EAGLE TREE
S Y S T E M S

Using the FMA CPD-4 Co-Pilot X/Y Sensor Head with the OSD Pro
Document Version 0.5 (beta version)

These instructions pertain to connecting the FMA CPD-4 X/Y sensor head (the head) to the OSD Pro, for display of the Artificial Horizon Indicator (AHI) line on the OSD Pro display.

Note that these instructions are to be followed at your own risk, since some splicing and soldering of wires is required. Don't for get to perform a full "antenna down" range check after the installation!!

Note also that the "X" mounting configuration for the head is not yet supported with the AHI display.

Eagle Tree plans to have a more straightforward connection method, which does not require splicing/soldering, soon.

Connecting the Head when using the Co-pilot Computer

This connection method is the easiest, but requires two 10K resistors. Your CPD-4 computer will continue to provide stabilization after the modification.

a) locate a 3 wire servo extension cable. This will be converted into a 2 wire cable.

b) To convert the cable into a 2 wire cable, cut off the unused part (where the signal line would normally connect), as shown in Figure 1 below. Remove the orange or white signal wire, leaving only two wires (black/brown and red wires).

c) solder a 10K resistor (wattage, tolerance not important) to the end of each of the remaining wires of the servo extension cable. Insulate the solder joints with heat shrink or electrical tape.

d) splice/solder the other ends of the two 10K resistors to the 3rd and 4th wire of the CPD 4 X/Y sensor cable, as
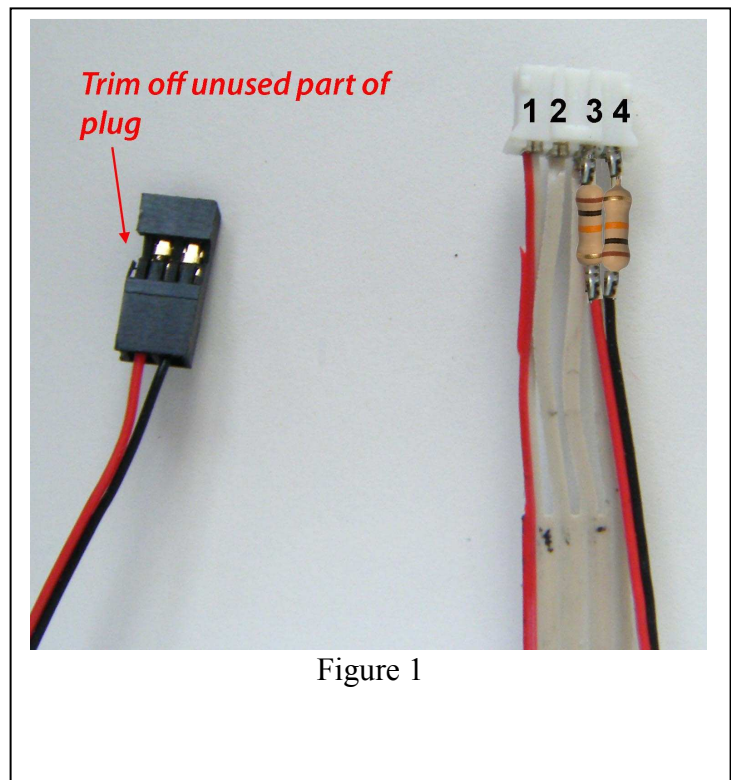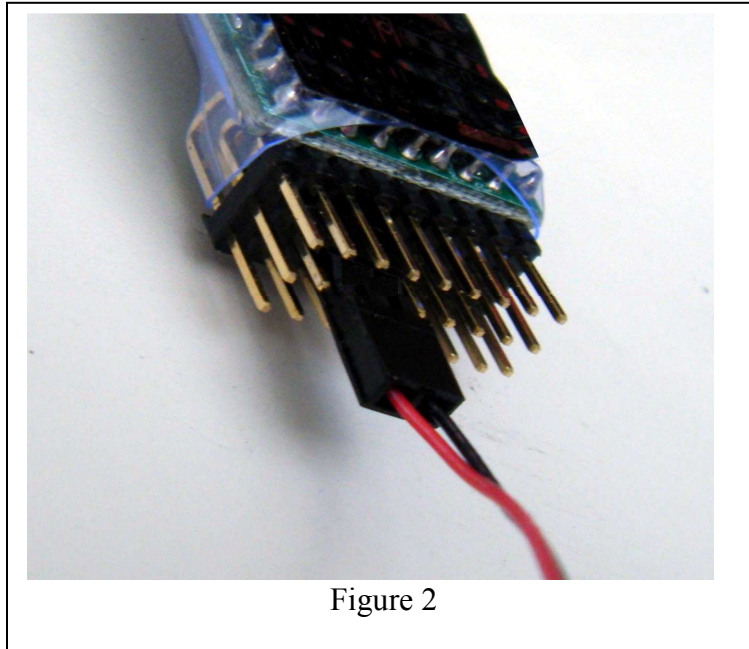

Trim off unused part of plug

1 2 3 4

Figure 1

shown in Figure 1. Note which wires are spliced, in relation to the polarization of the CPD-4 connector.   Do not rely on the red stripe on the CPD-4 connector for polarity, since this stripe's location varies among CPD-4 cables!

Note that the splice can be done anywhere along the length of the CPD-4 cable that is convenient. Figure 1 shows the resistors soldered to the end of the CPD-4 cable, since there was exposed metal there already.

Note: for clarity, the solder joints in the figure are not insulated. Of course, you must insulate them with tape or heat shrink!

e) connect the newly created 2 wire plug to the center pins of the "temp 2" and "temp 3" eLogger V3 inputs, as shown in Figure 2.   (note: this is not yet supported for Recorder users, but will be soon).   Note that the red wire goes to the center pin of "temp 2", and the black wire to the center pin of "temp 3."

Figure 2

f) Follow the software calibration instructions below.

Connecting the Head when NOT using the Co-pilot Computer

This connection method involves more wiring, but does not require the Co-pilot computer to be present for AHI display.   Note that no stabilization is presently provided when using this method.

a) Carefully remove the 4 pins from the connector at one end of the CPD-4 ribbon cable, by prying up the connector tabs with a needle or similar, and removing the pins from the connector.

b) Place electrical tape, small diameter heatshrink, or similar around each of the pins, so that they cannot touch each other when plugged into the eLogger.

c) The wires on the ribbon cable are numbered from "1" to "4" on Figure 3.   Note that these numbers correspond with the numbers shown in Figure 1.   Note: don't assume the red wire on the CPD-4 harness is wire number "1." Refer to the polarity of the CPD-4 connector in Figure 1 to determine which wire is wire 1.

Figure 3 and Figure 4 show how to connect these numbered wires to the eLogger. Note: the photos do not have the wire harness pins insulated, for clarity. But, you must do so!
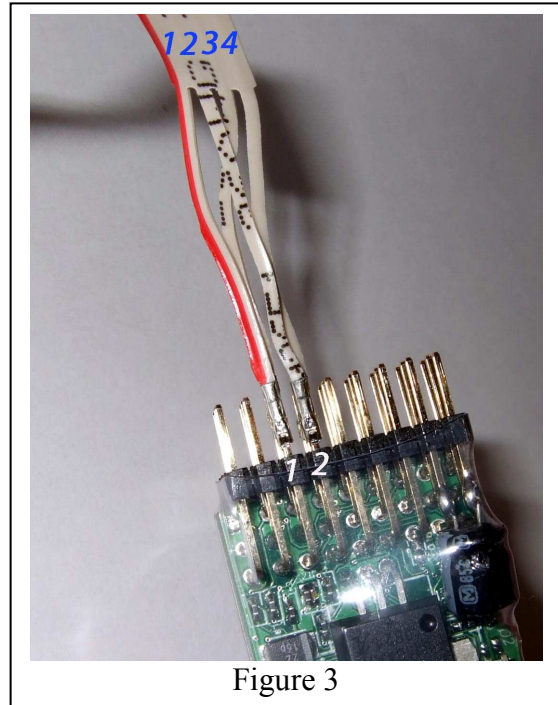

Figure 3

Here are the connections in text form:
Wire 1 connects to the bottom pin of the Temp 2 sensor input
Wire 2 connects to the bottom pin of the Temp 3 sensor input
Wire 3 connects to the middle pin of the Temp 2 sensor input
Wire 4 connects to the middle pin of the Temp 3 sensor input

Be careful to get the connections right, and make sure the pins can't touch each other. The eLogger or CPD-4 sensor could be damaged if so.

Also, note that if you build your own servo wires, you could replace the pins on the CPD-4 cable with servo pins, and then use two male servo connectors to build a more permanent cable.

d) Follow the software calibration instructions below.

Calibrating the AHI Display

After connecting the Head to the OSD Pro using one of the methods above, the next step is to configure the AHI display using the on-screen AHI menu.

Here are the steps to follow:

a) run the "AHI Calibration Wizard" in the AHI on-screen menu, as described below.
b) turn on the AHI Display in the same menu.

Figure 4

c) if the AHI display does not appear to be centered correctly in flight, choose the "Reset AHI for level flight" option on the on-screen menu, during flight.
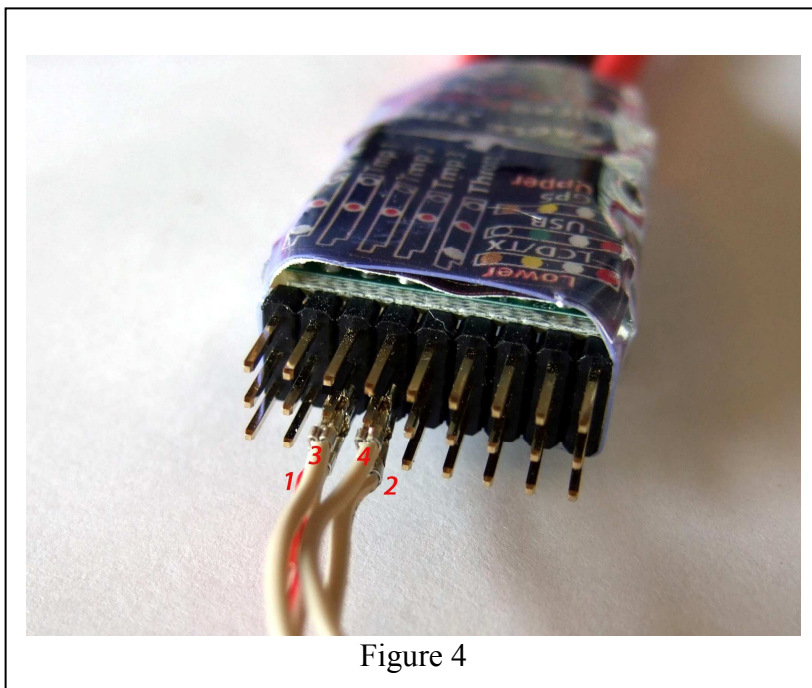
Here is a description of the AHI menu items:

- **Reset Level Flight:** This item lets you rezero the attitude sensor's settings, causing the AHI indicator to indicate zero bank and pitch.   This option should be used in-flight, when flying level
- **Show Artifical Horizon?:** Selecting YES enables the artificial horizon display to be enabled on the main screen
- **Use AHI Sensor for RTH?:**   (NOT YET AVAILABLE)
- **AHI Sensor Calibrate Wizard:** This wizard, described in detail below, calibrates the attitude sensor for AHI display.
- **CPD-4 without Servo Buffer?:**   This option may need to be set if are using the FMA™ Co-Pilot CPD4™ connected between the OSD-Pro and your servos.   See the *Using the Return to Home with Stabilization Systems* section in the OSD Pro manual for more information.

AHI Sensor Calibrate Wizard

The AHI Calibrate Wizard is used to calibrate the attitude sensor for use in displaying AHI on the main screen. The Calibrate Wizard must be run outdoors, during daytime, ideally at your flying field, in the open.   Each screen of the Calibrate wizard requiring you to make an adjustment is timed, and remains on the screen for approximately 10 seconds. Ensure that you have completed the adjustment before the timer counts to 0,

and make sure that you hold the adjustment until the next screen appears.   If you make a mistake during the Calibrate wizard, just run it again later.

- **Set model for level flight:** hold the model level with the ground (zero pitch and zero roll)
- **Tilt model full forward:** Tilt the model so that the nose is pointing straight down toward the ground, keeping the wings level.
- **Tilt model full backward:** Tilt the model so that the tail is pointing straight down toward the ground, keeping the wings level.
- **Tilt model full left:** Tilt the model so that the left wing is pointing straight down toward the ground, keeping the center line of the fuselage parallel to the ground.
- **Tilt model full right:** Tilt the model so that the right wing is pointing straight down toward the ground, keeping the center line of the fuselage parallel to the ground.