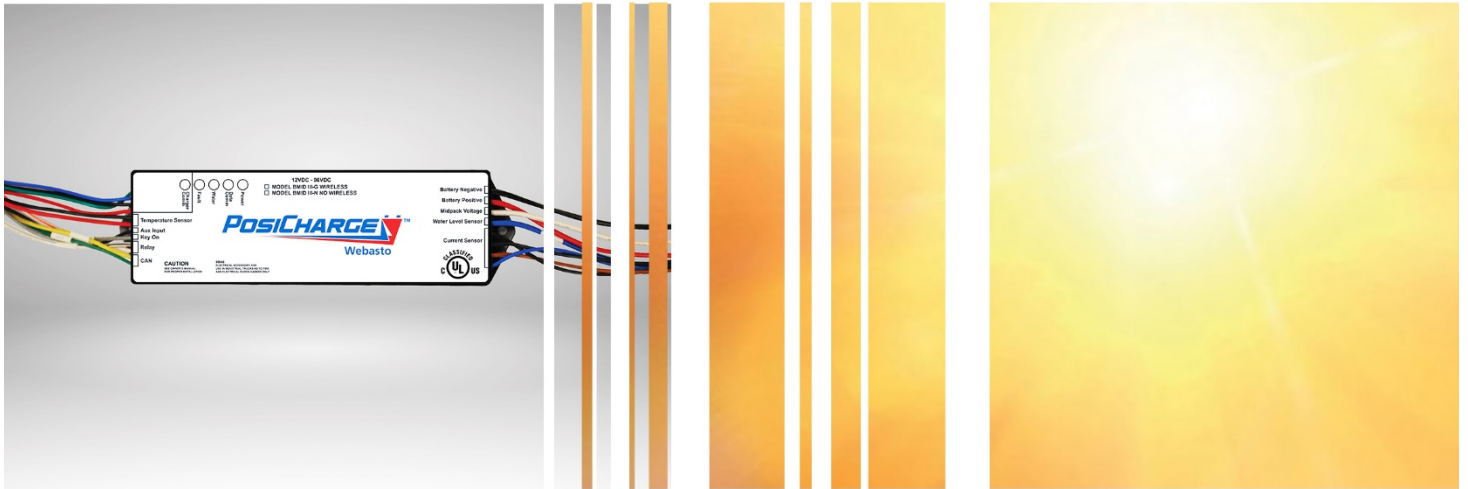


BMID III (Battery Rx) Installation Manual

Battery Management Tool

Battery Rx



Installation of the BMID units requires proper programming and calibration. Please follow the instructions and fill out the data validation sheets for submittal

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This BMID Installation Manual includes the latest information available at the time of printing. Webasto Charging Systems, Inc. reserves the right to make changes to this product without further notice. Changes or modifications to this product by other than an authorized service provider could void the product warranty.

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FCC Information

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.

This product has been designed to protect against Radio Frequency Interference (RFI). However, there are some instances where high powered radio signals or nearby RF producing equipment (i.e. digital phones, RF communications equipment, etc.) could affect operation.

If interference to your charge station is suspected, Webasto recommends the following steps be taken prior to contacting customer support for assistance.

1. Relocate nearby electrical appliances or equipment during charging.
2. Turn off nearby electrical appliances or equipment during charging.

**WARNING**

Changes or modifications to this product by other than an authorized service provider could void FCC compliance.

Save These Instructions

This document is your guide to installation and use of the PosiCharge BMID products.

The installation examples shown are for batteries in material handling and tug/tow vehicles.


IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**TABLE OF CONTENTS – BMID III**

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IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**1 Scope**

This manual describes the installation procedures for the Battery Rx.

2 Overview

 WARNING	Read and follow the instructions and warnings in this Manual before attempting to install or service this product. Failure to do so can result in serious injury or death. Keep this Manual for future reference.
--	---

The Battery Rx Battery Charging Monitoring System, referred to in this manual as Battery Rx, performs several functions. The Battery Rx:

- Records performance data for the life of the battery
- Monitors battery health continuously
- Alerts the user if battery health is threatened

During a charge cycle, the Battery Rx transmits charging requirements to the battery charger. Webasto battery charger manuals refer to this function as a BMID.

The temperature sensor comes in several models

- 09525-001 1.5" long, submersible
- 09525-002 2.5" long, submersible (Standard size in the installation kits)
- 09525-003 3.5" long, submersible
- 08664 Non-submersible for sealed batteries

The water level sensor (Webasto 19303) is optional and must be ordered separately.

BMID Installation Kits	
Part Number	Description
26131	KIT, UNIVERSAL INSTALL, BATTERY MONITOR, BASIC
26132	KIT, UNIVERSAL INSTALL, BATTERY MONITOR, ANDERSON
26133	KIT, UNIVERSAL INSTALL, BATTERY MONITOR, SCHALTBAU
26134	KIT, UNIVERSAL INSTALL, BATTERY MONITOR, SEALED BATTERY
26135	KIT, UNIVERSAL INSTALL, BATTERY MONITOR, DUAL SBX
26136	KIT, UNIVERSAL INSTALL, BATTERY MONITOR, GSE BURTON
26509	KIT, UNIVERSAL INSTALL, BATTERY MONITOR, ANDERSON COMM & TEMP SENSOR

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS

The Battery R_x is installed on the top of the battery and includes all hardware required to perform installation.

The Battery R_x has six interfaces:

1. Charger communication for SVS and MVS series chargers
2. Voltage sensor
3. Current sensor
4. Water level sensor (Optional)
5. Temperature sensor



The sixth interface provides for future expansion.







Figure 1 - Battery R_x Outline

3 Symbol Usage

Throughout this manual, take special note of the information marked with the following symbols:

 DANGER	Contains information about safety practices necessary to prevent personal injury or death.
 WARNING	Contains information about safety practices necessary to prevent fire or equipment overheating.
NOTE	Offers helpful information for installation or usage, but does not contain personnel or equipment safety related information.


IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**4 Installing the Battery Rx**

 WARNING	An improperly installed Battery Rx may cause the charger to charge incorrectly, and may void your battery warranty.
 DANGER	Electric shock hazard. Only trained personnel should install or maintain this equipment.
 DANGER	Hydrogen gas may be present in battery compartments. Be sure to work on equipment only in a well-ventilated environment.
 DANGER	Battery Rx modules are installed on electrically live battery packs. Use insulated tools during the installation.

The Battery Rx should be located near the center of the battery pack.

4.1 Temperature Sensor Installation

Choose one of the center cells in the battery pack as the temperature sensor installation location (typically the hottest cell). Install the temperature sensor as follows:

 WARNING	Use only the submersible type temperature sensor with flooded batteries. DO NOT use the black plastic temperature sensor. It is not designed for submersion and will give erratic readings.
--	--

Flooded Batteries

Carefully drill a 0.5" hole in the center of the case of the selected battery cell. You must use a drill stop to avoid contact with the electrolyte or plates. Seat the grommet securely in the hole then insert the temperature sensor submerging it into the electrolyte. Ensure that the temperature sensor grommet is securely seated against the shrink tubing at the wired end of the sensor.

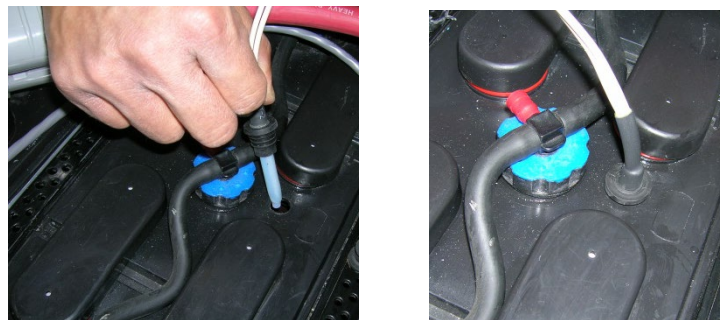


Figure 2 - Temperature Sensor Installation

Sealed Batteries:

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Note: *It is important to read the battery temperature accurately. Use the preferred method if possible.*

Preferred method:

Insert the non-submersible temperature sensor between two cells.

Non-preferred method:

If the sensor does not fit between the cells, the sensor may be placed under the cell interconnect bar.

4.2 Water Level Sensor Installation

NOTE	The Water Level Sensor must be installed on the third cell from the negative terminal of the battery. Refer to Figure 3.
-------------	---

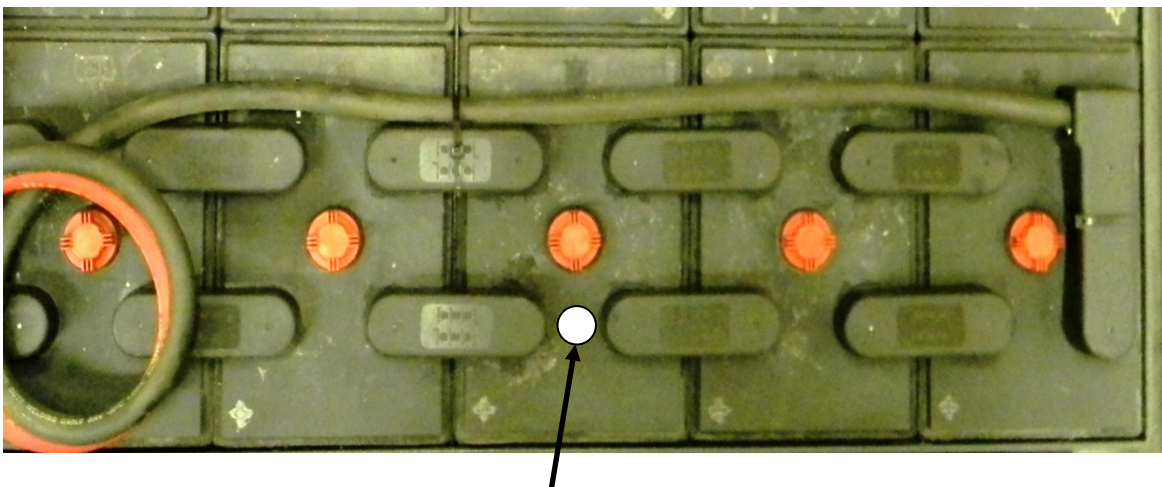


Figure 3 - Water Level Sensor Location

Flooded Batteries

Carefully drill a 0.5" hole in the center of the case of the selected battery cell. You must use a drill stop to avoid contact with the electrolyte or plates.

Seat the grommet securely in the hole then insert the water level sensor, submerging it into the electrolyte.

Sealed Batteries

The Water Level Sensor is not used.

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**4.3 Voltage and Current Sensor Wiring**

CAUTION	The current sensor wires must be attached first before Battery Positive and Battery Negative connections. This is required to properly reset the Battery Rx at time of installation. Refer to Figures 5 and 6.
----------------	---

Installing Mounting Hardware for Voltage and Current Sensor Wiring

1. Remove the plastic cover from the appropriate terminal or interconnect bar.
2. Drill a .188" diameter hole between .290" to .350" deep (drill bit supplied in hardware kit). Use of a drill stop is recommended.
3. Gently tap the knurled brass insert into the hole flush with the terminal/ interconnect bar surface. Refer to Figure 4.
4. Use the #6 screw, flat washer, and lock washer to attach the sensor wire to the insert. Torque the screw to 9.60 in-lb (1.085 N-m).
5. Apply a small amount of terminal protective grease to completely coat the screw and ring terminal.
6. Replace the plastic cover.
7. Repeat the procedure for each sensor wire.



Figure 4 - Knurled Brass Insert Installation

Installing the Current Sensor Wiring and Battery Rx Voltage Wires (See Figure 6)

- 1 Current Sensor Shunt (Blue) - attach to the positive (+) end of the cell interconnect, which is the side closest to the negative terminal
- 2 Current Sensor Shunt Temp (Black) - attach to the center of the interconnect
- 3 Current Sensor Shunt (Brown) – attach to the negative (-) end of the cell interconnect, which is the side farthest from the negative terminal
- 4 Battery Positive – attach to battery at positive terminal
- 5 Battery Negative – attach to battery at negative terminal

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- 6 Mid Pack Voltage - attach to the cell interconnect at the battery center.

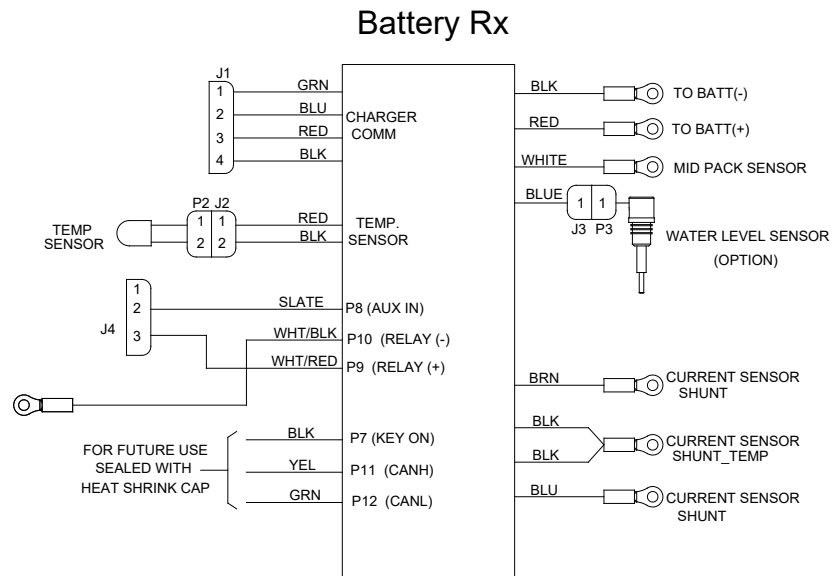
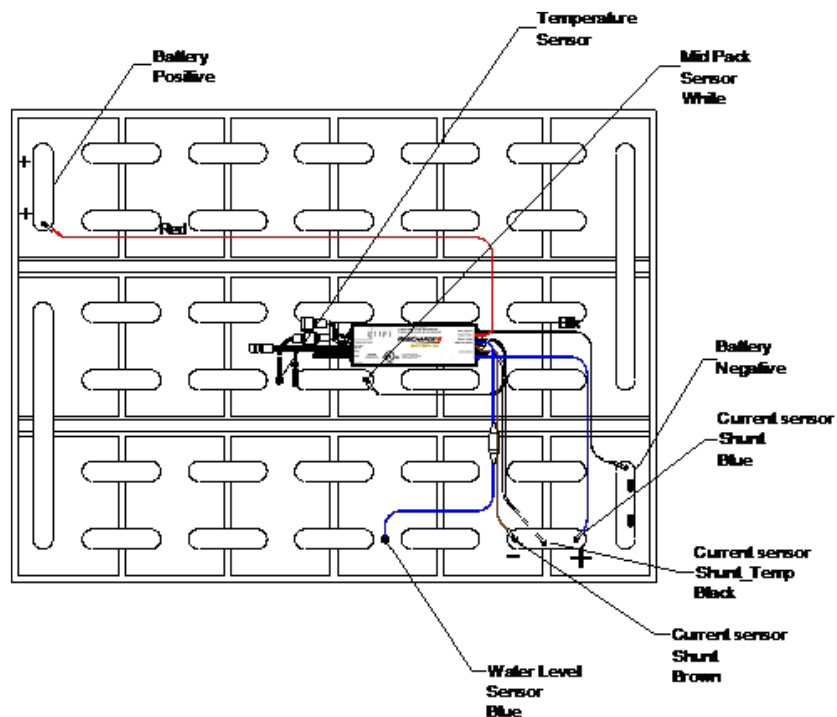


Figure 5 Battery Rx Wiring Diagram



IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**Figure 6 - Battery Rx Installation****4.4 Final Assembly**

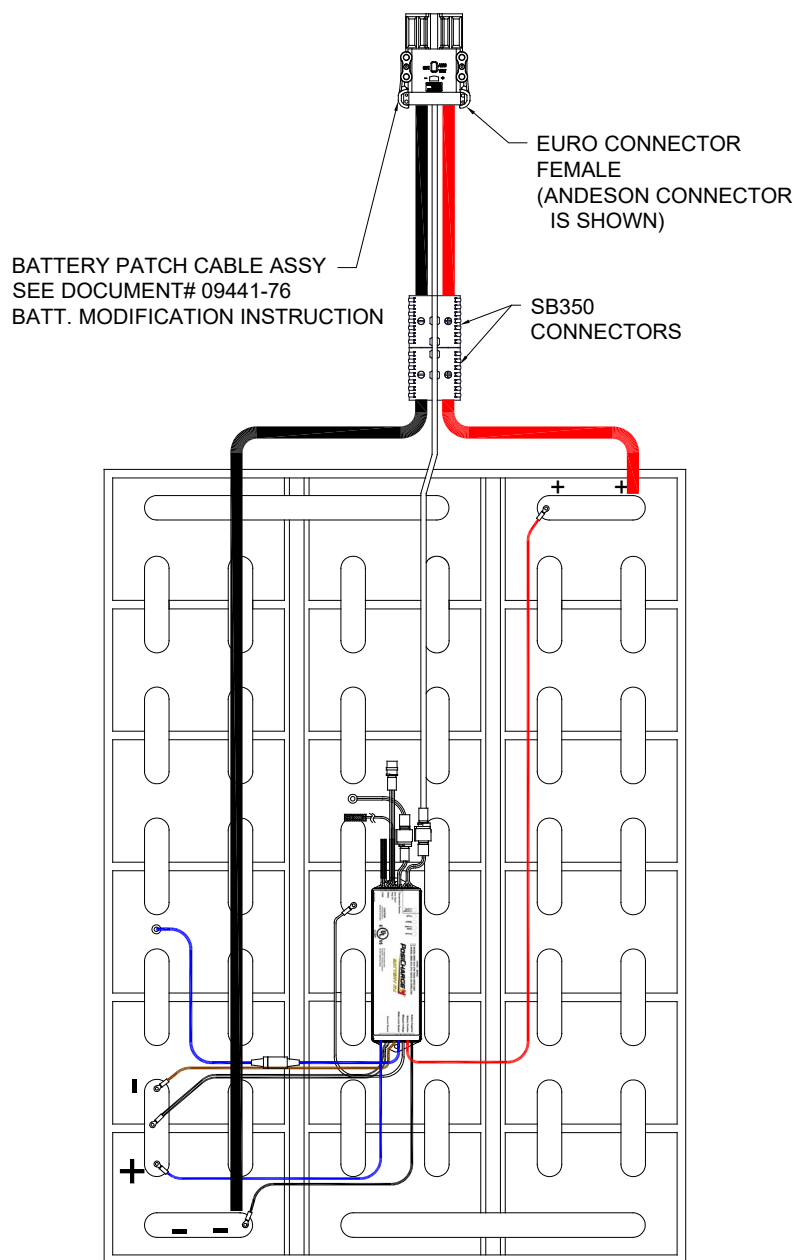
1. Secure the Battery Rx to a convenient interconnect bar with the supplied polypropylene tie-wrap.
2. For SVS / DVS / ELT / MVS Chargers only, connect the Charger Comm to the Battery Rx.
3. Connect the water level and temperature sensors to the Battery Rx.
4. Route and secure the wiring as required to prevent damage. Neatness counts.
5. Notify Customer Support of installation completion.

5 LED Status Indicators**BMID III status indicators visible from the top of BMID III:**

1. Green LED – on when power is supplied to the BMID III.
2. Orange LED - blinks during wireless communication with the back office.
3. Blue LED – blinks when water level is sufficient, off when water level is low.
4. Red LED – blinks if software error.
5. Yellow LED – blinks if the BMID III is communicating with the charger using SmartGuard, off if no communication.

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**6 Truck Kit Configurations****Single Euro Battery Side Connection**

Figure 7 show a typical installation of the BMID in a single connector pack.

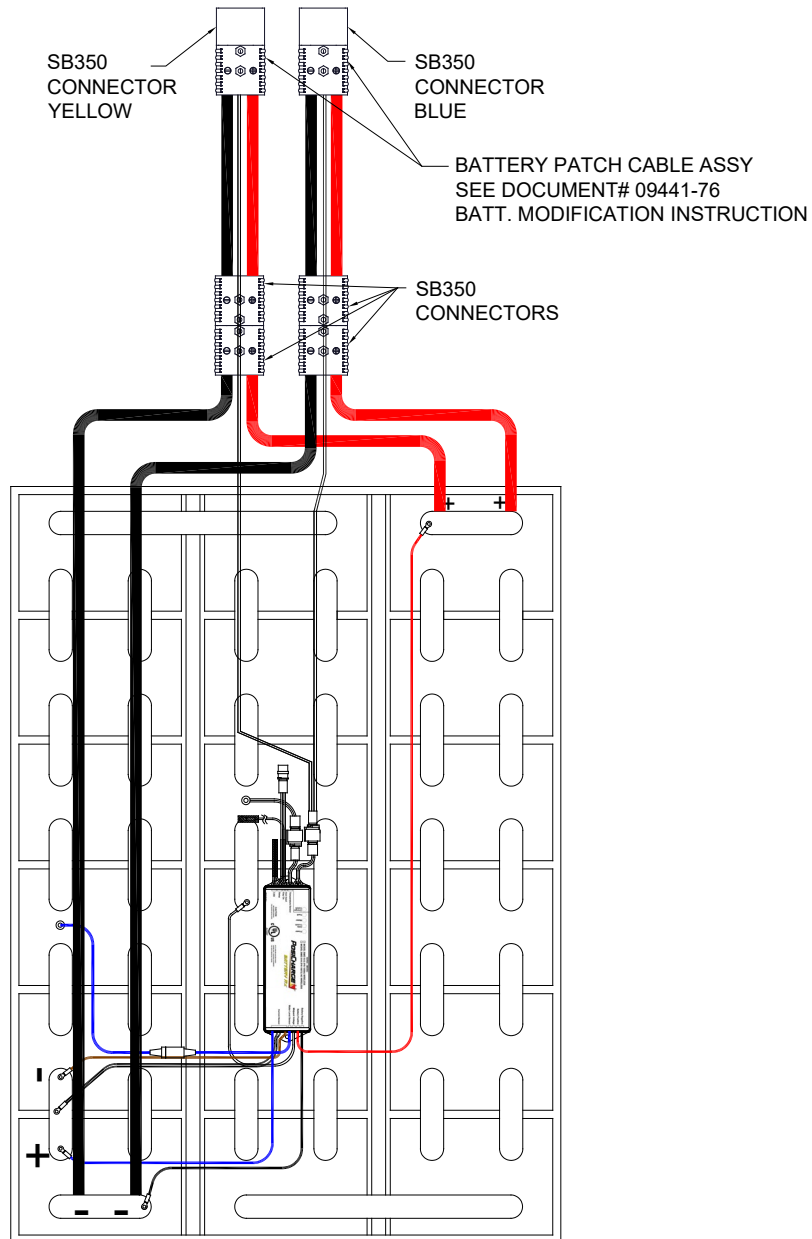


Representing 36V battery configuration

Figure 7 - Typical BMID Installation on a Single Connector Battery Pack

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**Dual SBX Connection Battery Side**

Figure 8 show a typical installation of the Battery Rx in a double connector pack.




Representing 36V battery configuration

Figure 8 - Typical BMID Installation on a Dual SBX Battery Pack

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**7 Pressure Wash Limitation**

BMID III has been designed to withstand high pressure wash spray to 120PSI.

	WARNING	Exposure to Pressure Washers above 120PSI voids warranty
---	----------------	--

8 Communication Wiring**8.1 Single Anderson Euro Connector Communication Wiring, Battery Side**

The communication wiring provides the safety interlock signal (called the pilot), and the communication between the BMID and the charger. The communication wiring must be connected properly for the SVS or MVS series chargers to initiate charge.

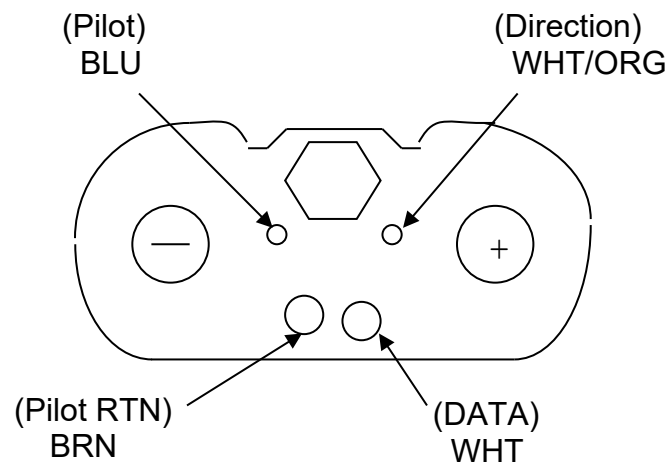
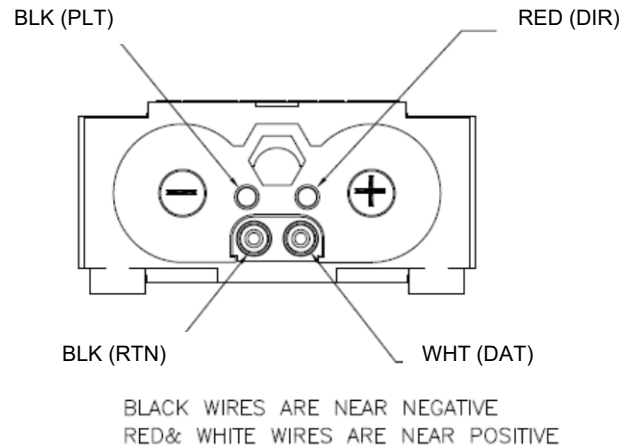
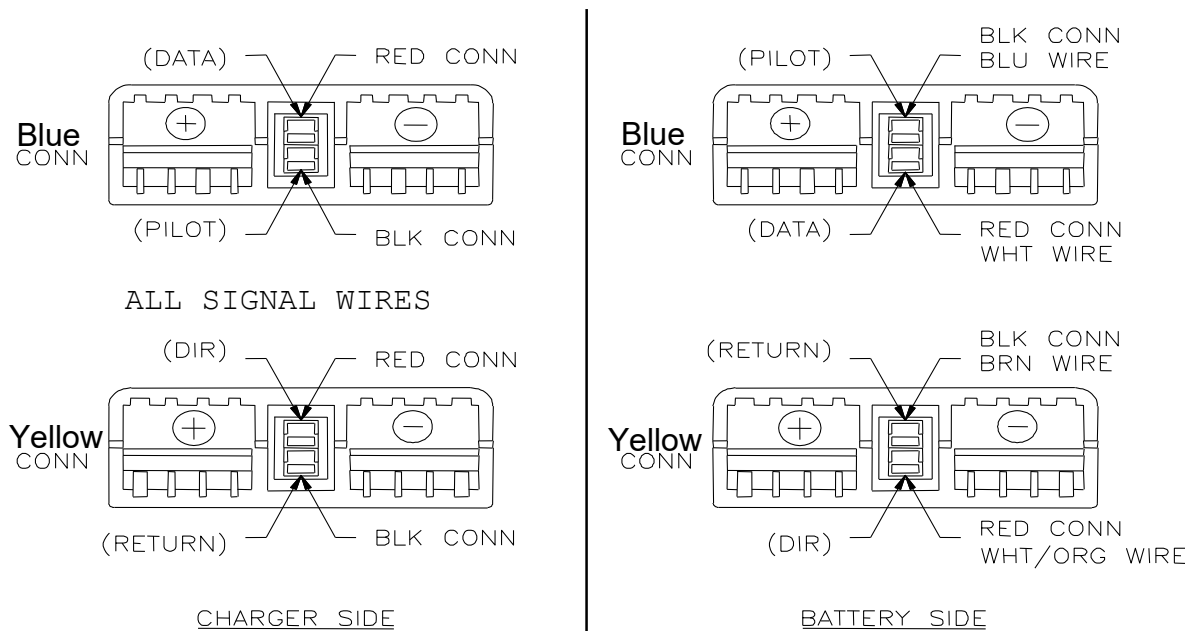
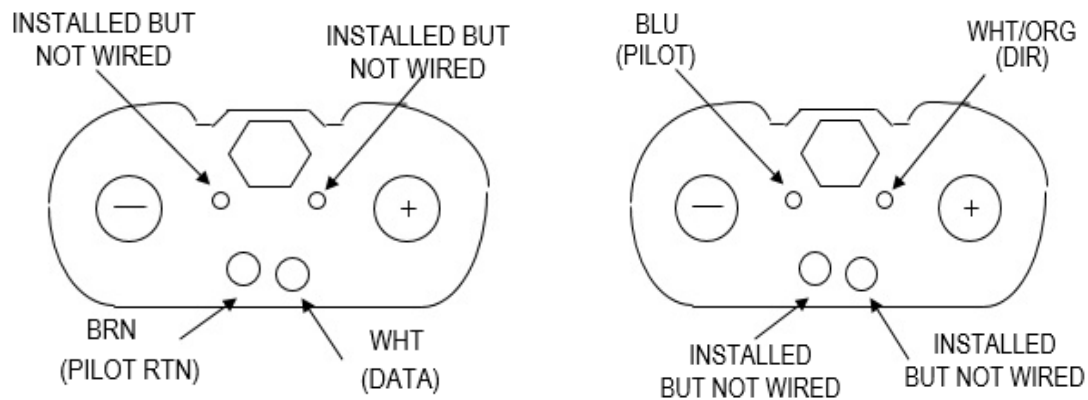


Figure 9 - Wiring for Anderson Euro A32

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**8.2 Single Schaltbau Euro Connector Communication Wiring, Battery Side**FRONT VIEW OF CONNECTOR**Figure 10 - Wiring for Schaltbau Euro LV320****8.3 Dual SBX Connector Communication Wiring, Charger and Battery Side****Figure 11 – Wiring for Dual SBX 320 Connector**

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**8.4 Dual Anderson Euro Connector Communication Wiring, Battery Side****Figure 12 Wiring for Dual Anderson Euro**

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9 Battery Rx Programming Guide

Note: If using a SVS, DVS, ELT or MVS fast charger to program the unit, you may skip directly to Sec 10.5 (pg. 28).

9.1 Battery Rx Dongle Utility Setup

1. From the installation disk, click on **Battery Rx Utility Install**. This will load the Prolific USB Driver, Dotnet 4.0, and the utility to the computer. Details outlined in the Battery Rx Utility DDA Installation Guide P/N 19078-76.

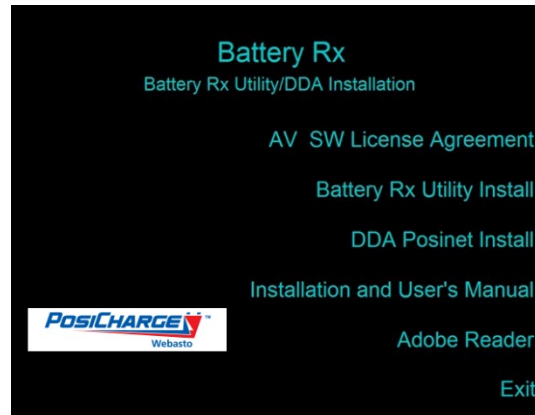


Figure 13 - Installation Disk Menu

2. Verify Battery Rx unit is installed on the battery (12-96 VDC).
3. Attach the Rx to the dongle.
4. Using an USB A/B cable connect the dongle to a USB port on the computer.
5. Double-click the "Battery Rx Utility.exe" file to run the program.
6. The program will automatically search and sync to the first available COM port.

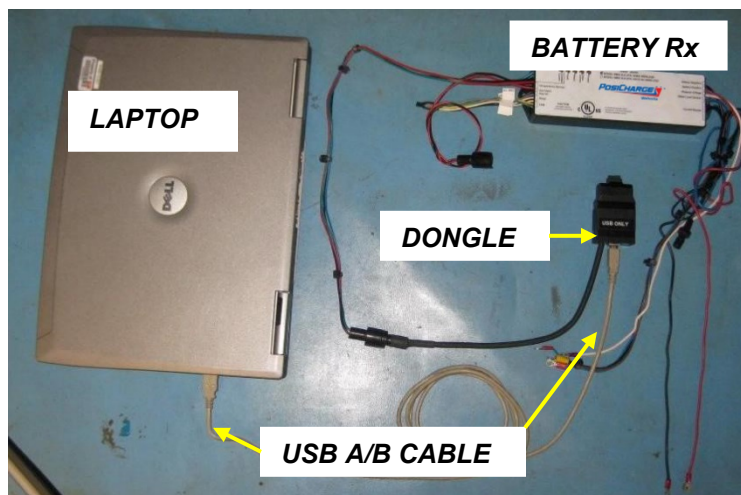
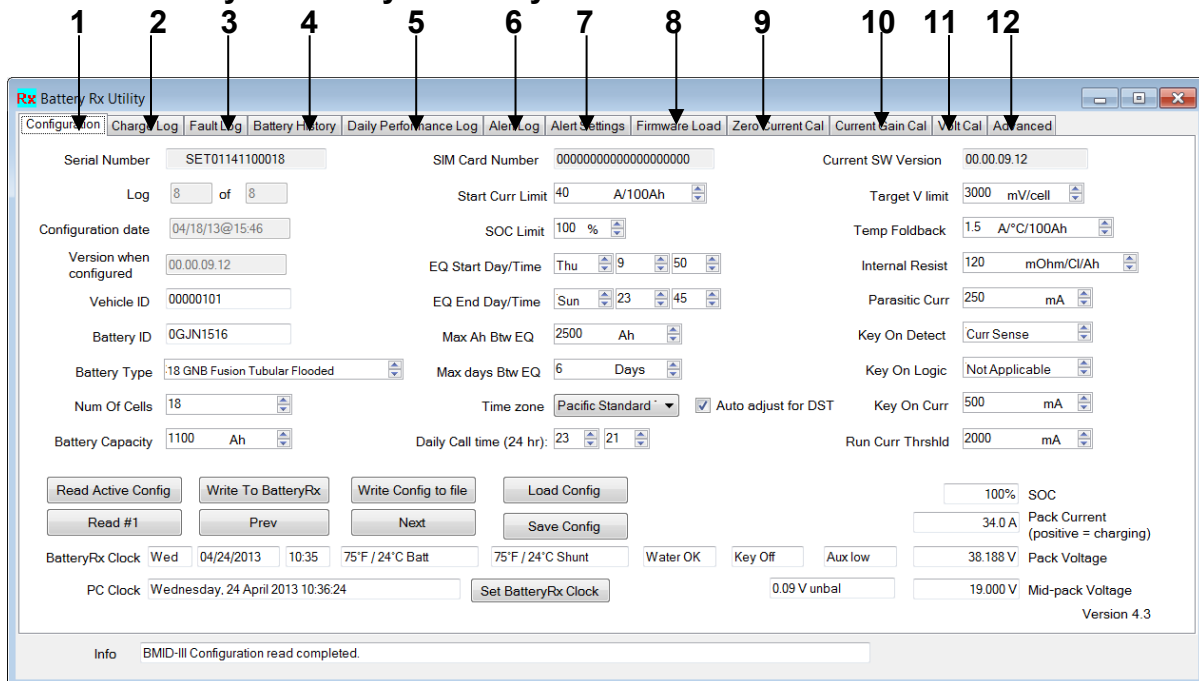


Figure 14- Dongle – Computer Connection Setup

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**9.2 Summary of Battery Rx Utility Features****Figure 15 - Battery Utility Interface**

Battery Rx Utility tool has features that program, collect information and load firmware to the unit.

1. Configuration - Set the Rx parameters.
2. Charge Logs - Download and view the Charge Logs.
3. Fault Logs - Download and view charger Fault Logs.
4. Battery History - Download and view the History Logs.
5. Daily Performance Logs - Download and view the Daily Logs.
6. Alert Logs - Download and view the BatteryRx Alert Logs.
7. Alert Settings - Set the Rx Alerts thresholds.
8. Firmware Load – Load new Firmware.
9. Set zero current calibration
10. Calibrate current sensor
11. Calibrate pack and mid-pack voltage sensors
12. Advanced features
 - a. BatteryRx Cloning
 - b. BatteryRx Clear logs
 - c. Generate BRAT data file

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9.3 Rx Configuration Programming Instructions Using the Utility

On the **Configuration Tab**, set the following parameters:

Figure 16 - BMID Programming Utility

1. **Vehicle ID:** Enter an 8-Character (Alphanumeric) Vehicle ID #.
2. **Battery ID:** Enter an 8-Character (Alphanumeric) Battery ID #.
3. **Battery Type:** Choose the battery type (2500 charger has 3 optional battery types).
4. **Battery Number of Cells:** Enter the number of cells of the battery.
5. **Battery Capacity:** Enter the battery capacity.
6. **Start Current Limit:** Recommend leaving default value (40A/100Ahs).
7. **SOC Limit:** Recommend leaving default value (100%).
8. **EQ Start Day/Time:** Enter the Equalization Start Day and Time.
9. **EQ End Day/Time:** Enter the Equalization End Day and Time.
10. **Max Ah Btw EQ:** Enter dash lines (-) at EQ Start Day to activate this option.
11. **Max days Btw EQ:** Enter dash lines (-) at EQ Start Day to activate this option.
12. **Time Zone:** Choose the Time Zone.
13. **Daily Call Time (24 hr):** Set the Call Time (Recommended 00:15).
14. **Target V Limit:** Leave as default (3000 mv/cell).
15. **Temperature Foldback:** Recommend leaving default value (1.5 A/C/100Ahs).
16. **Internal Resist:** Leave as default (120 mOhm).
17. **Parasitic Current:** Leave as default (250 mA).
18. **Key on Detect:** Leave as default (Curr Sense).
19. **Key on Logic:** Leave as default (Not Applicable).
20. **Key On Curr:** Leave as default (500 mA).
21. **Run Curr Thrshld:** Leave as default (2000 mA).
22. **Set Clock:** Click "Set Clock" - Syncs the Rx Unit time to the PC Clock.

Click "**Write to BatteryRx**" to store the new configuration.

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS**WARNING**

Ensure that BatteryRx configuration has been programmed prior to beginning Current Calibration.

9.4 Current Calibration - 2500 Series / Opportunity Chargers

When using the Battery Rx with a 2500 Series / Opportunity Charger, the Rx current sensor must be calibrated using a current clamp, dongle, laptop, battery and the Battery Rx Utility program. SVS series chargers are auto-calibrated and do not need this current calibration.

**WARNING**

A calibrated current clamp (Recommended: Fluke Model i1010 or equivalent) must be used to monitor the calibration current. Failure to use an accurate current clamp may lead to bad historical data and possibly void the Battery Rx warranty.

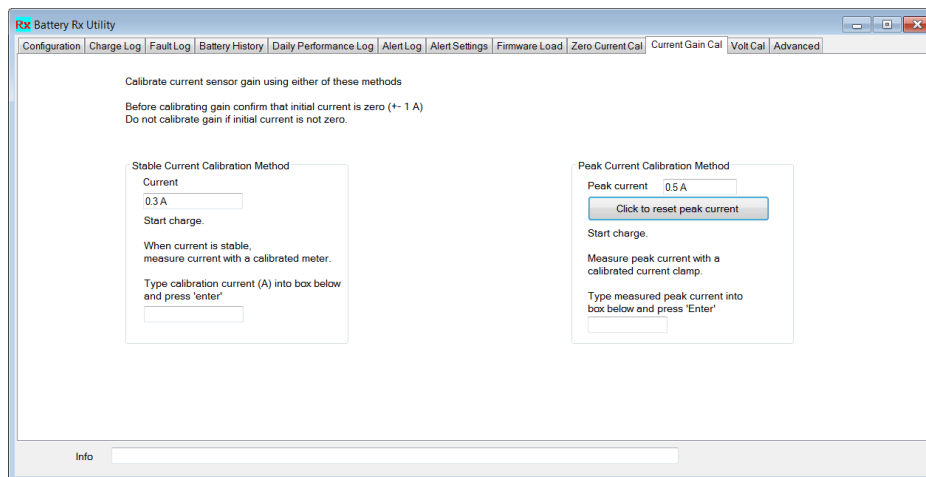


Figure 17 – Current Calibration Tab

Stable Current Calibration Method

Important: The battery on the truck should be discharged enough (e.g. <70%SOC) to ensure proper current calibration. Ideally, the current should be above 150 A. Alternatively, a load bank can be used in place of a charger.

1. Connect the battery to the charger.
2. Connect the current clamp to the charger output cable.
3. Stop the charge and note the Zero Amp value shown on the Battery Rx Utility screen (Tolerance = +/- 1.0A). Record this value on the Battery Rx Installation checklist (Appendix A).
4. Restart the charge and allow the current to stabilize at a constant value (10 sec. or more).
5. Enter the current that is shown on the current clamp into the Stable Current Calibration box in the Battery Rx Utility screen (current should be entered as

IMPORTANT INFORMATION – SAVE THESE INSTRUCTIONS

- negative if a load bank is used). Record this value on the Battery Rx Installation checklist (Appendix A).
6. Stop the charge and again note the Zero Amp value shown on the Battery Rx Utility screen. Record this value on the Battery Rx Installation checklist (Appendix A).
 7. Calibration is now complete. Fill in the remaining data on the Battery Rx Installation Checklist (Appendix A).

Alternative Peak Current Calibration Method

This method of calibrating the current sensor can be used if the current is not stable during the charge. This can happen if the battery is nearly fully charged.

1. Stop the charger. Confirm that the current is less than 1 A.
2. Place a calibrated clamp-type current meter on the positive charging cable.
3. Set the “maximum hold” feature on the meter to capture the peak current.
4. Click the “Click to reset peak current” button.
5. Start the charger and let it run until the current has peaked.
6. Stop the charger.
7. Type the peak current recorded by the meter into the box and hit <Enter>.
8. Restart the charger and confirm that the BatteryRx current readings match the current meter.

9.5 Manual Programming Rx Units with SVS/DVS/ELT/MVS Chargers

Figure 18 - Charger Control Panel

1. Make sure charger is on and the screen reads “**Charger Ready Connect Vehicle**”
2. Connect vehicle to the charger. If a charge begins, press STOP and proceed to step 3. If a BMID parameter fault or a charge fault is indicated, this is normal for a first time set-up and you should proceed to step 3.
3. Press the **SELECT** button until **BMID CONFIGURATION** appears.
4. Press **ENTER** Charger will prompt “**Enter Key Code**”

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5. Press and hold down the **DOWN ARROW** and **ENTER** keys until “**Key Code Accepted**” appears. Release keys and wait 10 seconds. The charger will automatically enter into the BMID Configuration mode and prompt **Initialize BMID**.
6. Press the **SELECT** button until **Initialize Date:** appears. Press the **UP and DOWN ARROW simultaneously for 10 seconds** (No indication of completion). Press the **SELECT** button until **Initialize BMID** appears. Select **OK**. Press **ENTER**. The Battery ID heading should appear.

Note: Use the **UP ARROW** and **DOWN ARROW** to change BMID parameters. Press **ENTER** to set values. Press **SELECT** to move on to successive entries.

- **Battery ID** - Enter an 8-character (alphanumeric) value.
 - **Vehicle ID** - Enter an 8-character (alphanumeric) value.
 - **BMID S/N** - Auto-populated - 8 digits.
 - **Initialize Date:** - Auto-populated.
 - **Battery Type** – Choose the battery type.
 - **Number of Cells** - Select # of cells.
 - **Battery Capacity** - Select Ahs capacity.
 - **Start Current Limit**. Recommend leaving default value (40A/100Ahs).
 - **Terminating SOC Limit** - Recommend leaving default value (100%).
 - **Internal Resistance** - Leave as default (120 mOhms).
 - **Max Ah Between EQs** – Enter dash lines (-) at EQ Start Day to activate this option.
 - **Max Days Between EQs** – Enter dash lines (-) at EQ Start Day to activate this option.
 - **EQ Start Day of the Week** – Select start day of the week.
 - **EQ Start Time** – Select start time.
 - **EQ End Day of the Week** – Select end day of the week.
 - **EQ End Time** – Select end time.
 - **Target Voltage Limit** – Leave as default (3.000 V/cell).
 - **Temperature Fold back** – Recommend leaving default value (1.5A/100Ahs).
 - **Key On Detect** - Leave as default - (Current Sensing).
 - **Key On Current Threshold** – Leave as default (0.5000 V).
 - **Run Time Threshold** – Leave as default (2.0000 V).
 - **Non_Posi Chrg Thres** – Leave as default (3.0000A/100Ahs).
 - **Non_Posi EQ Thrshld** – Leave as default (2.4000V/Cell).
 - **Parasitic Current** – Leave as default (0.2500 Amps).
7. Press **CLEAR** twice to exit the BMID PARAMETERS menu.
 8. Disconnect charger from the battery, wait for the charger to prompt **Charger Ready Connect Vehicle**. Connect the vehicle and confirm that a charge starts.
 9. Complete the Battery Rx Installation Checklist (Appendix A).

Note - The Current Calibration on the SVS/DVS/ELT/MVS Chargers are done automatically.

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Appendix A- Battery Rx Installation/Validation Data Sheet



Battery Rx Installation/Validation Checklist

Customer: _____

Charger Type:

SVS/DVS Indoor ☐

Battery Mfr: _____

Address: _____

DVS/MVS Outdoor ☐

Battery Voltage: _____

Opportunity ☐

Ah Capacity: _____

Contact: _____

Battery Type: Flooded ☐ Gel ☐ AGM ☐

Telephone #: _____

Battery Rx Firmware Version: _____

Installation Date: _____

				Validation					Calibration				Non GPRS units ONLY P/N 16672			
				For Use With the Battery Rx Utility Installer					Opportunity Chargers ONLY (Current Clamp Required)				(Call the Help Desk before changing the default values of the following parameters: Start I, SOC Limit, Target Voltage Limit, Temp Foldback, Internal Resistance)			
Vehicle ID	Battery ID	Unit Installed Correctly <small>See Pg 2</small>		Battery Temperature (Battery Rx Utility Screen)	Battery Voltage (Battery Rx Utility Screen)	Battery Voltage (Meter Reading) (Tolerance = +/-0.1v)	Mid Pack Voltage (Battery Rx Utility Screen)	Mid Pack Voltage (Meter Reading) (Tolerance = +/-0.25v)	Initial Zero Current (Battery Rx Utility Screen) (Tolerance = +/-1.0A)	Current Calibration (Battery Rx Utility Screen)	Current Calibration (Current Clamp Reading) (Tolerance = 200A +/- 2.0A)	Final Zero Current (Battery Rx Utility Screen) (Tolerance = +/-1.0A)	Start Current (I) Limit	EQ Start Day/Time (M, Tu, W, Th, F, Sa, Su)	EQ End Day/Time (M, Tu, W, Th, F, Sa, Su)	Time Zone (P, M, C, E)
		Yes	No													
1)	1)			°F	v	v	v	v	A	A	A	A				
2)	2)			°F	v	v	v	v	A	A	A	A				
3)	3)			°F	v	v	v	v	A	A	A	A				
4)	4)			°F	v	v	v	v	A	A	A	A				
5)	5)			°F	v	v	v	v	A	A	A	A				
6)	6)			°F	v	v	v	v	A	A	A	A				
7)	7)			°F	v	v	v	v	A	A	A	A				
8)	8)			°F	v	v	v	v	A	A	A	A				
9)	9)			°F	v	v	v	v	A	A	A	A				
10)	10)			°F	v	v	v	v	A	A	A	A				

1) Thermistor/Temp Sensor installed on centermost cell?
2) Water Level Sensor installed on 3rd cell from negative battery post?
3) Water Level Sensor operating properly?
4) Current Sense Shunt blue and brown leads installed correctly? (Blue lead nearest to negative battery post)
5) Current Sense Shunt leads installed prior to Rx voltage leads? (If not, reconnect the Rx voltage leads)
6) Charger Comm lead properly connected? (SVS/DVS/MVS Chargers ONLY)
7) Half Pack voltage lead installed correctly?
8) All wires bundled and routed neatly?
9) Date and Time set correctly?

NOTES: (Report unit failures, Changes to default parameters, etc)

Battery Rx S/N or Battery ID:	
Battery Rx S/N or Battery ID:	
Battery Rx S/N or Battery ID:	

1)	Place S/N Sticker Here (1)	7)	Place S/N Sticker Here (7)
2)	Place S/N Sticker Here (2)	8)	Place S/N Sticker Here (8)
3)	Place S/N Sticker Here (3)	9)	Place S/N Sticker Here (9)
4)	Place S/N Sticker Here (4)	10)	Place S/N Sticker Here (10)
5)	Place S/N Sticker Here (5)	11)	Place S/N Sticker Here (11)
6)	Place S/N Sticker Here (6)	12)	Place S/N Sticker Here (12)

Email the form to:
IPCSERVICE@webasto.com