WS500

ADVANCED DC CHARGE CONTROLLER

POWERED BY dragonfly® ENERGY

A BOLD NEW SOLUTION FOR BATTERY CHARGING

The Wakespeed WS500 Advanced Alternator Regulator is the only model on the market that can utilize current, voltage, and temperature to deliver the most precise and effective charging possible. Ideal for 12V, 24V, and 48V battery systems – with configurability for voltages in between – the WS500 is the perfect solution for charging lead acid-based or new generation $LiFePO_4$ lithium-ion battery banks.

This Advanced Alternator Regulator can be connected to a current shunt to monitor current flow to and from the batteries, enabling the regulator to control charging based on a combination of system voltage and amperage delivered from the alternator to the batteries. In addition, the WS500 can also monitor alternator and battery temperatures and modify charging output to ensure optimal safety and charging performance at the alternator and batteries.

- Wide ranging support for a variety of battery technologies
- Advanced, multi-PID engine control provides the most accurate charging available
- Simple to install, configure, and operate
- Best charge control for lithium battery chemistries
- Superior protection for your investment

Other features of the WS500 include:

- Adaptive Idle Technology minimizes impact of the regulator 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 discounted charging
- Provides Multiple Alternator Support without the need for relays or switching device
- Full BMS Compatibility using RV-C and OSEnergy protocols

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WS500

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SYSTEM VOLTAGE

12-VOLT 24-VOLT 48-VOLT	Yes - Auto-detected
OTHER FULLY CUSTOMIZABLE FROM 12 TO 48/52V	No hardware changes necessary.

FIELD POLARITY

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

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.

Battery Temperature and/or current may optionally be supplied via CAN when used with suitable BMS.

CONFIGURATION

VIA BUILT-IN SWITCH	Basic charge profile by battery type: Battery capacity Alternator output range Battery ID
VIA WAKESPEED APPLICATION	Fully customized / optimized configuration for battery, alternator, and system through easy to use application.

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 BattleBorn LiFeP04 Custom #1 Custom #2 (Preconfigured with $LiFePO_4$ 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 nominal temperature ranges by dynamically limiting charge current.

ADVANCED CONFIGURATION

VIA USB PORT	100+ advanced adjustments accessible via Wakespeed Application in Expert Mode
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. Several industry standard CAN cabling systems are supported, including RJ45/CAT5, M12-5 (NMEA, Device-Net), RV-C cabling systems.
ENHANCED CAN PROTOCOL SUPPORT INCLUDE:	RV-C, NMEA2000, Victron VEreg, SMA, LUX, as well as several proprietary CAN communications protocols with selected BMS manufacturers.

FIELD OUTPUT CONTROL

DEFAULT VALUES	Large Alternator Mode (10%) Small Alternator Mode (75%) Halt Power Mode (50%)
ADVANCED CONFIGURABLE	Maximum field bandwith 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 built-in USB connector.
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.

WHITE SPACE

Customizable alternator loading vs. RPMs to match available engine power, optimizing alternator output while preventing engine overloading

ZERO OUTPUT TECHNOLOGY

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

ADVANCED CONFIGURATION

YES - ON MULTI 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 / support relationship between charge sources.
YES - DUEL ALTERNATORS ON SINGLE ENGINE	Field output can be split from single charge controller to drive dual alternators charging common ban.

BMS COMPATIBILITY

YES	Compatible with multiple BMS brands using RV-C and OSEnergy protocols, as well as a select list of Proprietary BMS 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 SETTING	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 6.75"L x 3.875"W x 2.375"H
FOOTPRINT	190mm x 100mm 7.50"L x 3.875"W
ENCLOSURE	Diecast Aluminum Alloy - designed for IP67 designed
FINISH	Powdercoated
WIRING HARNESS	Color coded tinned wire. Expandable sheathing.
TERMINAL CONNECTORS	Ampseal 23-pin waterproof Ruggedized RJ45 (CAN).
USB CONNECTOR	USB Type B
WARRANTY	2-Year Limited Warranty