



WS500

**ADVANCED
ALTERNATOR
REGULATOR**

Configuring Regulator With DIP Switches

While the WS500 Alternator Regulator provides an extensive level of configurability via its USB connection to a PC-based configuration software, the simplest way to configure your WS500 Alternator Regulator is via the onboard DIP switches. With these, you can select one of eight preset battery programs to match your battery type, identify the battery being charged, define battery capacity and toggle between small and large alternator modes. Please refer to the online User Guide for further reference.

SELECTING BATTERY ID

The Battery ID provides a designator for the battery being monitored by the WS500 alternator regulator. Used in CAN connected systems.



**1OFF/2OFF
House Battery**



**1ON/2OFF
Main Starter**



**1OFF/2ON
Secondary House**



**1ON/2ON
Other**

SELECTING CHARGE PROFILES

The WS500 offers the ability to select from one of eight charging profiles based on battery types being charged, including two customizable profiles which can be configured on a PC via the regulator's USB port. Refer to the online User's Guide for detailed profile values and configuration instructions.



**3OFF/4OFF/5OFF
Default, AGM#1**



**3ON/4OFF/5OFF
Std. FLA**



**3OFF/4ON/5OFF
Deep Cycle FLA**



**3ON/4ON/5OFF
High Density AGM**



**3OFF/4OFF/5ON
Gel**



**3ON/4OFF/5ON
Carbon Foam**



**3OFF/4ON/5ON
Custom #1**



**3ON/4ON/5ON
Custom #2 LiFeP04**

DEFINING BATTERY CAPACITY

Provides configurability based on the size of the battery bank being charged. Four capacity levels shown at right.



**6OFF/7OFF
< 250Ah**



**6ON/7OFF
250Ah-500Ah**



**6OFF/7ON
500Ah - 750Ah**



**6ON/7ON
> 750Ah**

SMALL/LARGE ALTERNATOR (FULL OUTPUT) MODES

Small Alternator Mode limits the maximum alternator output to 75% of maximum field potential and can be used to protect smaller alternators with larger battery loads and smaller engines and belts from excessive alternator horsepower loads. (Percentage adjustable via PC configuration. See online User Guide for details).



**8 OFF
Large Alternator Mode**



**8 ON
Small Alternator Mode**

LED Status/Advisory Codes

An onboard LED, visible on the front cover of the WS500 Alternator Regulator indicates operational and diagnostic codes during operation. There are three modes of information: Standard Operation (green), Error/Advisory mode (red), and Sync Mode (when the regulator is responding to a dominant regulator or a BMS via CAN bus) indicated by orange LED pattern. Error messages are identified by a numeric count, following the generic 'error' sequence which will be repeated twice. LED blink patterns are described below:

Idle		Short Flash/Long Delay (4 sec.)
Ramp to Bulk		Short Flash/Short Delay (1/4 sec.)
Acceptance		Flash/Flash/Long Delay (2 sec.)
Over Charge		Equal Flash/Delay (1/4 sec.)
Float/Post Float		Equal Long Flash/Delay (2 sec.)
Equalize		Short Flash/Flash/Long Delay (1.5 sec.)
Error*		Equal Long Flash/Delay (2 sec.)
Restarting		Equal Flash/Delay (1/4 sec.)

* Error pattern repeated twice, followed by flashing of Error ID #. See reference guide for details.

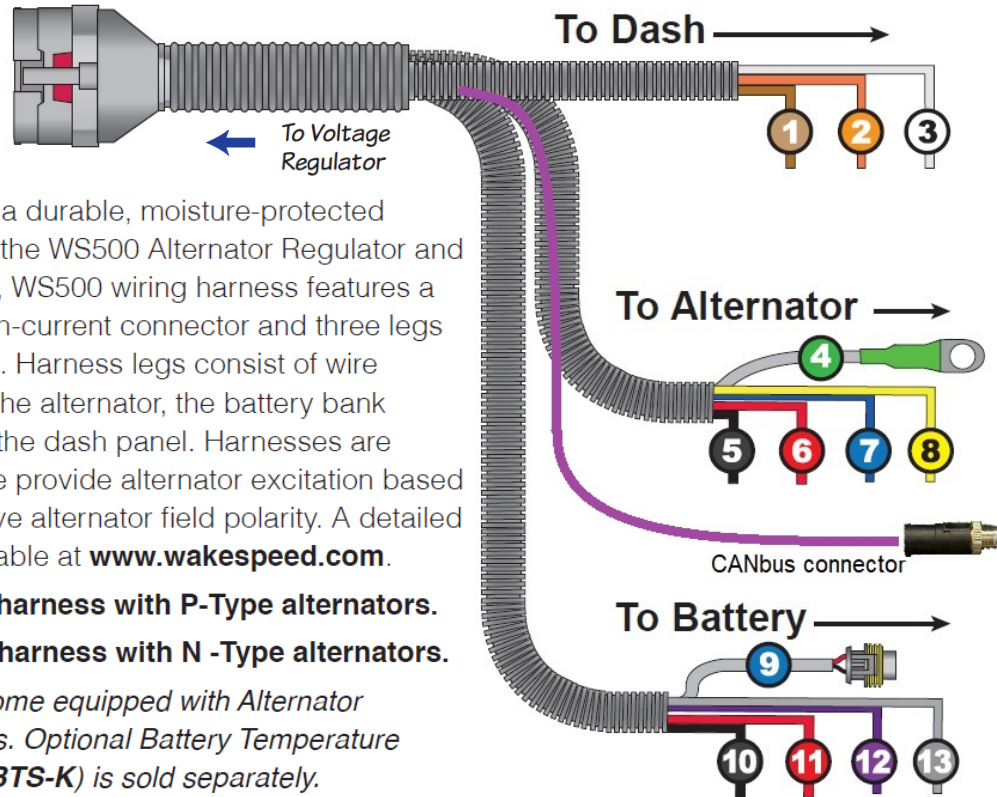
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ADVANCED ALTERNATOR REGULATOR



Designed to provide a durable, moisture-protected connection between the WS500 Alternator Regulator and the electrical system, WS500 wiring harness features a rugged Ampseal high-current connector and three legs of tinned marine wire. Harness legs consist of wire groups destined for the alternator, the battery bank being charged, and the dash panel. Harnesses are configured to provide provide alternator excitation based on positive or negative alternator field polarity. A detailed User's Guide is available at www.wakespeed.com.

Use the WS500-PH harness with P-Type alternators.

Use the WS500-NH harness with N-Type alternators.

NOTE: Harnesses come equipped with Alternator Temperature Sensors. Optional Battery Temperature Sensor Kit (WS500-BTS-K) is sold separately.

- ① **Ignition Wire (Brown)** Connects to switched voltage source (key switch or oil pressure switch). Must see zero volts when off and minimum of 8.5 VDC to activate.
- ② **Lamp/Feature Out Wire (Orange)** Remains neutral during normal regulator operation, and provides a source of ground to drive warning lamp or alarm if faults are detected. See User Guide for details.
- ③ **Feature In Wire (White)** Can be connected to a voltage source greater than 8.5 VDC to enable a range of selectable optional capabilities as detailed in the User's Guide.
- ④ **Alternator Temperature Sensor (Grey two-wire cable. Green cable shrink.)** Connects to alternator case bolt or ground post.
- ⑤ **Alternator Ground (Black)** Connects to alternator ground post.
- ⑥ **Alternator Positive (Red)** Connects to alternator positive output post. Fused at 15A.
- ⑦ **Alternator Field (Blue)** Connects to alternator's external field terminal.
- ⑧ **Stator (Yellow)** Connects to alternator's AC/stator output.
- ⑨ **Battery Temperature Cable (Grey two-wire cable. Blue cable shrink.)** Provides a connection point for optional battery temperature sensor. Battery Temperature Sensor (WS500-BTS-K) sold separately.
- ⑩ **Battery Ground Sense* (Black/Yellow Stripe)** Connects to ground terminal of battery being charged. Connect wire to battery ground terminal closest to the center of the battery bank.
- ⑪ **Battery Positive Sense* (Red/Yellow Stripe)** Connects to positive terminal of battery being charged. Connect wire to battery positive terminal closest to the center of the battery bank. Fused at 3A.
- ⑫ **Current Sensing** (+) (Purple)** Connects to the positive sense terminal on the battery shunt.
- ⑬ **Current Sensing** (-) (Grey)** Connects to the negative sense terminal on the battery shunt.

*Battery voltage sensing is most accurate when positive and negative sense wires are located nearest the center of the battery bank, or at opposite ends of the battery bank. See discussion of voltage sensing in the User's Guide for more information.

**Current sensing is calibrated for a 500A/50mV (default) current shunt. Installation may depend on whether shunt is installed HIGH or LOW. Refer to User's Guide for recommendations.

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