

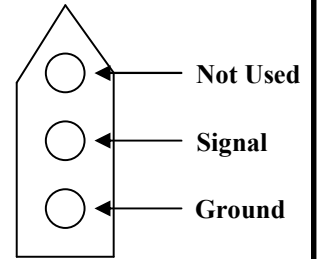
## 230-VM-USM setup for Fuel Level

### **(STEP 1) Mounting of USM (Universal Sensor Module)**

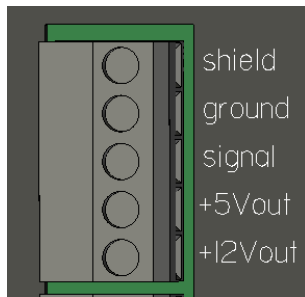
1. Select a location for the USM box. This should be located near the recorder to minimize the amount of V-Net cable length. Try to pre-plan the route that each sensor cable will take. This allows for proper installation of the module and best accommodates the sensor cables to the module layout.
2. Run the cable from the fuel level sensor to the USM location and cut cable to length. Ensure cable are secured to and located away from high heat areas and/or moving chassis components.

3. Connect wires to the fuel level sensor as shown:

**Ground = From sensor body**  
**Signal = From sensor signal wire**



4. Remove the 6 screws from the lid of the USM.
5. Mounted inside are four terminal strips, one for each channel corresponding to ports that are labeled 1-4 on the housing lid and channels 1-4 in the software. (shown below is a picture of one terminal strip for one channel)



**Shield**

Sensor cable shield wire (if cable is equipped)

**Ground**

Sensor ground / earth

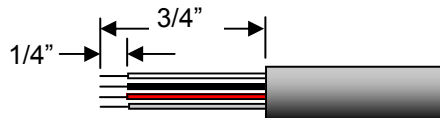
**Signal**

Signal from sensor to data logger

**+5V or +12V**

Power for sensor

6. Select the port labeled for each sensor you are installing.
7. Remove Strain Relief nut from USM box and slide it over the cable.
8. Carefully strip approximately .750" from the main cable jacket. Be sure not to damage internal wires.
9. Carefully strip approximately .250" of insulation from each sensor wire. (Red, Black, Clear, Shield, etc.)



10. Loosen the appropriate screws on terminal strip
11. Insert cable into strain relief on the appropriate port of the USM box.
12. Connect the correct wires to the terminal strip (shown on right) and tighten each terminal screw.
13. Slide strain relief nut to strain relief on USM box and secure tightly.
14. Reinstall the housing lid and 6 screws

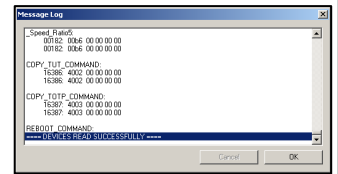
**Not Used = Red Wire**  
**Ground = Black Wire**  
**Signal = Clear Wire**

**In order for the USM to read and work correctly, the USM must be programmed into configuration file. Continue to Step 2 on next page.**

# Programming of Fuel Level

## **(STEP 2) Adding USM Sensor Channels to Datalink II Software**

1. Connect the Racepak serial communication cable between your PC and the data logger
2. Power up the data logger and wait 5 seconds.
3. Open the DatalinkII software.
4. Open the configuration file using the command **File / Open Car Configuration** from the main menu. Select the configuration matching your Racepak data logger and click on the OK button. For instance, V300\_1000 or IQ3\_config.
5. Select **Edit**, then **Read VNET Config** located in the main menu selection.  
**Note: Insure power to the data logger is on, before the Send process. If the PC will not communicate with the data logger, turn the data logger power off , wait 5 seconds, then turn on and retry. If a USB to serial adapter is in use, disconnect the adapter from the PC, reconnect and verify COM port settings.**
6. When selected, a Message Log dialog box will be displayed and the **Read VNET Config** process will start. When completed the following Message Log dialog box will appear (as shown on right).
7. The message **DEVICE READ SUCCESSFULLY** should appear at the bottom of the dialog box indicating the read was successful.
8. Select **OK**
9. You will now have 4 new channels in the channel list for the USM module (as shown).
10. Select **File** from the menu bar then select **Save**.



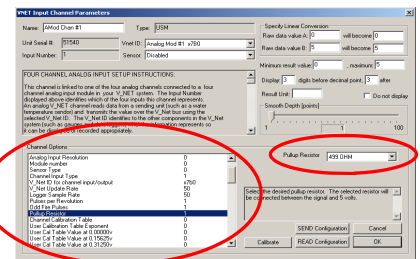
AMod Chan #1	N/S
AMod Chan #2	N/S
AMod Chan #3	N/S
AMod Chan #4	N/S

This action will automatically add the four sensors channels from the USM, to the Configuration file, as shown. The AMod Chan numbers correspond with the numbers molded on the USM lid, found above each cable input port.

**Note: The Read function adds the 1-4 Channel Buttons regardless if any sensors are connected to the USM.**

## **(STEP 3) Programming Sensor Channel Name / VNET ID / Sensor Type**

1. Right click on the channel matching the port that is wired to the fuel level sensor. This will open the VNET Input Channel Parameters dialog box.
2. Using the pull down arrow found in the **Vnet ID** input box, locate **Fluid Levels**.
3. Click the **+** to expand the list and then select **Fuel Tank Level 1**.
4. Using the pull down arrow found in the **Sensor** input box, scroll down, locate and select the **0-5 Volt Standard Resolution Sensor**.
5. Under the Channel Options window (bottom left corner) change the **Pullup Resistor** to **499 OHM** (as shown on right).
6. Click the Send Configuration button found on the bottom right corner.  
**Note: Insure power to the data logger is on, before the Send process. If the PC will not communicate with the data logger, turn the data logger power off , wait 5 seconds then turn on and retry. If a USB to serial adapter is in use, disconnect the adapter from the PC, reconnect and verify COM port settings.**
7. When the send action is complete, as indicated by the **Devices Read Successfully**, select the OK button.
8. Turn the power off on the recorder for at least 5 seconds.
9. Programming is now complete.



**Continue to Step 4 on next page to calibrate the values and sensor**

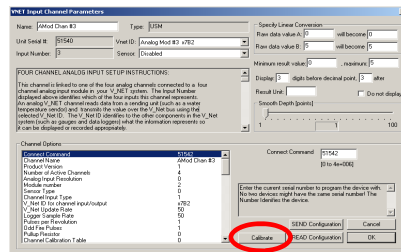
# Calibration of Fuel Level

## (STEP 4) Fuel Level Sensor Calibration

**Note:** If sensor is installed in tank and cannot be removed for ease of calibration, the tank must be completely empty prior to starting calibration sequence. Once sequence is started, the below process will set values when empty, then the tank will need to be completely filled so full values can be set.

**To calibrate the newly installed sensor, perform the following procedures:**

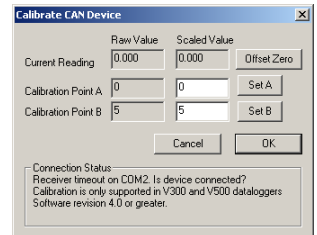
1. Connect the serial cable between the Racepak data logger in the car and your PC.
2. Apply power to the RacePak data logger and wait at least 5 seconds.
3. Start the DataLink software in your PC.
4. Select **File** from the menu bar then select **Open Car Configuration**. Select the configuration matching your Racepak data logger and click on the OK button. For instance, V300\_1000 or IQ3\_config.
5. Right click on the **Fuel Level** channel. This will open the VNET Input Channel Parameters dialog box..
6. Locate the Calibrate button, at the bottom right corner of the dialog box. Left click this button.



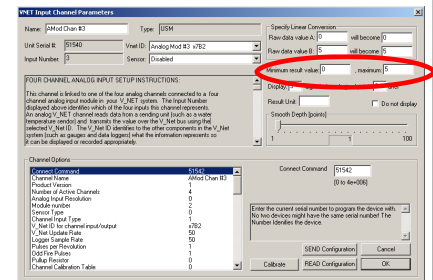
7. The system will connect to the fuel level sensor and open a CAN Calibrate Device dialog window.

**NOTE:** To assign calibration values, we will use the Set A and Set B buttons. Set A will be our first calibration point. This is entered with the fuel level sensor in an empty position. (0 % fuel).

8. Insure the fuel level sensor is at the empty position and the Scaled Value is at 0.
9. Click the Set A button. The system will reassign the current output voltage reading to the Set A box.
10. Now completely fill the tank (or physically move the sensor to the full position (100% fuel).
11. Insert 100 into the Set B Scaled Value input box and click the Set B button.
12. Select the **OK** button.



13. Next we need to edit the Minimum Result Value to 0 and the Maximum to 100. These numbers are found in the upper right corner of the VNET Input Channel Parameters dialog window and are used for the graph scaling.
14. Select the SEND Configuration button, located in the lower right corner of the VNET



15. Input Channel Parameters box, then select OK when completed.
16. Select File from the menu bar then select Save
17. Turn the power off on the recorder for at least 5 seconds. Throttle calibration is now complete.

**Installation, Programming and Calibration are now finished. System is ready for normal use.**