



# Instruction Manual for the Data Recorder Electric Expander

Document Version 1.8

Model # CDR-ECV

Thank you for your purchase! This instruction manual will guide you through the installation and operation of your Data Recorder Electric Expander. ***Please read the entire manual carefully before proceeding.*** If, after you read the manual (including the Troubleshooting section!!), you have further questions or problems, see the Support page on <http://www.eagletreesystems.com> for additional information, or email us at [support@eagletreesystems.com](mailto:support@eagletreesystems.com).

## Packing List

Your package should include the following: Electric Expander (standard 100 amp, or larger 300 amp sensor), and a printed version of this manual. Please check your box for printed addenda to this manual which may be included if changes were made after printing.

## How the Electric Expander Works

The Electric Expander is compatible with our Flight Data Recorder V2/Pro, all Seagull systems, Car Data Recorder, and Boat Data Recorder products. It is not compatible with our original Flight Data Recorder VI product.

The Electric Expander works with your Data Recorder to measure motor battery pack voltage and current. The Expander measures current by means of a tiny, lightweight hall effects current sensor ring. Battery pack voltage is measured by the alligator clip attached to the expander. NOTE: a common ground between your battery pack and the Recorder is required for the voltage measurement to work correctly.

## Connecting the Electric Expander to the Recorder

***EXTREMELY IMPORTANT:*** The Electric Expander Connector **\*\*MUST\*\*** be connected correctly to your Recorder, or severe damage to the Recorder will occur. The Expander connects as shown in Figure 1, to the right of the USB connector, with the RED wire of the connector facing UP. If you are uncertain as to how to connect the expander, don't hesitate to email us!

**IMPORTANT:** Do not connect the Battery as part of this step!

The expander plugs into the Data Recorder as shown in Figure 1. Make sure that you connect it in the correct location on the recorder, and with the correct polarity!

**WARNING:** Never connect the Electric Expander with the voltage measurement wire connected to your battery, unless you are absolutely sure of where to plug it into the Recorder! Connecting it to the wrong place on the recorder while 'hot' is guaranteed to cause serious damage to the Recorder.

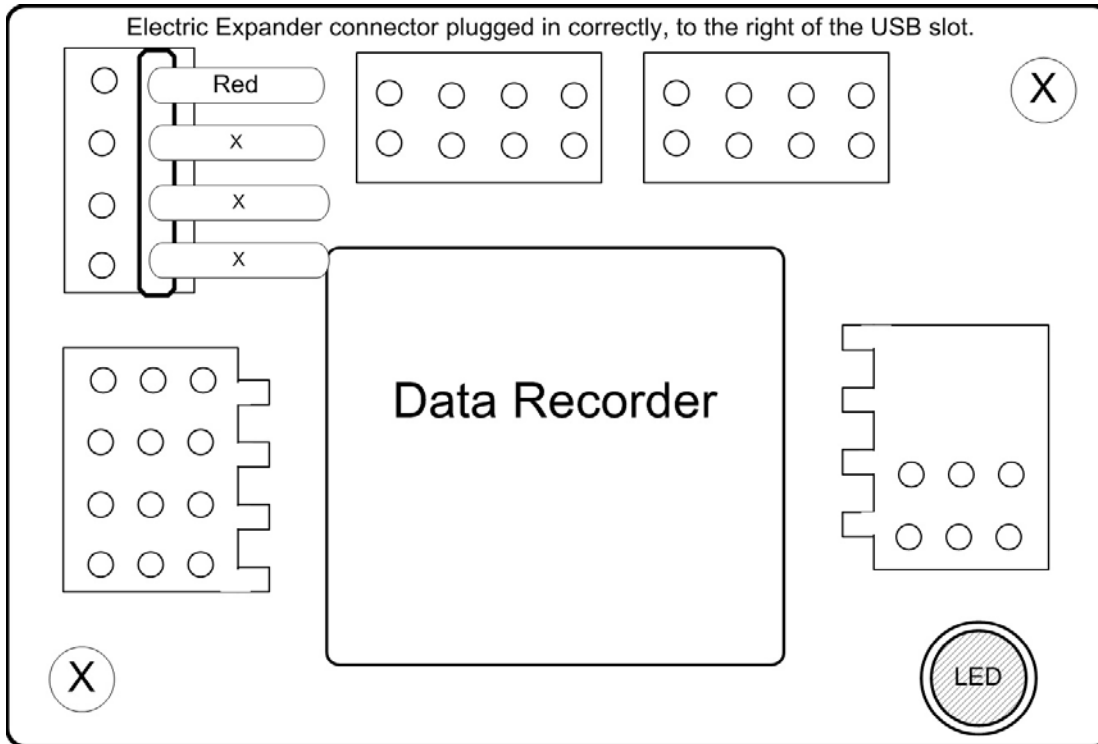


Figure 1

## Connecting the Electric Expander to Your Battery

To measure current the hall effects current sensor ring can be installed around either the positive or negative wire leading from your battery to your speed controller. It works through the wire's insulation, and hence no cutting of the wire is necessary. It can be installed facing either direction, as it is not polarized.

The alligator clip is for measuring battery pack voltage. It should be attached to an exposed part of the positive (normally red) battery wire or terminal between the battery and the speed controller. It must be in direct electrical contact with the positive battery wire. Alternatively, the alligator clip can be removed and soldered to the wire leading to the ESC for a more permanent installation.

If an easily removable installation is desired, one convenient way to do this is to have a removable wire "section" with Dean's or other plugs on either end (male/female). Both the current and voltage leads of the Electric Expander can attach to this wire section (the alligator clip is normally cut off and the voltage wire soldered), and the section can be removed easily from the model when electric measurement is not desired.

## Configuring the Expander with the Recorder and the Application

If you have not already done so, install your Data Recorder in your model and set up the Recorder software as described in your instruction manual.

### *Special Instructions for 300 Amp Sensor*

If you are using the **300 Amp sensor**, complete the following step:

- Connect the Recorder and click "Tools, Custom Hardware Options" and click ON the option for 300 Amp sensors. Then, click "OK".

### *Recorder Logging Setup*

If you desire to log current or voltage in the Recorder, connect the Recorder to your PC as described in the Recorder manual, and under Tools->Choose What to Log, choose Electric Motor Voltage and Electric Motor Current in the Optional Parameters section. Choose other parameters you want to log as described in the Recorder manual.

To display the new parameters, under Tools->Choose What to Display, choose numeric and/or instrument display of Motor Voltage, Motor Current, Motor Wattage, and/or cumulative amp-hours.

### ***Seagull Dashboard Setup***

If you are using the Seagull Wireless system, choose “Tools, Choose Parameters to Display on the Seagull Dashboard” and select the desired Dashboard parameters to display, per the Seagull manual.

## **Playing Back Data after the Run**

After your race, download data to your PC as described in the Recorder Manual. If you have selected to log and display motor voltage, current, and/or RPM, these instruments and/or numerical readouts should appear in the application.

## **Troubleshooting**

Below is a list of problems that may be encountered, and steps to remedy them. If your particular issue is not addressed by the below, see the Support page on <http://eagletreesystems.com> or email [info@eagletreesystems.com](mailto:info@eagletreesystems.com). Include a full description of your problem, your machine configuration, brands/models of receivers, transmitters and servos, application and Recorder firmware version if possible (from Help->About in the app) and any other relevant details.

**Issue:** I do not see motor voltage and/or current values changing after using the Expander.

**Solution:**

- Make sure that you have selected logging of voltage and/or current in the “Choose What to Log” dialog box under the Tools menu.
- If voltage is not working but current is working, make sure that there is an electrical connection between the ground wire of your battery and the ground (black) wires of your Recorder Y cables (receiver ground). Some BECs or ESCs isolate battery ground from receiver ground. However, to measure pack voltage there must be an electrical connection. We are aware of no issues with connecting a wire between battery ground and receiver ground in these cases, but proceed with caution as there is the unlikely possibility that your hardware may be damaged by such a connection, and make sure you do an antenna down range check after making this change.
- Ensure that you have selected motor voltage and/or current in the “Choose What to Display” dialog box under the Tools menu.
- Doublecheck your connections to ensure that the Recorder is connected correctly to the Electric Expander, and the battery.
- Ensure that you are operating within the ranges listed in the Specifications section below.

## **Electric Expander Specifications**

Motor Voltage: 0 to 50V

Motor Current: (standard sensor) 0 to 100 amps, with approximately 50 mA resolution  
(300 amp sensor) 0 to 300 amps, with approximately 150 mA resolution

Weight: (standard sensor) approximately 0.3 ounces  
(300 amp sensor) approximately 1 ounce

## **Limited Warranty**

Eagle Tree Systems, LLC, warrants the Electric Expander to be free from defects in materials and workmanship for a period of one (1) year from the date of original purchase. This warranty is nontransferable. If your unit requires warranty service during this period, we will replace or repair it at our option. Shipping cost to us is your responsibility.

To obtain warranty service, contact us by phone, fax or email to request an RMA number. No returns will be accepted without this number.

This limited warranty does not cover:

- The Software included with the Data Recorder. See the Software license agreement for more information on Software restrictions.
- Problems that result from:
  - External causes such as accident, abuse, misuse, or problems with electrical power
  - Servicing not authorized by us
  - Usage that is not in accordance with product instructions

- Failure to follow the product instructions

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