Instruction Manual for the Altimeter MicroSensor V4
Document Version 1.1

Thank you for your purchase! This instruction manual will guide you through the installation and operation of your Altimeter MicroSensor V4 (the Altimeter). ***Please read the entire manual carefully before proceeding***.   If, after you read the manual, 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.   Please visit our support web page for the full color, electronic version of this manual which may be updated if changes were made after printing, or if you want to view the manual on your computer.

Intended Uses
The Altimeter is intended exclusively for recreational use in radio control models and model rockets. Other uses are not supported. Further, using the Altimeter in situations where its use or failure could result in loss of life, bodily injury or property damage is expressly prohibited.

What the Altimeter Does
The Altimeter is a precision instrument that uses barometric pressure to measure altitude, just as full sized planes do.   Advanced temperature compensation and factory calibration ensure the best possible accuracy, with no user calibration required. When used standalone, the Altimeter displays your maximum altitude on the built-in 7 segment LED display.   The maximum altitude continues to be updated and displayed on the LED, until you turn power off and on the MicroSensor. When power is turned off and on, the maximum altitude from the last flight is displayed, and now the MicroSensor is ready to record your next maximum altitude (even if it is lower than the previous maximum altitude).

Additionally, the Altimeter can be connected to your eLogger V4 or V3 to provide altitude data for your entire flight, and can even be used in your own microcontroller/firmware project.   When connected to the eLogger, altitude data can be can be downloaded, displayed and graphed using the eLogger's Windows software. **NOTE: the Altimeter V4 is NOT compatible with our prior eLogger V1 or V2 products.**

Want to use the Altimeter for your own hardware/firmware project? Read on in the manual for more information!

Range check: It is extremely unlikely that the installation of the Altimeter will affect your model's radio range or control.   But, as always after making an electronics change to your model, it is very important that you range and function test your model once the Altimeter is installed to ensure that there is no impact on your system.

Packing List
Your package should include the following: The Altimeter, the Standalone Power Supply Cable, and a printed version of this manual.

## Installing the Altimeter in your Model
The Altimeter can be mounted anywhere in the model.   If you wish to read the LED without removing the wing or panel, a small rectangular hole can be cut at the mounting location of the circuit board, and the board mounted with tape or Velcro, so that the LED is visible at all times.   NOTE: If your airframe uses a "ram-air" intake into its cockpit area for cooling or other purposes, the pressure increase can cause a slightly lower reported altitude. To mitigate this, do not expose the Altimeter V4 to direct airflow or place it in a "ram-air" chamber. Also, to reduce additional error, do not mount the Altimeter V4 anywhere it will be exposed to rapid temperature changes during the flight.

Using the Altimeter in Standalone Mode

Powering the Altimeter in Standalone Mode
For standalone mode (not connected to an eLogger), connect the Standalone Cable to the gold pins of the Altimeter, as shown in Figure 1. The polarity of the connection is as follows:
RED = Positive (Vdd)

Figure 1
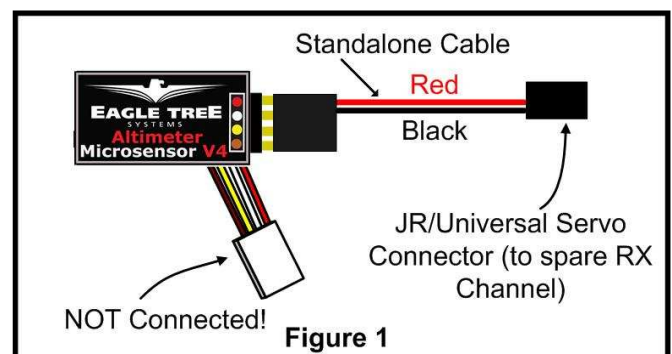
BLACK = Negative (ground)

Note that the RED wire of the standalone cable corresponds with the red dot on the label.

The JR/Universal servo end of the Standalone Cable connects to a spare Receiver channel or small battery. Note that the voltage must be between about 4V and 16V. **Do not exceed 16V**!

IMPORTANT: Ensure that you connect the Standalone Cable with the correct polarity, or the Altimeter could be damaged, voiding the warranty!   Note that in Standalone Mode, the 4 wire cable built into the Altimeter must NOT be connected to anything!

Configuring Metric vs English Units in Standalone Mode

When powered on, the LED readout will briefly display "0" if the unit is configured for English (Feet), or will display a "1" if configured for metric (Meters).   The factory default configuration is Feet.

To switch between English and metric units, connect the Standalone Cable as described above, but don't power the Altimeter.   Then, connect a small piece of wire (like a paperclip) between the unconnected pins of the Standalone Cable's 4 pin connector, corresponding to the brown and yellow dots on the label, as shown in Figure 3. This creates a jumper between the brown and yellow labeled pins.

Figure 2

Then, power the Altimeter via the Standalone Cable.   A "0" will then flash a few times to indicate that English units are configured, or a "1" will flash if Metric units are configured.   If the wrong units are configured, just disconnect the power from the Altimeter and reconnect it.

Once the desired units are configured, disconnect from power and remove the wire jumper.   Then, when reconnected to power, the desired units should be displayed briefly ("0" or "1").

Reading Altitude in Standalone Mode

When the Altimeter is powered on, after the Units setting is displayed ("0" or "1"), the highest altitude attained during your last flight is repeatedly displayed, one digit at a time, on the LED.   For example, if the highest altitude attained was 320 Feet, "3 – 2 – 0" will flash repeatedly on the LED, with a pause (blank LED) after the altitude is completely displayed, but before it is displayed again.

To reset the max trigger, just turn power off and on to the MicroSensor.   Then, after landing from your next flight, the highest altitude attained during that flight is displayed automatically, overwriting the highest altitude from your prior flight (even if the new highest altitude is less than the prior flight's highes altitude). **Note that an altitude of at least 60 Feet (18 Meters) must be attained, before a new highest altitude is displayed.**

The highest altitude of your last flight is automatically saved, so that when you turn the unit back on, that altitude is displayed.

For example, if you fly and reach a max altitude of 100 Feet, when you land "1 – 0 – 0" will be displayed.   Then, when you turn power off and on, "1 – 0 – 0" will again be displayed.   If you then fly again and reach an altitude of 500 Feet, "5 – 0 - 0" will be displayed when you land.
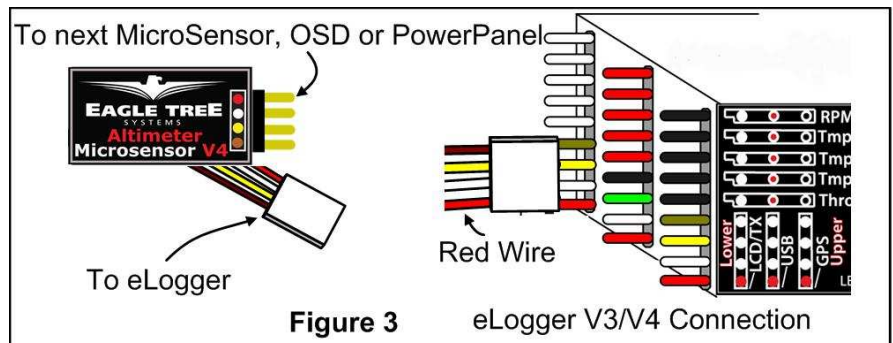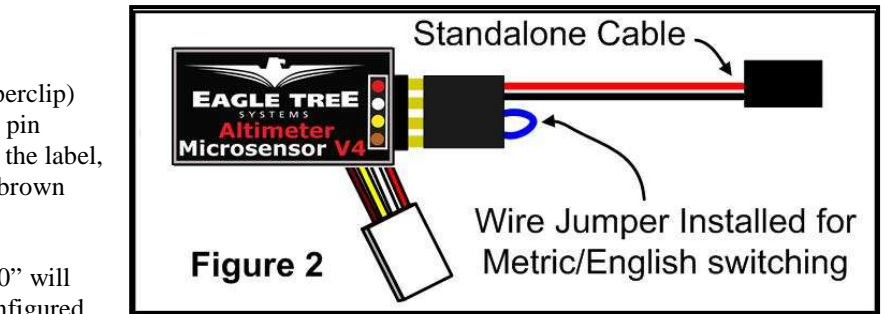
Using the Altimeter with your eLogger V4 or V3

Windows Software and Firmware Update

To use the Altimeter, you must update your software to **Eagle Tree Windows Software version 9.45** or later. To update, download the latest software from the support page of our website, located at http://eagletreesystems.com/Support/apps.htm .   After downloading and installing the software, the firmware of your eLogger will need to be updated.   To upgrade your firmware, just click "Hardware, Firmware Control" and click the Update button for the eLogger.

Figure 3

Connecting the Altimeter to the eLogger V4/V3

The Altimeter plugs into the "LCD/OSD" or "LCD/TX"

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port of your eLogger V4 or V3, as shown in Figure 3. If you have a PowerPanel or other MicroSensors, those can "daisy chain" connect to the pins on the side of your Altimeter, with the polarity as indicated on the Altimeter label. **NOTE: The Standalone Cable must not be used when connected to the eLogger!**

Configuring the Altimeter with the Windows Software
If you have not already done so, set up the Recorder software as described in your instruction manual. Then, choose one or more of the Altimeter options below:

Logging Altitude
To log altitude, just click "Hardware -> Choose Parameters to Log in the Recorder" and check the "Altitude" box.

Displaying Altitude in the Windows Software
To display the Altimeter Gauge and/or Numeric Altitude Display, click "Software, Choose Instruments to Display on the PC Screen" and check the "Altimeter Gauge," and/or "Numeric Altitude" boxes.

Graphing Altitude
To graph altitude, click "Data/2D Chart" and select "Altitude" for graphing.

Displaying Altitude on the PowerPanel LCD
Select "Hardware, Configure PowerPanel Display", and choose "Altitude" for PowerPanel display.

Using the MicroSensor with your own Firmware/Microcontroller

Please see this document for information on using the MicroSensor with your own firmware:

http://www.eagletreesystems.com/support/manuals/microsensor-i2c.pdf

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 support@eagletreesystems.com. Include a full description of your problem, your PC configuration, your Eagle Tree hardware and software versions, and any other relevant information.

Issue: Altitude doesn't vary in my recordings
Solutions:
- Ensure that the Altimeter is connected correctly to the MicroPower
- Ensure that you are logging altitude, under "Hardware, Choose Parameters to Log in the Recorder"

Specifications (Approx)

- Measures altitude up to approx 20,000 Feet (6096 Meters) Above Sea Level
- Resolution: approx. +/- 1 foot (0.3 Meters)
- Power input (Standalone Mode) : 4V to 16V
- Weight: approximately 4 grams (0.15 oz)
- Dimensions: approximately 28 mm x 16 mm x 10 mm (1.1" x 0.62" x 0.4")
- Precalibrated – no user calibration required
- Advanced Temperature Compensation
- Metric or English units

Limited Warranty
Eagle Tree Systems, LLC, warrants the Altimeter 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, email support@eagletreesystems.com for further instructions.

This limited warranty does not cover:
- The Software. See the Software license agreement for more information on Software restrictions.
- Problems that result from:

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- o External causes such as accident, abuse, misuse, or problems with electrical power
- o Servicing not authorized by us
- o Usage that is not in accordance with product instructions
- o Failure to follow the product instructions

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE (OR JURISDICTION TO JURISDICTION). OUR RESPONSIBILITY FOR MALFUNCITONS AND DEFECTS IN HARDWARE IS LIMITED TO REPAIR AND REPLACEMENT AS SET FORTH IN THIS WARRANTY STATEMENT. ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN TIME TO THE TERM OF THE LIMITED WARRANTY PERIOD AS DESCRIBED ABOVE. NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THE LIMITED WARRANTY PERIOD HAS EXPIRED. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THIS LIMITATION MAY NOT APPLY TO YOU.
WE DO NOT ACCEPT LIABILITY BEYOND THE REMEDIES PROVIDED FOR IN THIS LIMITED WARRANTY OR FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, ANY LIABILTY FOR THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES, FOR PRODUCTS NOT BEING AVAILABLE FOR USE, OR FOR LOST DATA OR LOST SOFTWARE. OUR LIABILITY WILL BE NO MORE THAN THE AMOUNT YOU PAID FOR THE PRODUCT THAT IS THE SUBJECT OF A CLAIM. THIS IS THE MAXIMUM AMOUNT FOR WHICH WE ARE RESPONSIBLE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.