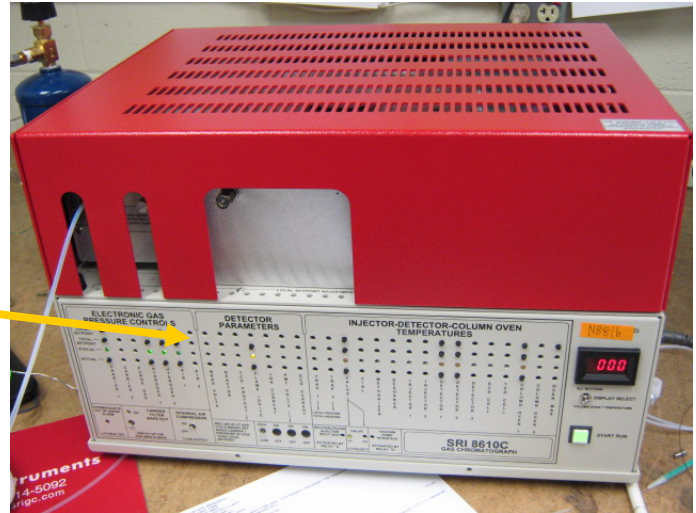


Operating the SRI Mudlogger GC configuration

The SRI Mudlogger GC is available on the 8610C chassis for benchtop operation.

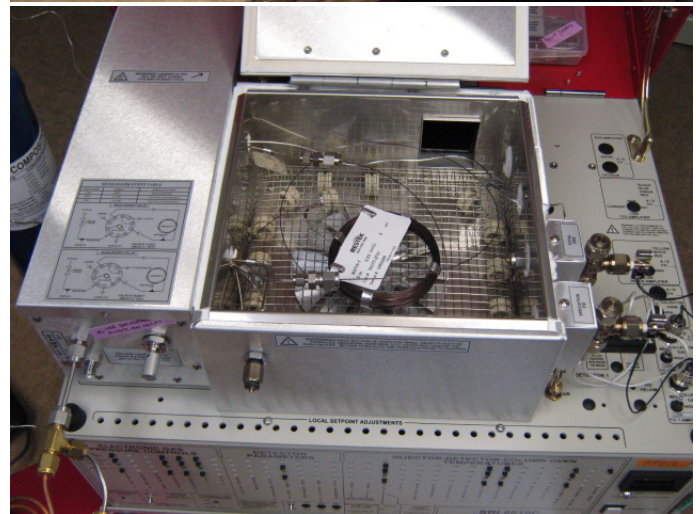


It is also available in a rack-mount version which fits in a standard 19inch rack. The height of the rack-mount chassis is eight units (14 inches).



The GC is equipped with a column oven, a valve oven and two identical FID (flame ionization detector) detectors with identical amplifiers. One FID is used to detect the speciated hydrocarbons (methane, ethane, propane, butanes, pentanes and hexanes and heavier). Analysis time is 1 minute for C1 through C5

The other identical FID is used to measure the total hydrocarbons (totalgas) continuously and constantly.



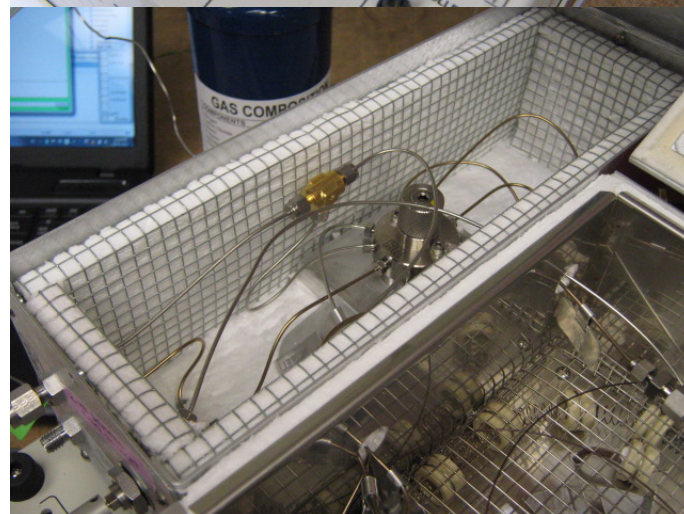
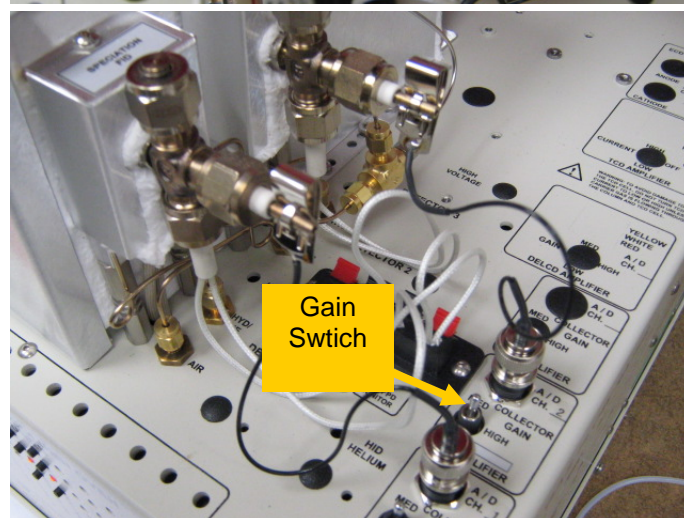
Operating the SRI Mudlogger GC configuration

The Speciation and TotalGas FID detectors are mounted on the right side of the column oven.

The two FID detectors are connected to two identical amplifiers. The speciation FID amplifier (channel 1) is normally operated on low or medium gain.

The TotalGas FID (CHANNEL 2) is normally operated on medium gain, but may be operated on low or high also depending on whether the totalgas is unusually high or low.

The valve oven is located on the left side of the column oven. An electrically operated Valco 10port Gas Sampling Valve is mounted in the valve oven which is typically heated to 60C. The valve is used to inject the gas sample for speciation and also to backflush the column after the pentanes have eluted.



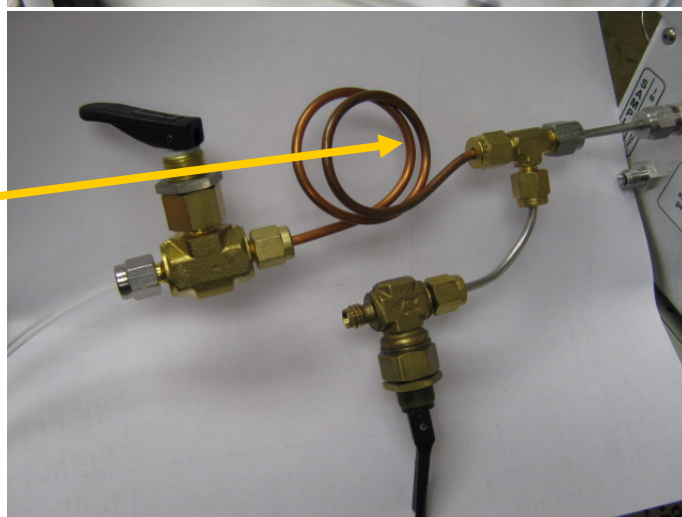
Operating the SRI Mudlogger GC configuration

The sample is connected to the inlet fitting on the valve oven (1/8inch Swagelok). The sample must be free of particulates to avoid clogging the tubing inside. A 20 micron frit or filter is required.

It is a good idea to supply the sample to the GC through a manifold such as the one shown at right. One toggle valve turns the sample off and on while the other toggle valve can be opened to bleed the sample through to the GC quickly. Since the total flow to the GC is about 10 milliliters per minute, the volume of tubing prior to the GC can be important.

A needle valve on the front of the valve oven adjusts the flow of sample gas to the TotalGas FID.

The flow must be adjusted to approximately .5 milliliters per minute. This correlates to a reading of 1000 millivolts on medium gain when the sample is 100% methane.



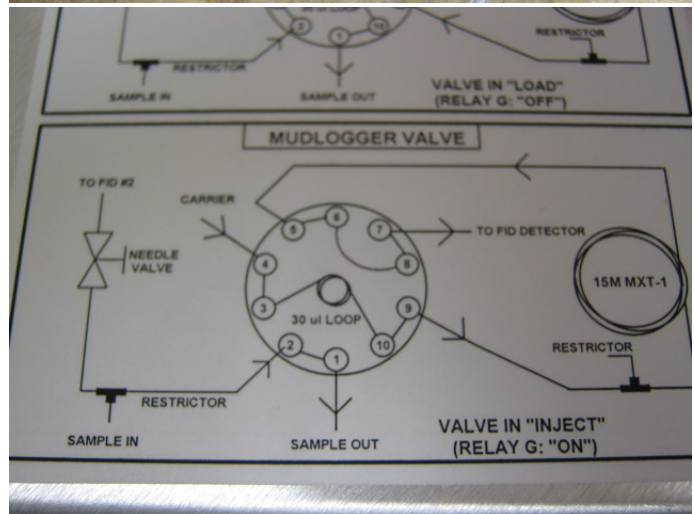
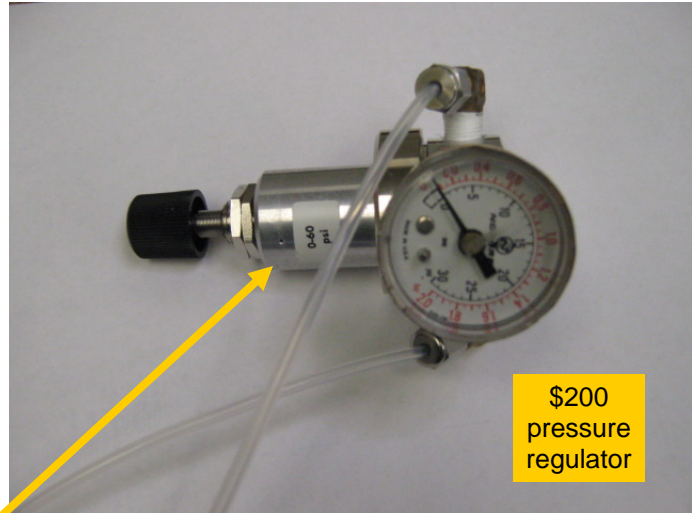
Operating the SRI Mudlogger GC configuration

The sample must be supplied to the GC under a constant pressure (typically 10 psi).

A good quality pressure regulator is important because if the pressure changes the TotalGas calibration will change also.

The Speciated results are not affected by pressure changes, just the TotalGas results.

A map showing the plumbing is affixed to the top of the valve oven.

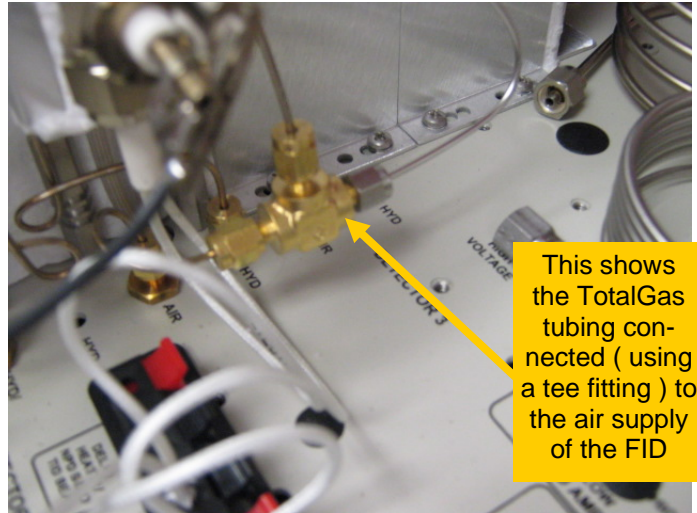


Operating the SRI Mudlogger GC configuration

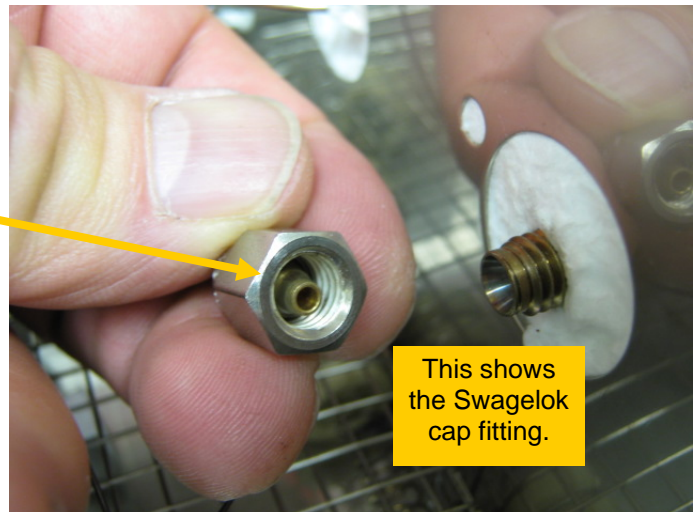
The TotalGas flow is connected to the TotalGas FID with approximately 12 inches of .005" id stainless steel tubing. The small interior diameter is important to minimize the delay time (the time it takes for the sample gas to move from the inlet fitting to the detector).

The TotalGas sample can be introduced to the FID either through the air supply connection or via the FID flame jet. The jet inlet must be capped off when connected via the air supply.

Connection through the jet is the standard way unless otherwise specified by the customer). Connecting via the jet results in better linearity (see the data comparison on the next page).



This shows the TotalGas tubing connected (using a tee fitting) to the air supply of the FID



This shows the Swagelok cap fitting.



This shows the TotalGas tubing connected to the normal jet inlet to the FID

Operating the SRI Mudlogger GC configuration

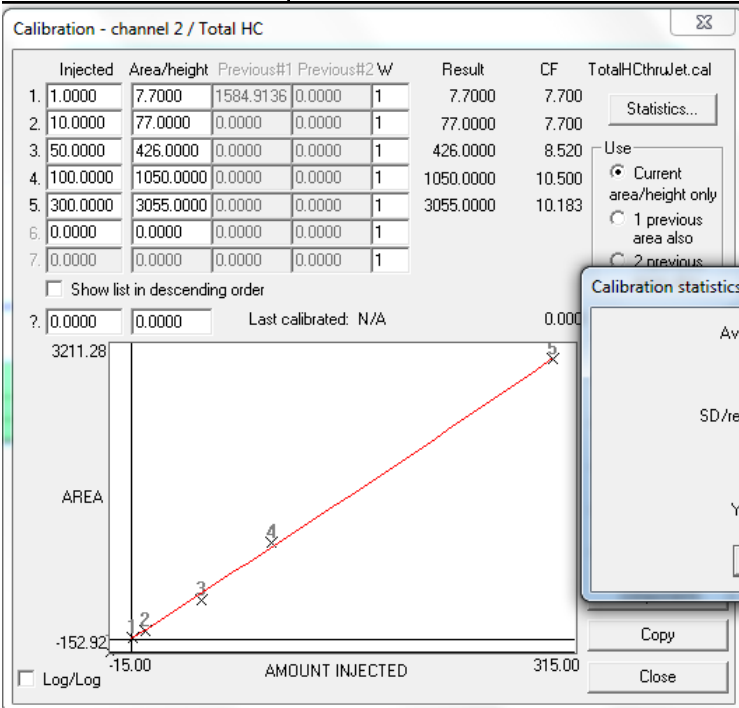
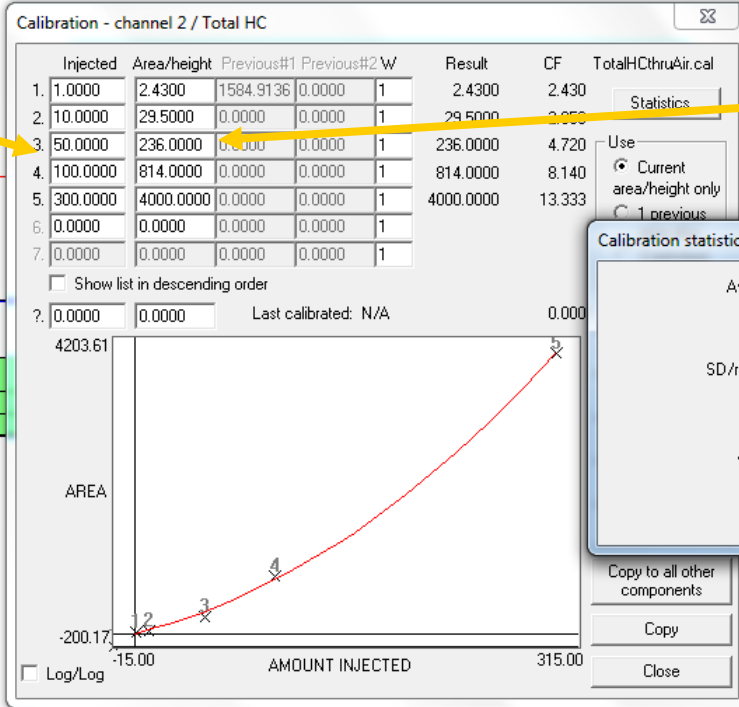
Methane concentration (1, 10, 50, 100 and 300%)

FID signal in millivolts

The 5 point curve at right shows the Total-Gas response (in millivolts) when the sample is introduced through the air supply to the FID. Because of the non-linearity, a quadratic curve was used. Methane gas with concentrations of 1%, 10%, 50%, and 100% were supplied to the GC. Propane was supplied for the 300% level.

This curve shows the same gases introduced through the FID jet. The linearity is better through the jet so a straight line fit is used.

It is **IMPORTANT** that the needle valve be adjusted so that 100% methane equals 1000 millivolts on medium gain. If the signal is higher then the linearity will be worse,

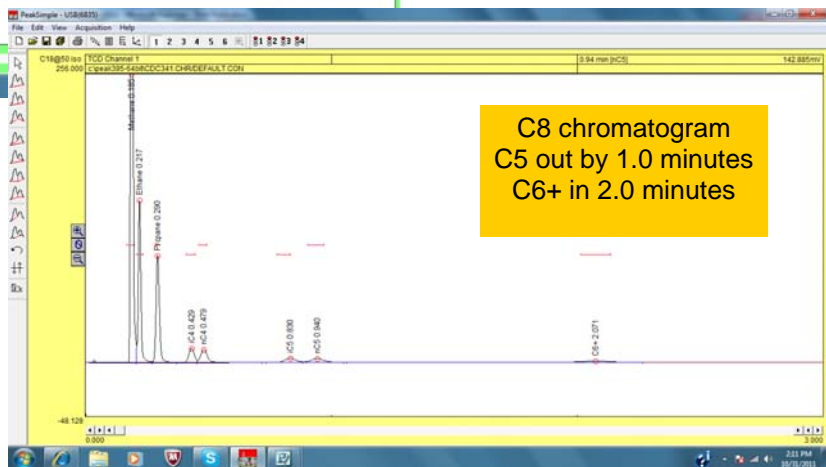
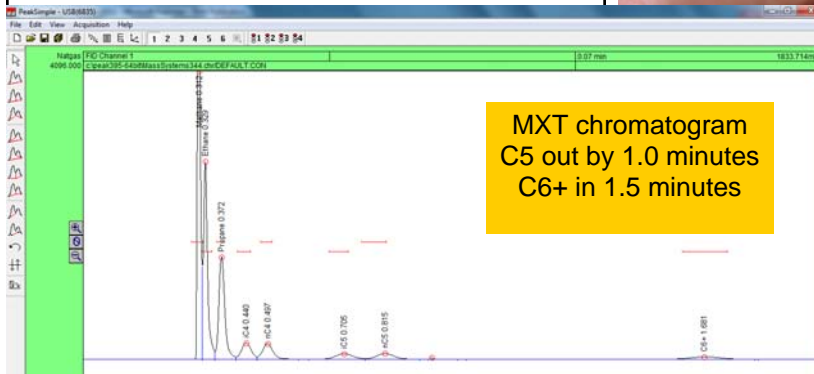
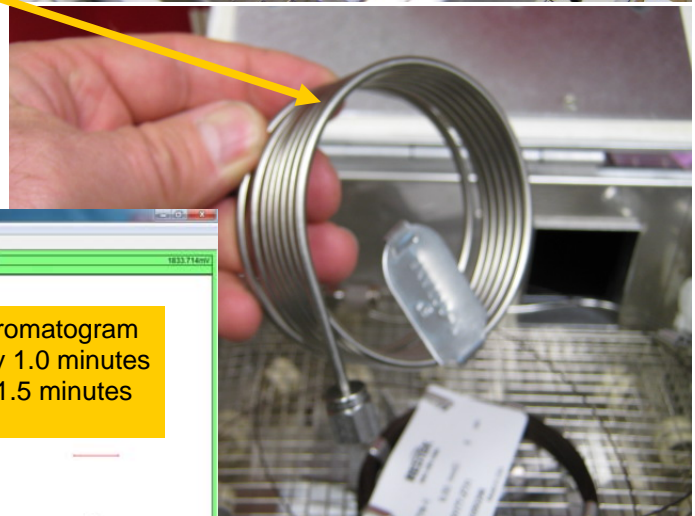
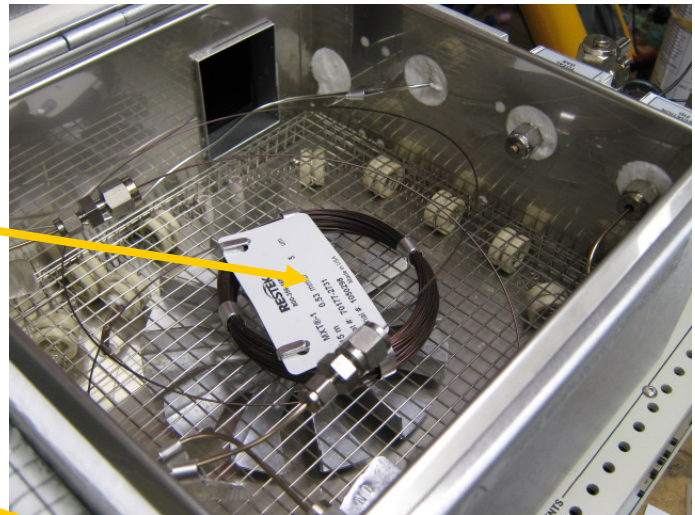


Operating the SRI Mudlogger GC configuration

The column that is typically used to speciate the sample is a 15 meter MXT 1 5micron film .53mm capillary column.

A 2meter n-octane on Ressil-C packed column is also commonly specified. Both columns can be used interchangeably on either helium or hydrogen carrier gas.

Separation of ethane from methane may be slightly better on the C8 column, but C6+ takes longer.



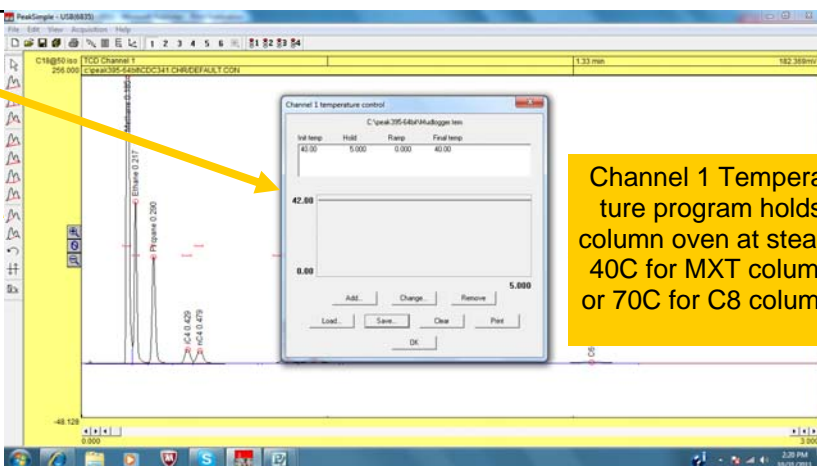
The C8 column can only be heated to 150C while the MXT can go to 300C .

Operating the SRI Mudlogger GC configuration

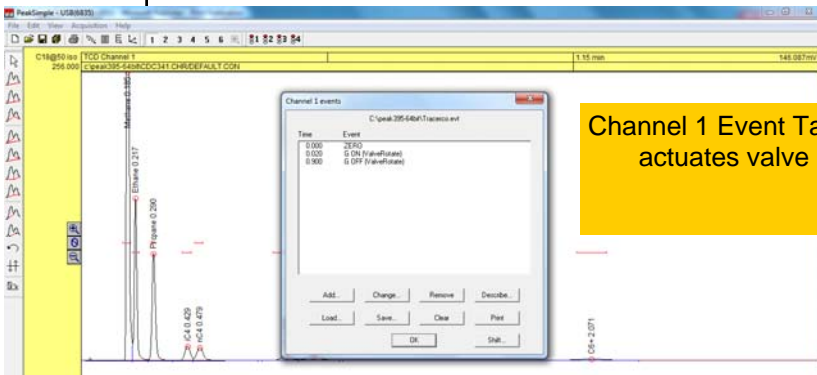
Set the Channel 1 temperature program to a steady isothermal temperature. 40C is ideal for the MXT column, while 70C or higher is appropriate for the C8 packed column.

The Channel 1 Event table rotates the Valco 10 port gas sampling valve immediately at the beginning of the analysis (.02 minutes) and rotates it back at .9 minutes (back-flush C6+). The valve timing is adjustable by the user. *For example, if the user wanted C5+ back-flush instead of C6+, the valve would be rotated back to the Load position at .6 minutes instead of .9 minutes.*

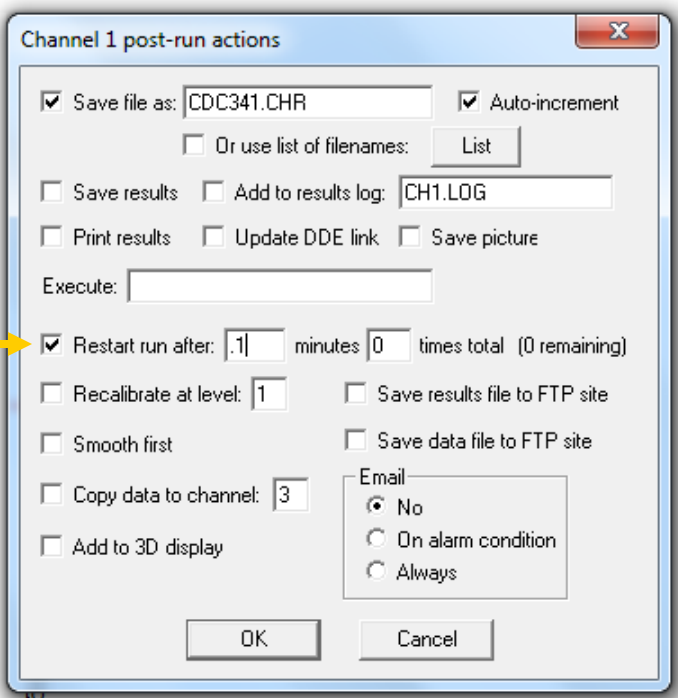
Typically the Channel 1 Postrun screen is configured (re-start run is checked) so the speciation analysis is automatically re-started after a short delay (in this case .1 minutes). A new analysis is made every minute or two depending on the user's time requirements.



Channel 1 Temperature program holds column oven at steady 40C for MXT column or 70C for C8 column.

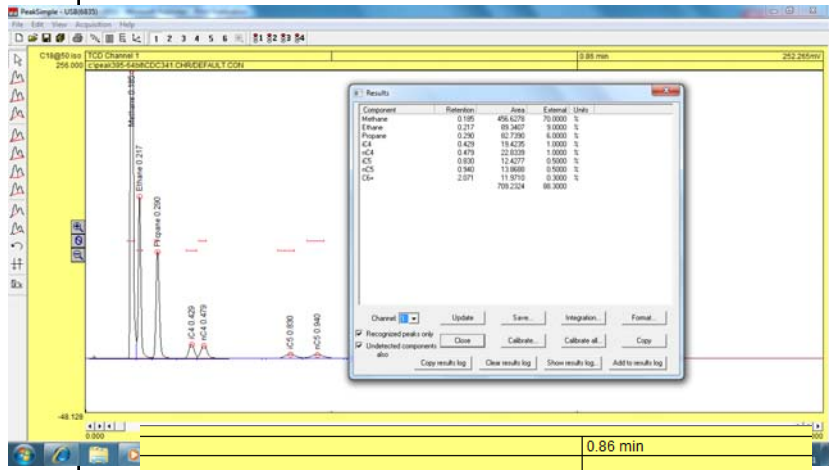


Channel 1 Event Table actuates valve



Operating the SRI Mudlogger GC configuration

The Results for the speciation analysis appears in the View/Results screen at the end of the speciation analysis.



The speciation Results includes the calibrated answer for each component detected in Channel 1.

Component	Retention	Area	External	Units
Methane	0.185	456.6278	70.0000	%
Ethane	0.217	89.3407	9.0000	%
Propane	0.290	82.7390	6.0000	%
iC4	0.429	19.4235	1.0000	%
nC4	0.479	22.8339	1.0000	%
iC5	0.830	12.4277	0.5000	%
nC5	0.940	13.8688	0.5000	%
C6+	2.071	11.9710	0.3000	%
		709.2324	88.3000	

To include the TotalGas result, enter the event table shown at right.

Time	Event
0.000	DATA NORMAL
0.100	DATA ZERO
0.200	DATA NORMAL
0.300	DATA ZERO
0.400	DATA NORMAL

Operating the SRI Mudlogger GC configuration

As shown at right, the Total Gas signal is plotted on channel 2. In this case the sample was 100% methane which resulted in a signal level of 1000 millivolts.

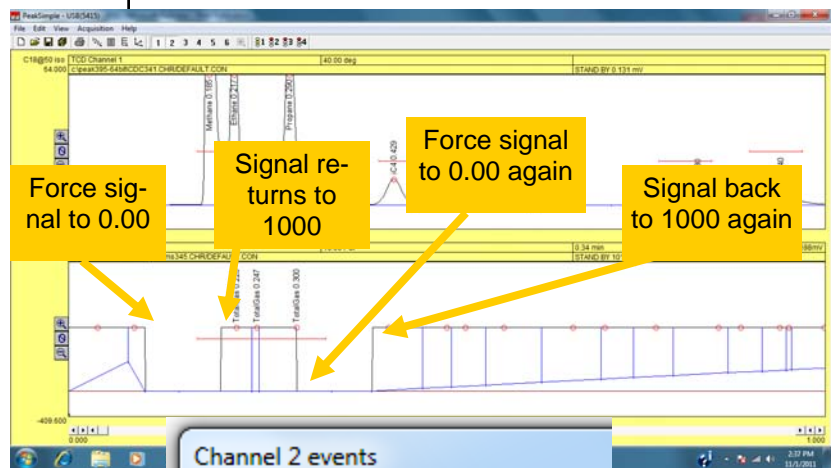
As instructed by the Event table, at .1 minutes the signal was forced to 0 millivolts.

At .2 minutes the signal returns to 1000mv.

At .3 minutes the signal is forced to zero again.

At .4 minutes the signal is allowed to return to 1000mv.

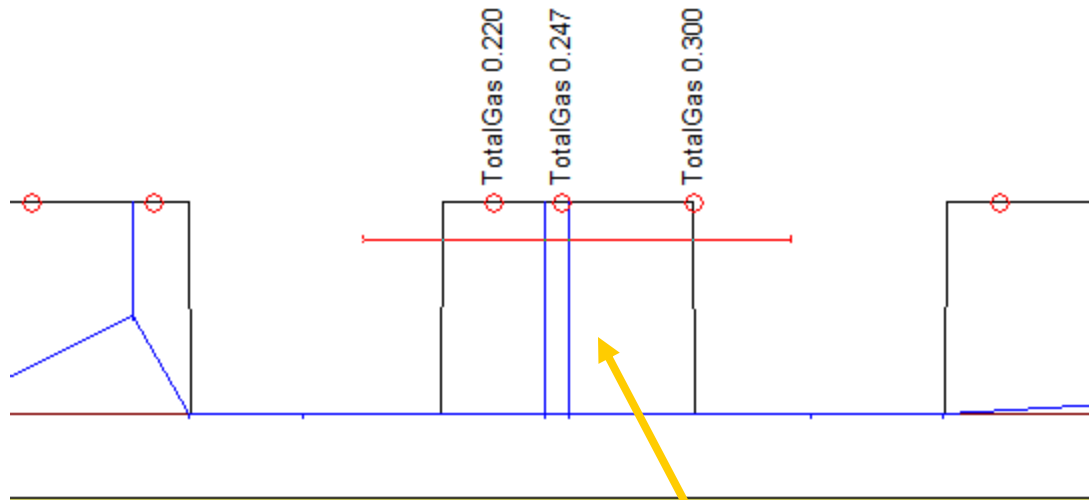
The effect is to create a square shaped peak which can be calibrated just like any other peak.



Channel 2 events

C:\peak395-64bi

Time	Event
0.000	DATA NORMAL
0.100	DATA ZERO
0.200	DATA NORMAL
0.300	DATA ZERO
0.400	DATA NORMAL



Operating the SRI Mudlogger GC configuration

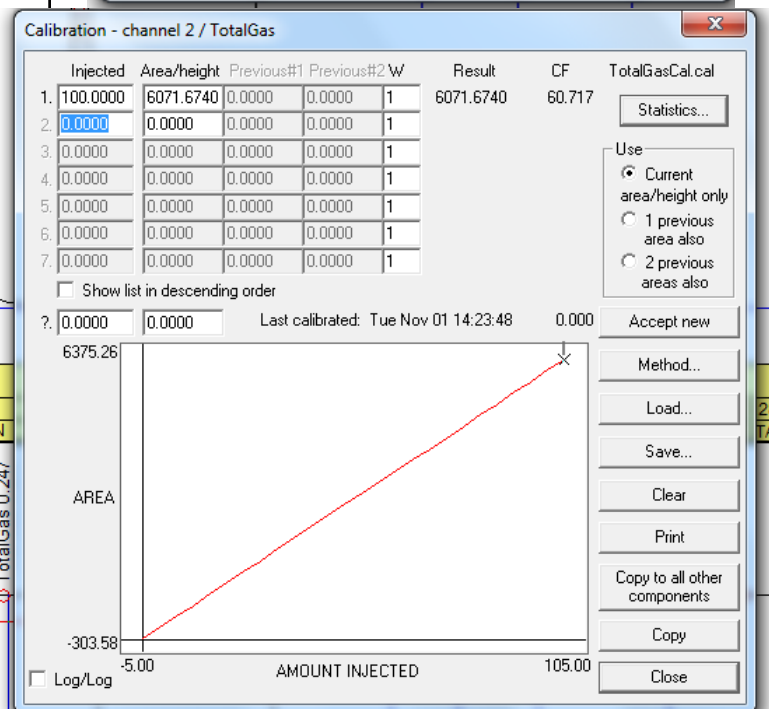
Create a component window for the square shaped peak.

Use a different peak number from any peak number which might be used in channel 1. The screen at right shows the peak number to be 21.

Set the radio button to show "Total of all Peaks".

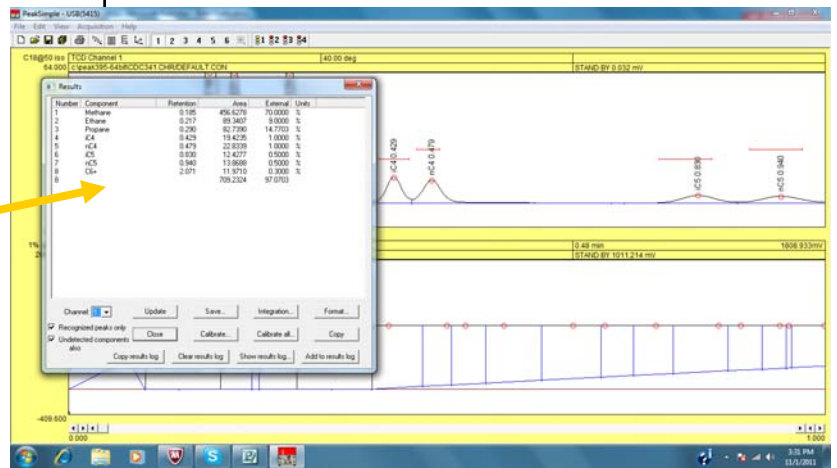
This insures that all the peaks which might be detected within the square shaped peak are included in the total.

Calibrate the square shaped peak just like any other peak. You can calibrate only at 100% methane as shown at right, or you can calibrate at multiple levels (1%, 10% etc).

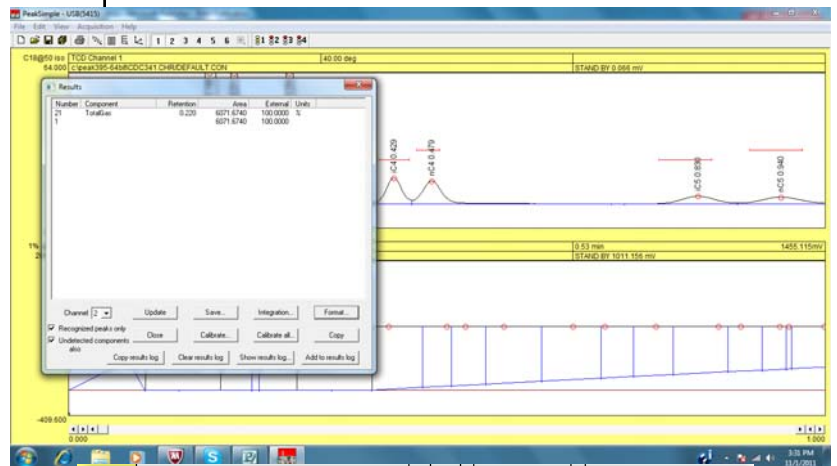


Operating the SRI Mudlogger GC configuration

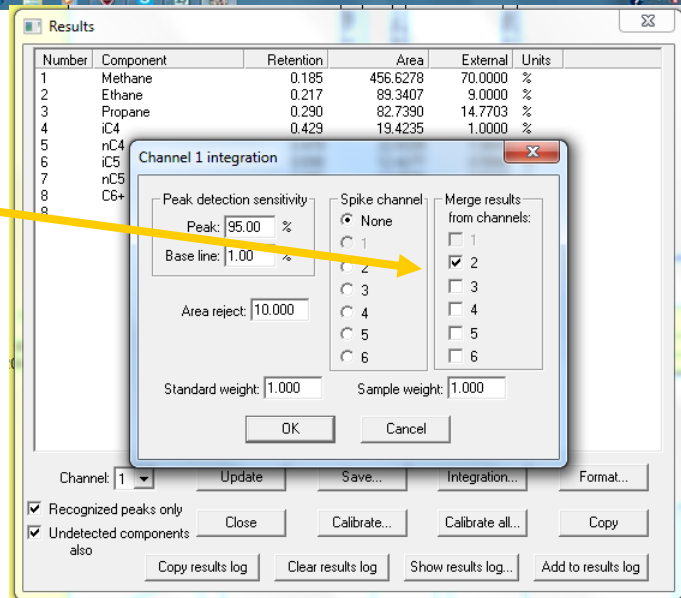
The Channel 1 Results screen shows the speciated results.



The Channel 2 results screen shows the TotalGas results.



If you click the Integration button in the Channel 1 results screen you can merge the channel 2 data into the Channel 1 report.



Operating the SRI Mudlogger GC configuration

The result from the channel 2 now appears in channel 1 Results screen.

Number	Component	Retention	Area	External	Units
1	Methane	0.185	456.6278	70.0000	%
2	Ethane	0.217	89.3407	9.0000	%
21	TotalGas	0.220	6071.6740	100.0000	%
3	Propane	0.290	82.7390	14.7703	%
4	iC4	0.429	19.4235	1.0000	%
5	nC4	0.479	22.8339	1.0000	%
6	iC5	0.830	12.4277	0.5000	%
7	nC5	0.940	13.8688	0.5000	%
8	C6+	2.071	11.9710	0.3000	%
9			6780.9064	197.0703	

Channel: 1

Recognized peaks only

Undetected components also

Buttons: Update, Save..., Integration..., Format..., Close, Calibrate..., Calibrate all..., Copy, Copy results log, Clear results log, Show results log..., Add to results log

Operating the SRI Mudlogger GC configuration

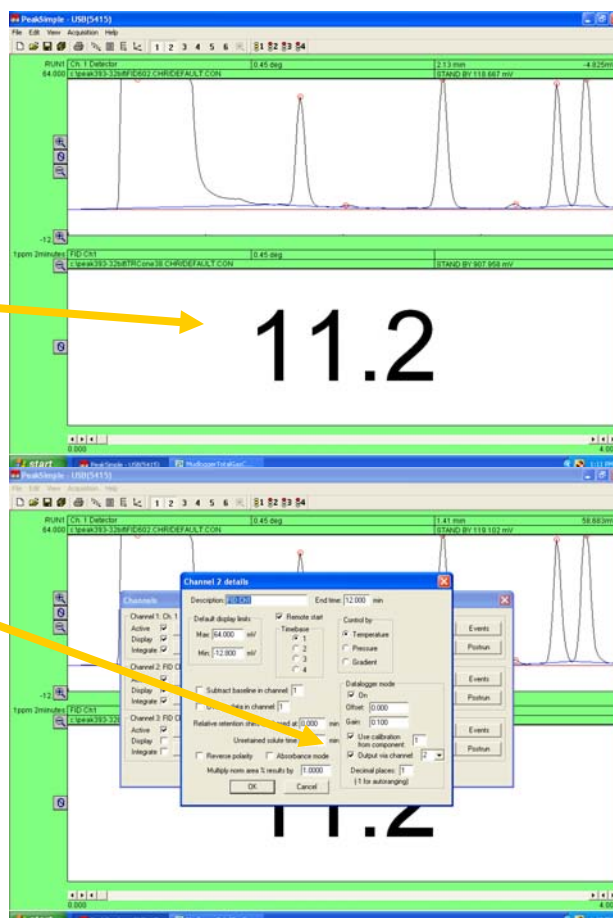
The TotalGas reading can be displayed by the PeakSimple data system as either a millivolt level strip chart or as a large number in the middle of the screen as shown at right.

To display the number instead of the stripchart, navigate to the Details Box. Click the Datalogger mode ON.

The millivolt signal from the TotalGas FID can be multiplied by whatever number is inserted in the "Gain" box. This is useful if you want to display the TotalGas in "Units" or "percent".

The TotalGas FID millivolt signal is not perfectly linear however. This can be corrected and compensated by using a calibration curve.

To calibrate the TotalGas signal click the "Use calibration from component" box with the number 1. This calibration curve linearizes the millivolt signal which is displayed in numbers on the screen. To output a linearized millivolt analog signal click the analog output channel desired.



Channel 2 details

Description: End time: min

Default display limits: Max: mV Min: mV

Remote start

Control by: Temperature Pressure Gradient

Timebase: 1 2 3 4

Subtract baseline in channel: Overlay data in channel:

Relative retention shifts are based at: min

Unretained solute time: min

Reverse polarity Absorbance mode

Multiply norm area % results by:

Datalogger mode: On Off

Offset: Gain:

Use calibration from component:

Output via channel:

Decimal places: (-1 for autoranging)

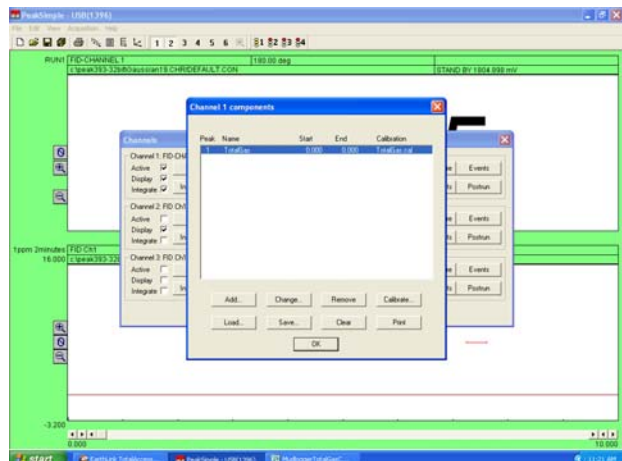
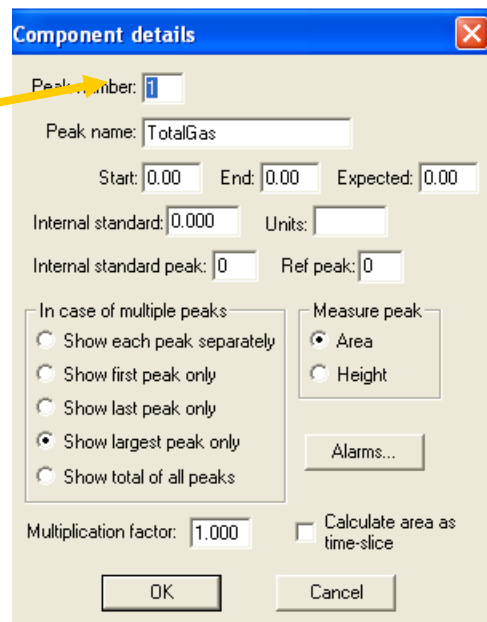
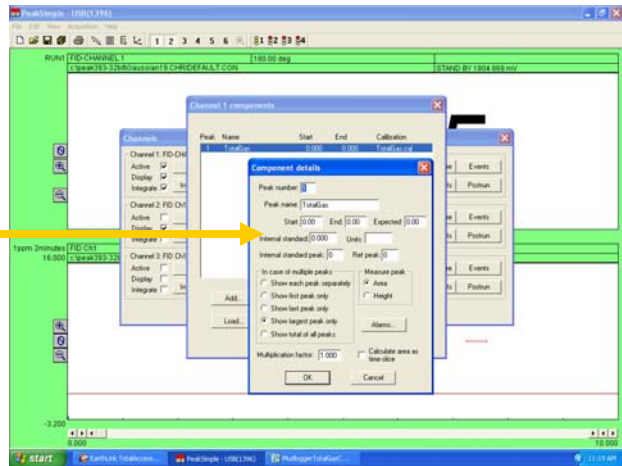
Operating the SRI Mudlogger GC configuration

Navigate to the Component Table screen and Add a Component which looks like the one shown at right.

Note that the Peak number is the number 1. This is the same number we entered in the Details Box on the previous page.

Once the Component Details have been entered, highlight the component in the list by clicking on it.

Then click the Calibrate button below.



Operating the SRI Mudlogger GC configuration

Enter the calibration information in the mini spreadsheet of the calibration curve.

In this example:

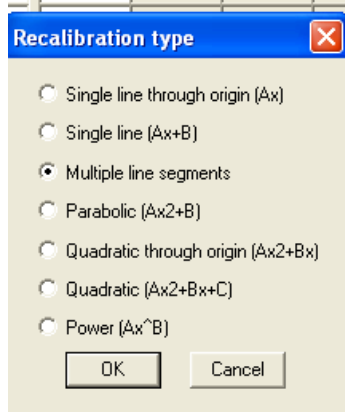
A 2% methane gas mix resulted in a millivolt reading of 600, so 600 was entered in column 1 row 1.

2 was entered in column 2 row 1.

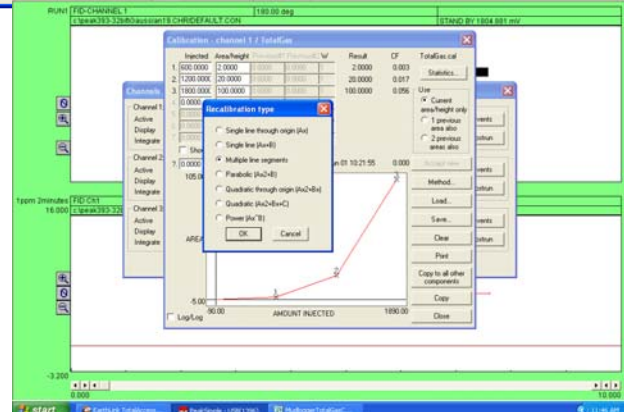
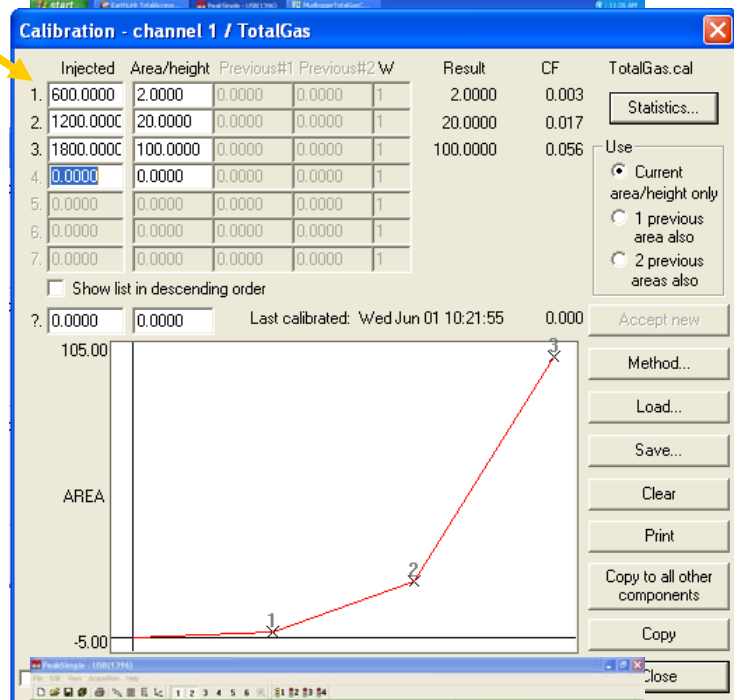
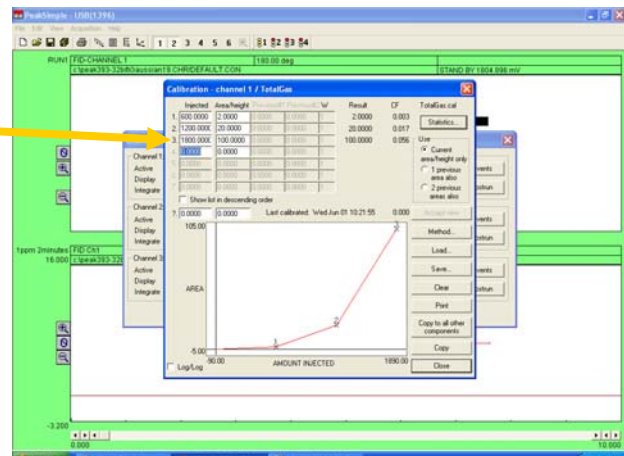
A 20% methane standard resulted in a millivolt reading of 1200 millivolts

A 100% methane standard resulted in 1800 millivolts.

The three point calibration curve was modeled using the multiple line segment method.



The TotalGas now reads correctly on the screen even though the millivolt response is not linear.

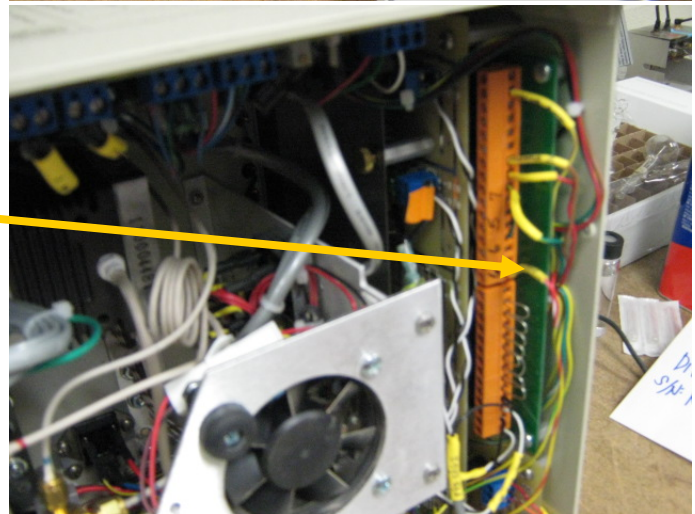
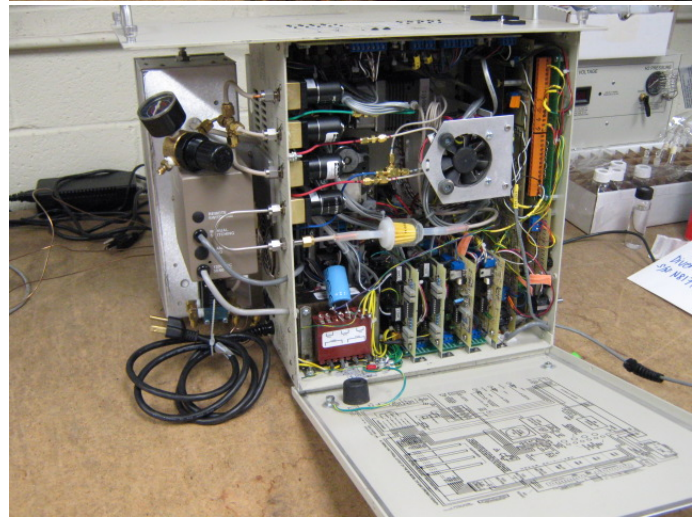


Operating the SRI Mudlogger GC configuration

Most Mudlogger GCs are configured on the Model 410 Rack Mount chassis shown at right, but the procedure is the same for Mudlogger GCs configured on the 8610C or 8610V chassis.

Remove the screws holding the bottom plate on the GC and tilt the GC on its back to expose the inside.

The A/D board is mounted along the right side of the GC.



Operating the SRI Mudlogger GC configuration

The A/D board has orange screw terminals which are labeled.

You will need two wires to connect the linearized analog millivolt signal to an external data system or strip chart recorder.

Connect one analog wire to the ground terminal labeled GD.

Connect the other analog wire to the terminal labeled Analog Out #2 (if that is the one you selected in the Details screen).

Route the analog wires out one of the available holes in the right side of the GC chassis and connect to your external device.

