

# dcConnect™



## WIRELESS VEHICLE MONITORING SYSTEM (wVMS)

### USER'S MANUAL

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*Important Safety,  
Installation,  
Operation, and  
Maintenance  
Instructions*

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**Lester**  
ELECTRICAL

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## RATINGS LABEL

The ratings label is located on the bottom of the Wireless Vehicle Monitoring System (wVMS) module. The label provides the serial number (SERIAL NO), part number (PART NO), nominal DC input voltage range of the battery pack (VOLTS), maximum continuous / peak measurable DC input charge current ratings (AMPS - C), and maximum continuous / peak measurable DC input discharge current ratings (AMPS – D) of the module.

An example ratings label is provided below.

<Insert Image>

Please fill in the blank label that is provided below with the information from the ratings label on your module for future reference.

<Insert Image>

Document any configuration or settings changes that are made by marking the ratings label on your module or on an additional label or tag attached to your module.

**SAVE THIS MANUAL: Keep it in a location where it is available to anyone who may operate the module.**

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## **IMPORTANT SAFETY INSTRUCTIONS**

1. **SAVE THESE INSTRUCTIONS** – This manual contains important safety and operating instructions.
2. Before using battery charger, read all instructions and cautionary markings on battery charger, battery, and product using battery.



**LOOK FOR THIS SYMBOL TO POINT OUT SAFETY PRECAUTIONS. IT MEANS: *BE ALERT—YOUR SAFETY IS INVOLVED.* IF YOU DO NOT FOLLOW THESE SAFETY INSTRUCTIONS, INJURY OR PROPERTY DAMAGE CAN OCCUR.**

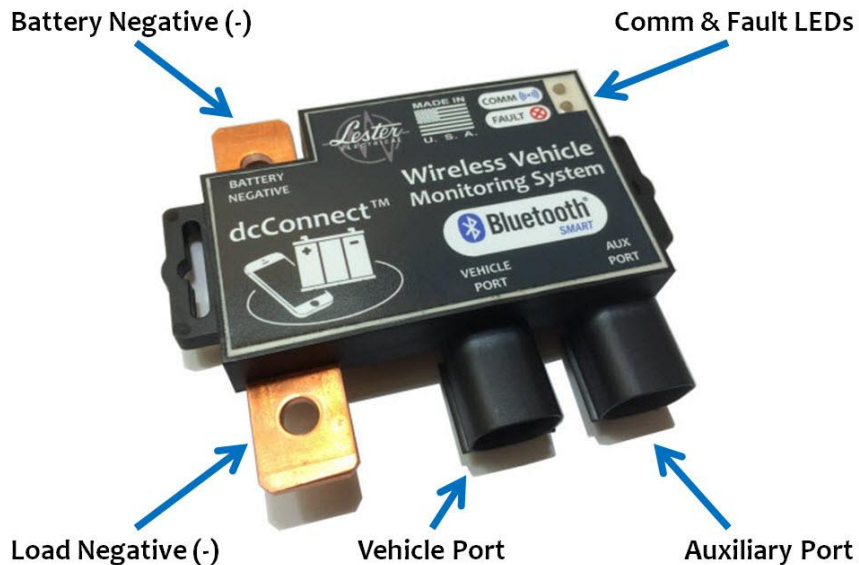
3.  **WARNING: DISCONNECT THE BATTERY CHARGER AND CONNECTION TO BATTERY PACK POSITIVE BEFORE INSTALLATION.**
4.  **WARNING: DO NOT ALLOW ANY METALLIC OBJECTS TO SHORT ACROSS THE TERMINALS OF THE MODULE TO ANY OTHER CONDUCTORS.**
5.  **WARNING: ALWAYS SHIELD EYES WHEN WORKING NEAR BATTERIES. DO NOT PUT WRENCHES OR OTHER METAL OBJECTS ACROSS BATTERY TERMINAL OR BATTERY TOP. ARCING OR EXPLOSION OF THE BATTERY CAN RESULT!**
6.  **WARNING: DO NOT PLACE THE MODULE ON OR NEAR FLAMMABLE MATERIALS.**
7.  **CAUTION: DO NOT INSTALL THE MODULE IF IT HAS RECEIVED A SHARP BLOW, BEEN DROPPED, OR OTHERWISE DAMAGED. HAVE A QUALIFIED SERVICE TECHNICIAN EXAMINE AND REPAIR AS NEEDED.**
8.  **CAUTION: DO NOT DISASSEMBLE THE MODULE. HAVE THE MODULE EXAMINED BY A QUALIFIED SERVICE TECHNICIAN. INCORRECT RE-ASSEMBLY OF THE MODULE MAY RESULT IN AN EXPLOSION, ELECTRIC SHOCK, OR FIRE.**
9.  **CAUTION: MAKE SURE THE BATTERY SYSTEM HAS THE PROPERLY RATED VOLTAGE, AMP-HOURS AND TYPE FOR THE MODULE.**
10.  **WARNING: IMPROPER CONNECTIONS TO THE MODULE CAN CAUSE AN ELECTRICAL FIRE.**
11.  **DANGER: TO PREVENT ELECTRICAL SHOCK, DO NOT TOUCH UNINSULATED PARTS OF THE MODULE, CHARGER DC OUTPUT CONNECTOR, BATTERY CONNECTOR, OR BATTERY TERMINALS. MAKE SURE ALL ELECTRICAL CONNECTORS ARE IN GOOD WORKING CONDITION. DO NOT USE CONNECTORS THAT ARE CRACKED, CORRODED OR DO NOT MAKE ADEQUATE ELECTRICAL CONTACT. USE OF A DAMAGED OR DEFECTIVE CONNECTOR MAY RESULT IN A RISK OF OVERHEATING OR ELECTRIC SHOCK.**

## **SAVE THESE INSTRUCTIONS**

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## 1. INTRODUCTION

<Insert Introduction>



*Figure 1-1: wVMS Module Connectors and Indicators*

## 2. RECEIVING AND INSTALLING THE MODULE

Unpack the wVMS module and examine it for shipping damage. In the event that shipping damage is found, report it as a claim with the freight company.

Do not operate a damaged module. Contact your dealer.

Proper installation is important to achieve optimum performance and life from module. Allow as much free air space around the module as possible. Please refer to the Specifications section for specific storage and operating environmental specifications.

### 2.1 Tools Required for Installation

**1/2" or 9/16" wrench** (battery post hardware)

**7/16" wrench** (shunt connection hardware)

**3/8" wrench** (shunt connection hardware)

**11/32" wrench or nut driver** (module mounting)

**1/4" wrench** (module mounting)

**Torque wrench capable of 90-100 in/lbs along with 1/2" or 9/16" deep socket** (battery post hardware)

**Torque wrench capable of 60 in/lbs along with 7/16" socket** (shunt connection hardware)

**Heat gun**

### 2.2 Installation Procedure

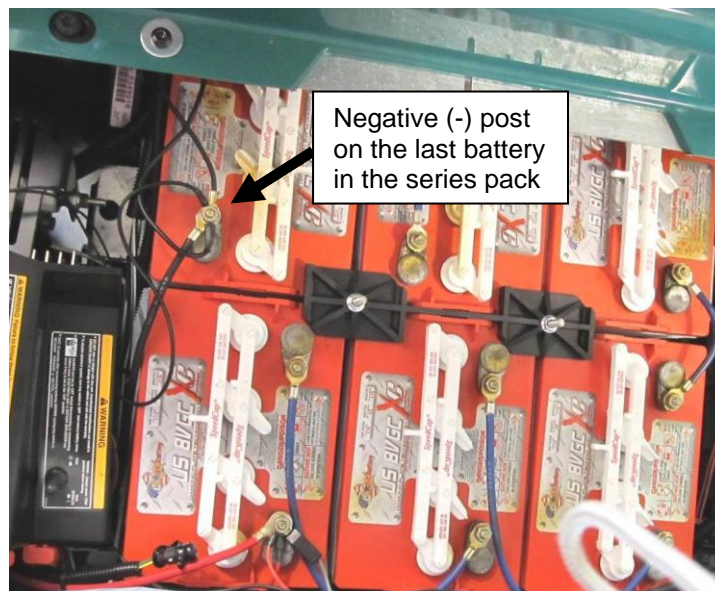
1. Before starting the installation process, you MUST verify that your vehicle is compatible with the wVMS module. Use the RATINGS LABEL section of this manual to compare the [1] nominal DC input voltage range of the battery pack (VOLTS), [2] maximum continuous / peak measureable DC input charge current ratings (AMPS - C), and [3] maximum continuous / peak measureable DC input discharge current ratings (AMPS - D) for the module to the ratings for your vehicle. If the ratings for the module are not compatible with the ratings for your vehicle, DO NOT install the module in your vehicle.
2. Place the key or switch into the OFF position.



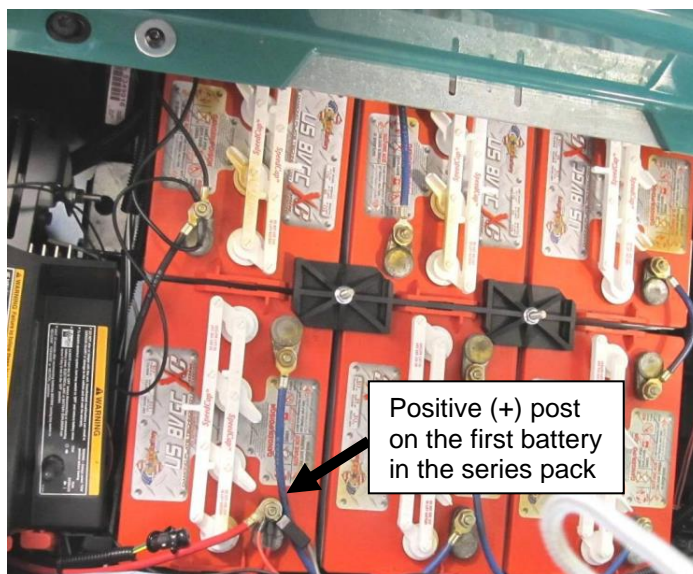
3. Locate the RUN/TOW switch (if it exists on your vehicle). Place the switch into the TOW position.



4. Locate the last battery in the series pack. Disconnect all battery cables attached to this battery's negative (-) post, which is system negative (-) for the battery pack, using the appropriate wrench.



5. Locate the first battery in the series pack. Disconnect all battery cables attached to this battery's positive (+) post, which is system positive (+) for the battery pack, using the appropriate wrench.



6. If using an optional module mounting bracket, mount the module to the bracket using the two (2) #8 screws and locking nuts. Tighten the hardware using the 1/4" and 11/32" wrenches.



7. Attach the #6 AWG cable to the end of the module shunt marked "BATTERY NEGATIVE" on the top decal and "- BAT" on the bottom of the enclosure using the 1/4"-20 hardware. Torque the hardware to 60 in-lbs (7 Nm). **NOTE:** If your vehicle uses battery cables larger than #6 AWG, ensure that your vehicle is compatible with the module, as is outlined in installation Step #1, and consult with your dealer before completing the installation.



8. Insulate the connection that you just made by placing the shrink tube over the 1/4"-20 hardware on the module shunt. Secure by shrinking the tubing over this connection using a heat gun.





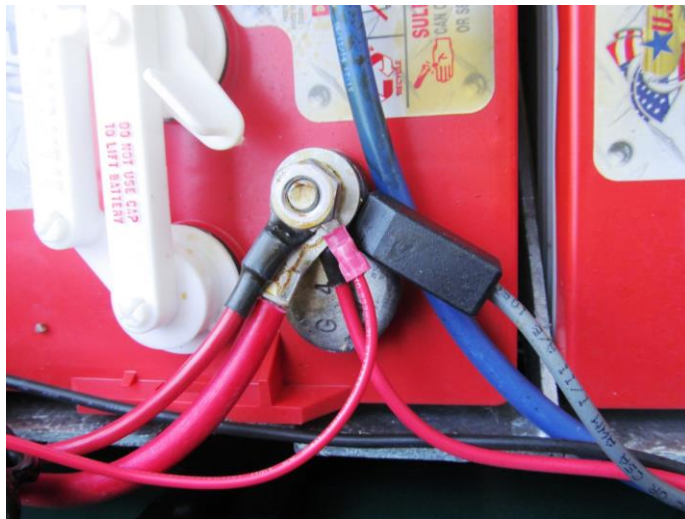
9. Mount the module to your vehicle, with or without an optional mounting bracket, ensuring that you will be able to reach the negative (-) battery post from installation Step #4 with the other end of the #6 AWG cable that you just connected to the module shunt.
10. Locate all of the cables that you removed from the negative (-) battery post during installation Step #4. Attach these cables to the module shunt connection marked "LOAD" on the bottom of the enclosure using the 1/4" hardware. Torque the hardware to 60 in-lbs (7 Nm).



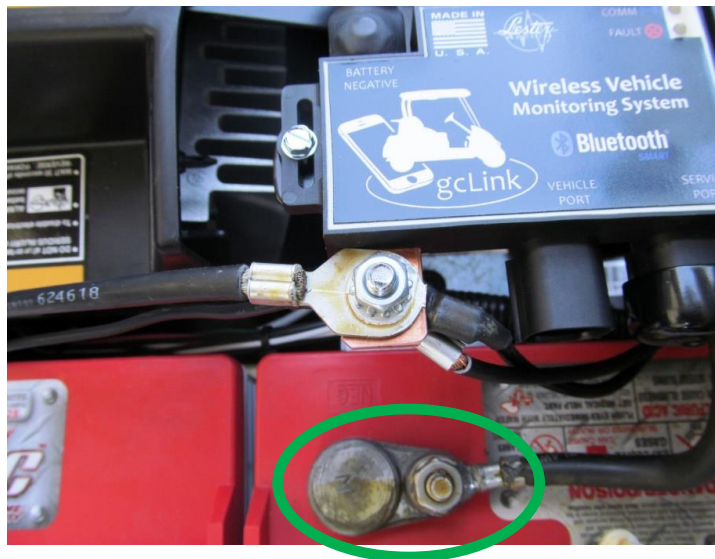
11. Locate the 6-pin connector assembly. The RED wire with the 5/16" ring terminal will be needed in the next step.



12. Locate all of the cables you removed from the positive (+) battery post during installation Step #5, along with the RED wire with the 5/16" ring terminal from the 6-pin connector assembly referenced in installation Step # 13. Install all of these connectors, including the RED wire from the 6-pin connector assembly, to the positive (+) battery post from installation Step #5. Torque the hardware to 90-100 in-lbs (10-12 Nm).



13. The other wires that are part of the 6-pin connector assembly are used with an optional wireless lockout assembly. Installation instructions are provided with these assemblies.
14. During installation Step #7, you attached a #6 AWG cable to the module shunt. Connect the other end of this cable (5/16" ring terminal) to the negative (-) battery post from installation Step #4. Torque the hardware to 90-100 in-lbs (10-12 Nm).



15. Connect the 6-pin connector assembly to the module connector labeled "VEHICLE PORT" on the top decal.



16. Secure all new wiring to the vehicle body using wire ties.

17. Locate the RUN/TOW switch (if it exists on your vehicle). Place the switch in the "RUN" position.



### 3. APPLICATION COMPATIBILITY AND INSTALLATION

<Insert Application Compatibility and Installation>

### 4. APPLICATION SETUP

After the installation of the wVMS module, some final setup items need to occur using the application.

When your module arrives, it is configured to allow any Bluetooth Smart application to connect to it. The first connection will give Administrative Privileges, or Rights, to the module. Administrative Privileges give the user access to the following functionality:

- Viewing/Changing the Rated Pack Voltage
- Viewing/Changing the Rated Pack Amp Hours
- Clear White List
- Accept All Devices on Next Connect
- Give Next Connect Admin Privileges
- Clear Battery History

To begin, turn on the device, open the application and connect to the module. (FOR ANDROID USERS: The application performs best if Bluetooth is enabled prior to making the application active. Bluetooth functionality is enabled in the device's settings menu.)

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## <Insert Application Screenshots>

If the application is not showing the functionality associated with having Administrative Privileges within the “Alerts & Settings” page, you will not be able to finish the Setup.

The following items need to be set/verified within the “Alerts & Settings” page.

1. Set/Verify the “Rated Pack Voltage”
2. Set/Verify the “Rated Pack Amp Hours”

Typically, the battery pack will list a 20 HR and/or a 5 HR rate. As a battery-powered electric vehicle will generally not be used in a manner that aligns strictly with these rates, the capacity of the pack may not strictly adhere to these rates either. Also, the actual Amp Hour capacity of the pack will vary depending on the age/use of the pack. If a 5 HR rate is specified, use the associated Amp Hour capacity with this rating. If ONLY a 20 HR rating is specified, use the 20 HR rating.

After setting, or altering, “Rated Pack Voltage” and/or “Rated Pack Amp Hours”, the VMS module must be rebooted. This is done by removing the 6 pin connector on the module labeled “Vehicle Port” from its receptacle, waiting a moment, and then plugging back in.

Note, it is allowed for a user to alter the Amp Hour rating at a later date if it’s felt the entered Amp Hour rating does not accurately reflect that of the pack. The user is reminded to reboot the module after altering the Amp Hour rating.

For the best user experience it is recommended to charge the battery, allowing the charge cycle to run to completion, after a module boot sequence. The first charge after a module boot sequence better aligns the State of Charge of the pack—giving a more accurate battery state.

Lastly, the user may wish to also change the “Device Name”. This is accomplished on the “Alerts & Settings” page. Please note, it may be necessary to reboot the device running the application in order for the device to utilize the new name. Please see the section “Rebooting Device” if instructions are needed to do so.

NOTE to dealers: After initial setup using the application, you will need to allow the owner’s application to connect to the device. This can be done in one of three ways by navigating to “Alerts & Settings”, and selecting either:

- “Clear White List”. This will allow the next user to connect to become the “first connection”—i.e. administrator, and erase the dealer’s device from the list of allowed connection devices.
- “Give Next Connect Admin Privileges”. This will allow the next user to connect to become an administrator, yet preserve the dealer’s device on the list of allowed connection devices.
- “Accept All Devices on Next Connect”. This will allow the next user to connect yet not to become an administrator and preserve the dealer’s device on the list of allowed connection devices.

## 5. REBOOTING THE APPLICATION

Occasionally, it may be necessary to reboot the application. This is done by completely closing the application and restarting it. Android and iOS devices have a similar, but slightly different methodology for doing this.

### Android

1. Push and HOLD the Home button to bring up the task manager.
2. Scroll to the application icon and swipe the icon to the left or right.

### iOS

1. Double click the Home button to bring up the task manager.
2. Scroll to the application icon and swipe the icon up.

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## 6. REBOOTING THE DEVICE

Occasionally, the device on which the application is installed may need to be rebooted. This is not an issue caused by application itself, but by general use of the device. Rebooting of Android and iOS devices is a fairly consistent process between the two types of devices. Simply Press and Hold the power button until the option of Reboot or Power Down becomes available. An option of Power Down only, obviously requires the user to turn on the device after the system has shut down.

## 7. SYSTEM OPERATION

<Insert System Operation with Screenshots>

## 8. FREQUENTLY ASKED QUESTIONS (FAQ)

1) Q) Why does the application report the battery voltage as being much higher than the nominal voltage of my pack?

A) A battery pack that measures at its nominal voltage is either in use or close to fully discharged. A fully charged pack can measure a good deal higher than its nominal voltage.

2) Q) The application seems locked up or unresponsive. How do I recover?

A) Reboot the application as described in the section "Rebooting the Application".

3) Q) The device on which the application is installed is acting erratically. How do I recover?

A) Reset the device as described in the section "Rebooting Device".

4) Q) Why am I not able to connect to the device? It seems to connect for a second and then drops off.

A) Connection privileges are limited to ten devices per VMS module. If the VMS module has given permission to less than ten devices to connect, the device in which you're attempting to connect, does not have connection privileges. A device with Administrative privileges needs to allow connection rights to the device which is not connecting. An Administrative device can allow connection privileges to another device by connecting to the VMS module, navigating to the "Alerts & Settings" page and selecting either:

a) "Accept All Devices on Next Connect" to give the next device that tries to connect simple connection privileges.

OR

b) "Give Next Connect Admin Privileges" to give the next device that tries to connect Administrative connection privileges.

## 9. WIRING DIAGRAM

<Insert Wiring Diagram>

## 10. SPECIFICATIONS

<Insert Specifications>

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## NOTES



Represented By:

