WS ™

Configuration Utility Notes
Battle Born LiFePO4 Batteries

Note: Any LiFePo4 battery system not equipped with compatible CANbus communication will require mitigation to protect the alternator and other sensitive electronics from potential battery disconnects. This includes the use of an alternator equipped with avalanche diodes, battery protection devices, or a keeper battery. While the WS500 can provide superior charge control for your batteries, it cannot mitigate voltage spikes caused by battery disconnect events.

Developed in conjunction with the Dragonfly/Battle Born engineeering team, these instructions and the accompanying wiring diagram represent a "best practice" approach to charging Battle Born drop-in LiFeP04 batteries.

Required Components:

- WS500 Alternator Regulator – Updated to the current firmware revision and configured with the Battleborn Batteries charging profile
- WS500 Wiring Harness, such as the WS500/PH or WS500/NH
- WS500/BT Battery Temperature Sensor
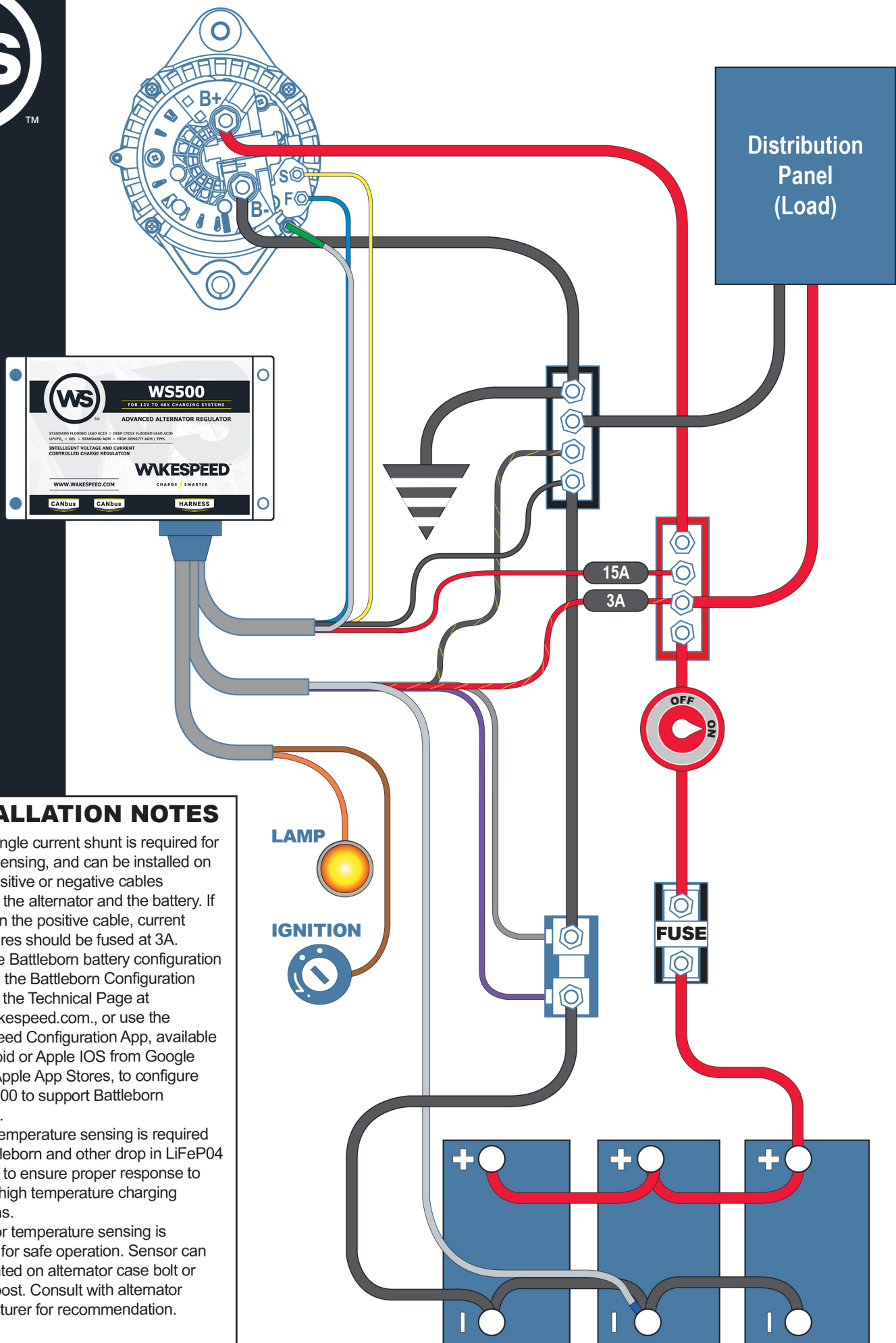- 500A/50mV Current Shunt

In LiFeP04 systems where CANbus communication is not available, the best practice for alternator/regulator control is to provide the regulator with the ability to monitor ambient battery temperature and current into and out of the batteries. By closely monitoring battery temperature and the charge rate into the batteries, the WS500 can charge more safely by staying within the the Battleborn battery's recommended C-rate and working temperature range.

When installing the configuration profile for your batteries, be sure to set the proper battery capacity multiplier to ensure that the regulator will be able to accurately monitor charging based on the overall capacity of the batteries being charged. See the Configuration Utility User's Guide for instructions when modifying the configuration profile.

In order to safely monitor charging voltage, the regulator's power and voltage sense wires (red and red/yellow tracer) must be connected in a location that's always on alternator side of any switches or fuses.

Battle Born Configuration Data Points	
Alternator Temperature Setpoint	100°C
Default Battery Capacity Multiplier	500ah = 0.0
Engine Warmup Delay	30 Sec.
Bulk Voltage Target	14.4V (Std. 12V system)
Float Voltage Target	13.5 (Std. 12V system
Maximum Charge Rate	0.50C
Hard Temperature Limits (High / Low)	>45°C / <0°C
Reduced (0.2C) Charge Rates (High / Low)	40°C to 45°C / 0°C to 5°C

IMPORTANT: The information is provided for reference, and is intended to provide guidance required to tailor the configuration profile to your system. Please refer to the Wakespeed Communications and Configuration Guide and Configuration Utility Users Guide for detailed configuration instructions.

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WS500
FOR 12V TO 48V CHARGING SYSTEMS

ADVANCED ALTERNATOR REGULATOR

STANDARD FLOODED LEAD ACID ◇ DEEP CYCLE FLOODED LEAD ACID
LiFePO₄ ◇ GEL ◇ STANDARD AGM ◇ HIGH DENSITY AGM / TPPL

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CANbus   CANbus   HARNESS

**Distribution
Panel
(Load)**

15A

3A

OFF
ON

FUSE

LAMP

IGNITION

+   **+**   **+**

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INSTALLATION NOTES

1. Only a single current shunt is required for current sensing, and can be installed on either positive or negative cables between the alternator and the battery. If placed on the positive cable, current sense wires should be fused at 3A.

2. Install the Battleborn battery configuration file using the Battleborn Configuration Utility on the Technical Page at www.wakespeed.com., or use the Wakespeed Configuration App, available for Android or Apple IOS from Google Play or Apple App Stores, to configure the WS500 to support Battleborn batteries.

3. Battery temperature sensing is required with Battleborn and other drop in LiFeP04 batteries to ensure proper response to low and high temperature charging conditions.

4. Alternator temperature sensing is required for safe operation. Sensor can be mounted on alternator case bolt or ground post. Consult with alternator manufacturer for recommendation.