increasingly looking for ways to help their customers maintain and protect their long-term investment.

Morningstar's *Energy Storage Partner Program™* (ESP) makes it possible for selected premium battery partners to offer additional value and support for their customers by offering them a more proven, better documented and controlled storage system. With energy storage typically accounting for a very large share of the overall system's cost, ESP helps advanced chemistry battery manufacturers to provide the maximum level of assurance that system owners and operators need. This document is intended to provide essential information and recommendations for integrating Morningstar charge controllers with the Energy Storage Partner's batteries. Proper integration of these products is dependent upon successful implementation of the custom settings outlined in the sections below. These settings are the result of cooperation between manufacturers and have been agreed upon by both parties.

### Battery Overview:

GenZ Energy is an Australian company formed with the specific intent of creating cost effective, safe Lithium Ferro Phosphate batteries and energy storage solutions that perform reliably in the extreme conditions of the Australian outback. After several years of design and product refinement, the rack mount 3kWh and 2kWh battery modules for industrial and home energy applications were created, and genZ is now a leading and respected brand within Australia. In addition to rack mounted battery module genZ produce a range of lead acid replacement batteries designed for use in applications where a sealed lead acid battery would have previously been used.

### Features & Benefits:

- Significantly reduced size and one third of the weight of equivalent lead acid batteries
- Battery Management System built in – safe charging and more cycles for long term performance
- Available in either rack mounted or plastic case form factor
- Flexible mounting options
- Industrial coated steel casing and simple Anderson connector (rack mounted batteries)
- Zero emissions and rated to 55°C ambient operating temperature
- 12V, 24V and 48V versions

Models: <https://www.genz.com.au/buy-batteries-online-australia/>

Voltages: 12V, 24V & 48V (nominal)

Amp Hour Capacities: 4.5-115.6Ah

**Note:** For information regarding battery bank configuration options, please contact the battery manufacturer.

**For optimal integration, the recommended settings are as follows:**

\* Use 12V settings for custom programming

**Critical Settings:**

Nominal Battery Voltage	12V	24V	48V
Absorption Voltage	14.4V	28.8V	57.6V
Absorption Time	30 minutes		
Absorption Ext	Enabled		
Extension Voltage	12.0V	24.0V	48.0V
Extension Time	30 minutes		
Temperature Compensation	0.0V (Disabled)		
Float Stage	Enabled		
Float Voltage	13.8V	27.6V	55.2V
Float Timeout	30 minutes		
Equalize	Not enabled		
Battery HVD	Enabled		
High Voltage Disconnect	14.8V	29.6V	59.2V
High Voltage Reconnect	14.4V	28.8V	57.6V
Load LVD (Low Voltage Disconnect)	12.25V	24.5V	49.0V
Load LVR (Low Voltage Reconnect)	13.0V	26.0V	52.0V

**Note:**

Many lithium batteries include a BMS that can implement an internal battery disconnect in the event of a deep discharge to prevent permanent damage to the battery chemistry. It is important that proper low voltage load disconnect settings are used to prevent this from occurring during charging. Damage to the controller due to a battery disconnect during charging is typically not covered under warranty. Incidental damage to loads is also not covered under warranty.

**Optional Recommended Settings:**

Nominal Battery Voltage	12V	24V	48V
Low Battery Temperature Foldback	Optional (High limit = 1 degC, Low limit = 0 degC)		
Battery Service Reminder	Not enabled (Monitor Ah capacity with external shunt measurement)		
Float Cancel	Not enabled		
Max Regulation Limit	14.5V	29.0V	58.0V
Max Current Limit	Optional (1C max, 0.5C recommended)		
Equalize	Not enabled		

Delay Before Load LVD	1 min (Possibly longer for cold weather)		
Load Current Compensation	Default = 0.006 $\Omega$ (V/A) (Should be calculated based on 0.35/C)		
Load HVD*	Enabled		
Load HVD (High Voltage Disconnect)	15.0V	30.0V	60.0V
Load HVR (High Voltage Reconnect)	14.8V	29.6V	59.2V
Battery Charge LED Indications:			
• LED G → G/Y 75%+	14.4V	28.8V	57.6V
• LED G/Y → Y 50% - 74%	13.8V	27.6V	55.2V
• LED Y → Y/R 25% - 49%	12.75V	25.5	51.0V
• LED Y/R → R 10% or below	12.5V	25.0V	50.0V

\* Load HVD - May help to protect loads from potentially harmful voltage spikes that can be caused by external charging sources continuing to operate during battery removal.

These settings are available for the Morningstar controllers listed below:

#### **12-24V systems:**

ProStar MPPT (includes low temperature foldback to limit the max. charge current)

SunSaver MPPT

ProStar (PWM) Gen 3 (includes low temperature foldback to limit the max. charge current)

#### **24-48V systems:**

TriStar MPPT (compatible with 12V, 24V, 36V, 48V, 60V nominal systems)

TriStar MPPT 600V (compatible with 24V, 36V, 48V and 60V nominal systems)

TriStar [PWM] (compatible with 12V, 24V, 36V and 48V nominal systems)

#### **Communications hardware required for programming Custom Settings with MSView:**

ProStar MPPT, ProStar (Gen 3), SunSaver MPPT

UMC-1 USB MeterBus Adapter- <http://www.morningstarcorp.com/products/usb-meterbus-adapter/>

MSC PC RS-232 MeterBus Adapter- <http://www.morningstarcorp.com/products/pc-meterbus-adapter/>

EMC-1 Ethernet MeterBus Converter-  
<http://www.morningstarcorp.com/products/ethernet-meterbus-converter/>

TriStar, TriStar MPPT, TS-MPPT-600V

Includes an RS-232 port for connection to a PC.

EMC-1 Ethernet MeterBus Converter-

<http://www.morningstarcorp.com/products/ethernet-meterbus-converter/>

Tripp Lite U209-000-R USB / Serial DB-9 (RS-232) Adapter Cable (not available from Morningstar)

All TS-MPPT-60 (150V and 600V) models also include an Ethernet port and EIA-485 port.

**MSView Software Download:** <http://www.morningstarcorp.com/msview/>

**MSView Configuration Files:**

<https://www.morningstarcorp.com/wp-content/uploads/2019/04/GenZ-MSView-Configuration-Files.zip>

**Other links:**

[Morningstar Best Practices by Battery Chemistry](#)

[Morningstar Custom Settings Info Pages](#)

**IMPORTANT:**

genZ and Morningstar Corporation are separate companies with unaffiliated ownership.

Neither genZ nor Morningstar Corporation make any warranties explicit or implied with this product information. Morningstar makes no representation or assumption of liability regarding the charging requirements for any type of battery or model.

Some of the material being presented may be based on information that has been provided by other parties such as battery specs and operational parameters.

Performance may vary depending on use conditions and application.