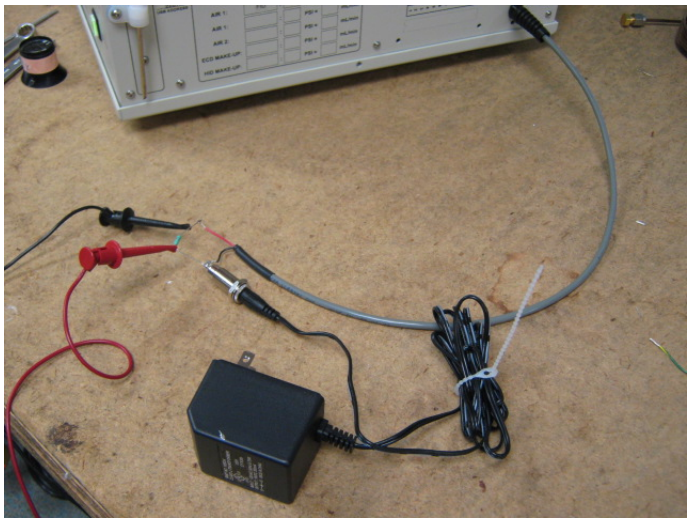
4-20milliamp output from PeakSimple

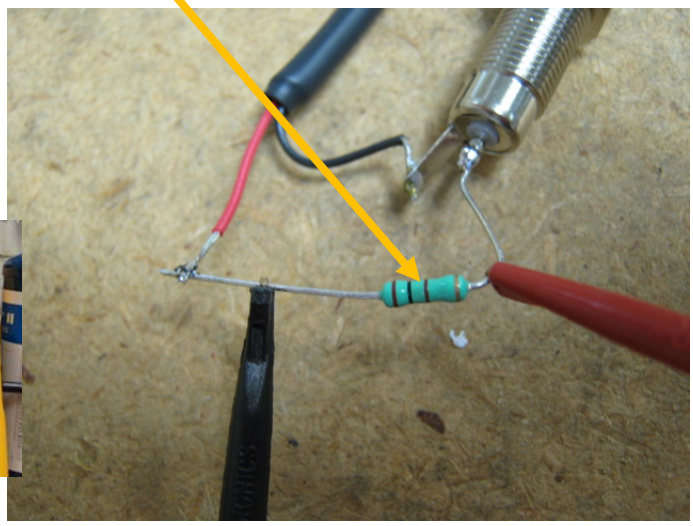
October 2013

PeakSimple is capable of outputting one 4-20milliamp signal. Only one 4-20ma signal per A/D board is possible. The 4-20 output signal is a two wire cable that exits the right side of the GC.



The user must add a power supply of some type and a sensing resistor.

In this case the sense resistor is 100 ohms, and has been added to the end of the 4-20ms output cable as a visualization aid. In reality, the power supply and resistor would be some distance away at the control room or where the 4-20ms signal is monitored.

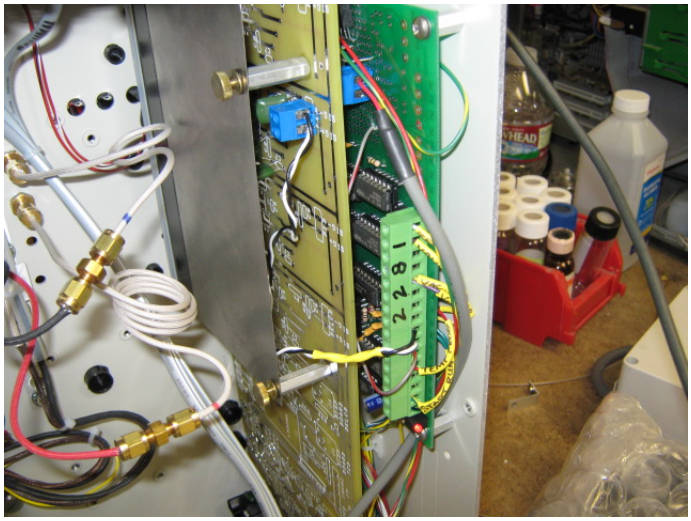


For a quick test, use a voltmeter connected across the sense resistor to measure the voltage created by the 4-20ma current. If the sense resistor is 100 ohms, then a 4ma current will result in a voltage of 400millivolts across the resistor.

4-20milliamp output from PeakSimple

October 2013

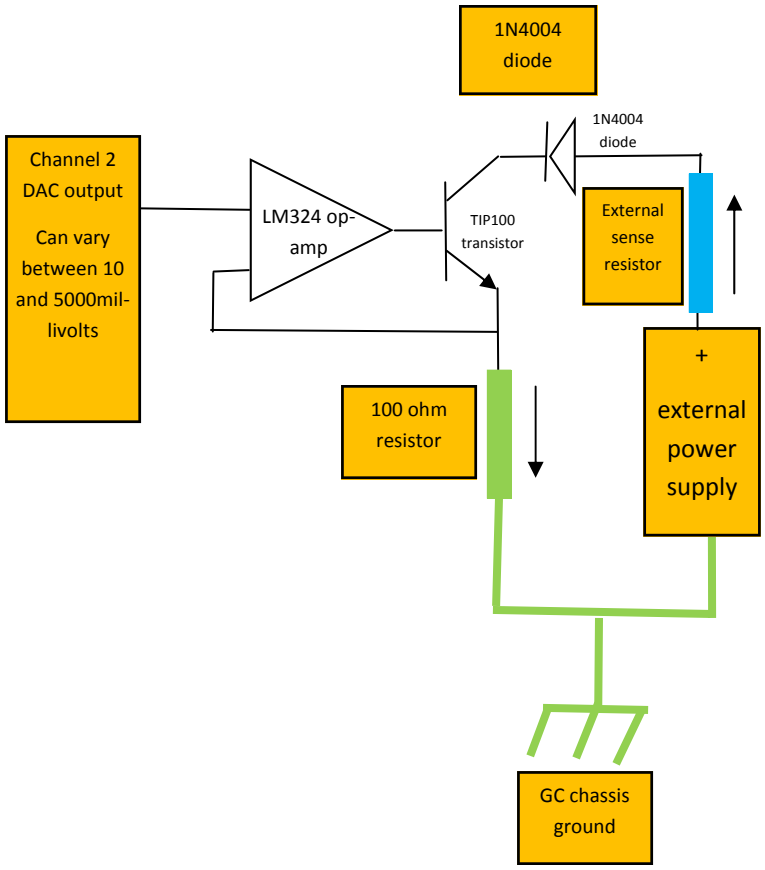
The 4-20ma circuit is located on the Model 333 A/D board.



The circuit itself looks like the diagram at right.

The channel 2 DAC outputs a voltage which is converted to a current by the LM324 op-amp and power transistor. If the DAC output is 400 millivolts then the current is 4ma. If the DAC ouput is 2000millivolts then the current is 20 ma.

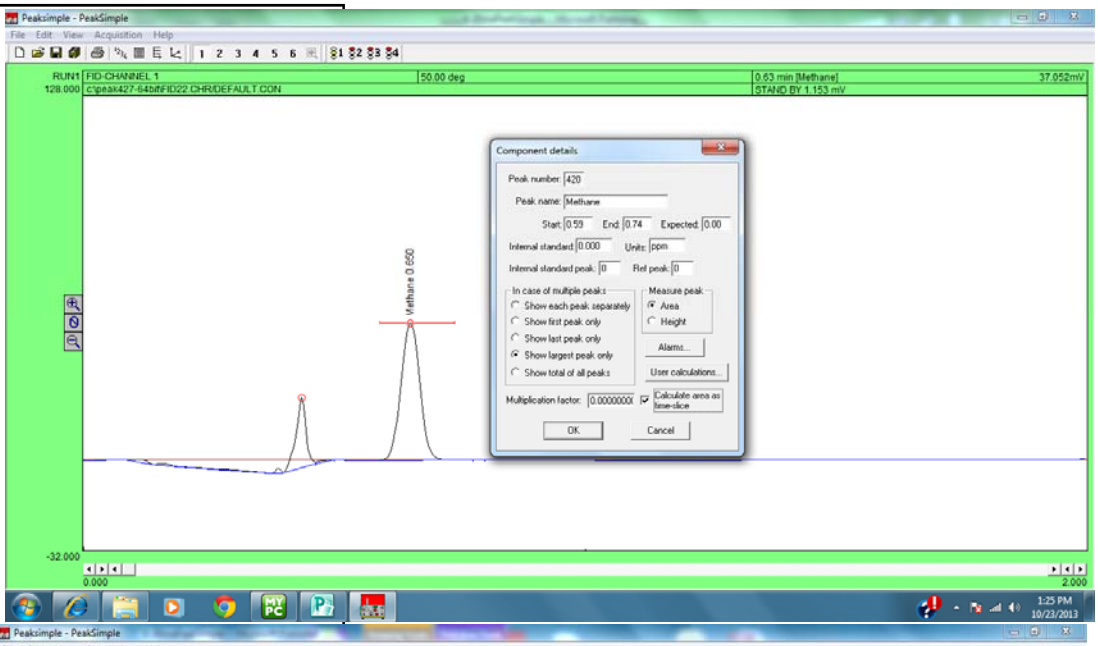
In PeakSimple, channel 2 must be ACTIVE for this to work.



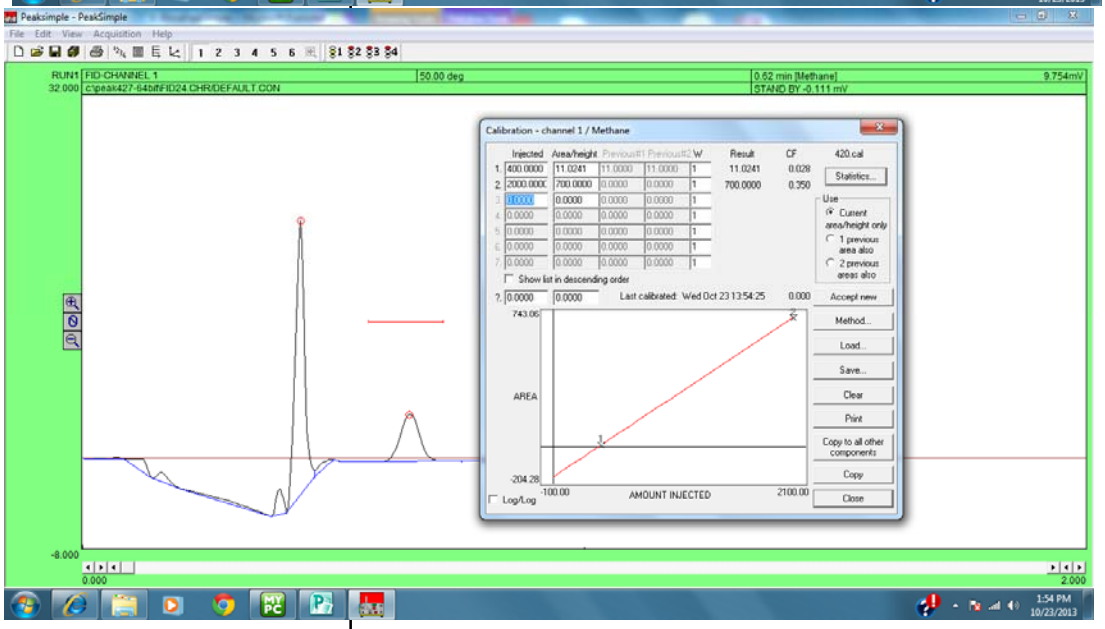
4-20milliamp output from PeakSimple

October 2013

Select a peak which you want for the 4-20 output. In this case, it's a methane peak.



Create the retention window with the peak number 420. The 420 peak number is a special number which triggers the 4-20 output. Other peak numbers will not do this.



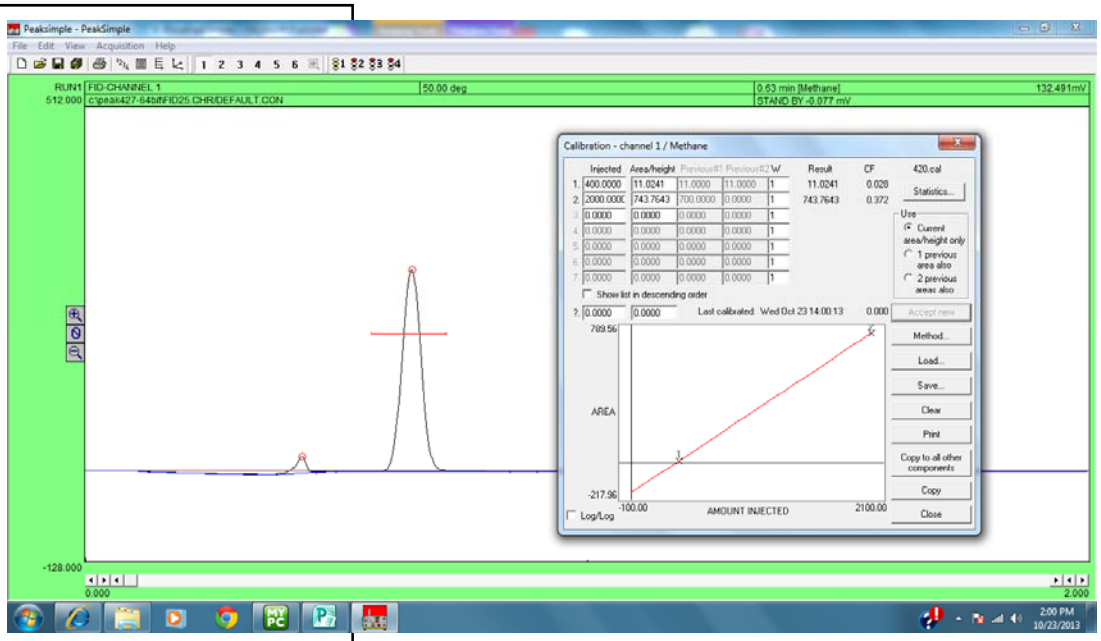
Then calibrate the peak at two levels.

Enter the number 400 in the Level 1 "injected" and the area of the methane peak you want 4ma to correlate to. In this case, the area of the methane peak is 11 area counts for ambient methane which is about 2ppm.

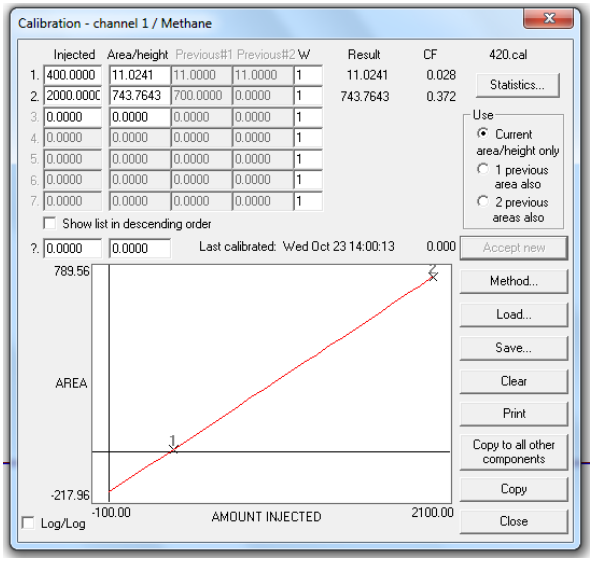
4-20milliamp output from PeakSimple

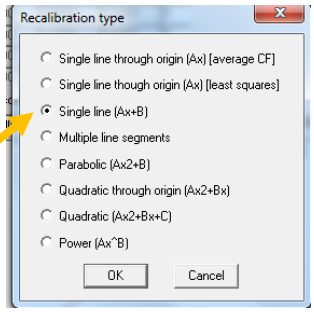
October 2013

Next inject a larger amount of methane, perhaps 100ppm or whatever level you want 20ma to correlate to.



Enter the number 2000 in the Level 2 " injected " cell, and the area of the 100ppm methane peak in the next cell. In this case the area is about 743 area counts.





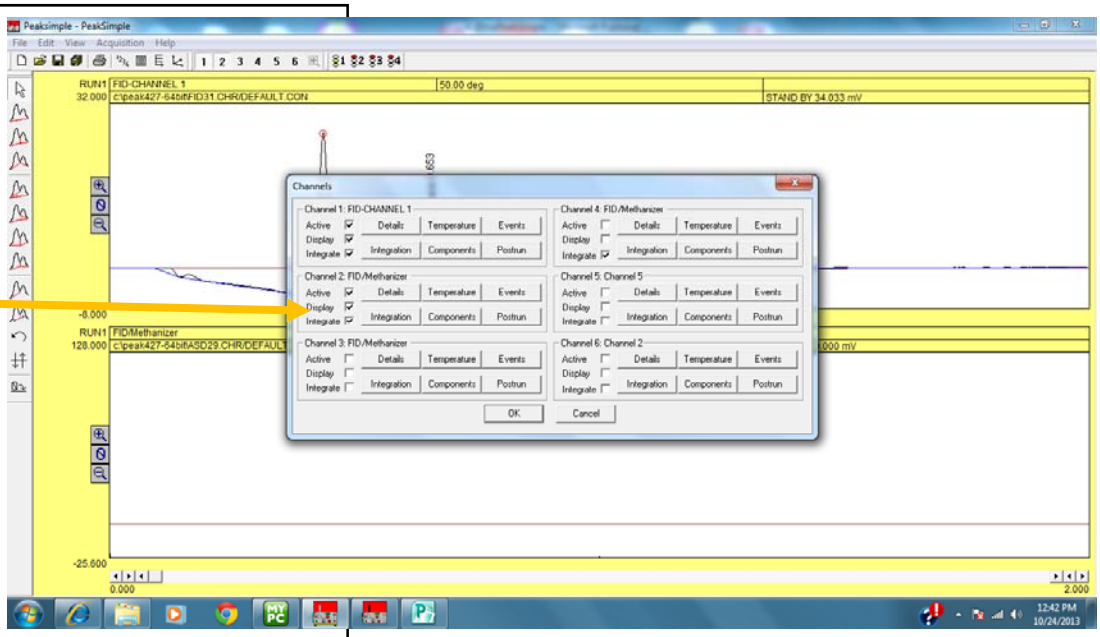
Click the method button and select straight line fit, non-zero intercept.

The resulting calibration curve should look something like the one at right.

4-20milliamp output from PeakSimple

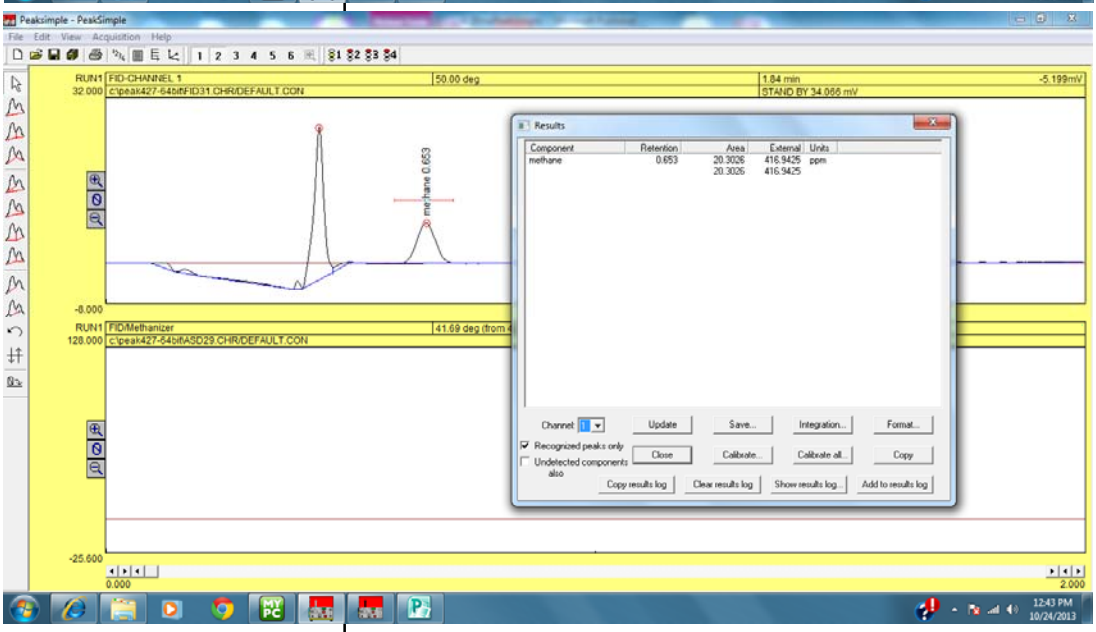
October 2013

Make sure that channel 2 is Active by clicking in the Edit/ Channels screen.

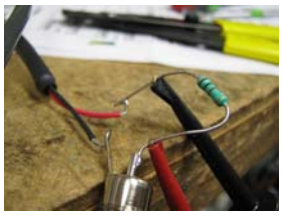


Inject an intermediate amount of methane, 10ppm for example.

In the Results screen note the number in the External or Internal column. In this case its 416.9.



The voltmeter reading across the sense resistor shows 408 millivolts which is approximately correct.



4-20milliamp output from PeakSimple

October 2013

Note that the 4-20ma output only changes at the end of an analysis, and that the current is held constant during the subsequent analysis and only updated once the next analysis is complete.

You can force the reading to update by clicking the control, alternate and P keys simultaneously. This is a PeakSimple shortcut which performs all the actions specified in the Postrun screen.

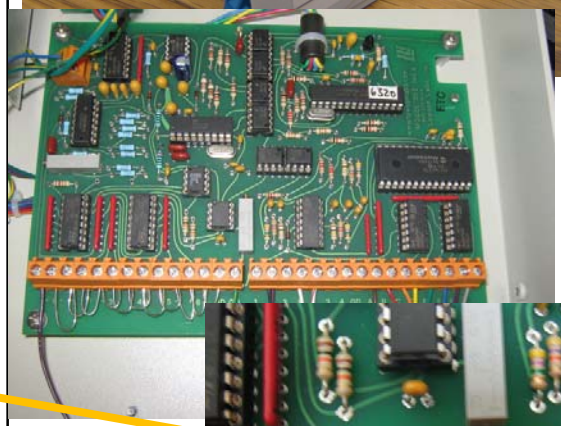
The 4-20 milliamp output circuit has been changed as of July 2014. See the following pages.

4-20milliamp output from PeakSimple

July 2014

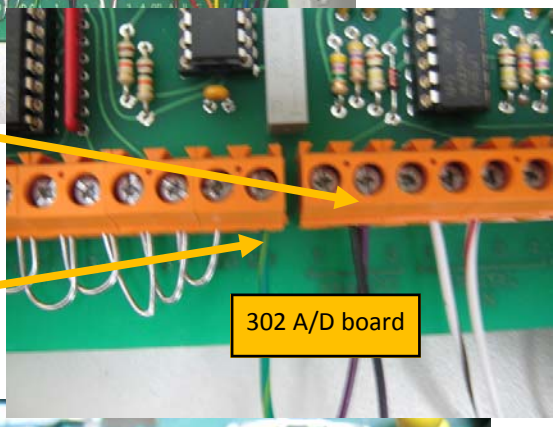
Starting July 2014 SRI is using the Acromag TT237-0600 device to implement the 4-20ma output option. SRI part# 8670-0420 July 2014 price $695.

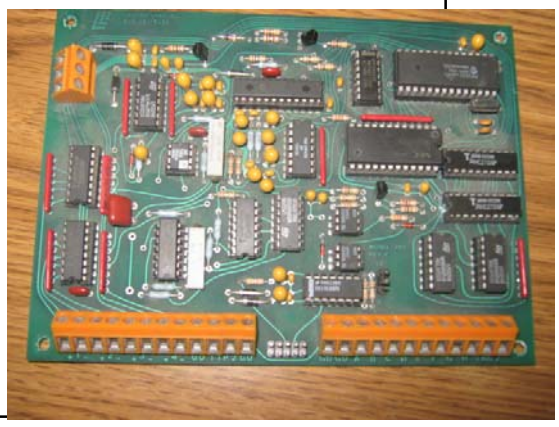
This device is driven directly from the Channel 2 DAC output of the PeakSimple A/D board, and allows for either sourcing or sinking the 4-20ma current.

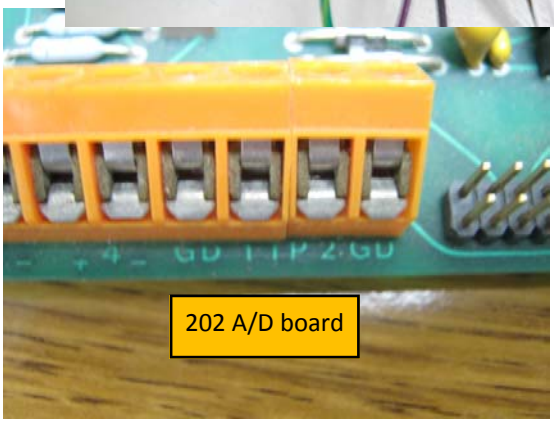


Connect the Acromag terminal 3 to the PeakSimple (PS) terminal labelled “analog out 2) or TP2 depending on the the type of PS A/D board.

Connect the Acromag terminal 4 to the PS terminal labelled “GD” (ground).



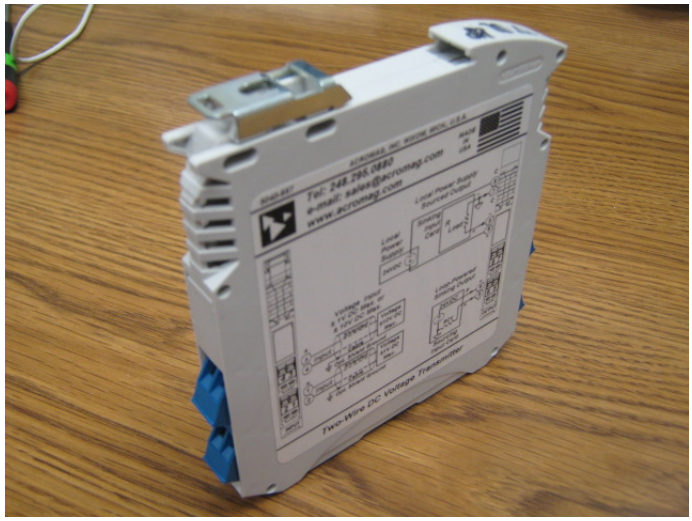




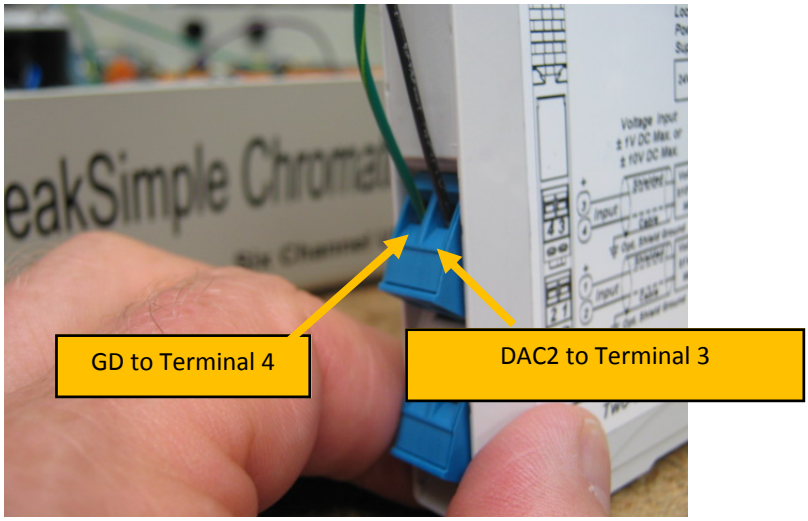
4-20milliamp output from PeakSimple

July 2014

The Acromag is self-powered from the 4-20ma loop's power supply (typically 24 volts DC).

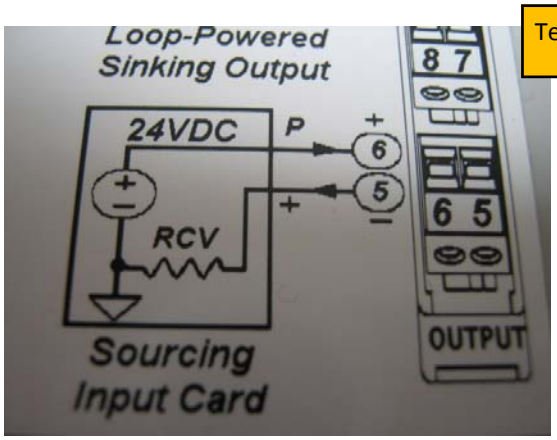


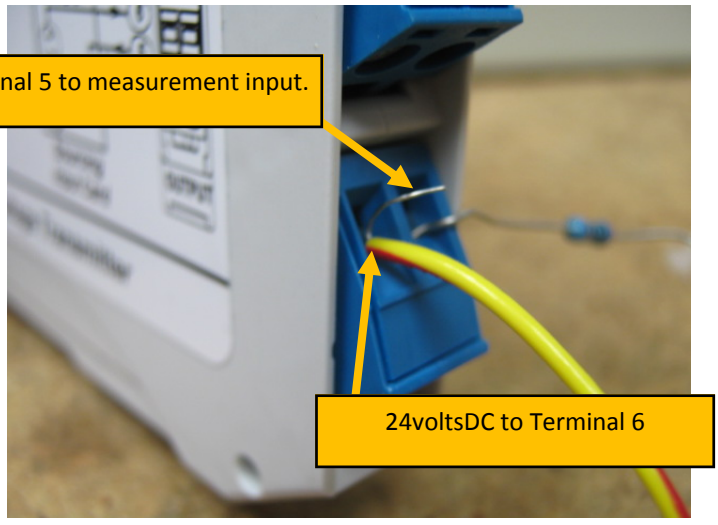
Connect the two wires from the PS DAC 2 and GC (ground) to the Acromag terminals 3 and 4. See the diagram on the Acromag.



Connect the positive of the 24voltDC power supply to Terminal 6. Connect Terminal 5 to the input of your 4-20ma measuring device. This may be a gage or a circuit board in a PLC.

The 24volt power supply minus is normally connected to the PLC or gage common.





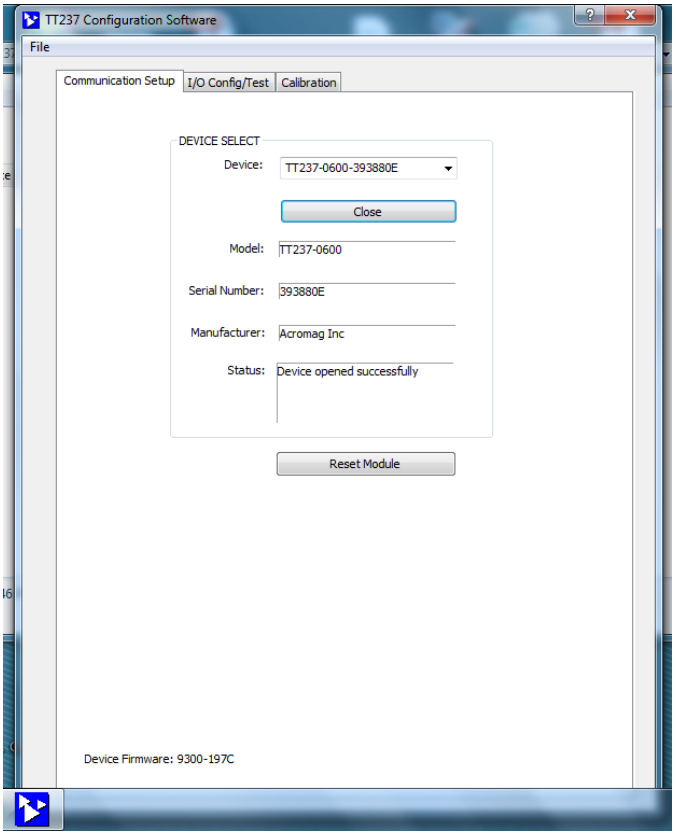
4-20milliamp output from PeakSimple

July 2014

The Acromag may be programmed and calibrated via a mini-USB cable and software available from Acromag.com.

The programming will already have been done if the Acromag is purchased from SRI.

The Acromag software recognizes the part.



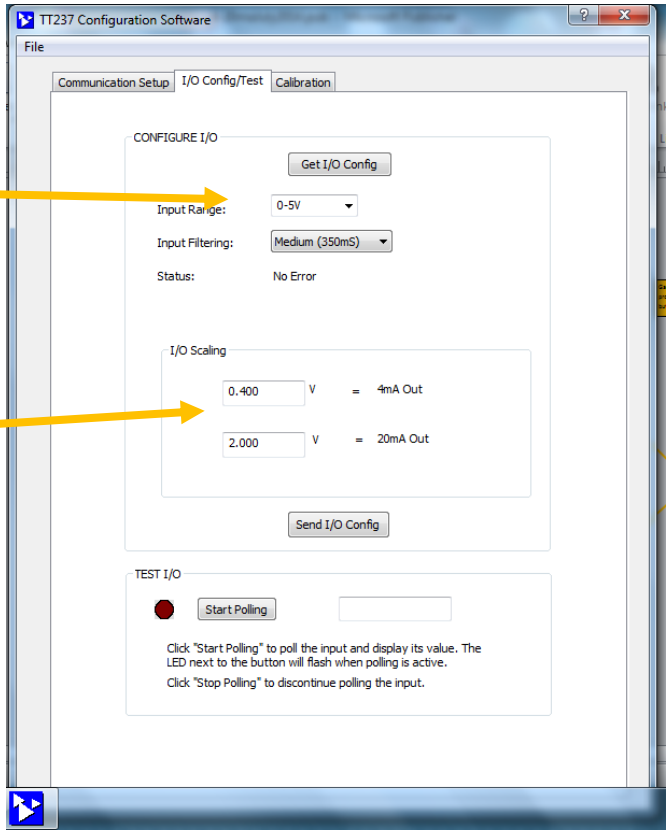
4-20milliamp output from PeakSimple

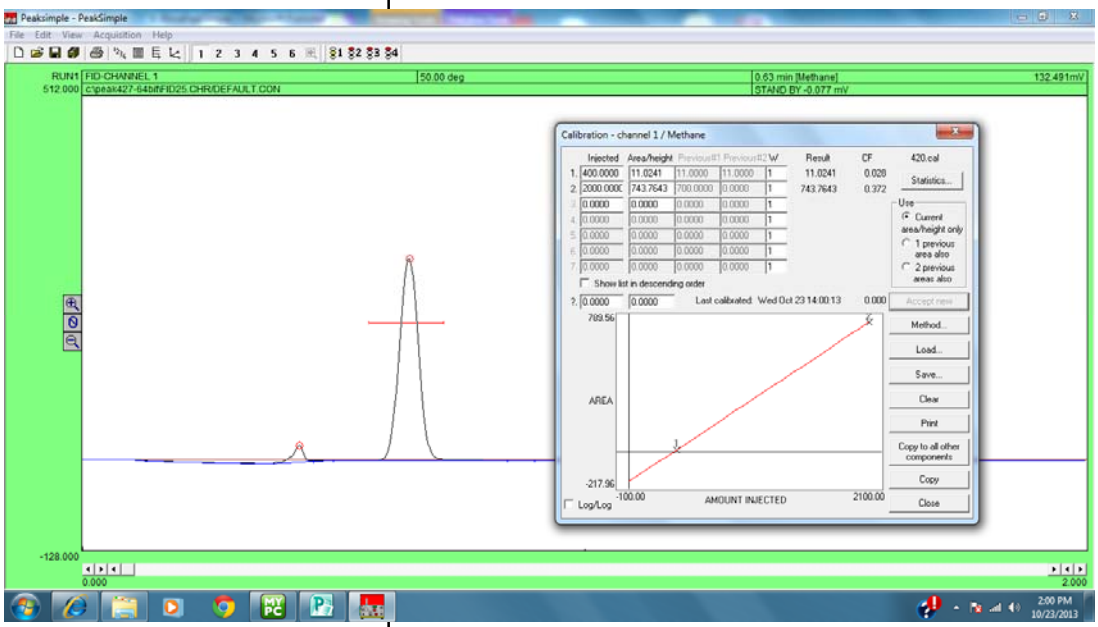
July 2014

Click the I/O Config tab and set the input range to 0-5volts

Set the 1/O scaling so that 400milli-volts (from the PS DAC 2) equates to 4ma and 2000millivolts from PS equates to 20ma.

This will have been done already by SRI.





Calibrate PeakSimple according to the directions on page 4 and 5 of this document.

4-20milliamp output from PeakSimple

July 2014

The Acromag will come with two pieces of Velcro for mounting.

Tape the Velcro to the side of the Acromag which does not have the circuit diagrams.

Connect the Acromag to the side of the SRI GC or some other convenient spot.