

HF-MAX™

Modular • Redundant • High Efficiency • Full Power & Temperature



HF-MAX™

Industrial Switch Mode Battery Charger / Power Supply





HF-MAX™

Modular, Redundant Platform

High Availability/Uptime Architecture

Industrial Construction

Natural Convection Cooled (No Fans)

Intelligent Power Modules (iPMs)

Hot Swappable

12V, 400-1600W, 20-80A

24V, 400-1600W, 10-40A

Low DC Output Ripple

High Efficiency

Full Power & Temperature

Wide DC Voltage Ranges

DC Voltage Switches

Temperature Compensation

Sophisticated Alarming & Logging

Ethernet Communication

Confirm Local Presence Button

Remote Voltage Sensing

AREMA Compliant

Made in the USA

- Industrial switch mode (high frequency) technology
- 400W hot-swappable Intelligent Power Modules (iPMs)
- 4-slot chassis provides up to 1600W of DC output power (80A for 12V, 40A for 24V)
- 2-slot chassis provides up to 800W of DC output power (40A for 12V, 20A for 24V)
- Multiple iPMs in a single chassis provide redundancy (N+1, N+2, etc) and will continue to operate if the User Interface Module (UIM) fails for high availability/uptime applications
- UIM (system controller) is AC/DC powered for continued operation without AC
- Heavy-duty construction for industry-leading ruggedness and reliability
- Natural convection cooled (no fans)
- Conformal coated circuit boards for protection from moisture and other contamination
- High energy efficiency of > 93% at 240 Vac and > 91% at 120 Vac and full load
- California Energy Commission (CEC) battery charger system efficiency compliant (pending)
- Low DC output ripple - battery eliminator option standard
- Universal AC input: 100-240 Vac, 50-100 Hz
- Adjustable brackets for wall, shelf, floor, or EIA 19-in and 23-in rack (front or rear) mounting
- Flexible battery types - Nickel-Cadmium (Ni-Cd), Flooded Lead-Acid (FLA), Valve Regulated Lead-Acid (VRLA)
- Battery temperature compensation with controlled limits
- Remote voltage sensing
- Alarms can be individually enabled/disabled, assigned a delay, assigned a priority, and assigned to the summary alarm relay
- Form C, dry contact summary alarm relay
- Logging of up to 10,000 history records, downloadable as a CSV file
- Ethernet communication standard for field or remote monitoring, access to logging data, and programming (local only using the Confirm Local Presence button for security)
- Confirm Local Presence button for extreme network security
- SNMP alarming and NTP date/time synchronization via Ethernet
- Real-time clock with battery backup
- Internal web server uses a modern, responsive framework
- Full AC input and DC output protection
- LED status indicators
- Meets or exceeds AREMA requirements

INTUITIVE USER INTERFACE & INTERNAL WEB SERVER

Alarm Relay Terminals

Form C, dry contacts. Configurable per alarm via the web server.

Battery Temperature Sensor Connector

Enabled/disabled, compensation value, min compensation limit, and max compensation limit configurable via the web server.

Volts Per Cell Rotary Switches

Used to manually set the float voltage per cell. Not used if the "Number of Cells" rotary switches are set to "00", which enables float voltage control via the web server.

UIM Status LED

Green LED. Provides the status of the UIM.

Alarm LED

Red LED. Provides notification of system alarms and faults.



Ethernet Connector

Provides local or remote access to the internal charger web server via a standard Internet browser. The web server is used to check the status of the charger (DC amps, AC volts, etc), control the charger (on/off, manual equalize, etc), configure settings/alarms, and view/download the history log. NTP time synchronization and SNMP alarming are also supported.

Remote DC Voltage Connector

Enabled/disabled using the web server.

Number of Cells Rotary Switches

Used to manually set the number of battery cells. Setting to "00" enables control via the web server.

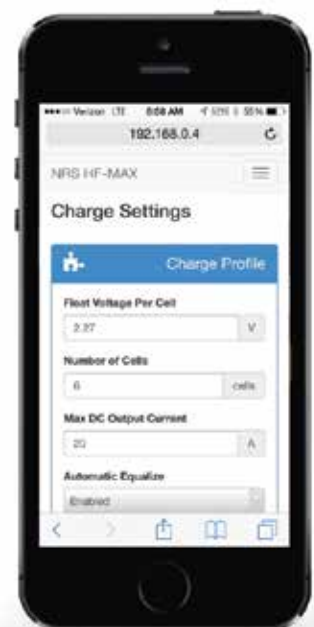
Confirm Local Presence Button & LED

Pressing the button enables setting/alarm changes to be saved via the web server for a set amount of time. This ensures that the changes are being made locally and provides the highest level of possible security.

AC Present LED

Blue LED that is on when AC power is present.

The HF-MAX internal web server uses a modern, responsive framework for attractive display on smart phones and tablets, in addition to laptop and desktop computers.



SPECIFICATIONS

AC Input

Voltage range, rated	100-240 Vac
Voltage range, operating	90-264 Vac
Frequency, rated	50-100 Hz
Frequency, operating	45-105 Hz
Phase	Single-phase
Current per iPM, maximum	5A
Efficiency	> 91%, 120 Vac, full load; > 93%, 240 Vac, full load
Power factor	> 0.98, 120 Vac, full load; > 0.96, 240 Vac, full load
Protection	Current limit, surge, transient, under voltage, over voltage
Fusing	Externally replaceable

DC Output

Voltage range	
12 Vdc	11.50-20.00 Vdc;
24 Vdc	23.00-40.00 Vdc;
Power, maximum	400W per module; 1,600W in the 4-slot chassis; 800W in the 2-slot chassis
Current, maximum	
12 Vdc	20.0A per module; 80.0A in the 4-slot chassis; 40.0A in the 2-slot chassis; full current capability up to 20V
24 Vdc	10.0A per module; 40.0A in the 4-slot chassis; 20.0A in the 2-slot chassis; full current capability up to 40V
Protection	Current limit, short circuit, reverse polarity, surge, transient
Fusing	Externally replaceable

Environmental

Operating temperature	-40 °C to 70 °C (-40 °F to 158 °F); full DC output power/current capability across the full temperature range
Storage temperature	-55 °C to 85 °C (-67 °F to 185 °F)
Operating humidity	0-95%, non-condensing
Storage humidity	0-95%, non-condensing

User Interface

Communication	Ethernet; 10/100BASE-TX; auto crossover, auto MDI-X; RJ45 connector; support for TCP/IP, NTP, and SNMP Traps; internal web server; ability to be used for networked comm or direct comm (direct connection to a laptop)
DC voltage switches	2 switches for Number of Cells; 3 switches for Volts per Cell
LEDs	4 single-color;
UIM	AC Present, Alarm UIM Status, Confirm Local Presence
iPM	1 tri-color; DC Output, Fault
Button	Confirm Local Presence
Battery temp comp	Yes (sensor optional)
Remote voltage sensing	Yes (wiring optional)
Alarming	
Alarms	Individually enabled/disabled, assigned a delay, assigned a priority, assigned to the summary alarm relay
Summary alarm relay	Form C, dry contact 1A at 30 Vdc, 0.5A at 120 Vac
Ethernet alarming	SNMP Traps
Logging	Up to 10,000 events (alarms, faults, AC on/off)

Mechanical

Cooling	Natural convection (no fans)
Protection	Conformal coated circuit boards
AC/DC terminals	AAR
Dimensions (WxHxD)	Including standard brackets
4-slot chassis	18-15/16 x 10-5/16 x 11-13/16 inches
2-slot chassis	10-1/4 x 10-5/16 x 11-13/16 inches
Weight (approximate)	
4-slot chassis (empty)	22 lbs
2-slot chassis (empty)	13 lbs
Single iPM	6 lbs
Mounting	Shelf, wall, floor, EIA 19-inch rack (front or rear)

Reliability & Certifications

MTBF	Telcordia SR-332, MIL-STD-267, 40 °C ambient
UIM	964,000 hours
iPM	738,700 hours at full output
AREMA *	FCC Part 15, Class A; CEC Appliance Efficiency Regulations, Title 20 (pending); EN emissions, immunity, safety (pending); CE certified (pending); designed to UL 1564, 1012, 1236
* DC dielectric strength substitute equivalent to the peak AC dielectric strength specification	