



PRO Charging Systems

Safety, Installation, and Operating Instructions

Instructions importantes concernant la sécurité

Manual for the Following Battery Optimization Systems (B.O.S.) Models:

BOS12V2, BOS12V3, BOS12V4, BOS8V6



031121 – 70347

IMPORTANT NOTICE:

Please save and read these safety, operating, and installation instructions before installing or applying AC power to your Pro Charging Systems (PCS) charger. Contact technical support at PCS with any product, installation, or service questions (615.471.5300).

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IMPORTANT SAFETY INSTRUCTIONS

INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ

SAVE THESE INSTRUCTIONS. This manual contains important safety and operating instructions for future reference.
CONSERVER CES INSTRUCTIONS. CE MANUEL CONTIENT DES INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ ET LE FONCTIONNEMENT.

Understand and relate the Hazard Levels and Signal Words utilized in this manual with the following definitions:



This symbol means: Immediate hazards, which will result in severe personal injury or death.



This symbol means: Hazards or unsafe practices, which could result in severe personal injury or death.



This symbol means: Hazards or unsafe practices, which may result in minor personal injury, product or property damage.



This symbol means BE ALERT! Your safety, or the safety of others, is involved!

PERSONAL SAFETY PRECAUTIONS



Always read all instructions before using your charger!

- 1. Wear complete eye protection and clothing protection.** Avoid touching eyes while working near battery. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, eyes, or other surfaces. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and seek medical attention promptly.
- 2. Dress properly.** Wear protective, electrically nonconductive clothes and nonskid footwear. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can

produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn. Wear restrictive hair covering to contain long hair.

3. **Avoid working alone.** Be sure someone is within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
4. **Stay alert.** Watch what you are doing and use common sense. Do not operate any BOS when you are tired.
5. **Keep children away.** Children must never be allowed in the work area. Do not let them handle machines, tools, battery chargers, BOS, or extension cords.
6. **Keep work area clean.** Cluttered areas invite injuries.
7. **Observe work area conditions.** NEVER smoke or allow a spark or flame in the vicinity of battery or engine. Don't expose to rain. Keep work area well lit.
8. **Do not overreach.** Always keep proper footing and balance. Do not reach over or across electrical cables or frames.
9. **Avoid electrical shock.** To reduce risk of electrical shock, unplug BOS from batteries before attempting any maintenance or cleaning.
10. **Store idle equipment.** When not in use, store equipment in a dry location to inhibit rust. Always lock up tools and equipment and keep out of reach of children.
11. **Maintain BOS with care.** Inspect periodically and, if it has received a sharp blow, been dropped, or otherwise damaged in any way, have it repaired by an authorized technician. Do not disassemble BOS; contact PCS technical support when service or repair is required (615.471.5300). Incorrect reassembly may result in risk of electrical shock or fire.
12. **Check for damaged parts.** Before using any BOS, carefully check any part that appears damaged to determine that it will operate properly and perform its intended function. Check for broken parts and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the BOS if any part does not operate properly.
13. **Replacement parts and accessories.** When maintaining, only use accessories intended for use with this BOS. Approved accessories are available from Pro Charging Systems (615.471.5300).

SAVE THESE INSTRUCTIONS!

INSTALLATION AND PREPARATION



To reduce risk of battery explosion, follow these instructions, those published by the battery manufacturer, and by the manufacturer of any equipment that you intend to use in the vicinity of battery. Review all cautionary markings on these products and on the engine. *Pour réduire le risque d'explosion, lire ces instructions et celles qui figurent sur la batterie.*



RISK OF EXPLOSIVE GASES: WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. Batteries generate explosive gases during normal battery operation. For this reason, it is of utmost importance that prior to each use of your BOS, you read this manual and follow the instructions exactly. *Il est dangereux de travailler a proximité d'une batterie au plomb. Les batteries produisent des gaz explosifs en service normal. Il est aussi important de toujours relire les instructions avant d'utiliser le chargeur et de les suivre à la lettre.*

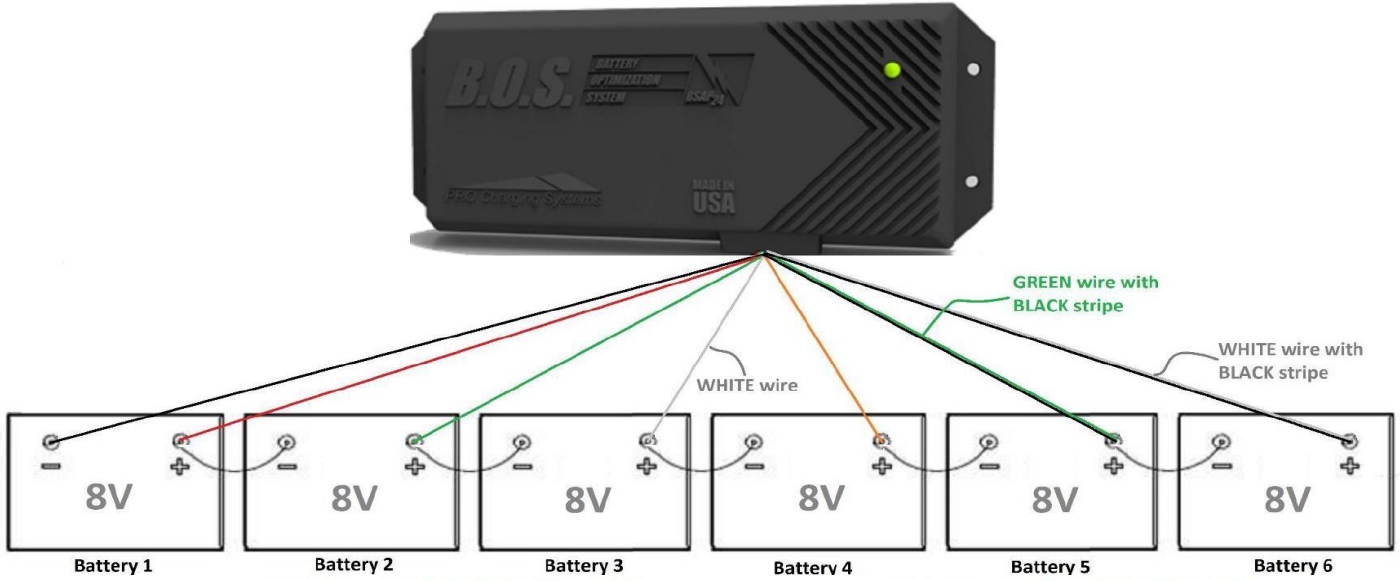
Do not operate BOS in a closed-in area or restrict ventilation in any way.

Ne pas faire fonctionner le chargeur dans un espace close et/ou ne pas gener la ventilation.

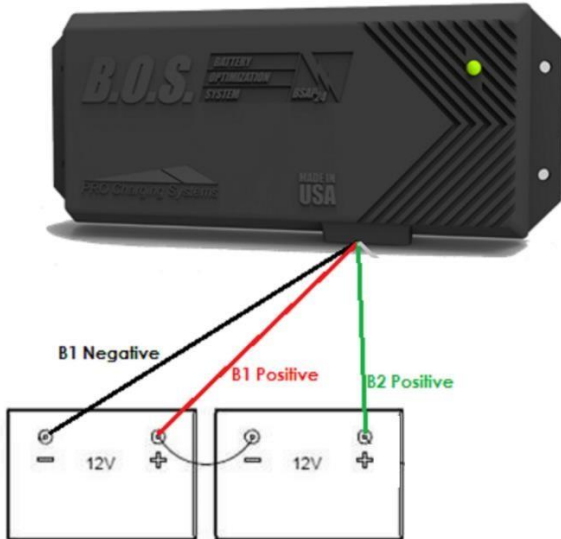
Clean battery terminals. Be careful to keep corrosion from coming into contact with eyes.

Connect the BOS' cables as shown below depending on your model.

8V6 BOS CONNECTIONS



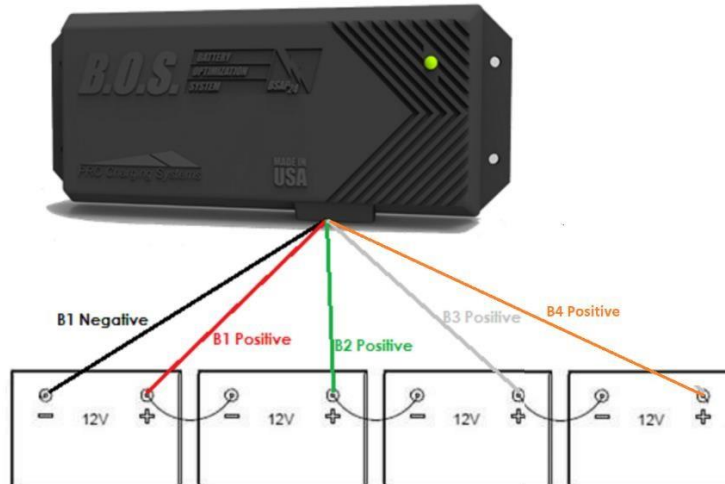
12V2 BOS CONNECTIONS



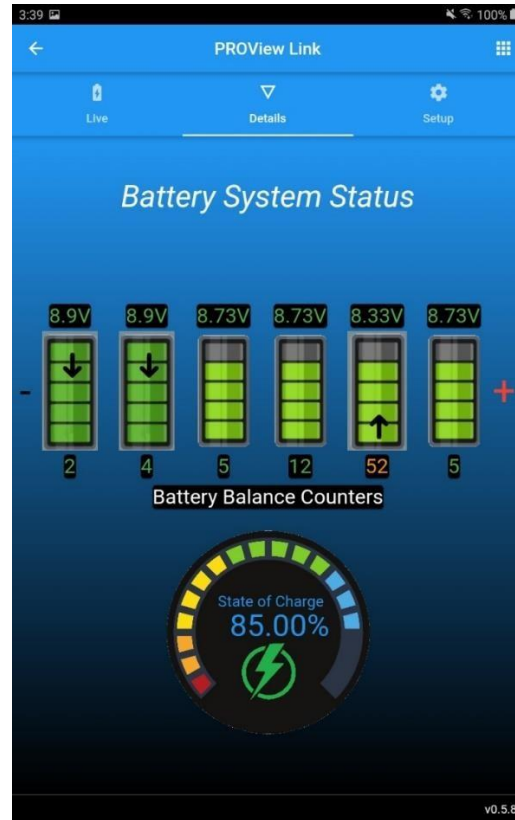
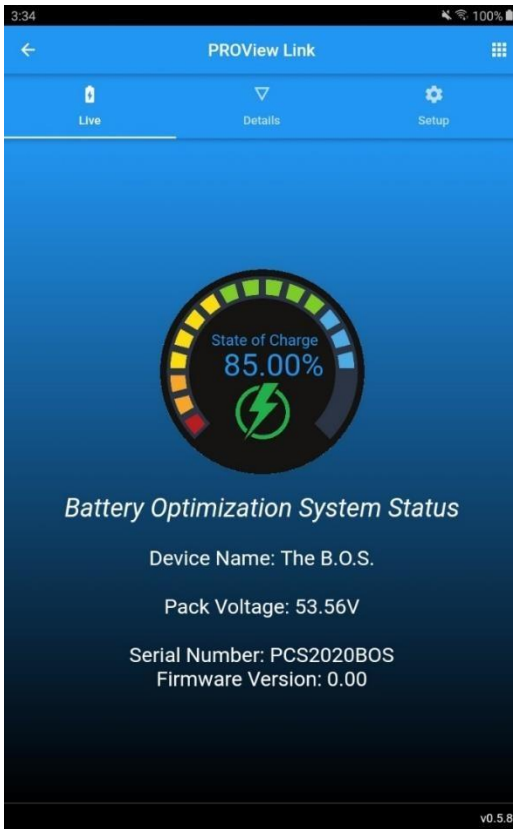
12V3 BOS CONNECTIONS



12V4 BOS CONNECTIONS



APP OPERATION - screenshots:



Counters under each battery will represent how many times a battery has been balanced. Red, Yellow, or Green numbers are visual aids to show which battery was balanced more/less than the other batteries in the pack. A Red number may indicate that specific battery is the weakest (weak link) in the pack while a Green number may indicate the strongest battery in the pack.

GENERAL OPERATION



WARNING Be extra cautious to reduce risk of dropping a metal tool onto battery. It might cause a spark or short-circuit a battery or other electrical part, possibly resulting in an explosion. If damaged, contact PCS (615.471.5300).



CAUTION NEVER charge a frozen battery.

Ne jamais charger une batterie gelée.

Assure that the area around your BOS and batteries is properly ventilated.



DANGER Risk of electrical shock! Do not touch uninsulated parts of the BOS output connector, battery connector, or battery terminals.



CAUTION Study all battery manufacturers' specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.

Prendre connaissance des mesures de précaution spécifiés par le fabricant de la batterie, p. ex., vérifier s'il faut enlever les bouchons des cellules lors du chargement de la batterie, et les taux de chargement recommandés.



Never place the BOS directly above or below the battery being balanced; gases or fluids from the battery will corrode and damage the BOS. Locate the BOS as far away from the battery as DC cables permit.

Ne jamais placer le chargeur directement sous la batterie à charger ou audessus de cette dernière. Les gaz ou les fluides qui s'échappent de la batterie peuvent entraîner la corrosion du chargeur ou l'endommager. Placer le chargeur aussi loin de la batterie que les câbles c.c. le permettent.



Never smoke or allow an open spark or flame in the vicinity of the BATTERY the battery or engine.

Ne jamais fumer près de la batterie ou du moteur et éviter toute étincelle ou flamme nue à proximité de ces dernie.



Working in the vicinity of a lead -acid battery is dangerous. Batteries generate explosive gases during normal operation. For this reason, it is of the utmost importance that prior to each use of your BOS, you read and follow the instructions provided exactly.

Il est dangereux de travailler a proximité d'une batterie au plomb. Les batteries produisent des gaz explosifs en service normal. Il est aussi important de toujours relire les instructions avant d'utiliser le chargeur et de les suivre à la lettre.

BOS LEDs: Red/Green/Blue – as of 04/16/2020

RED:

- FLASHING
 - o If flashing RED, the BOS is not properly connected to the batteries **-OR-** a fuse is blown **-OR-** dead battery (<1.667V/cell)
 - ✦ Check voltage of each battery, check connections, and then check fuses

GREEN:

- SOLID
 - o If solid GREEN, the BOS is actively balancing one of the batteries

BLUE

- FLASHING EVERY 5 SECONDS o 1 flash **-OR-** 2 flashes every 5 seconds indicates voltage prediction algorithms are running and getting ready for an active balance
- FLASHING EVERY 15 SECONDS o 1 flash every 15 seconds indicates either a low voltage battery in the pack (<1.750V/cell) **-OR-** a high voltage (>2.333V/cell)
 - o 2 flashes every 15 seconds indicates the batteries are predicted to be close to each and additional algorithms are to be ran
- FLASHING EVERY 30 SECONDS o 1 flash every 30seconds indicates the batteries are balanced **-OR-** we see an over-temp
 - ✦ Unit will keep running prediction algorithms
 - ✦ If an over-temp, we will be able to see a fault in the app

FAULTS in app:

- **FAULT 1: Check voltage of each battery**
 - o One of the batteries is above 2.333V/cell or lower than 1.750V/cell
 - o Could indicate large imbalance during a charge/discharge – check app for individual battery voltages
- **FAULT 2: Overtemp**
 - o Unit will run a quick cool down procedure and restart
- **FAULT 3: LED FLASHING RED**
 - o Check battery connections, fuses, or dead battery (<1.667V/cell)

LIMITED WARRANTY

Pro Charging Systems, LLC (PCS) makes this Limited Warranty only to the original retail purchaser.

PCS warrants this battery charger for two years (unless the charger is used in a Restricted Market) from the date of retail purchase against defective materials and/or workmanship. Restricted markets include markets outside of the USA, Rental applications and Heavy Industrial applications. Sometimes RM is designated in the PCS Part number when ordered, but is not part of the model number. Chargers used in Restricted Markets will have a warranty period of 18 months from the date of retail purchase against defective materials and/or workmanship. CR refers to “Certified Reconditioned” and designates a 1year warranty.

If such defects should occur, this unit will either be repaired or replaced at the discretion of the manufacturer. It is the responsibility of the original purchaser to return the charger along with proof of purchase, transportation, and/or any mailing or handling charges prepaid to the manufacturer or its authorized representative. Chargers that are purchased more than two years beyond the date of production will automatically have a warranty start date that will be the two-year anniversary of the production date.

This limited warranty is void if the product is misused, improperly maintained, handled carelessly or incorrectly operated. Additionally, this warranty is void if the charger is disassembled, the charger’s charge cables are cut, the power cord is cut off, the charger is altered without authorization from PCS, the serial number is removed, or repair is attempted by anyone other than an authorized representative. PCS makes no other warranty other than this limited warranty and expressly excludes any implied warranty, including warranty for any incidental or consequential damages. This is the only expressed limited two-year warranty authorized by PCS and does not authorize anyone to assume or make any other obligation towards the product other than this three-year Limited Warranty. Some states do not allow limitation of incidental or consequential damages.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Please call Pro Charging Systems, LLC for full warranty information and/or service please call (615.471.5300).

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation.

Contains FCC ID: 2AB7YVDLC52

Below are some of our other options in chargers and battery accessories. Call our technical support group for more detailed information or visit our web site www.dualpro.com.