



Developed in conjunction with the Victron Energy engineering team, these instructions and the accompanying wiring diagram represent a “best practice” approach to charging Victron’s Smart Lithium LiFePO4 batteries.



**Required Components:**

- WS500 Alternator Regulator – **Updated to the current firmware revision (2.4.1)** and configured with the Victron Smart Lithium/VE Bus BMS charging profile
- WS500 Wiring Harness, such as the WS500/PH or WS500/NH
- WS500/BT Battery Temperature Sensor
- 500A/50mV Current Shunt

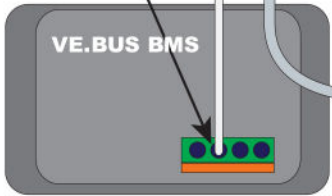
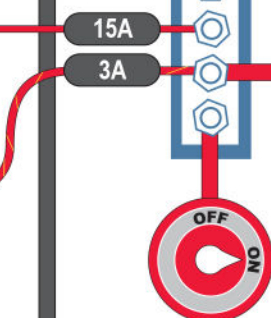
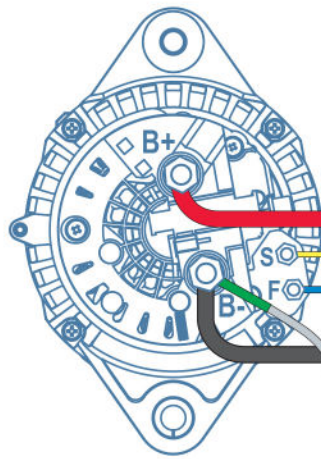
In systems where Victron’s Smart Lithium batteries are being managed by the VE Bus BMS, the regulator will monitor system voltage, ambient battery temperature and current into and out of the batteries. By closely monitoring battery temperature and the charge rate into the batteries, the WS500 can charge more safely by staying within the the Smart Lithium battery’s recommended C-rate and working temperature range. The Feature In wire is used to discontinue charging if the BMS activates its Charge Disconnect circuit.

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.

Smart Lithium 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.



### 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. In systems supporting Victron's Smart LiFeP04 batteries, the WS500's Feature In Wire should be connected directly to the Victron BMS Charge Disconnect Wire. This will force the regulator to shut down. DO NOT install contactor relays in the system when using this wiring best practice.
3. Install the Victron Smart Lithium configuration file using the Victron Configuration Utility on the Technical Page at [www.wakespeed.com](http://www.wakespeed.com), or use the Wakespeed Configuration App, available for Android or Apple IOS from Google Play or Apple App Stores.

FEATURE IN WIRE

LAMP



IGNITION



CHARGE DISCONNECT TERMINAL

VE.BUS BMS

Victron Smart LFP Battery Bank

Distribution Panel (Load)

15A

3A

FUSE

OFF

NO