WS500

ADVANCED DC CHARGE CONTROLLER

MADE IN THE USA

A BOLD NEW SOLUTION FOR BATTERY CHARGING

"Having been in the DC charging business for more than 20 years, I can tell you that the notion of using current as well as voltage to regulate charging has always been the holy grail for intelligent battery care," says Rick Jones, former Balmar VP and Co-Owner at TJCMicro. "Wakespeed Offshore's new WS500 Advanced DC Charge Controller finally delivers the ability to use both components and charge batteries the way that battery manufacturers have always recommended."

In a resounding departure from the vast majority of multi-stage regulators currently available, the WS500 uses a unique approach to charge control by factoring multiple criteria – battery voltage, current in, current out, battery temperature, alternator temperature – to create a smarter approach to battery care. Highly configurable and enabled to communicate via J1939 CAN protocol, the WS500 provides superior charging efficiency, and the singular ability to address the specific needs of newer battery technologies like LiFePO4 and similar chemistries.

Ideal for RV or marine applications, the WS500 auto-adjusts for 12-, 24- and 48-volt systems and allows advanced user-configuration for system voltages in between. The WS500 can be easily configured to most popular battery types: standard and high-density AGM, standard and deep-cycle flooded, gel, carbon foam and TPPL via an internal switch. Two custom presets (one of which is preconfigured for a LiFeP04 battery profile) can be configured to battery manufacturer recommendations or by an OEM installer to deliver optimized charging for specific applications. Advanced configuration via PC provides adjustment to more than 100 charging modes.

Some other exclusive features of the WS500 include:

- **Adaptive Idle Technology™ minimizes impact of the alternator on smaller engines by controlling alternator loads based on engine rpm.**
- **Zero Output Technology™ enables the regulator to limit output to loads when batteries require discontinued charging.**
- **Multiple Alternator Support, without need for relays or switching devices.**
- **Full BMS Compatibility using RV-C and OSEnergy protocols**

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WS500
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System Voltage

12-Volt	Yes - Auto-detect
24-Volt	
48-Volt	
Other	Yes - Custom Adjustable. No hardware changes necessary.

Field Polarity

A-Type (N)	Select compatible P- or N-type wiring harness to match alternator polarity.
B-Type (P)	

Regulation Capability

Charge controller is uniquely capable of driving alternator output based on a combination of three primary criteria: voltage, current, and temperature goals / limits – making it possible to configure charging to specific battery manufacturer recommendations.

Voltage	Yes - Via sense wires included in wiring harness
Current	Yes - Via amp shunt. Can be calibrated to support most shunts. 500A/50mV is default.
Temperature	Yes - Via alternator and battery temperature sensors. Real-time, variable charging output based on ambient alternator and battery temperature.

Basic Configuration

Via built-in dip switch	Charge profile by battery type Battery capacity Alternator output range Battery ID

Battery Charge Profiles

Eight preset programs based on battery type. Selectable via dip switch.	Default (Safe) &AGM#1 Standard FLA Deep Cycle FLA HD AGM Gel Carbon Foam (Firefly) Custom #1 Custom #2 (Preconfigured with LiFePO4 profile)
Charge Phase Criteria	Flexible charging protocol integrating: system voltage, battery acceptance current, battery temperature, alternator temperature, and / or time duration.
Extended Battery Temperature Range Support	Charge controller can be configured to provide safe charging of batteries outside of normal temperature ranges by dynamically limiting charge current.

Advanced Configuration

Via USB port	100+ advanced adjustments accessible via ASCII Terminal software.
Via App	Basic license to third-party app is provided — enabling access to monitoring, programming and diagnostic functions via computer or mobile device.

Communication

CAN (Control Area Network)	J1939-based CAN provides access for system integration and monitoring. Uses standard CAT5 or CAT6 cabling.Termination jumper included with charge controller
USB	Built-in Micro USB allows for advanced system configuration, diagnostics, and firmware upgrade.

Field Output Control

Default Values	Large Alternator Mode (100%) Small Alternator Mode (75%) Half Power Mode (50%)
Advanced Configurable	Maximum field bandwidth adjustable from 10% to 100% in one percent increments

Firmware Updates

Yes	Charge controller firmware updatable via built-in USB connector

Regulator Display

Onboard LED	Operational and troubleshooting/ fault data via blink pattern.
Remote Display	Via CAN to remote displays using commonly-accepted marine and RV protocols.

Adaptive Idle Technology™

Yes	Allows charge controller to dynamically reduce alternator output to prevent stalling, sluggish performance and match engine power curves at lower RPMs.

Zero Output Technology™

Yes	Enables charge controller to use current monitoring capabiltiy to limit output to match house loads only when batteries are fully charged.

Multiple Alternator Support

Yes - On twin engine applications.	Allows multiple charge controllers to communicate via the CAN to ensure balanced output and charging efficiency when supporting a single, large battery bank. Device hierarchy establishes master/slave relationship between charge sources.
Yes - Dual alternators on single engine	Field output can be split from single charge controller to drive dual alternators charging common bank. (30A max with High Capacity wiring harness)

BMS Compatibility

Yes	Compatible with multiple BMS brands using RV-C and OSEnergy protocols. Configurable to many available systems.

Temperature Sensing

Alternator Temperature Sensing	Sensor included in wiring harness. Active regulation based on ambient alternator temperature, ensures optimal output and alternator safety, versus simple capping typical of most voltage dependent regulator models.
Battery Temperature Sensing	Battery temperature monitoring protects the battery from over/ under temperature situations, as well as adjust voltage targets based on temperature. Temperature sensor enables regulator to adjust charging voltage to compensate for changes in battery temperature.
Internal Temperature Sensing	Protects charge controller's internal circuitry from damage due to out-of-range values.

Physical Data

Enclosure Dimensions	160mm x 100mm x 60mm 6-3/4"L x 3-7/8"W x 2-3/8"H
Footprint	190mm x 100mm 7-1/2"L x 3-7/8"W
Enclosure	Diecast Aluminum Alloy --- designed for ip67 desiged
Finish	Powdercoat
Wiring Harness	Color coded tinned wire. Expandable sheathing.
Terminal Connectors	Ampseal 23-pin waterproof Ruggedized RJ45 (CAN)
USB Connector	Micro USB
Warranty	2-year limited warranty

 www.tjcmicro.com