MORNINGSTAR INTEGRATED SERIES

GenStar MPPT™

DC System Controller

- True Controller Technology Integration
- WiFi and Bluetooth Connectivity
- Powerful Load Control
- Fanless Design

Advanced features can be built-in and fully integrated with exclusive snap-in ReadyBlocks, instead of wired outside the system as accessories:

- **ReadyBMS**– full communications and control with lithium batteries
- **ReadyRelay**– signaling (dry contact), advanced load control
- **ReadyShunt**– battery metering/monitoring, key metrics including SOC, energy in/out (Amp hours), current measurement for system sources and loads, and more

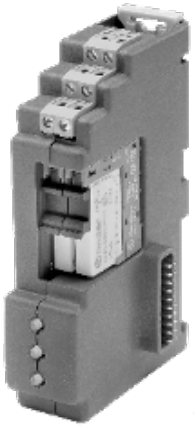
Since 1993 the name Morningstar has been synonymous with industry-leading charge controllers, used in mission-critical applications around the world. That tradition continues with Morningstar's GenStar MPPT. First in our new Integrated Series and a new flagship for Morningstar, GenStar MPPT combines the muscle of our iconic TriStar MPPT controller line with our most forward-thinking research and development yet in intelligent power conversion and control.

The revolutionary GenStar represents Morningstar's best engineering efforts brought together in a single design, with full, advanced communications and control features built-in– plus the ability to add more technology to any system through our innovative ReadyRail expansion technology. ReadyBlock™ snap-in modules make it easy to add key features when needed—such as BMS, Shunt and Relay capabilities-- ensuring a future-proofed system which can always be upgraded and is never obsolete. Equally important, GenStar MPPT is not just "compatible" with advanced battery chemistries such as lithium-- GenStar was engineered with lithium in its DNA.

In short, we designed GenStar MPPT to be the industry's first truly "future-proofed" charging system, one that can grow with a solar powering system as needs change. The new GenStars feature best-in-class efficiency and extremely low self-consumption, thanks to fanless design along with our acclaimed TrakStar™ MPPT technology. Full communications capability as a standard feature and international certifications for global use complete Morningstar's next generation of charge controllers—and set a new bar for the rest of the industry.

KEY FEATURES AND BENEFITS

- ReadyBlock expansion system through exclusive ReadyRail design achieves true controller technology integration. All information is instantly available since it's actually part of the hardware and software of the charge controller itself, instead of outside the system as with a typical stand-alone accessory device. Available ReadyBlock modules include:
  - » **ReadyShunt** – battery metering/monitoring, key metrics including SOC, energy in/out (Amp hours), current measurement for system sources and loads, and more
    ReadyBMS – full communications and control with lithium batteries
  - » **ReadyRelay** – signaling (dry contact), advanced load control
- Full network integration without requiring adapters or extra equipment– Modbus and ModbusIP via 485, Ethernet, WiFi, MS-CAN connects MS Devices (proprietary), GS network information bridging.
- WiFi, and Bluetooth connectivity with a mobile device and app for easy connection, dashboard views, downloading data, and firmware updates. It also includes our LiveView 2.0 web app interface on-board
- Powerful Load Control – built-in 30A load capability, unique for controllers in this power class
- Oversized PV Array Input capability – array input power rating @ 150% meets today's system design needs for PV oversizing
- Extensive electronic protections include cold-weather lithium "fold back" circuitry to guard against cold-weather charging damage. Also, short-circuit, over-current and reverse polarity to ensure the controller will not be damaged by wiring mistakes or overloads
- Fanless design for improved efficiency and exceptional long-term reliability



ReadyRelay block, part of the ReadyRail expansion system

8 Pheasant Run, Newtown, PA 18940 USA

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Technical Specifications

MODELS	GS-MPPT-60M-200V		GS-MPPT-80M-200V		GS-MPPT-100M-200V	
ELECTRICAL						
Maximum Battery Current	60A		80A		100A	
Max. Input Voltage	200V					
Max. Input Current	60A		80A		100A	
Nominal Operating Voltage	12-24-48VDc					
Battery Voltage Range	8V - 72V					
Load Current	30A		30A		30A	
Max. Self-consumption	< 3 Watts					
Grounding Leg	Negative (Positive Ground compatible with singular ground point)					
Real-Time Clock (RTC)	Yes, w/ coin cell backup					
Target peak efficiency	99%					
Transient Surge Protection	4500 W/port (battery solar and load terminals)					
Nominal Maximum Output Power	Max Output	Max PV Input*	Max Output	Max PV Input*	Max Output	Max PV Input*
12 Volt	800W	1200W	1064W	1600W	1330W	2000W
24 Volt	1600W	2400W	2128W	3200W	2660W	4000W
48 Volt	3200W	4800W	4256W	6400W	5320W	8000W
Max. Recommended Solar PV Input*	~150% of Nominal Max Output Power ("Max PV Input" Column Above)					
I/O, COMMUNICATION, INTERFACES	SD Card for logging, firmware updates, setpoints (unique with all 3 functions). USB-C for data, RS232/EIA-485 ports. Ethernet, WiFi, Bluetooth LE, MS-CAN					
ReadyRail ReadyBlock support	3 ReadyBlock slots for expandability (BMS, Shunt, Relay)					
Standard graphical meter	•					
RTS, Sense	•					
BATTERY CHEMISTRIES SUPPORTED	Lithium (multiple types), Lead-Acid (all types), NiCad, Flow					
PROTECTIONS	Reverse night current, Solar short circuit, PV reverse polarity, Solar overload (current limit), Load short circuit & overload, Battery removal protection, Low & high-temp foldback, High voltage foldback					
MECHANICAL						
Enclosure Rating	IP20					
PV input and battery max. wire size	1/0 AWG all models					
Load Wire Size Range	2.5 - 16 mm2 / 14 - 6 AWG					
Battery Sense Wire Size Range	0.25 - 1.0 mm2 / 24 - 16 AWG					

*The PV array power rating may exceed the controller's Max Nominal Output Power specification. The controller will limit battery current and prevent damage. Array oversizing should be considered on a case by case basis. See our array string sizer tool and related tech documentation. https://www.morningstarcorp.com/arrayoversizing

Technical Specifications (continued)

MODELS	GS-MPPT-60M-200V	GS-MPPT-80M-200V	GS-MPPT-100M-200V
SOFTWARE			
LiveView 2.0 web app	Dashboard, Settings Adjustment, Schedules, Actions, Firmware Update, Logged Data View		
Supported protocols	Modbus, ModbusIP, HTTP, SNMP (via EMC-1)		
Charge sync	Sync w/ peers		
Datalogging capacity & capability	Internal: 1 year max rate. With SD card, nearly infinite (depending on card) Event Logger plus daily and hourly records		
ENVIRONMENTAL			
Operating Ambient	-30C to +45C (full power); proportional derate to 60C		
Storage Temp Range	-50 to +80C		
Max. Operating Altitude	3000 meters		
Humidity	100% non-condensing		
CERTIFICATIONS			
UL 1741 / CSA 22.2 107-1	•		
IEC 62109-1	•		
EMC Directive 2014/30/EU	•		
ICES-003 (latest std, class B)	•		
FCC Class B compliant	•		
CEC Australia listing	•		
IEC 60950	•		
IEC 62093	•		
IEC 62509	•		

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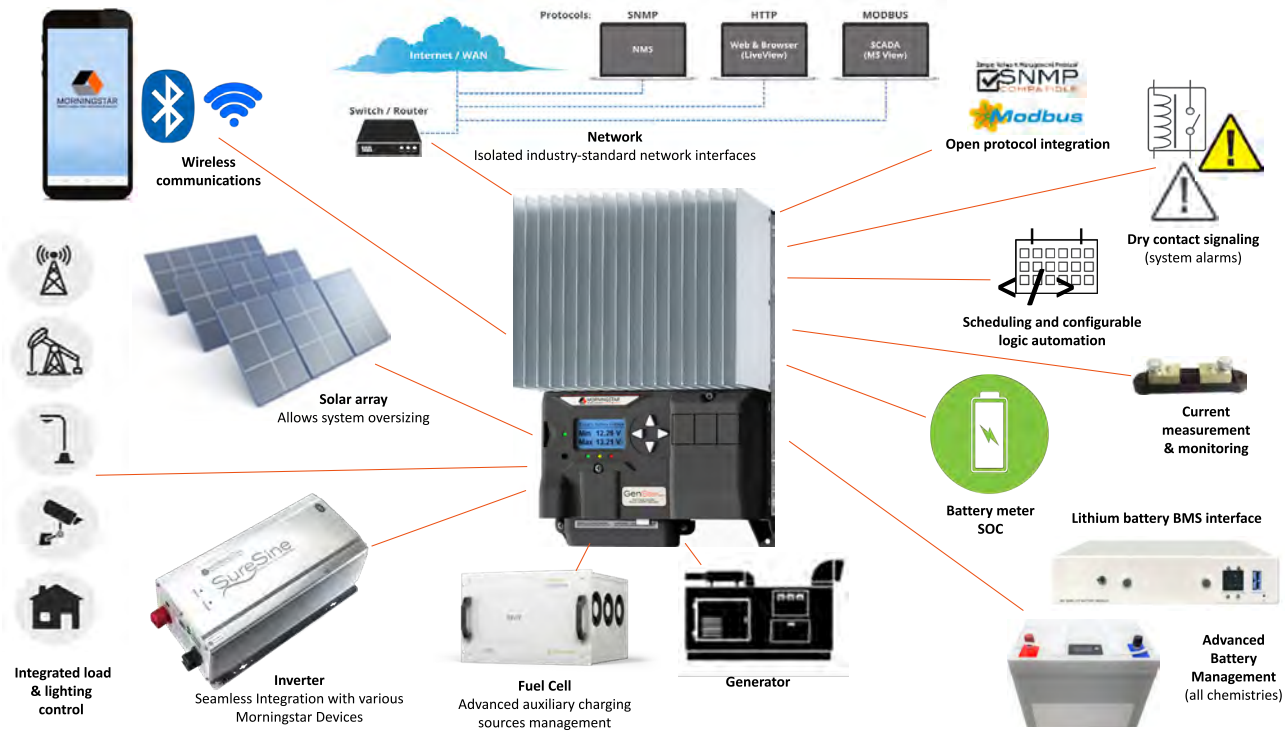
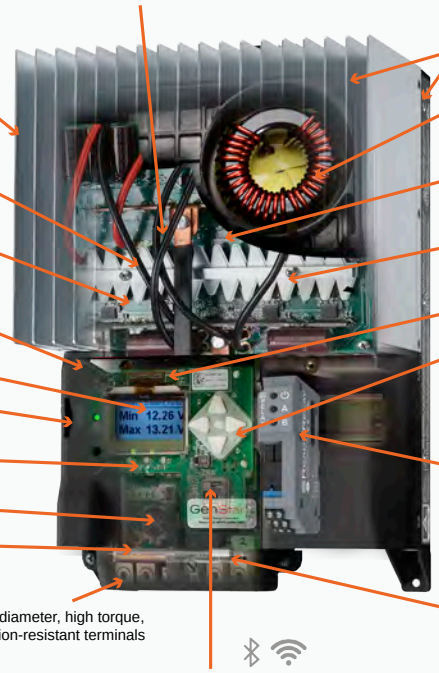
GenStar MPPT DC System Controller Capabilities



DirectFET™ MOSFET premium power devices for superior internal heat transfer and array isolation



Highly-conductive, precision extruded aluminum heat sink with tapered fins (made with new manufacturing technology) eliminates the need for cooling fans, improves efficiency, increases reliability

Four-phase energy conversion circuitry helps achieve industry-leading efficiency

Over-spec components withstand temperatures higher than boiling water

Tough Lexan polycarbonate UL-listed lower cover

Backlit LCD display for easier monitoring

SD card slot enables data-logging, updating, and settings configuration

Multi-layer electronic protection circuitry

Real-time clock with back-up memory

Built-in load control– unique in this controller class

Morningstar's acclaimed TrakStar technology ensures the highest solar array yield possible

TRAKSTAR™ MAXIMUM POWER POINT TRACKING

5-year warranty (2 1/2 times longer than many competitors)

Large diameter, high torque, corrosion-resistant terminals

Dual WiFi and BlueTooth wireless connectivity

Rigid, cast aluminum chassis with built-in inductor housings for superb mechanical integrity

Four-phase energy storage section with sealed, precision-wound, heavy duty copper coils

Higher grade copper "pour" resists excessive heat on circuit boards

Unique, patented FET spring ensures even, positive contact between heat-producing components and heatsink, improving thermal handling

State-of-the-art software control improves response

Unique, programmable "soft key" provides a "favorite" customized push-button command based on any action in the user interface

READY|RAIL

Unique ReadyRail/ReadyBlock architecture: enables easy integration of key features into the GenStar architecture with modular, snap-in blocks including the ReadyRelay (shown, for signaling and load control), ReadyBMS (for lithium battery communications), ReadyShunt (for advanced battery monitoring), and more

Communications data port: speaks Modbus

Modbus

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