

# **USER MANUAL**

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DataCan Program and Download Software V4.1.7

[www.datacan.ca](http://www.datacan.ca)

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### ***History of Changes***

Rev. No.	Date	Pages	Description of Changes
1.0.0	Nov - 2007	107	Initial Draft
1.8.6	May - 2010	84	Improve Clarity
1.8.7	June - 2010	85	Major Changes to the Graphing Interface
1.8.8	June - 2010	139	Added tool assembly and operations
2.0.2	July – 2010	141	Updated pictures
2.0.5	August – 2010	80-83	Added shift/scale section
			Added change line width and color instructions.
			Updated the Save Graphs section.
2.0.6	August – 2010	49, 75, 80	Updated Supervisor Mode info.
			Updated the gradient table section.
2.0.7	September - 2010	129-139	Added info to quartz tool sections
			Added o-ring basics

2.0.8	September – 2010	N/A	Updated Programming Tool Section Updated Configuration Section Added the Download Calibration file section Updated the Create Gradient Plot Section
2.0.9	October – 2010	N/A	Added Quick Print Functionality in Graph Section Updated Programming the Tool Section. Updated Download Jobs Section. Updated the Create Gradient Plot Section
2.2.5	January – 2011	53-59, 61-62, 95	Added info to Supervisor Mode section. Updated Change Units and Convert File sections. Added the Default File Output Format section. Added the Adjusting the Default Line Width section. Updated the Data Smoothing section. Added the Atmospheric Correction section.
2.2.6	May 2011	150-151	Added Geothermal Tool
2.5.3	September 2011	38-64	Updated sections involving "Configuration" where the options were moved to a menu instead of a separate screen. Updated the data smoothing section. Updated the loading of calibration files and the serial number to a quartz memory module. General wording changes.
2.5.5	November 2011	42-44, 52-53, 56, 62, 74-79, 83-85	Added Burst Gauge. Version 2.5.5 is the minimum version of the software needed to run this gauge. Updated burst gauge programming, downloading and graphing. Updated opening and closing of graphs.

			Added changing the number of decimal places for pressure to "Change Units".
2.6.3	March 2012	Many	<p>Append files in graph.</p> <p>Reporting: Options dialog, units menu removed, events tab.</p> <p>Wireless logger: connect button.</p> <p>Permanent: Modbus address on Info page, Find Surface Gauges.</p> <p>Graph: Settings, toggle annotations, gradient points, settings dialog, data smoothing, gradient type, events table.</p> <p>IT: Configuration file with defaults that can be stored to other users computers.</p> <p>7.1 Before Programming the Tool: Piezo gauges now store every 8 samples to memory.</p>
2.6.4	March 2012	12	Changed the configuration file location to the "Public" folder.
2.6.6	April 2012	Many	<p>"Graph" menu changed to "File".</p> <p>Removed "Reporting" menu item.</p> <p>Changed "Graph Settings" to "Units".</p> <p>Added how to change gauge labels in both the download and the graph.</p>
2.6.7	April 19, 2012	44, 47 – 49	<p>Added explanation of the Memory Piezo Gauge with Pressure Trigger</p> <p>Added explanation of the pre-burst for the Burst Gauge</p>
2.6.9	May 8, 2012	106 - 108, 149	Added a section 15.1.3 defining how data is stored to memory on quartz and piezo memory gauges.

			Added section 9.15 detailing numeric annotations.
2.7.2	July 3, 2012	196 - 208	Added section 15.6.5. Wireless Logging Added section 15.6.6 Wirelss Logger Setup Added section 15.6.7. DataCan ZigBee Wireless Receiver Setup Added 15.6.8. List of ZigBee Wireless Channels
2.7.7	August 10, 2012	26	Added more information about installing a download cable on Windows 7.
	August 13, 2012	115-118	Added section 9.16.1 describing the Liquid Level feature of the Gradient Graph
2.7.7 Rev 1	August 27, 2012	51-53	Added section 7.6 describing how to program the Quartz Pressure Recorder with a Pressure Trigger
2.7.9	September 17, 2012	198 – 199	Added the 4 to 20 mA output section for the permanent surface box.
2.8.3	October 2, 2012	119	Added Auto-Detect feature for determining liquid level
2.9.0	December 13, 2012	Many	Updated the about graph section. Updated the download data section. Added section 9.24. describing how to undo and redo actions
2.9.1	December 14, 2012	26-27	Updated Driver installation instructions for Windows 8
	January 22, 2013	142,143	Removed 'Units' tab from some Reporting images
2.9.2	January 22, 2013	93, 111	Added Annotation Settings, updated Show Numeric Annotations to reflect changes
2.9.7	April 17, 2013	81-137	Updated the graph section with new screen shots
2.9.8	May 3, 2013	164-168	Added 0.5" Piezo and 0.75" Welded Piezo

2.9.9	June 20, 2013	194	Edited the O-Ring on the image of geothermal battery housing from 2-212 to the correct size, 2-213
2.9.20	September 19, 2013	35-36	Updated images in Section 5
		125-127	Added Section 9.16.1 on "Set Start time to 0 Seconds"
	October 15, 2013		Added Rack Mount Surface Box Info
2.9.21	October 25, 2013	205-208	Updated Multi-Channel Logger Schematic
2.9.22	November 22, 2013	216	Updated O-Ring Installation Section about lubrication
2.9.23	April 8, 2014	196	Updated RTD info
2.9.24		176-177	
3.0.8	April 10, 2014	209-211, 142-151	Added using the software and load calibration files sections for the permanent surface box. Updated screen shots in the reporting section and added exporting job information
3.1.3	April 29, 2014	95-96	Added Remove Left/Right Graph Padding section
3.1.5	December 2, 2015	198	Changed Torque Spec on Geothermal Tool
3.1.6	February 2, 2016	221-223	Added Bubble Tube Thermocouple Info
3.1.7	June 21, 2017	187-189	Updated 0.75" Quartz DXB II Info - Added Replacing Memory Module Section
3.8.0	June 30, 2017	125-126	Added 9.15.2 Estimating Depth Curve from Gradients
3.8.9	March 12, 2018		Removed mechanical instructions and put them in the new "DataCan Memory Gauges – Maintenance and Operation Manual".
4.0.6	April 26, 2019		Add Windows 10 to supported OS list
4.1.7	March 26, 2020		Moved some information to separate guides.

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# 1 About This Guide

This document is intended as a supplement to formal training. DataCan is constantly working to improve its products. We must therefore reserve the right to change designs, materials, specifications and prices without notice. DataCan declines any liability that may arise out of the potential inaccuracies in this guide.

This guide assumes that you have some computing and tool knowledge. For more information, contact your local service representative.

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We thank you for any feedback or comments that will help us to continue to improve our products and service.

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## 2 Introduction

DataCan Services Corp. provides technology driven downhole measurement solutions that deliver productivity, quality and safety. We design, manufacture and service 200°C plus hybrid platform instruments, patent pending multi-cycle instant close shut-in tools, reservoir management systems and a suite of quartz and piezo-resistive pressure measurement instruments. We offer specialized solutions that will help you improve productivity in your applications.

We are the leader in ultra-high temperature circuit design, manufacturing and packaging.

- Our part selection process ensures the best long term reliability is provided.
- Our fully automated surface mount assembly procedures ensure the highest quality circuit is constructed every time with minimal heat impact.
- Our Hybrid design and construction techniques will enable DataCan and its customers to reliably enter the 177°C to 225°C market.
- Our metal to metal seal and fully welded designs prevent potential leaks.



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## 3 Product Description

DataCan's program and download software operates and controls all of DataCan's downhole and surface products. The software can be used to program tools, download the information stored on the tool memory, graph tool data, and create reports containing relevant job information. The software runs on Windows XP/Vista/7/8/10.

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### 3.1 Purpose

DataCan download software is designed to be as user friendly as possible while offering features not found on the competition's communication software.

DataCan's products are designed to store data to memory. Whether the memory is located downhole inside of a memory recorder, or at the surface in a surface read out box or multi-channel logger, the architecture of the data storage and retrieval remains the same.

DataCan stores data in "Jobs". One job has a start time and end time. For a memory pressure gauge, the start time is when the operator plugs the battery onto the pressure gauge. The end time for a memory pressure gauge is when the battery or power supply is removed from the gauge.

The act of powering the tool starts the tool and the program sequence. If you remove power from a tool then re-establish power, the program will restart as well.

Jobs can be downloaded individually or as a set. Jobs can be merged together. Jobs are not deleted by the act of re-programming the tool. The only way to delete a job is to instruct the software to perform the delete jobs command. You must delete all of the jobs at once.

You can sample any pressure gauge, surface box, or logger in real time and save files in real time to a remote location.

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## 4 DataCan Download Software Installation

Please read the **DataCan Software Install** guide for the specific operating system you are using for more details.

Each tool shipment comes with a DataCan USB Flash Drive that contains all of the files you need to install the software program and USB drivers.

Before installing DataCan Download Software, you should have your computer ready with one of the following operating systems: Windows XP/Vista/7/8/10.

To install DataCan Software from the Flash Drive:

- Insert the Flash Drive into a USB Port
- Open the **DataCan Download Software** folder.
- Double click the **setup.exe** file to launch the DataCan Software installation.
- Follow the instructions leading to the completion of the software installation.

New releases are available for download on our website <https://www.datacan.ca/downloads>.

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## 4.1 Configuration File

If the download software is being installed to multiple computers and the IT department would like the same defaults used for each computer, a configuration file can be saved and deployed.

Set up the download software on one computer with all of the settings the way that the user would like. Then close the download software.

In the Public User's "Documents" or "My Documents" folder for that user, there is a "DataCan" directory which contains the "DownloadSoftware.conf" file.

In XP: C:\Documents and Settings\All Users\Documents\DataCan\DownloadSoftware.conf

In Vista / 7: C:\Users\Public\Documents\DataCan\DownloadSoftware.conf

Install the download software on each computer. Open the software and close the software.

Then replace the same .conf file on each user's computer with the "DownloadSoftware.conf" file from the first computer.

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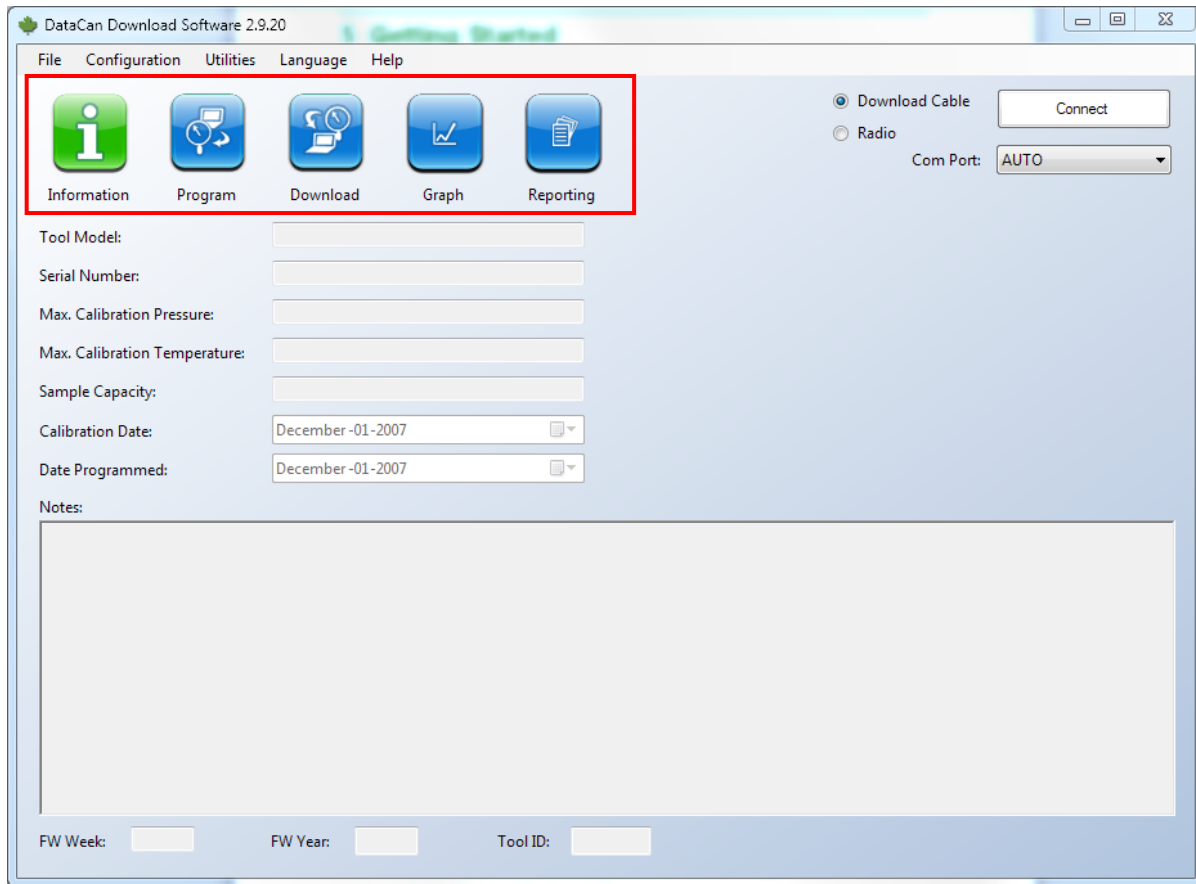
## 4.2 Installing the Download Cable Drivers Windows

Please read the **Quick Driver Install RevX\_X.pdf** guide for download cable driver installation.

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## 5 Getting Started

DataCan download software contains five main sections. Navigate between the five different sections by clicking the buttons shown below. The active section's button is highlighted green.



The five sections are as follows:

**Info** – See information about the connected tool.

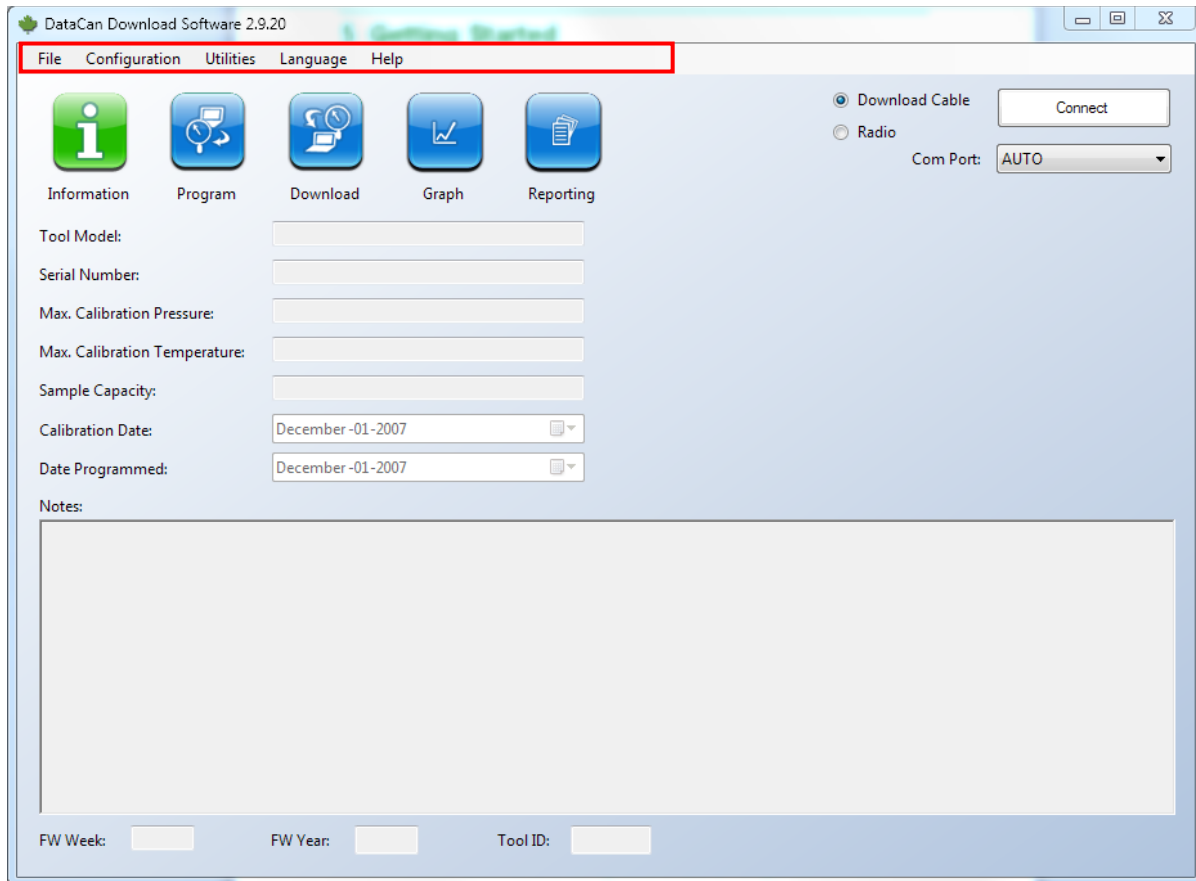
**Program** –Program the tool.

**Download** –Download data from the tool memory.

**Graph** – Create graphs and tables of the downloaded data.

**Reporting** – Create detailed reports of job information.

The software also has five menus containing additional features. Navigate between the five menus by clicking the menu title shown below.



The five menus are as follows:

**Graph** – Open, close and save jobs in graph and tabular form in the Graph Section.

**Configuration** – Change the settings of the connected tool.

**Utilities** – Calculate battery usage and perform real time sampling with the connected tool.

**Language** – Switch between English, Mandarin Chinese, and German languages.

**Help** – View graph help and software version details.

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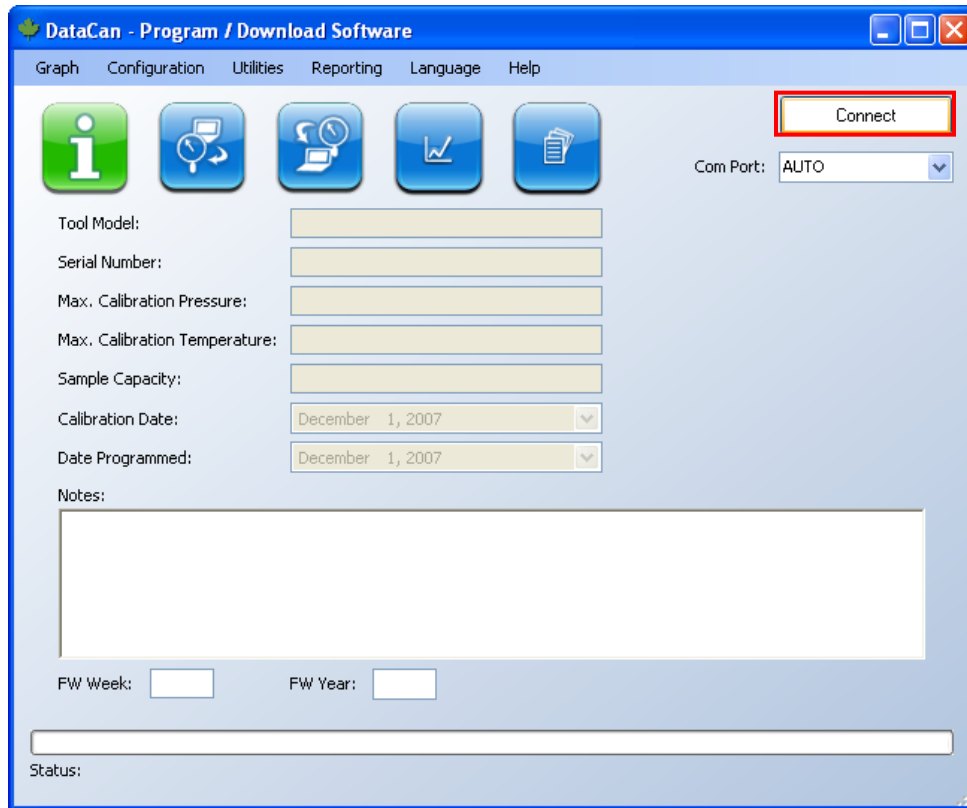
## 6 Connecting The Tool

Once the DataCan Download Software and the USB drivers have been installed you are ready to initiate communication with the tool.

Connect the green tool connection end of the DataCan Communication Cable to the gauge, surface box, or data logger. Connect the USB end to a receptacle on your computer.



Open DataCan Download Software. You will be directed to the info page shown below. Click on the **Connect** button.



Once the software has established communication with the pressure gauge the Tool Model, Serial Number, Max Calibration Pressure, Max Calibration Temperature and Sample Capacity fields will fill with information from the tool.



The screenshot shows the 'DataCan Download Software' window. The title bar includes the software name and the serial number 'P1242'. The menu bar contains 'Graph', 'Configuration', 'Utilities', 'Reporting', 'Language', and 'Help'. Below the menu are five icons: an information icon, a refresh icon, a pie chart icon, a line graph icon, and a document icon. On the right, there is a 'Disconnect' button and a 'Com Port' dropdown menu set to 'COM12'. The main area displays tool information for a 'Piezo Pressure Recorder' with serial number 'P1242'. The fields are as follows:

Tool Model:	Piezo Pressure Recorder
Serial Number:	P1242
Max. Calibration Pressure:	3000.019 psi
Max. Calibration Temperature:	155.02 DegC
Sample Capacity:	1 000 000
Calibration Date:	July 12, 2010
Date Programmed:	July 12, 2010

Below the tool information is a 'Notes' section with a large text area. At the bottom, there are fields for 'FW Week: 26' and 'FW Year: 2009', followed by a 'Status:' label and a long empty text field.

To edit the tool information fields enter **supervisor mode** by pressing **Ctrl + Shift + D** simultaneously on the keyboard. The background of the fields will change from grey to white and you will be able to enter the required information. It is necessary to save the new information by pressing the **Save Notes to Tool** button that appears only when in supervisor mode.

**DataCan Download Software - P1242 - Supervisor Mode**

Graph Configuration Utilities Reporting Language Help

Disconnect

Com Port: COM12

Tool Model: Piezo Pressure Recorder

Serial Number: P1242

Max. Calibration Pressure: 3000.019 psi

Max. Calibration Temperature: 155.02 DegC

Sample Capacity: 1 000 000

Calibration Date: July 12, 2010

Date Programmed: July 12, 2010

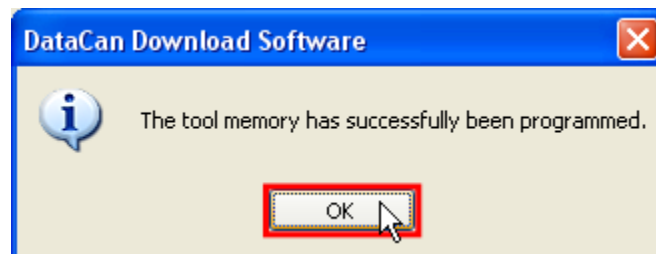
Save Notes to Tool

Notes:

FW Week: 26 FW Year: 2009

Status:

A pop up window will indicate when the changes have been made. Click **OK**.



The **Notes** section was added for the operator to manually capture other information such as job details, job location or reminders. To save your notes to the tool memory you must click the

**Program Tool** button (see next section) or use the same procedure as changing the tool information.

To disconnect the tool from the PC simply press the **Disconnect** button and unplug the tool.

**DataCan Download Software - P1242 - Supervisor Mode**

Graph Configuration Utilities Reporting Language Help

**Disconnect**

Com Port: COM12

Tool Model: Piezo Pressure Recorder

Serial Number: P1242

Max. Calibration Pressure: 3000.019 psi

Max. Calibration Temperature: 155.02 DegC

Sample Capacity: 1 000 000

Calibration Date: July 12, 2010

Date Programmed: July 12, 2010

**Save Notes to Tool**

Notes:

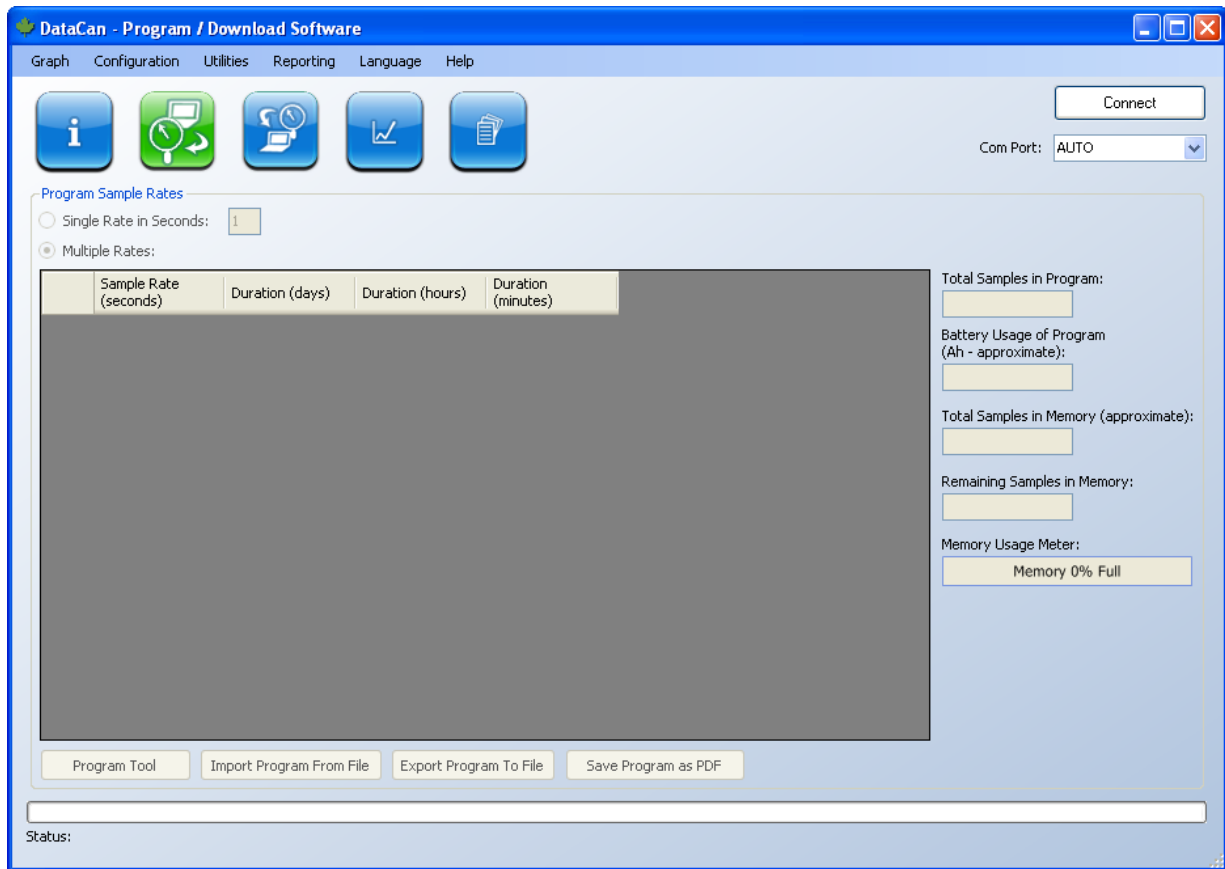
FW Week: 26 FW Year: 2009

Status:

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## 7 Programming the Tool

Enter the Program section by clicking on the following icon. Here you can create programs and store programs to the tool memory.



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## 7.1 Before Programming the Tool

For all memory gauges, the first step is **always** set to 1 second / sample for 64 seconds. This is so that the light (LED) on the battery flashes once per second and so that after 64 seconds there is data in the memory. This is a default step and cannot be changed.

There is one more default program step. At the end of your program, the gauge will sample at 30 seconds / sample. If your program is 1 hour long and you run a job for 1 day, then the tool will run at your programmed sample rate for 1 hour and then the next 23 hours will be run at 30 seconds / sample.

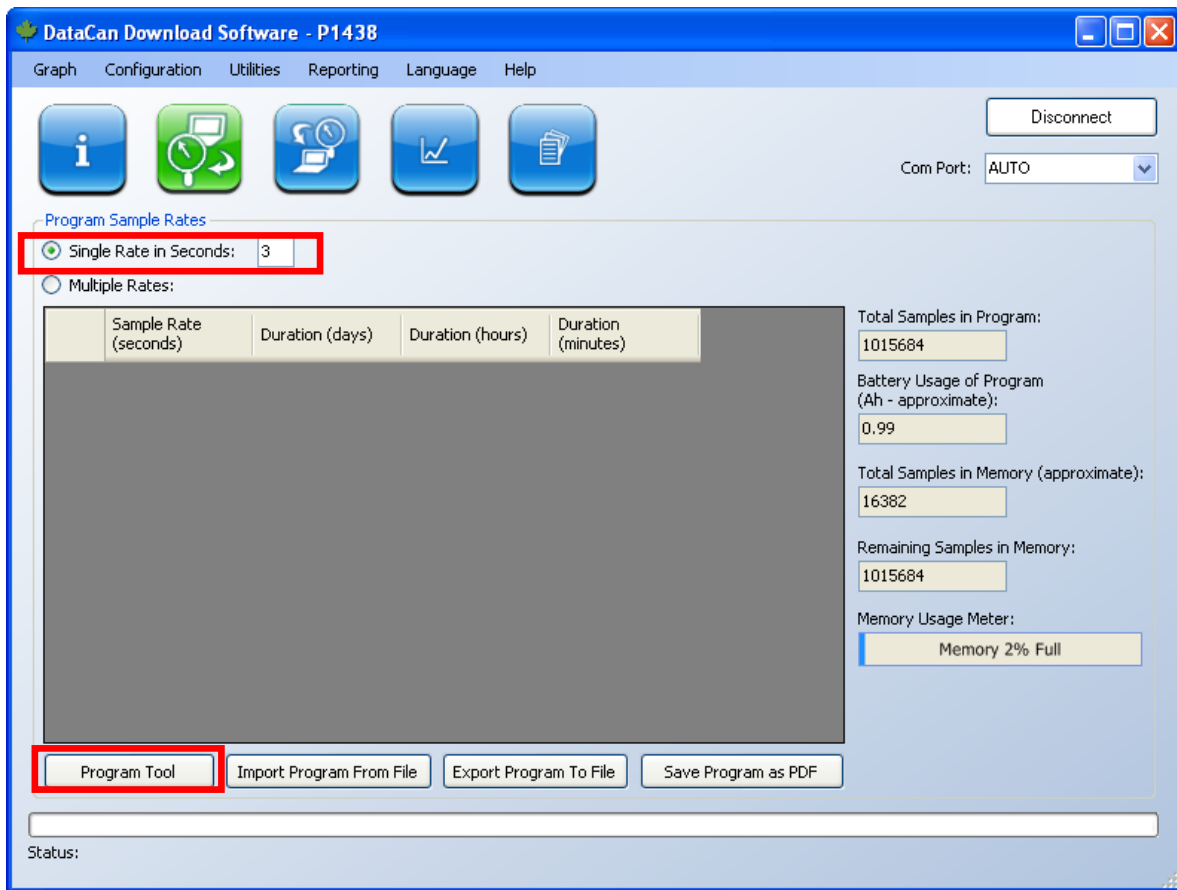
DataCan piezo pressure gauges write to memory every 8 samples. Hence, if you choose to enter a sample rate of 1 sample an hour, you will need to power the tool for 8 hours before any data will be written to the permanent non-volatile gauge memory.

If your sample rate is 30 seconds then  $30 * 8 = 240$  seconds (4 minutes).

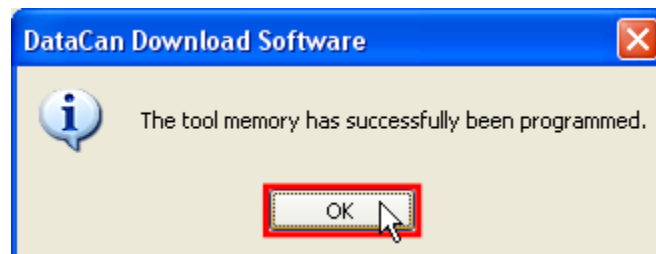
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## 7.2 Single Rate Program

To create a program using a single sample rate select the **Single Rate in Seconds** radio button under the **Program Sample Rates** heading. Enter the desired sample rate in the field provided. For example, if 3 is entered the tool will sample once every three seconds. The **Total Samples in Program, Battery Usage of Program, Total Samples in Memory, and Remaining Samples in Memory** will be calculated automatically. The **Memory Usage Meter** visually displays the percentage the samples of memory have used from the total. Click the **Program Tool** button to save the program to the tool memory.



A pop up window will appear when the program has been loaded on the tool. Click **OK**.



A DataCan Gauge Program Sheet will pop up which shows the details of the program entered into the tool memory. You can either choose to discard the sheet or save it to the PC as a pdf file. If you choose to save the sheet enter your name in the blank field provided and press the

**Save** button. This creates a record of the tool program that can be referred to when the tool is in operation.

**Gauge Program Sheet**

**DataCan Gauge Program Sheet**

**Gauge Information**

Tool Model : Piezo Pressure Recorder  
Serial Number : P1438  
Max. Calibration Pressure : 15000 psi  
Max. Calibration Temperature: 177 DegC  
Sample Capacity : 1 000 000  
Calibration Date : Wednesday, June 02, 2010

**Program**

Single Sample Rate: 3 seconds  
Time Until Memory Full: 35 days 13 hours 10.55 minutes

Date: Monday, September 27, 2010 02:10:19 PM      Programmed By:

## 7.3 Multiple Sample Rate Program

To create a program using multiple sample rates select the **Multiple Rates** radio button under the **Program Sample Rates** heading. Enter the desired sample rates and durations in the fields provided. Up to 16 steps can be entered in the program. When all the programs are completed the tool will default to 30-second sample rate and continue until the memory is full.

The **Total Samples in Program** and **Battery Usage of Program** will be calculated automatically. Click the **Program Tool** button to save the program to the tool memory.

The screenshot shows the 'DataCan Download Software - P1438' window. The 'Program Sample Rates' section is active, with the 'Multiple Rates' radio button selected. A table with 12 rows and 5 columns (Sample Rate, Duration (days), Duration (hours), Duration (minutes)) is displayed. The first four rows are filled with data: (1, 1, 0, 0, 1.07), (2, 5, 30, 0, 0.00), (3, 10, 10, 0, 0.00), and (4, 20, 5, 0, 0.00). The fifth row is highlighted in blue. To the right of the table, the 'Total Samples in Programs' is 626464 and the 'Battery Usage of Program (Ah - approximate)' is 1.44. At the bottom, the 'Program Tool' button is highlighted, along with 'Import Program From File', 'Export Program To File', and 'Save Program as PDF' buttons. The status bar at the bottom indicates 'Status: Complete'.

	Sample Rate (seconds)	Duration (days)	Duration (hours)	Duration (minutes)
1	1	0	0	1.07
2	5	30	0	0.00
3	10	10	0	0.00
4	20	5	0	0.00
5				
6				
7				
8				
9				
10				
11				
12				

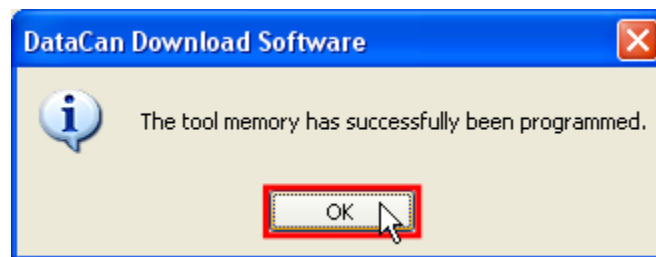
Total Samples in Programs: 626464  
Battery Usage of Program (Ah - approximate): 1.44

Program Tool Import Program From File Export Program To File Save Program as PDF



Status: Complete



When the programming is complete a pop up window will tell you the tool memory has been programmed successfully. Press **OK**.



A DataCan Gauge Program Sheet will pop up which shows the details of the program entered into the tool memory. You can either choose to discard the sheet or save it to the PC as a pdf file. If you choose to save the sheet enter your name in the blank field provided and press the **Save** button. This creates a record of the tool program that can be referred to when the tool is in operation. The sheet also shows the overrun time which is the time it takes to fill the tool memory after all the program steps have completed and the default sample rate of 30 seconds kicks in.


**Gauge Program Sheet**


**DataCan Gauge Program Sheet**

**Gauge Information**  
 Tool Model : Piezo Pressure Recorder  
 Serial Number : P1438  
 Max. Calibration Pressure : 15000 psi  
 Max. Calibration Temperature: 177 DegC  
 Sample Capacity : 1 000 000  
 Calibration Date : Wednesday, June 02, 2010

**Program**  

Step	Sample Rate	Days	Hours	Minutes	Samples
1	1	0	0	1.07	64
2	5	30	0	0.00	518400
3	10	10	0	0.00	86400
4	20	5	0	0.00	21600

**Summary**  

	Steps	Days	Hours	Minutes	Samples	Power Required
Total	4	45	0	1.07	626464	1.44 Ah

Date: Monday, September 27, 2010 02:14:24 PM
 Programmed By:

---

## 7.4 Burst Gauge Programming

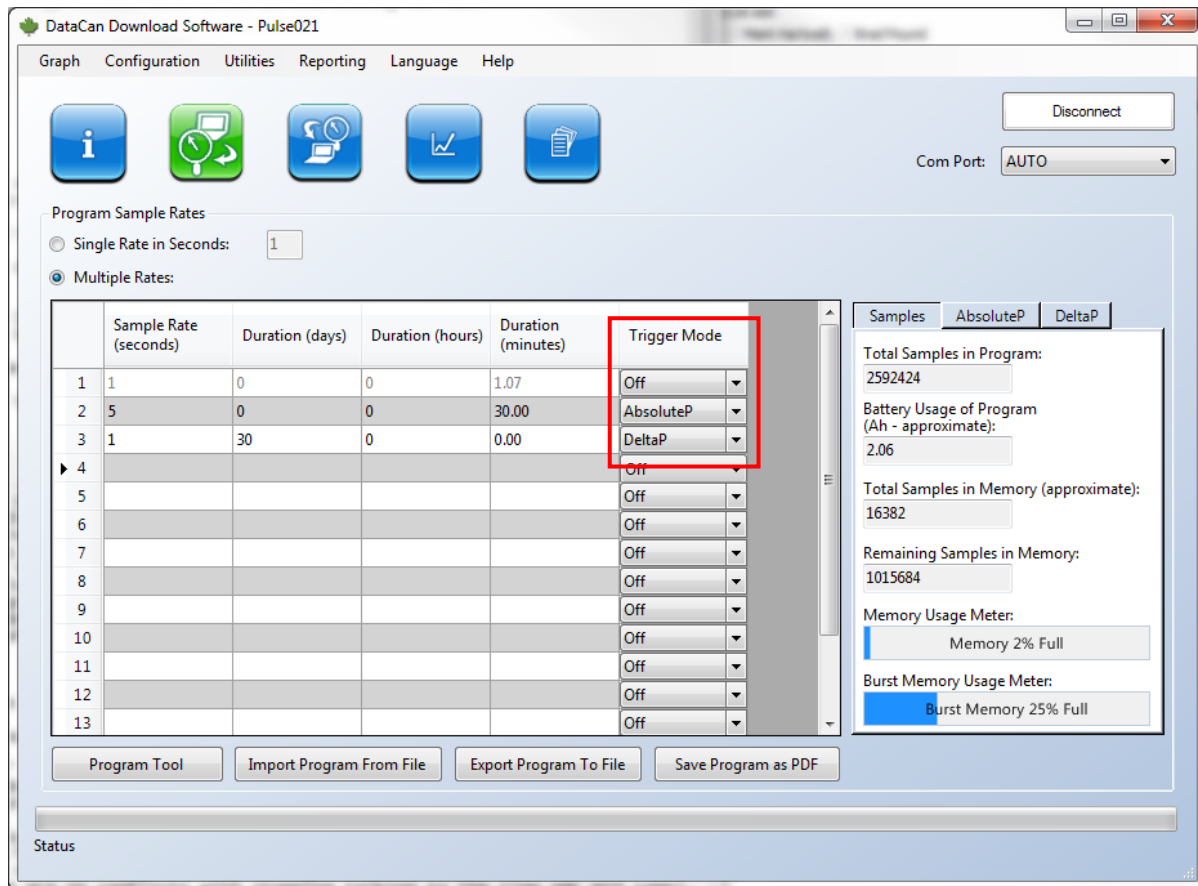
The Burst Gauge is programmed like any other memory gauge with the addition of a “Trigger Mode”. The trigger mode has 4 different options:

- ✿ Off – This mode stores pressure, temperature and time like a standard memory gauge. No triggers are enabled in this mode.
- ✿ Absolute P (or “Level Mode”)
- ✿ Delta P (or “Window Mode”)
- ✿ Calibration

For each program step, the gauge will not change to the next program step until the programmed Duration time is reached.

### 7.4.1 Pre-Burst Data

When the gauge is in Absolute P or Delta P mode, the gauge will sample at 10 kHz to determine if a trigger is found. Once a trigger is found, 0.6 seconds of the 10 kHz data is stored with the burst memory as pre-burst data.



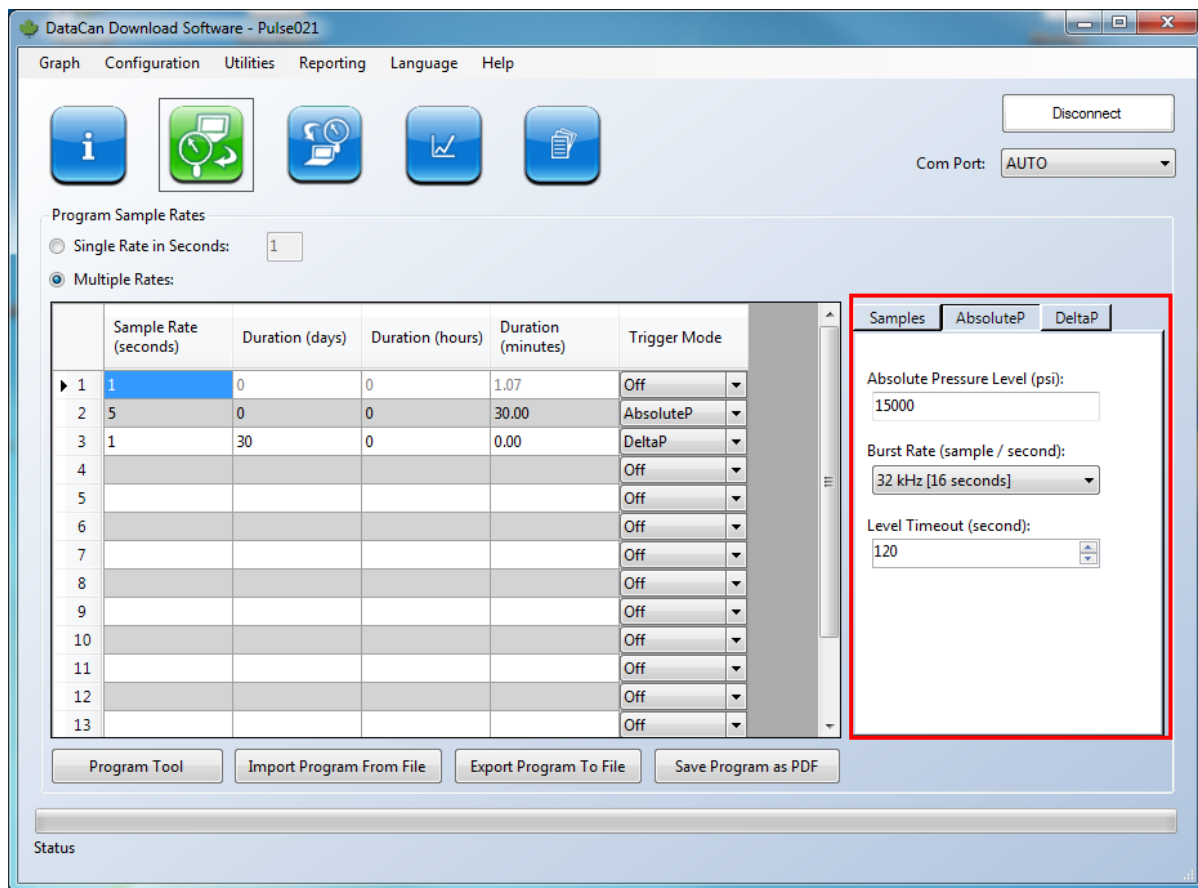
## 7.4.2 Off Mode

This mode stores pressure, temperature and time like a standard memory gauge. No triggers are enabled in this mode.

## 7.4.3 Absolute P ("Level") mode

This is one of two pressure triggered modes. The data is stored to memory at the sample rate set in the program page under "Sample Rate" until a trigger is found.

To the right of the main program window, if the user clicks on the button labeled "AbsoluteP", the options for this mode will appear underneath.



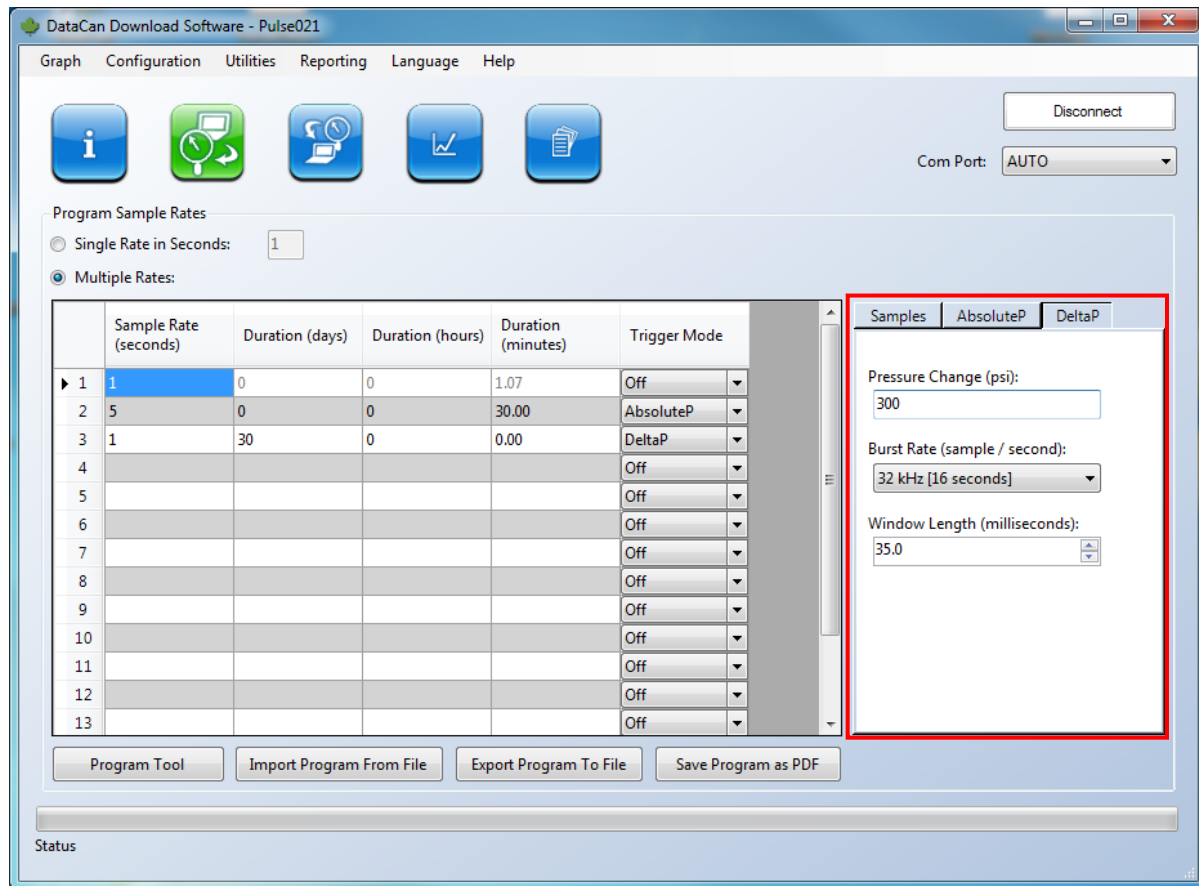
The trigger pressure is programmed in the box labeled "Absolute Pressure Level". Once the measured pressure goes above this level, the gauge will sample at the rate set in "Burst Rate" until the burst memory is full.

The "Level Timeout" is the number of seconds after a burst has completed until the gauge will ignore any other pressure triggers. This feature is so that if the well pressure remains above the burst threshold longer than the time that it takes to record one burst event, the gauge does not record a second burst event immediately. To disable this feature, enter a value of zero in this field.

## 7.4.4 Delta P (“Window”) Mode

This is the second of two pressure triggered modes. The data is stored to memory at the sample rate set in the program page under “Sample Rate” until a trigger is found.

To the right of the main program window, if the user clicks on the button labeled “DeltaP”, the options for this mode will appear underneath.



The trigger pressure is programmed in the box labeled “Pressure Change”. The gauge pressure is measured in small windows that have a length of “Window Length”. If during one of these windows, the pressure changes more than “Pressure Change”, a burst even occurs and the gauge samples at the rate set in “Burst Rate” until the burst memory is full.

## 7.4.5 Calibration Mode

Used internally by DataCan to calibrate both the slow and high speed sensor circuits.

## 7.5 Piezo Pressure Gauge with Pressure Trigger Programming

The Piezo Pressure Gauge with Pressure Trigger has two programming modes:

- 1) "Off" – Normal mode.
- 2) "On" – Pressure triggered mode.

DataCan Download Software - DHG1

File Configuration Utilities Language Help

Download Cable Disconnect  
Radio  
Com Port: AUTO

Program Sample Rates

Single Rate in Seconds: 1  
Multiple Rates:

	Sample Rate (seconds)	Duration (days)	Duration (hours)	Duration (minutes)	Trigger Mode	Trigger Window (+/-psia)	Time for Stability (seconds)	Stability Window (+/-psia)
1	1	0	0	1.07	Off			
2	5	0	0	0	On	30.0	60	2.0
3	5	0	0	0	On	30.0	60	2.0
4	10	30	0	0.00	Off			
5								
6								
7								
8	30	268	8	1.00	Off			

Program Tool Import Program From File Export Program To File Save Program as PDF

Status

Total Samples in Program: 259264  
Battery Usage of Program (Ah - approximate):  
Total Samples in Memory (approximate): 0  
Remaining Samples in Memory: 1032066  
Memory Usage Meter: Memory 0% Full

### 7.5.1 "Off" Mode

"Off" mode acts like a normal piezo pressure gauge. The gauge will same at the programmed sample rate for the programmed duration.

## 7.5.2 “On” Mode

“On” mode allows will sample to memory at the programmed sample rate until a trigger event occurs. Then the gauge samples at 1 sample per second until the stability criteria is met.

Before the trigger event, the gauge will run at the programmed sample rate until either: a trigger occurs, the memory is full or the battery dies.

At the beginning of each “On” program step, the current well pressure is saved by the gauge. The “Trigger Window” pressure is added to this first pressure and subtracted from this pressure to determine the maximum and minimum pressure that will cause the trigger to occur.

Trigger Mode	Trigger Window (+/-psia)	Time for Stability (seconds)	Stability Window (+/-psia)
Off			
On	30.0	60	2.0
On	30.0	60	2.0
Off			

Once the trigger is found, the gauge will sample at 1 sample per second until the pressure is stable within the programmed “Stability Window” for the programmed “Time for Stability”. In this example, the pressure would have to be within +/- 2.0 psia for 60 seconds before the gauge would exit this program step.

At the end of the stability period, the gauge advances to the next program step.

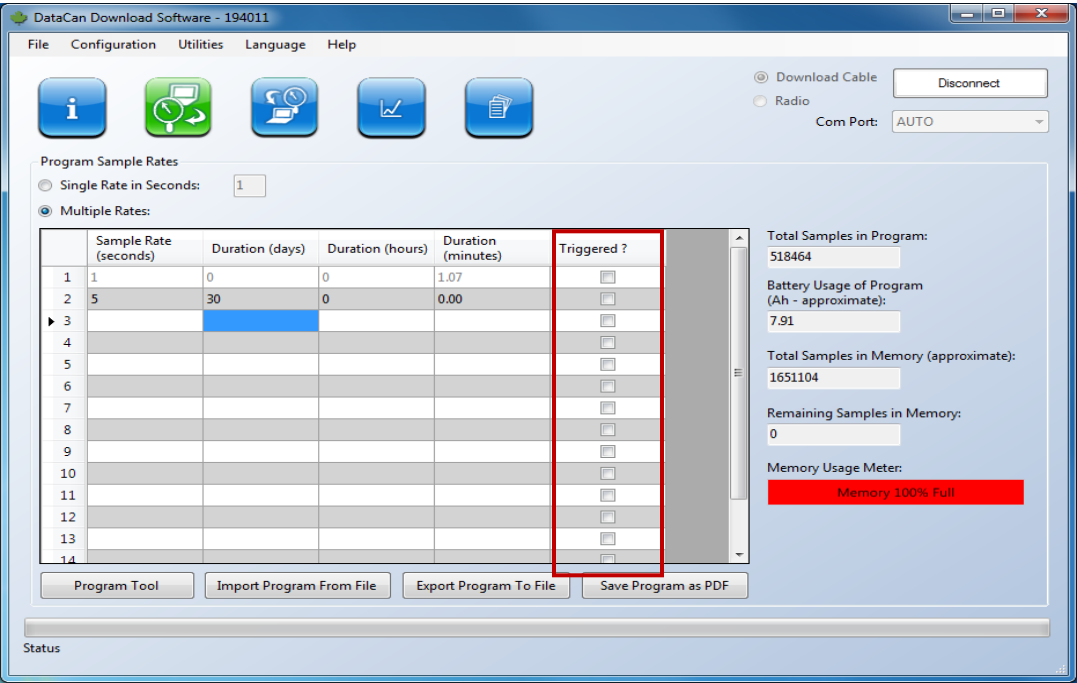
---

## 7.6 Quartz Pressure Recorder with Pressure Trigger

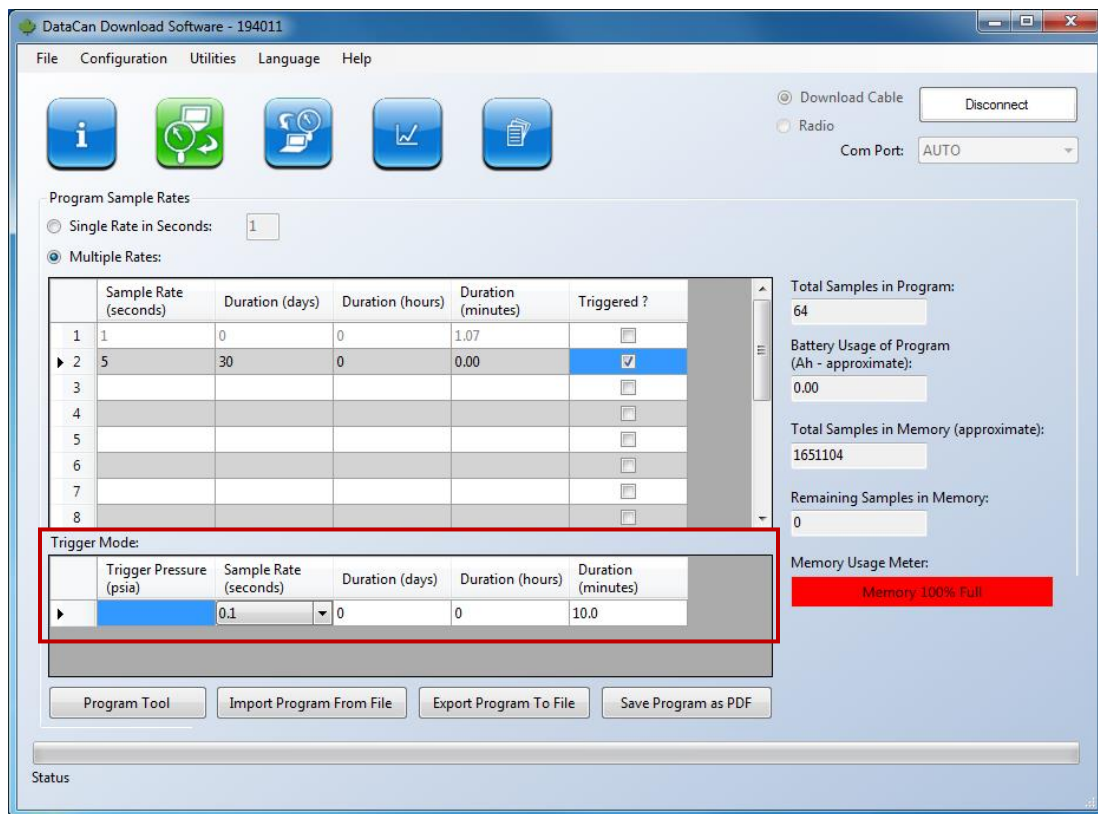
This optional feature on some quartz pressure recorders allows the user to program a faster sample rate when the pressure is above a programmed pressure.



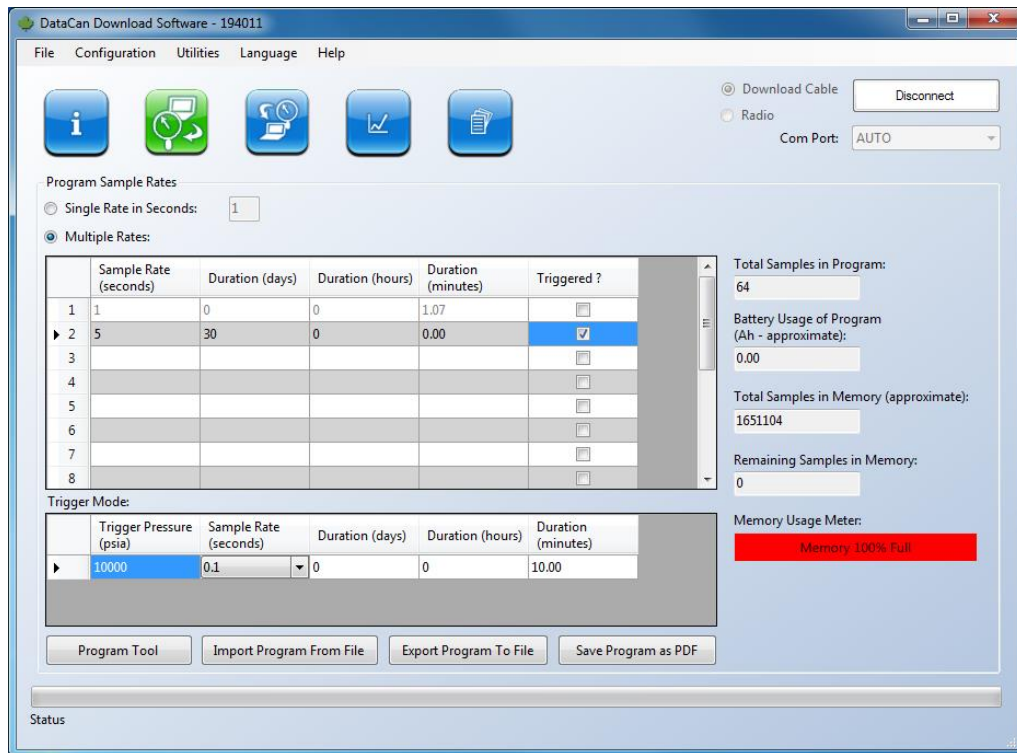
To enable the trigger, check the **Triggered?** box in the right column on the **Program** page.



Each program step with the **Triggered?** box checked will use the trigger program in the grid below.



Once the measured well pressure is above the **Trigger Pressure**, the gauge will start sampling at the trigger mode **Sample Rate** for the trigger mode **Duration**.



In the above example, during the second program step the gauge will sample at 5 seconds per sample. If the measured pressure ever goes above 10000 psia, the gauge will sample at a rate of 0.1 seconds per sample for 10 minutes.

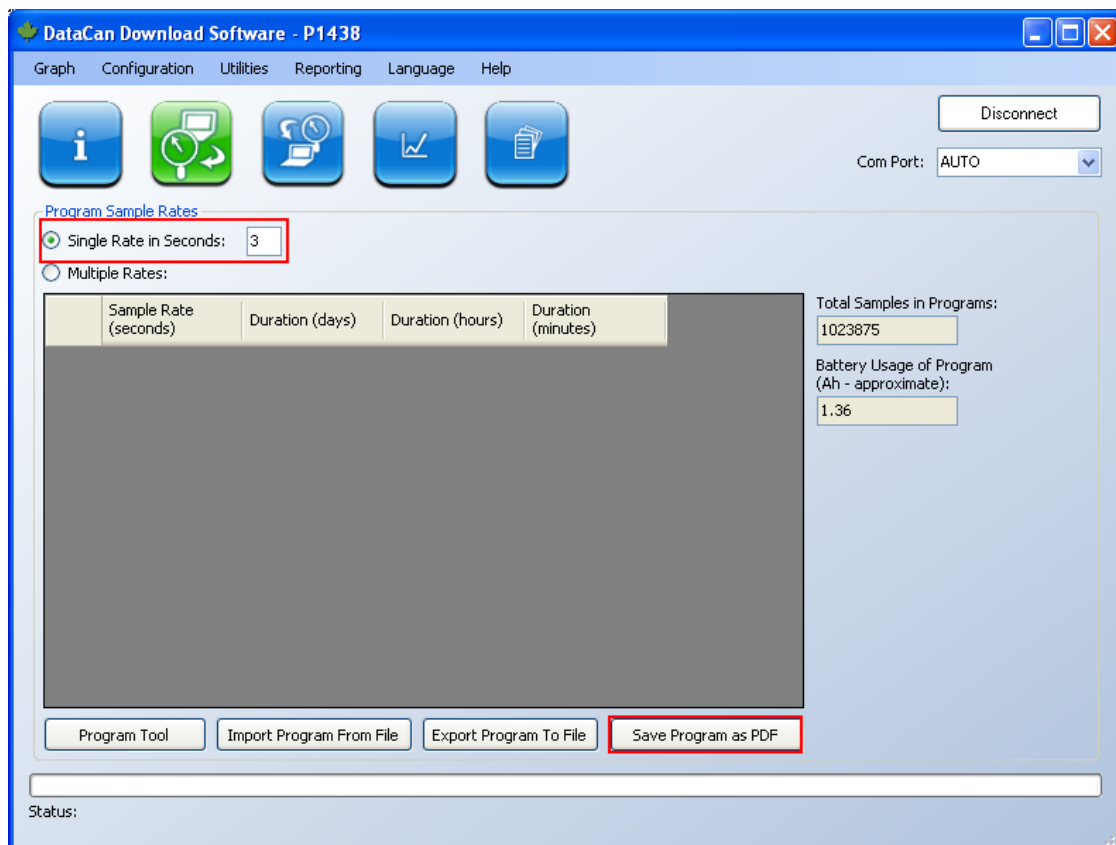
When the programming is complete, press the **Program Tool** button to save this to the gauge.

## 7.7 Save Program as PDF

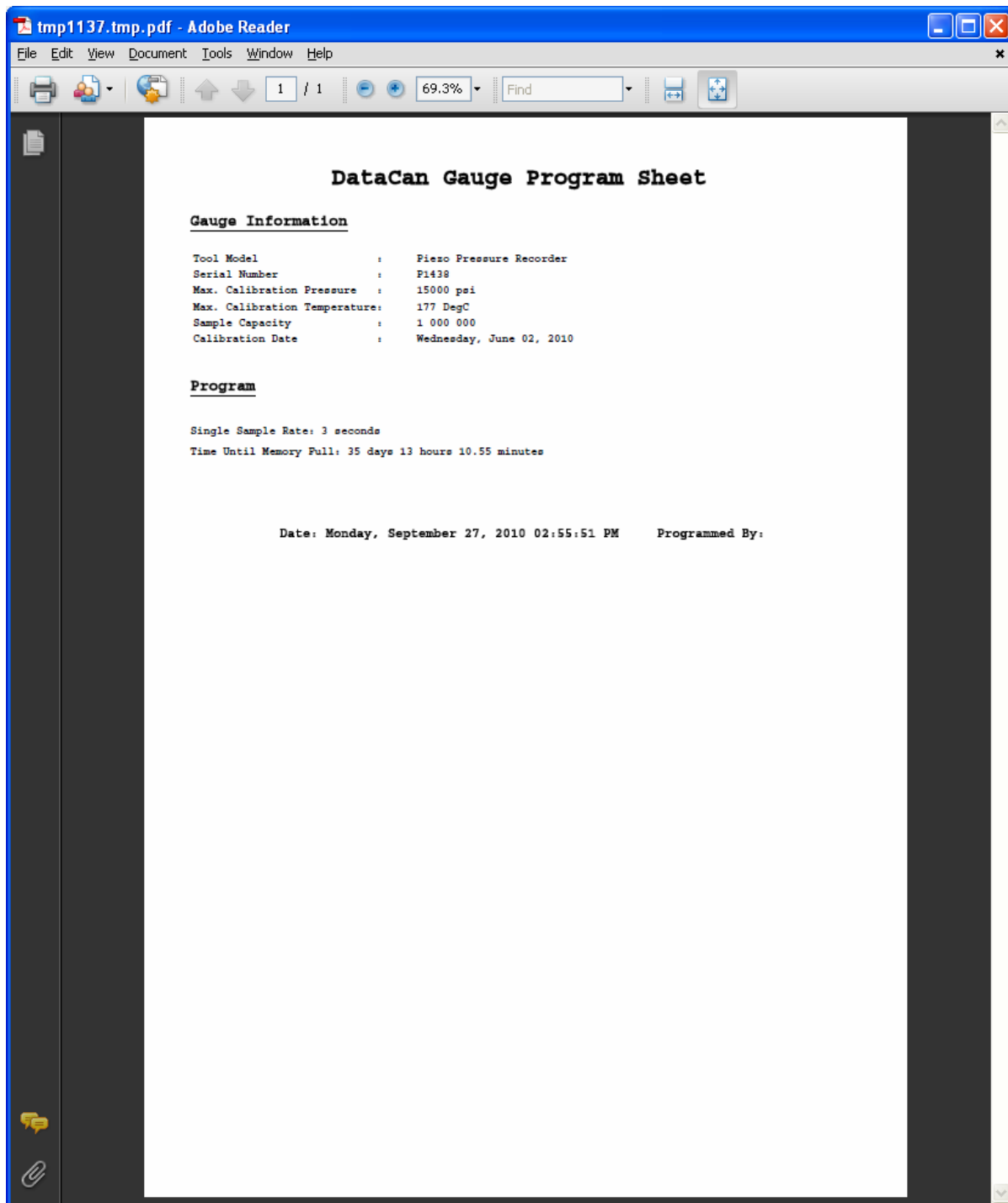
You can quickly and easily view and save the program as a pdf. This function is useful when the program information needs to be viewed and saved in document format immediately.

To quickly and easily save a pdf, select **Single Rates in Seconds** or **Multiple Rates** (both will produce a different pdf document).

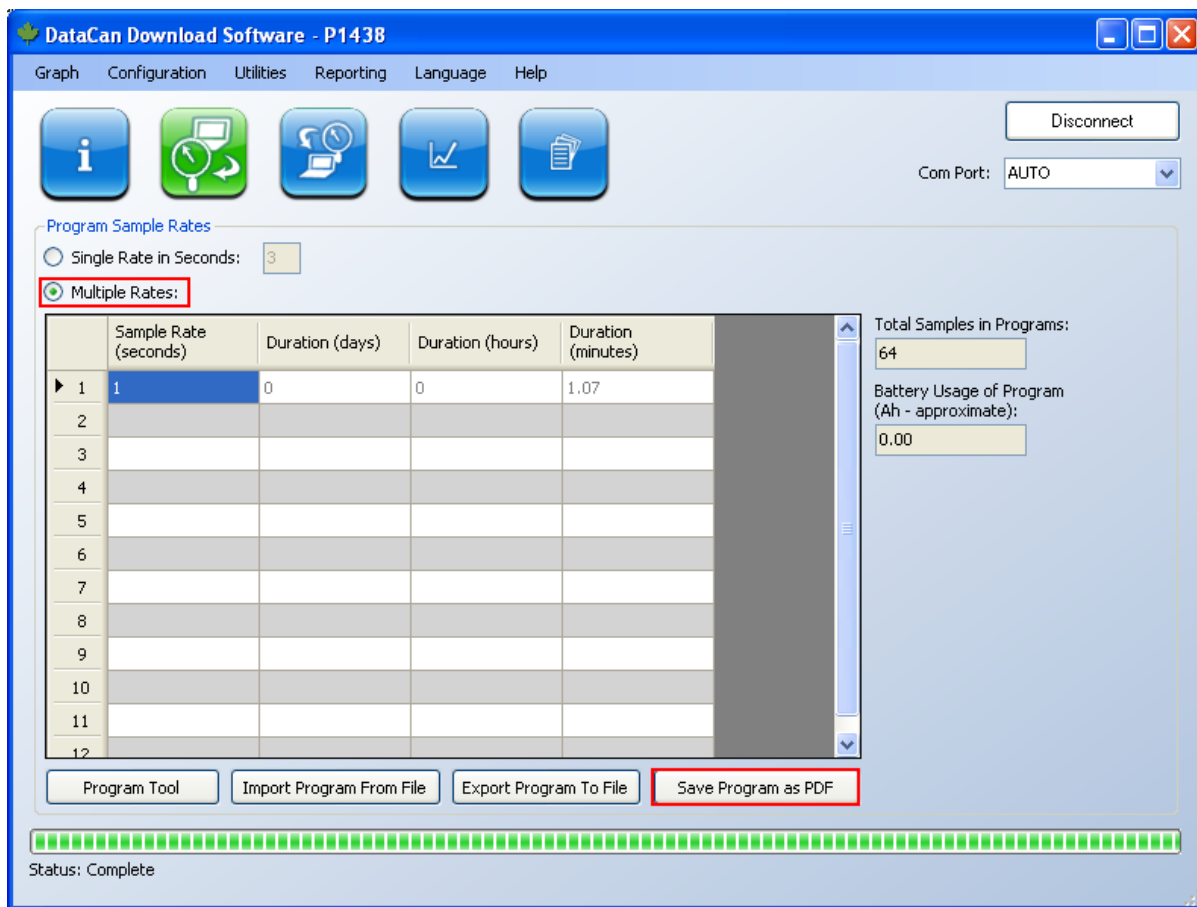
When the **Single Rates in Seconds** option is selected, click the **Save Program as PDF** button.



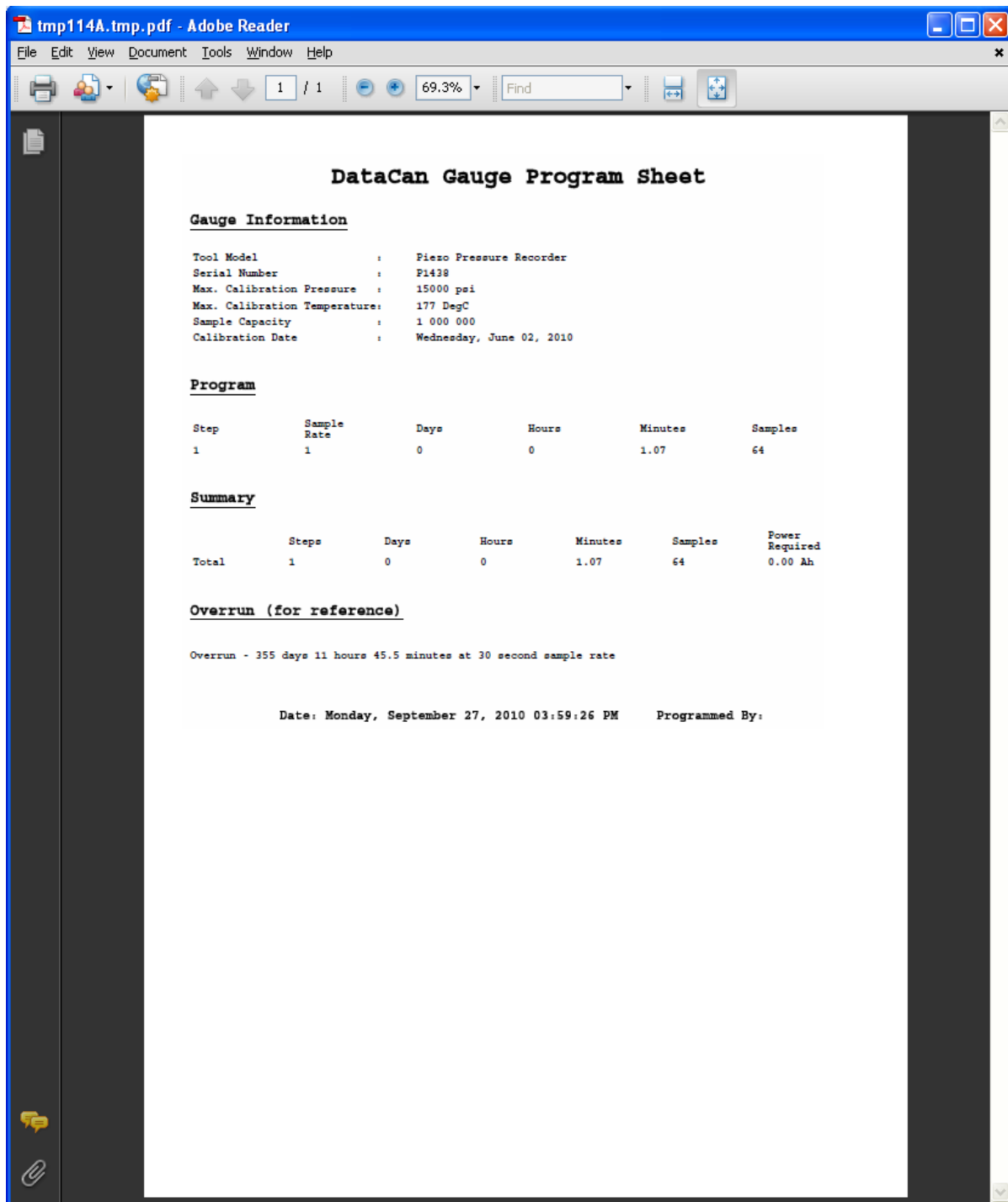
A DataCan Gauge Program Sheet will pop up, as a pdf, which shows the details of the program entered into the tool memory. You can choose to discard the pdf without saving a copy, or save a copy to the PC, or print the pdf. This creates a record of the tool program that can be referred to when the tool is in operation.



When the **Multiple Rates** option is selected, click the **Save Program as PDF** button.



A DataCan Gauge Program Sheet will pop up, as a pdf, which shows the details of the program entered into the tool memory. You can choose to discard the pdf without saving a copy, or save a copy to the PC, or print the pdf. This creates a record of the tool program that can be referred to when the tool is in operation. The sheet also shows the overrun time which is the time it takes to fill the tool memory after all the program steps have completed and the default sample rate of 30 seconds kicks in.

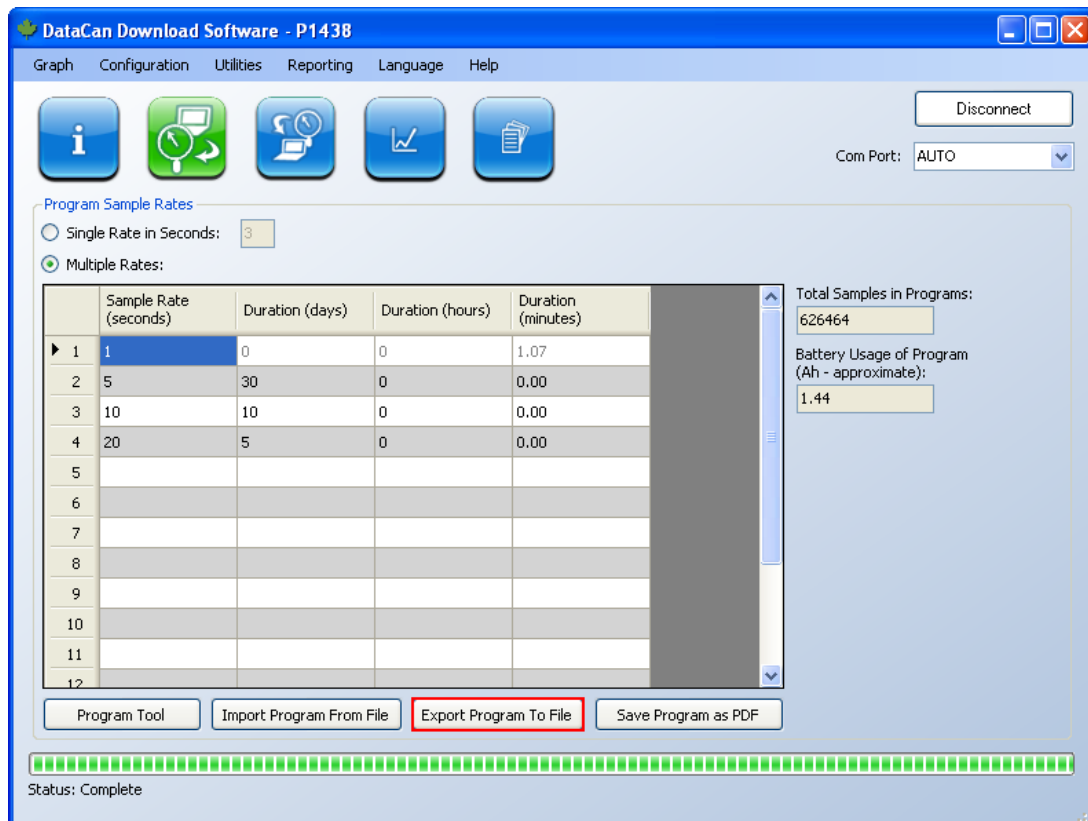


---

## 7.8 Export Program to File

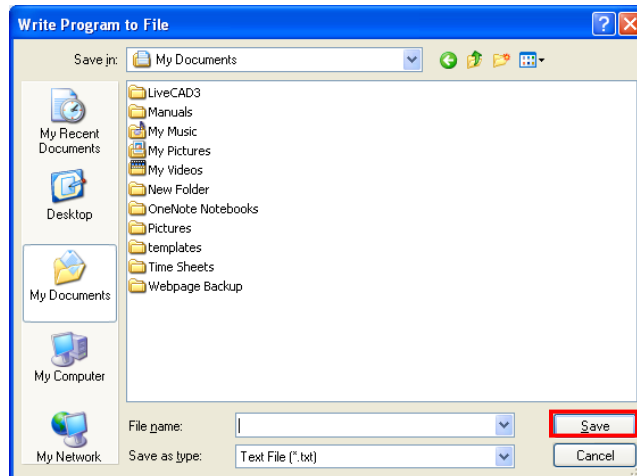
You can save a program to your PC for future use. This function is useful when a program is to be entered into an entire fleet of tools and the programmer does not want to manually program each individual tool.

After creating the program, click on the **Export Program To File** button.



Enter a file name and location to save the file and press the **Save** button. It will be saved as a text file.

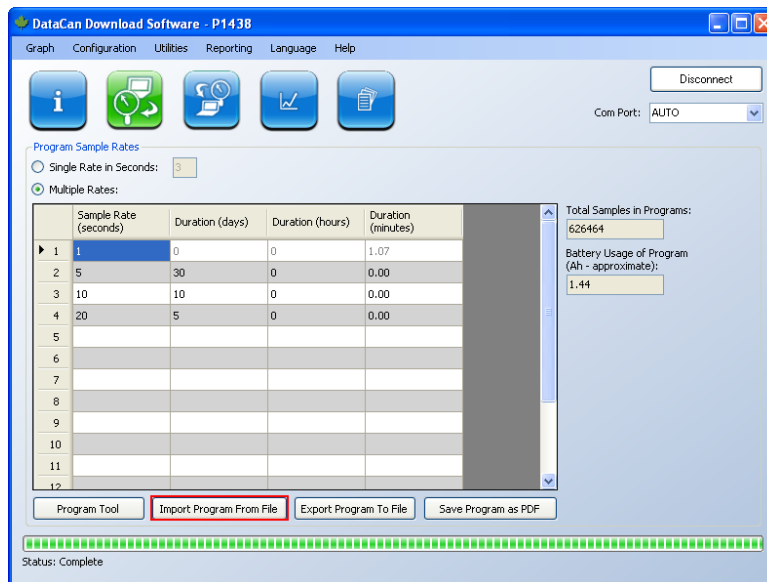




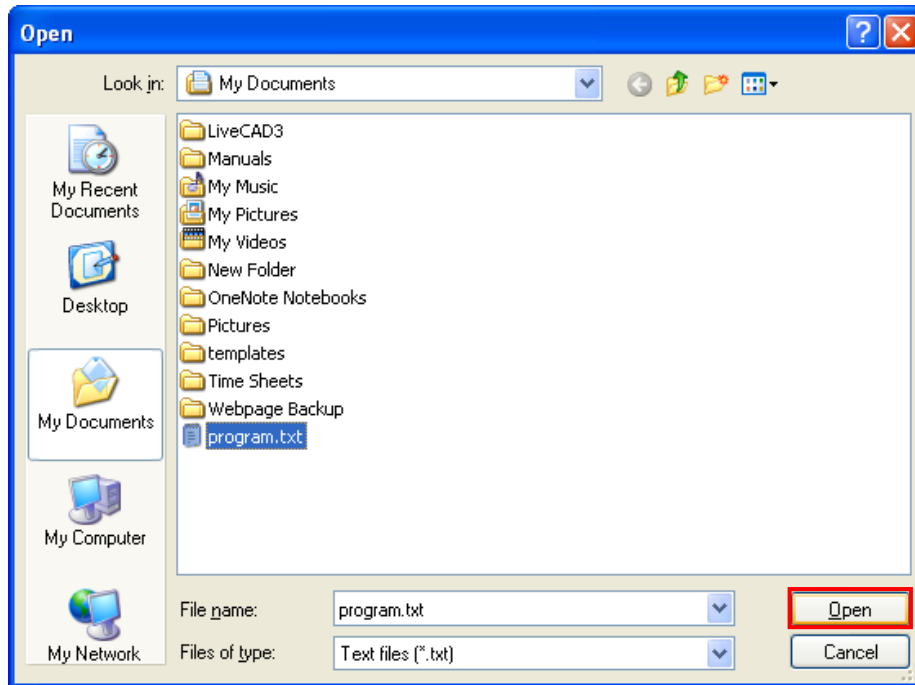
## 7.9 Import Program from File

Programs saved to the PC can be imported into DataCan Download Software so they can be loaded into the tool memory.

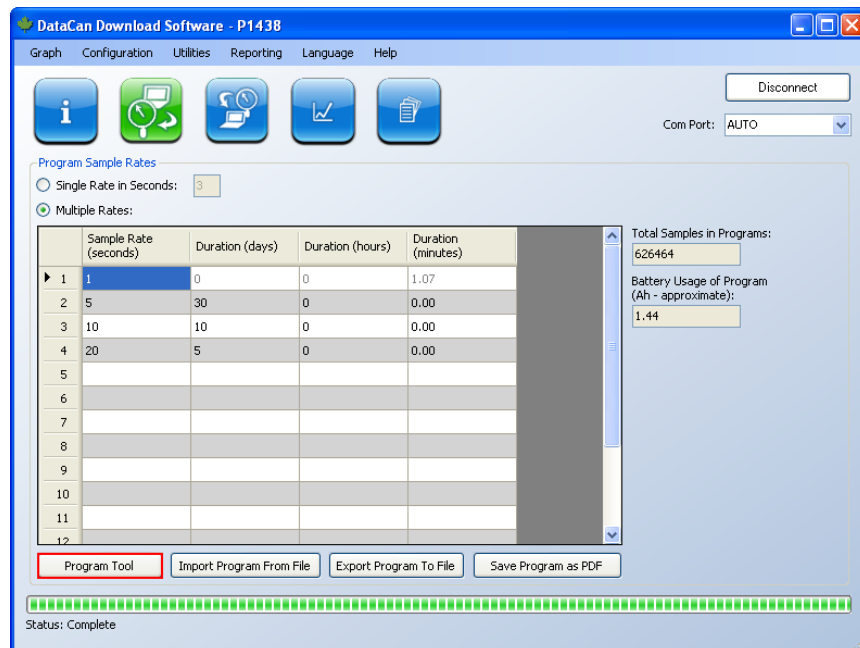
To import a saved program click on the **Import Program From File** button.



Select the program file you want to import and press **Open**.



The stored program will show up in the Program Sample Rates section. Remember to hit the **Program Tool** button to save the program to load the program to the gauge.



## 7.10 Jobs in Tool Memory

Enter the Download section by clicking on the following icon. Here you can view recorded jobs and download data.



The **Jobs in Tool Memory** section lists the jobs recorded in the tool memory when the tool is connected to the PC. Number of samples, maximum pressure, maximum temperature, and duration columns are updated once the data is downloaded from the tool.

DataCan Download Software 2.8.9 - DC0615

File Configuration Utilities Language Help

Download Cable Disconnect  
Radio  
Com Port: AUTO

**Download - Jobs in Tool Memory**

	Job Number	Approximate Number of Samples	Maximum Pressure (psia)	Maximum Temperature (degC)	Duration
1	<input checked="" type="checkbox"/>	1023			
2	<input type="checkbox"/>	4095			
3	<input type="checkbox"/>	4095			
4	<input type="checkbox"/>	16382			
5	<input type="checkbox"/>	16382			
6	<input type="checkbox"/>	40955			
7	<input type="checkbox"/>	81910			

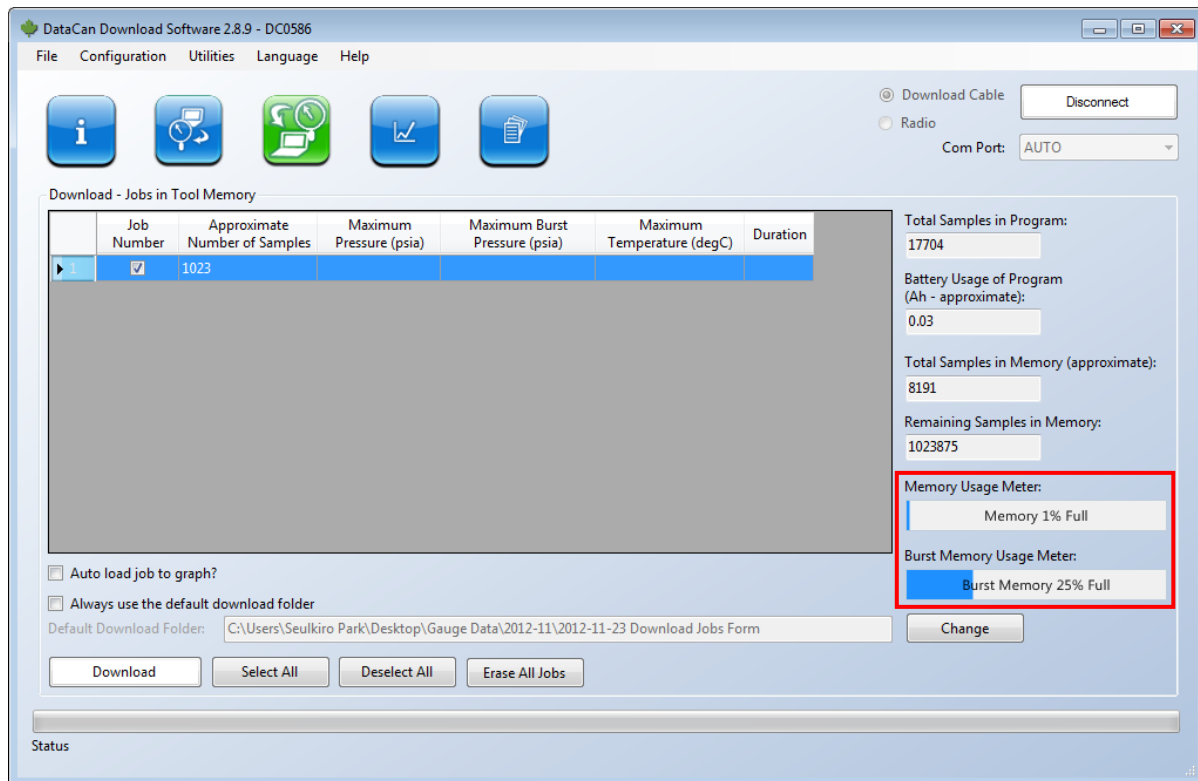
Total Samples in Program: 2592736  
Battery Usage of Program (Ah - approximate): 0.21  
Total Samples in Memory (approximate): 180202  
Remaining Samples in Memory: 335831  
Memory Usage Meter: Memory 35% Full

☐ Auto load job to graph?  
☐ Always use the default download folder  
Default Download Folder: C:\Users\Seulkio Park\Desktop\Gauge Data\2012-11\2012-11-23 Download Jobs Form Change  
Download Select All Deselect All Erase All Jobs

Status

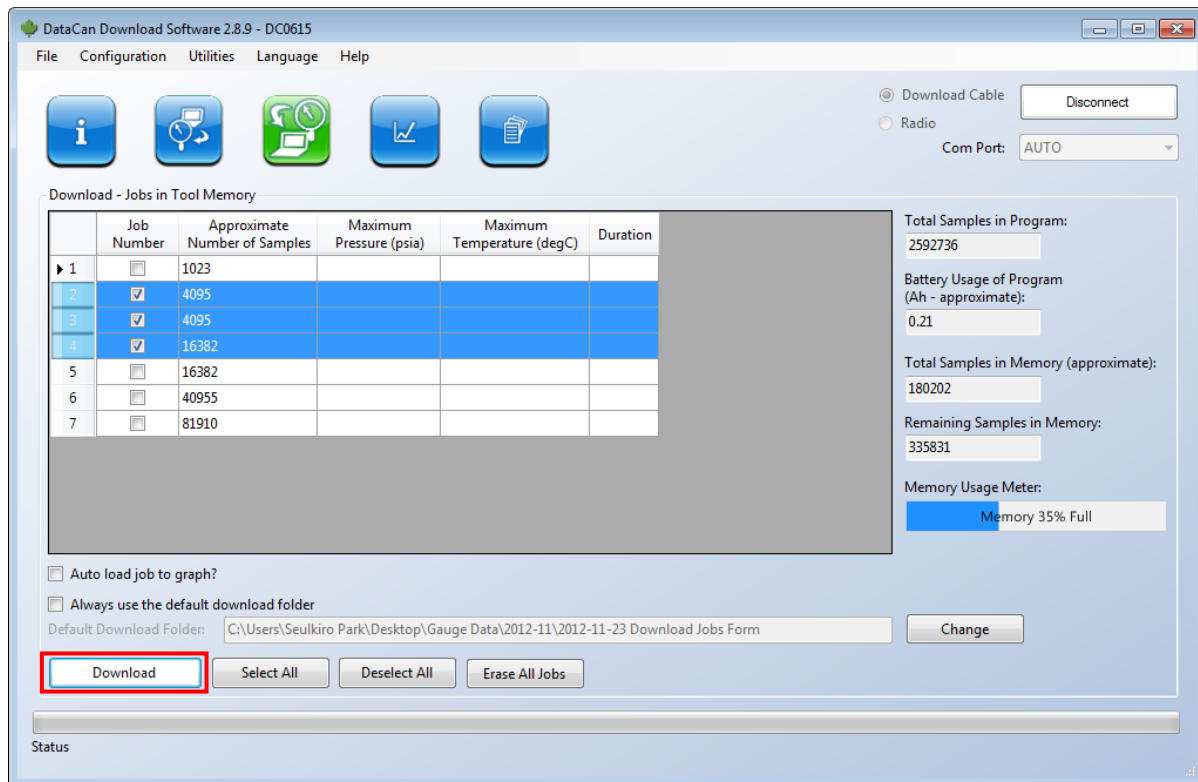
## 7.10.1 Main Memory and Burst Memory Remaining

The percentage of the memory that is full is shown in a bar graph on the right side of the download screen. For the Burst Gauge, the amount of burst memory that is used is also shown here. The Burst Gauge can have a total of 8 burst events stored. If the user is going to run a job that requires more memory than is available, please download and erase all the jobs in memory.

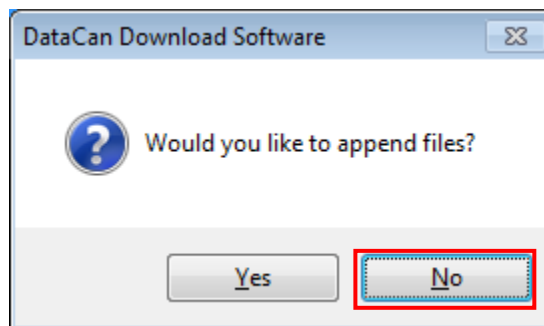


## 7.11 Download Data

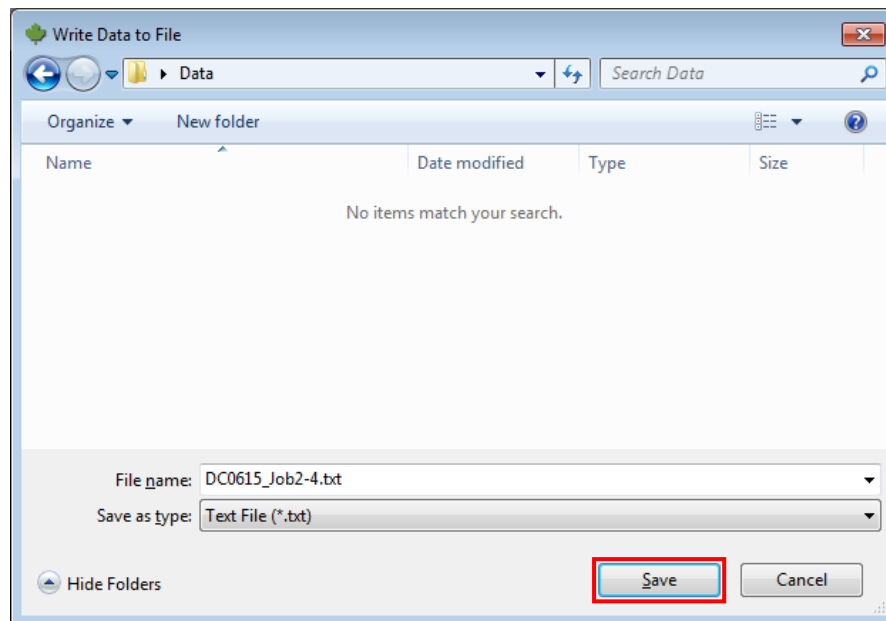
Select the check box next to the jobs that you want to download to your PC and click the **Download** button.



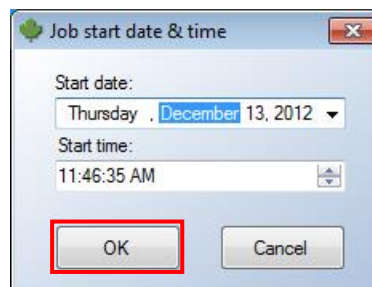
A pop up window will ask you if you want to append the files. If you click on the **Yes** button it will save the multiple jobs to the PC as a single file. If you click the **No** button it will save the jobs as individual files. Click **No** (it is better to append the files in the **Graph** portion of the software).



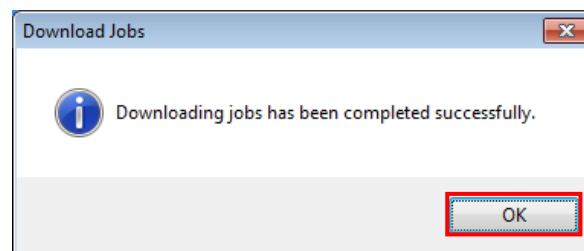
Select a location to save the data file from the tool. Press the **Save** button.



Select the start date and time that the tool battery was connected based on your records. Click **OK** to save the file.



When the jobs are finished downloading a pop up window will tell you that the download was successful. Click **OK**.



Notice that number of samples, maximum pressure, maximum temperature, and duration columns are now updated after the data is downloaded from the tool.

Download - Jobs in Tool Memory

	Job Number	Approximate Number of Samples	Maximum Pressure (psia)	Maximum Temperature (degC)	Duration
▶ 1	<input type="checkbox"/>	1023			
2	<input checked="" type="checkbox"/>	3239	14.510	1106.304	8 Minutes 20 Seconds
3	<input checked="" type="checkbox"/>	2199	14.510	1110.928	6 Minutes 36 Seconds
4	<input checked="" type="checkbox"/>	9862	14.510	1089.276	19 Minutes 23 Seconds
5	<input type="checkbox"/>	16382			
6	<input type="checkbox"/>	40955			
7	<input type="checkbox"/>	81910			

The software automatically converted the data file to a text (ASCII) file based on the settings (see Configuration section shown below) saved in the tool memory. To change Units, please refer to the Configuration Menu in Section 8.2.

Change Unit

Pressure Units: psia

Temperature Units: degC

Time Units: hours

Time Columns: Elapsed Time

Date Format: dd/MM/yyyy

Save Units to Tool Cancel

## 7.11.1 Burst Gauge Download

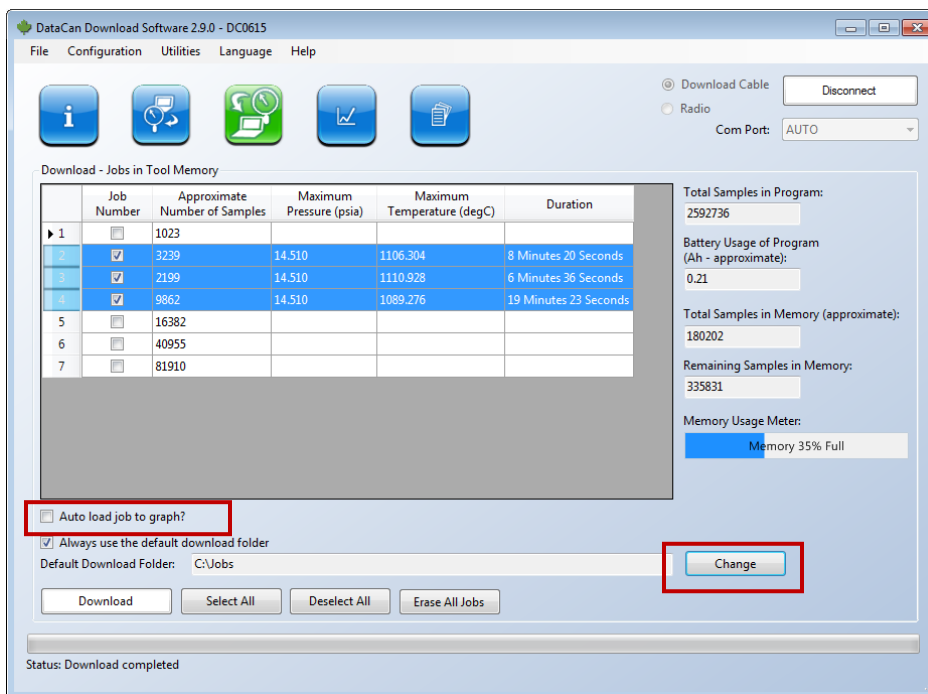
If there are burst events tied to a job being downloaded for the burst gauge, the burst event(s) will be downloaded automatically at the completion of the main job download.

Each burst event is stored in a separate file than the main job. As an example, if a job has 2 burst events, then 3 total files will be created: one for the main job and one for each of the two burst events.

---

## 7.12 Add a Default Download Folder

To force the software to save all downloaded files to a specific location on your computer, a default download folder can be selected.



To do this, put a check mark beside "Always use the default download folder". Next, click the "Change" button and select the folder you would like to use.

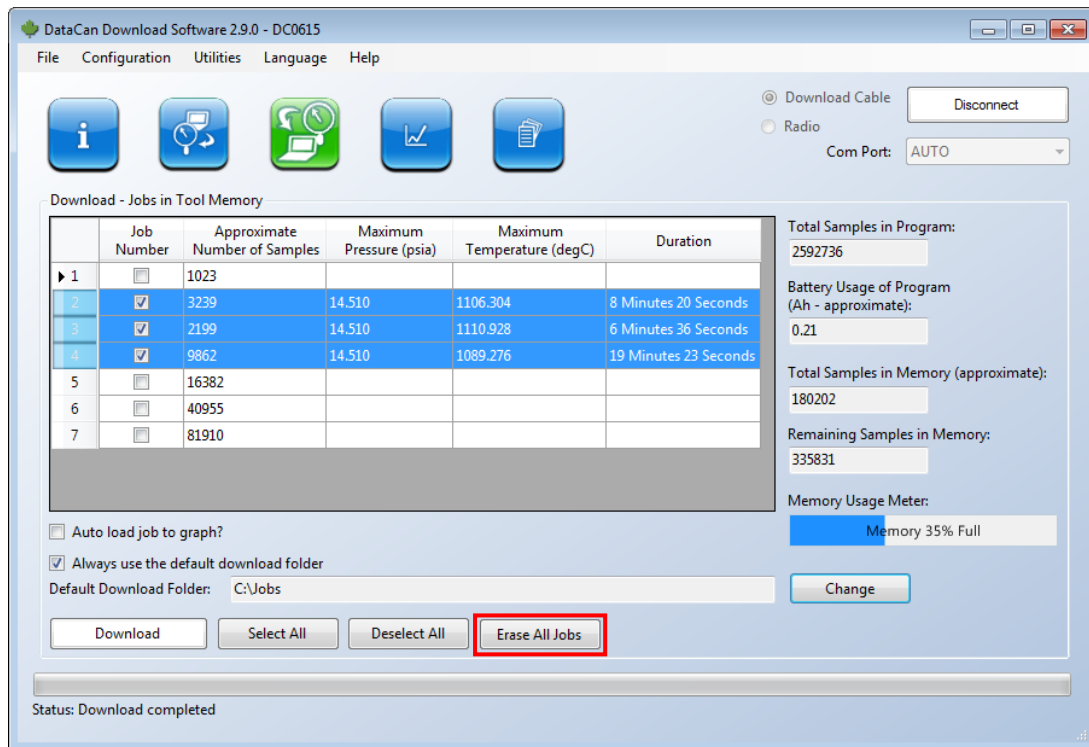


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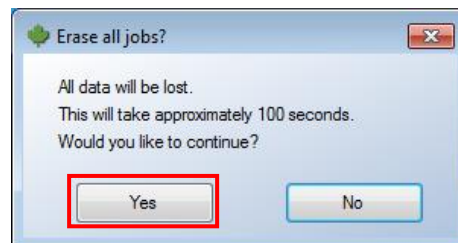
## 7.10 Erase Jobs from Memory

When the data from the tool has been downloaded onto a PC you can erase the jobs contained within the tool memory. This frees up space in the tool memory for future jobs.

To erase the jobs from the memory, select the **Erase All Jobs** button.



A window will appear that confirms you want to delete all of the jobs from the tool. Click **Yes** to proceed.



---

**IMPORTANT: You cannot erase individual jobs as this would result in fragmented memory. You must erase all jobs at once.**

**Do not disconnect until complete.**

---

---

## 8 Configuration

On the top menu bar, hitting the Configuration Button, and be directed to the following page.



The configuration tab allows advanced users to save new units to the gauge, auto load downloaded files to the graphing screen, convert files raw count files into real values, turn on or off the atmospheric correction, load calibration files and format the memory.

---

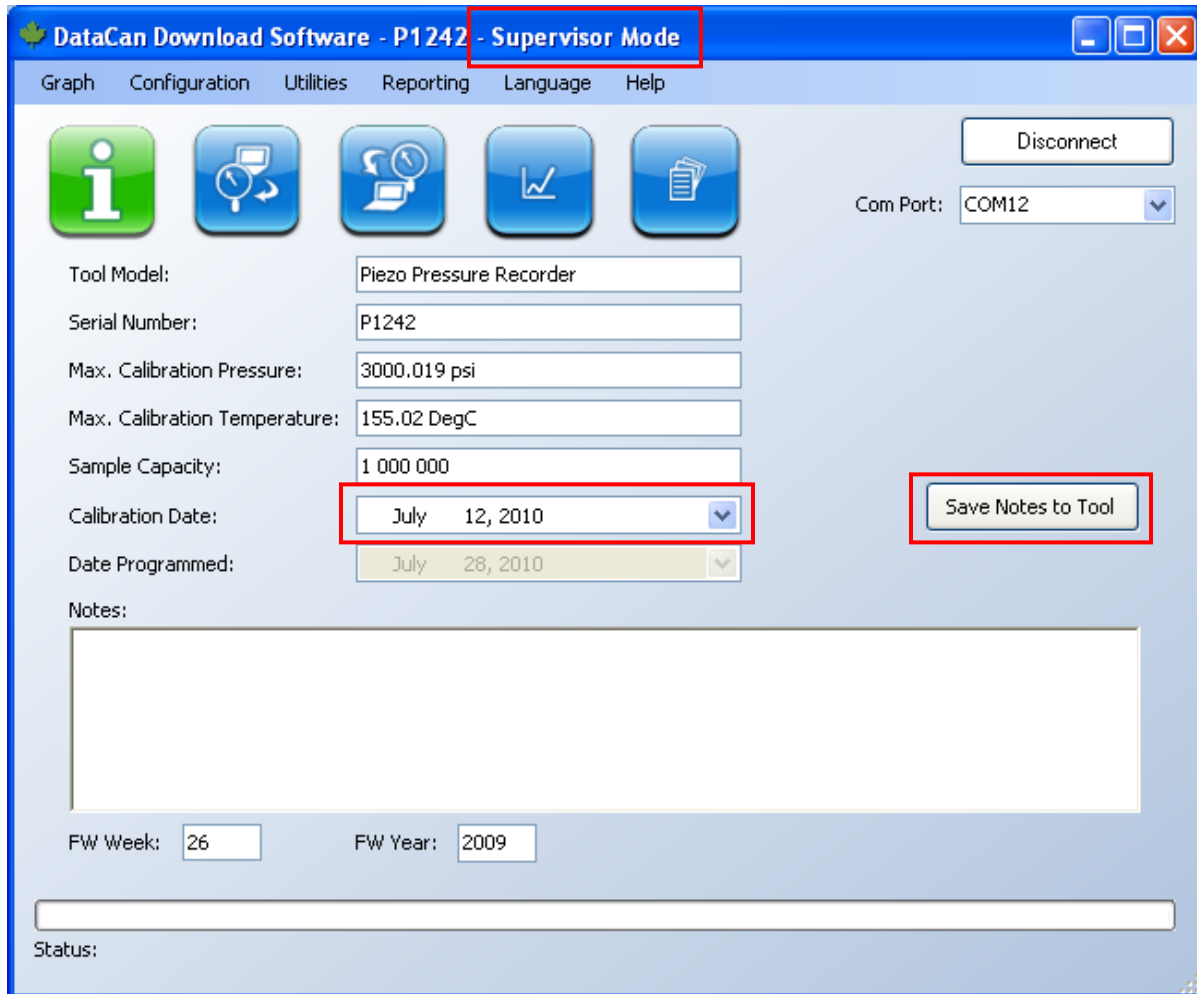
### 8.1 Supervisor Mode

Some of the functions in the configuration tab are inaccessible. To access all of the features of the configuration menu, you must enter "Supervisor Mode". To do so, you need to hold down the "Control", "Shift", and the "D" key. By pressing these three keys again, you can exit out of Supervisor Mode.

When you enter Supervisor Mode, the title bar changes, after the gauge serial number you can now see "Supervisor Mode".

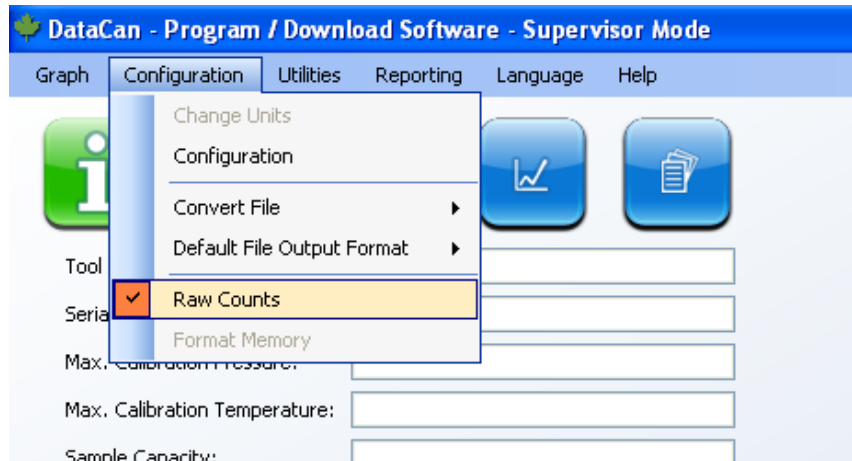
Also, the "Calibration Date" File is no longer grayed out; you can move your cursor over the Calibration Date window and change the calibration date. To save the new calibration date to the tool, you must hit the "Save Notes to Tool" button.

You can also enter any notes, like job details, or tool history, into the notes section. Again, you must hit the "Save Notes to Tool"



The line shift and/or scale functionality in the graph view is only available in this mode as well. Please refer to the "Adjusting the Line Shift/Scale Properties" section of this manual.

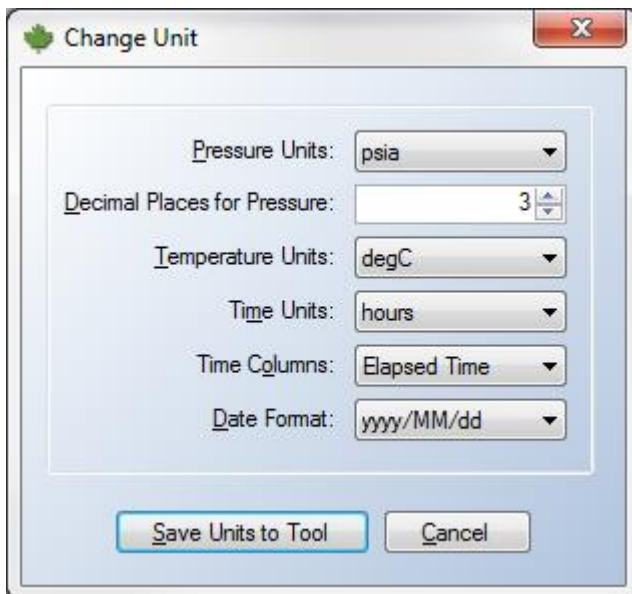
Another option available in this mode is the ability to convert binary data files and download jobs in "Raw Counts". Simply select the "Raw Counts" option from the Configuration menu in Supervisor mode prior to downloading or converting a file.



---

## 8.2 Change Units

To Change units, connect the gauge to the software, then select the “Change Units” option from the Configuration menu bar at the top. The following dialog box will appear:



Choose the units and time format that you prefer and hit the “Save” button. The number of decimal places displayed for pressure can also be changed here.

---

## 8.3 Convert File

If you ever need to apply a new calibration curve to old data, or vice versa, follow these steps.

---

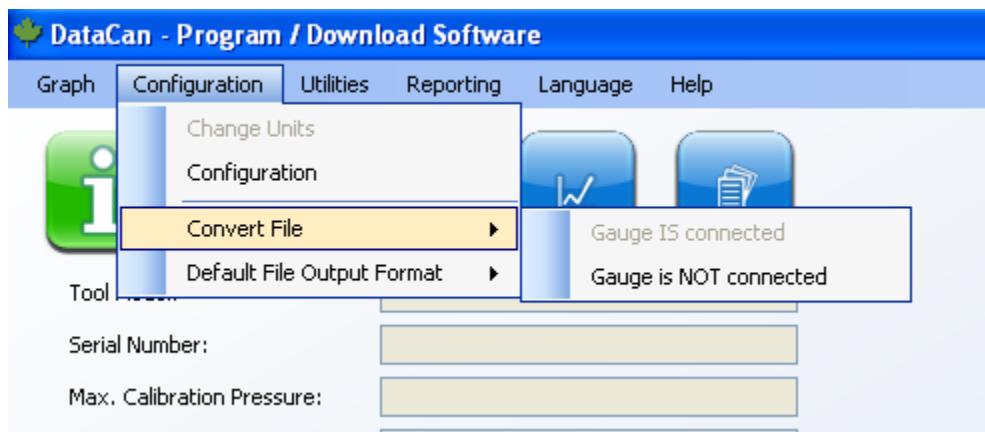
The gauge may be or may not be connected to convert binary data files.

---

To convert a file without connecting the gauge, the calibration files are required.

---

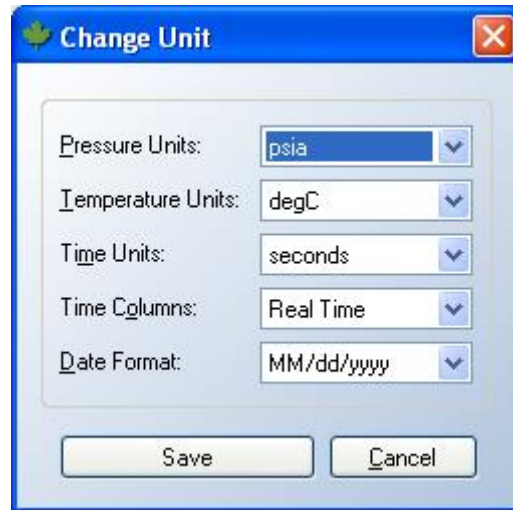
Click the "Configuration" item in the menu bar at the top. Then click "Convert File". Two options are displayed. If the tool is not connected, select the "Gauge is NOT connected" option.



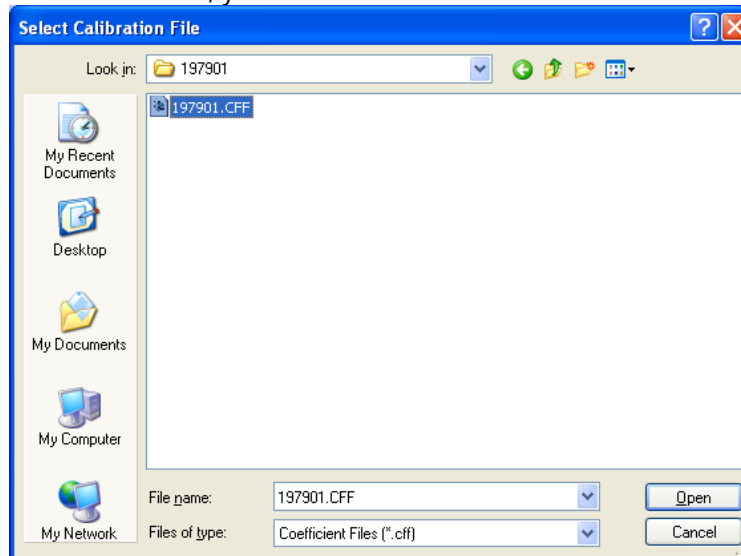
The following dialog box will appear. Select the tool type here.



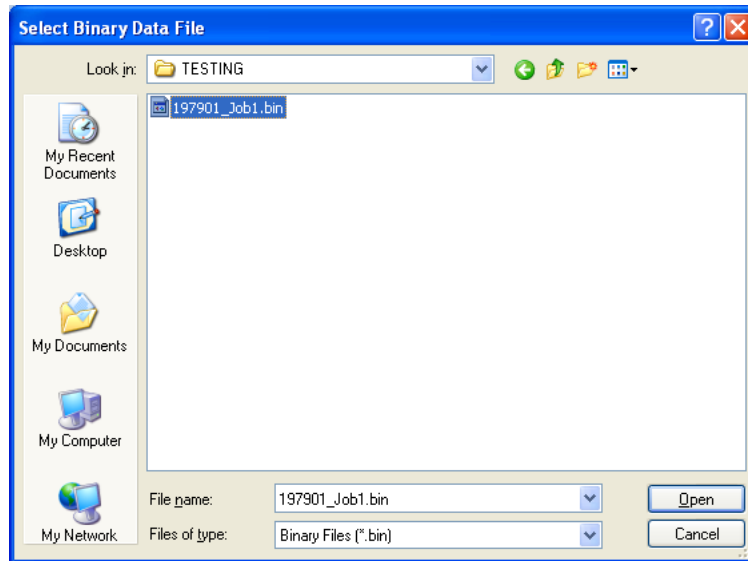
Next, the Change Unit dialog box appears allowing you to select the units you want for the text file to be created.



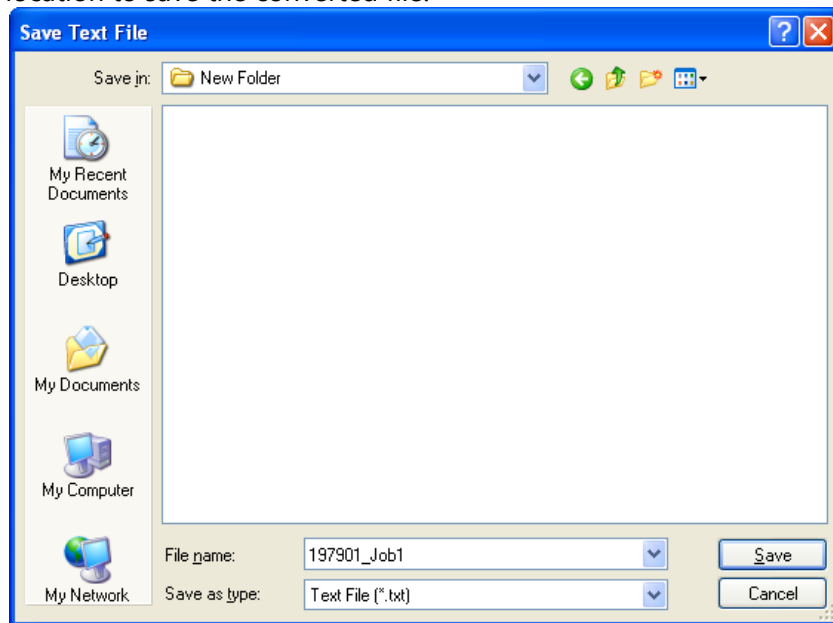
The next step is to select the calibration file for the tool type selected IF the tool is not connected. If the tool is connected, you will not be asked to select a calibration file.



Now select the Binary Data file that you would like to convert.

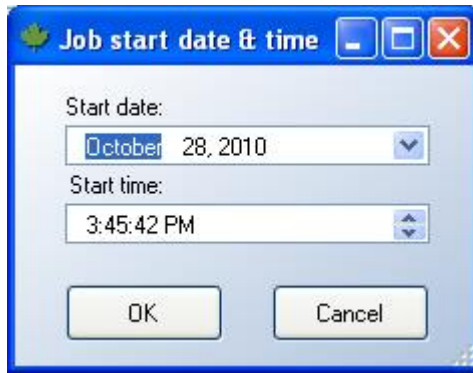


Last, choose a location to save the converted file.



Once the Save button is clicked the following dialog box appears. Choose the appropriate start date and time then click OK.



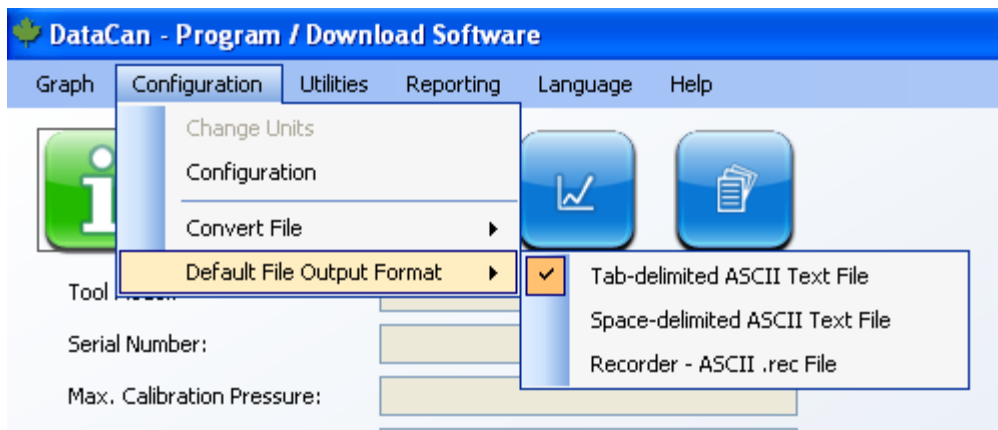


If the conversion was successfully completed, a message confirming the success will be displayed.

---

## 8.4 Default File Output Format

To change the default file delimiter option for all downloading and converting done in the software, simply select the desired option from the Configuration Menu. Once selected, this option remains the same until changed by the user.

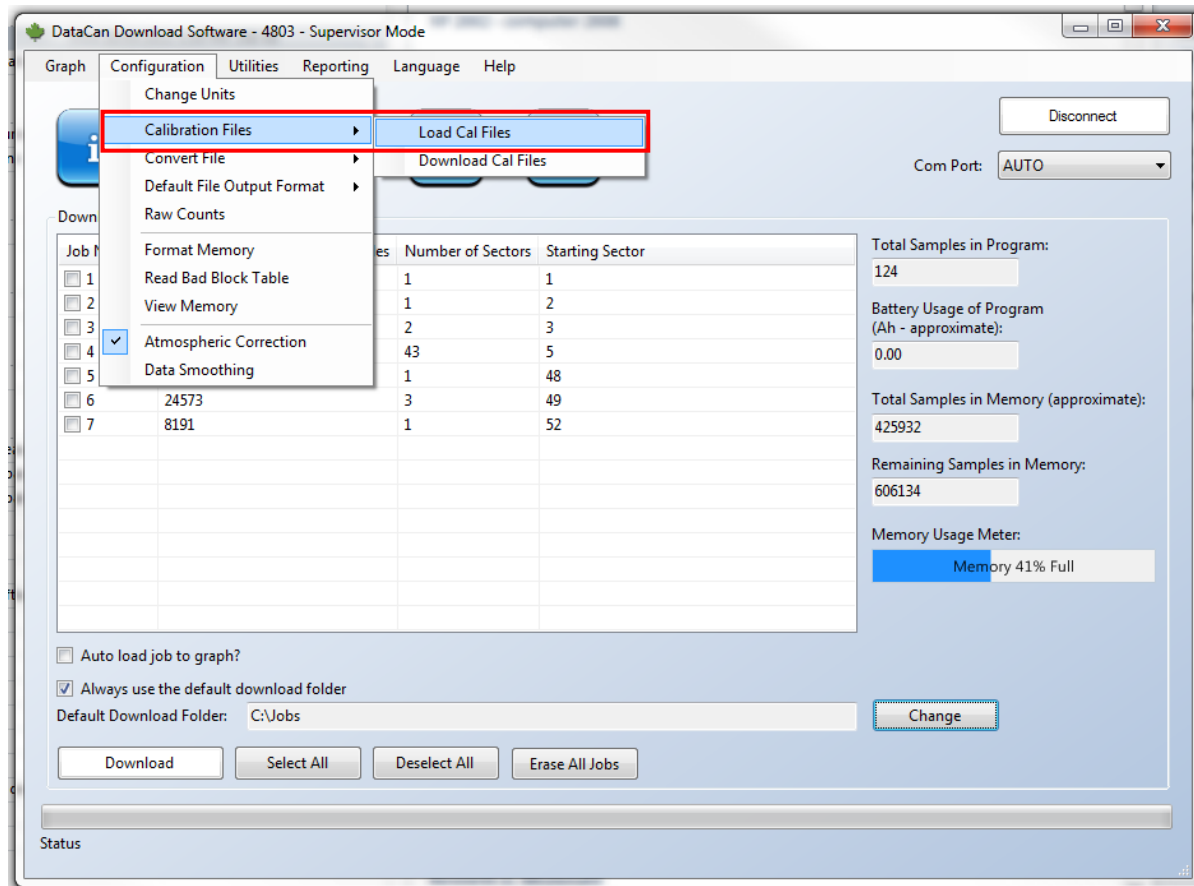


---

## 8.5 Load Calibration Files

To load a new calibration file onto into a memory tool or permanent / SRO surface box, follow these steps.

Open the DataCan Download Software and connect to the gauge. Press “CTRL+SHIFT+D” to enter “Supervisor Mode”. In the menu at the top, click on “Configuration”. Next, click “Calibration Files” and “Load Cal Files”.



Navigate to the flash drive that we sent with the gauges and into the “Calibrations” folder (or to the files you have saved in other locations).

Click “OK”. Once programming is completed, you can re-download any data that you have on the gauge.

## 8.6 Load Calibration Files – Memory Quartz

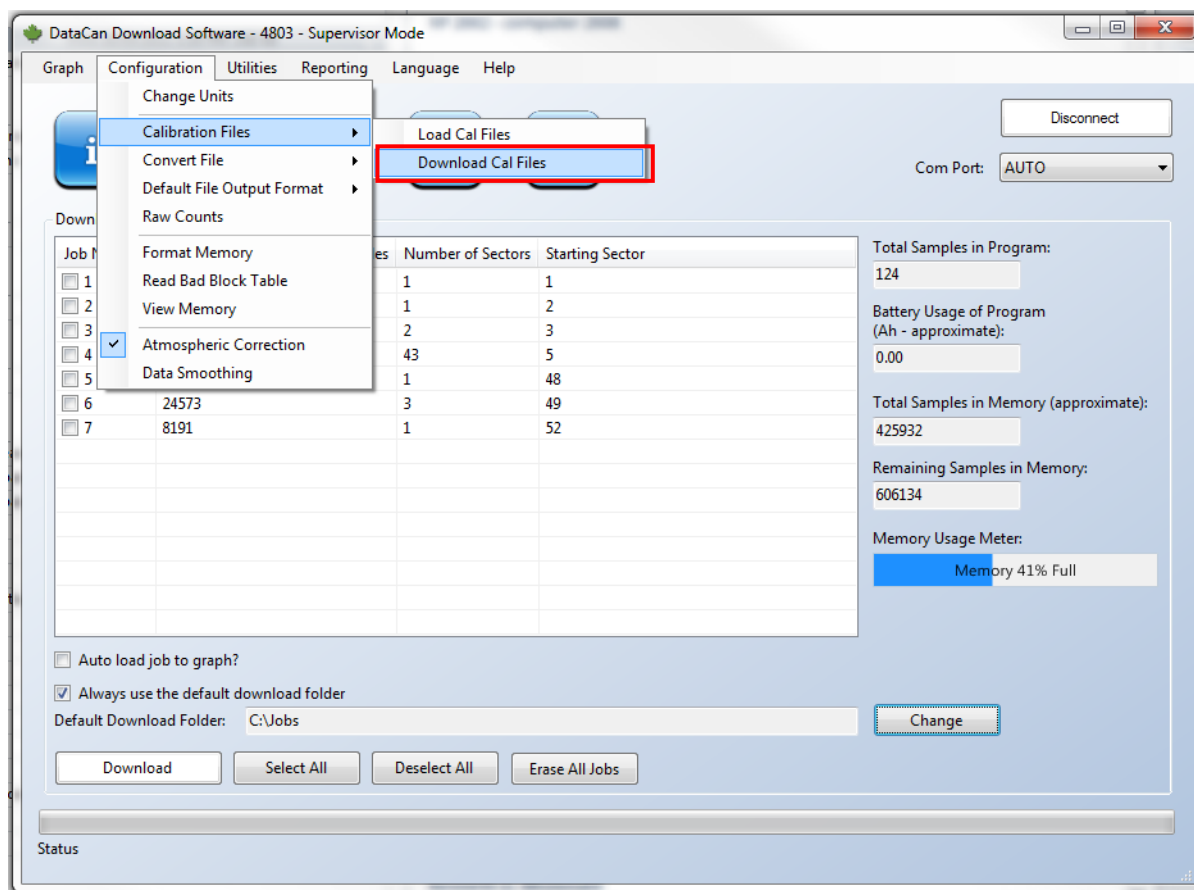
If a different quartz memory module / quartz transducer combination is used, connect the combination to the DataCan Download Software. On connect, the software will prompt the user

that a different quartz transducer is connected and ask the user if they would like to save the calibration files. Allow the software to do so.

## 8.7 Download Calibration Files (Piezo and/or Quartz Tool)

To download the calibration from a memory tool, follow these steps.

Open the DataCan Download Software and connect to the gauge. Press "CTRL+SHIFT+D" to enter "Supervisor Mode". In the menu at the top, click on "Configuration". Next, click "Calibration Files" and "Load Cal Files".



Navigate to a location on the computer to save the Calibration File (.cff) and associated files from the memory tool.

Click "OK". The Calibration File downloaded from the tool can be used when loading calibration files onto the tool.

---

## 8.8 Data Smoothing

The data smoothing option is designed to remove and noise from the recorded data while still preserving the true meaning of the samples.

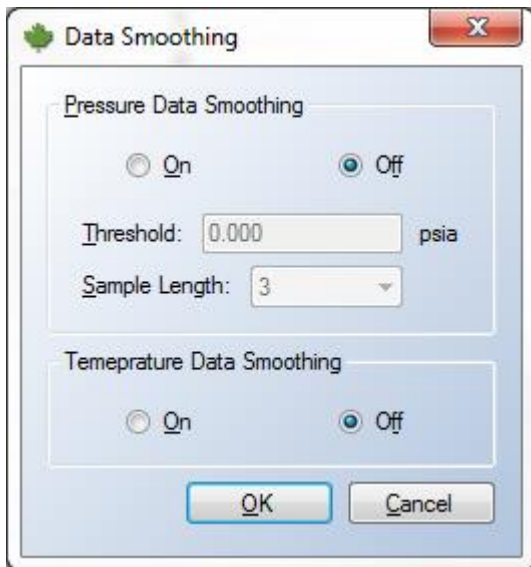
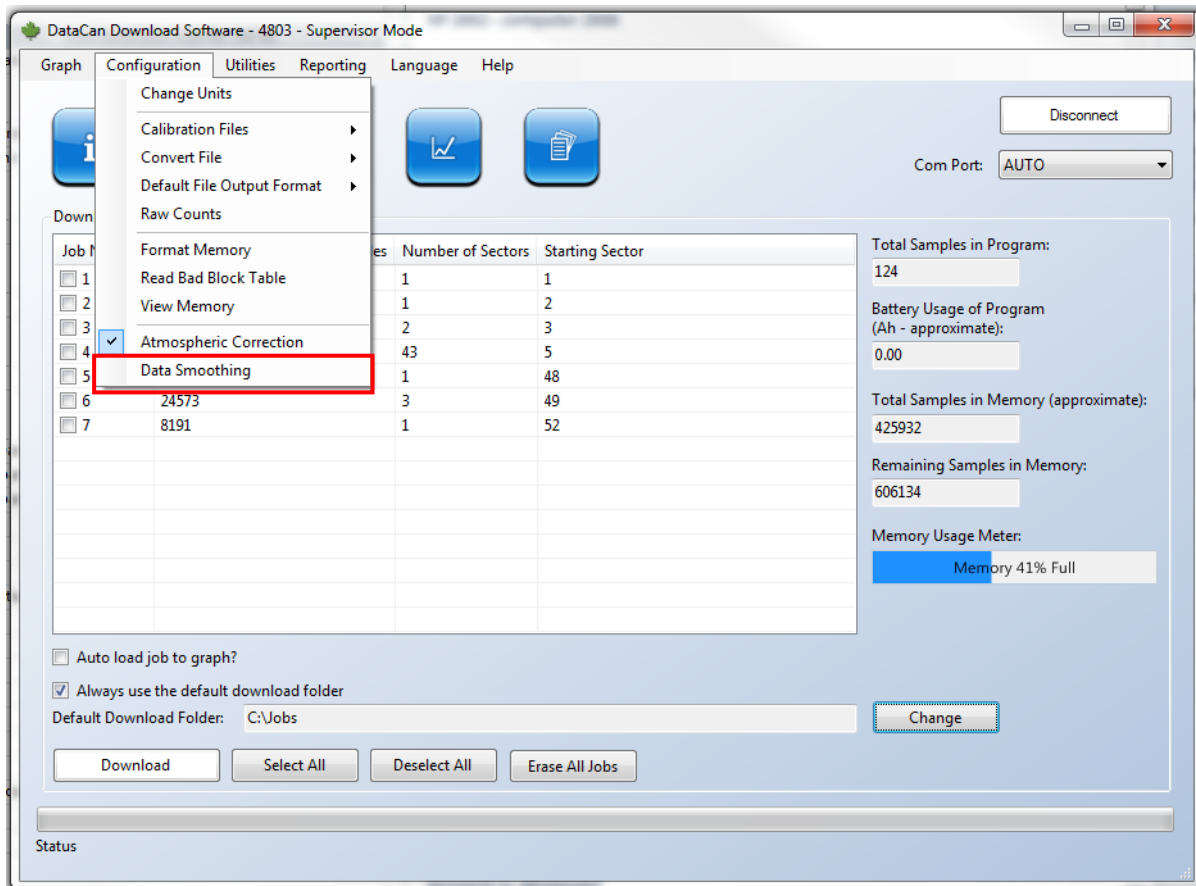
The smoothing works differently for pressure and for temperature. For temperature, a rolling average of "Sample Length" samples is taken. For pressure, that same "Sample Length" is used, but the data is only smoothed if the data does not change from one point to the next by the pressure specified in "Threshold".

---

The data smoothing can remove some features in the data if not set up correctly.

---

To enter the "Data Smoothing" configuration screen, click "Configuration" in the menu and then click "Data Smoothing".



---

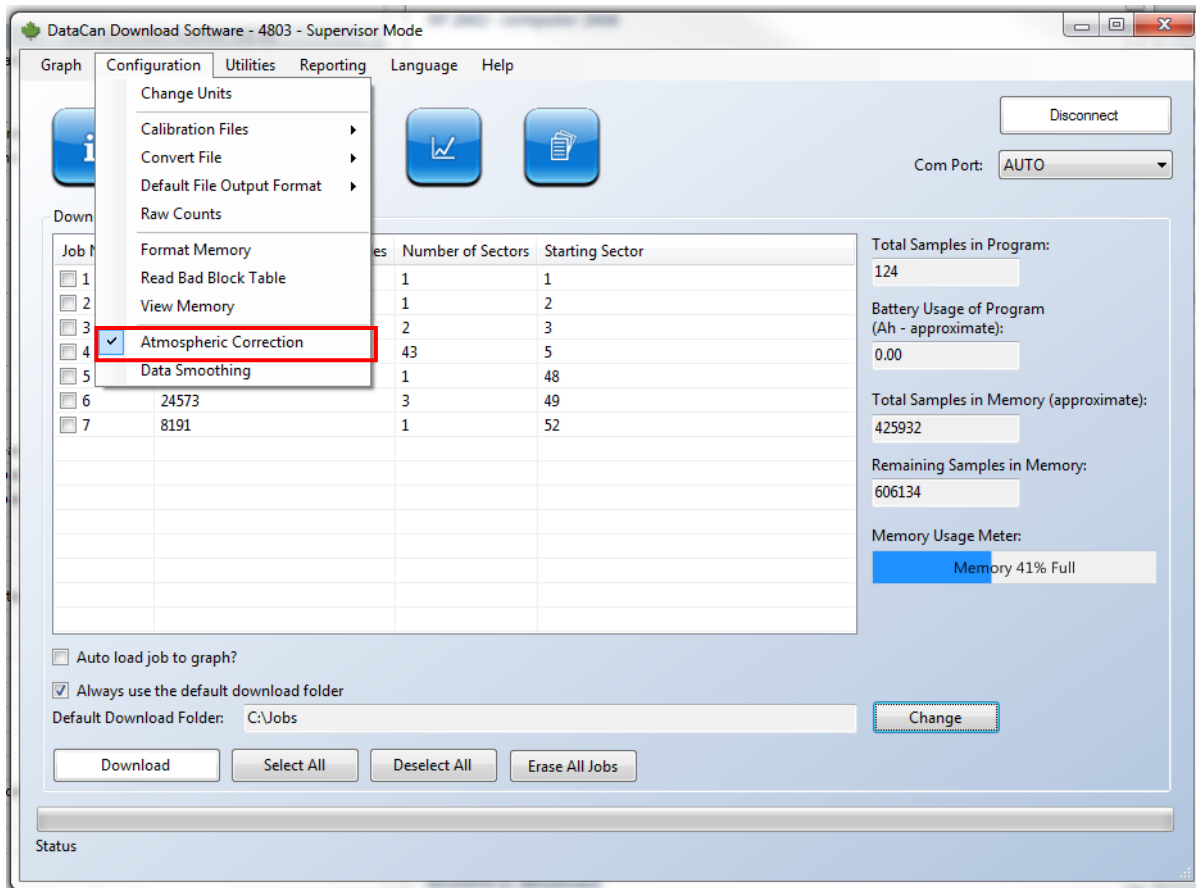
## 8.9 Atmospheric Correction

Piezo gauges have a minimum pressure threshold before they read accurate pressure. This threshold is normally slightly above atmosphere. The gauges are designed to read very accurately above this threshold.

The software can force readings below this threshold to read atmosphere. Once the data is above the threshold, where it is calibrated to read correctly, the data will not be affected by the software.

In the DataCan Download Software, press "CTRL+SHIFT+D" to get into "Supervisor Mode". Connect to the gauge. In the menu bar at the top, click "Configuration" then click "Atmospheric Correction" to turn this option on.

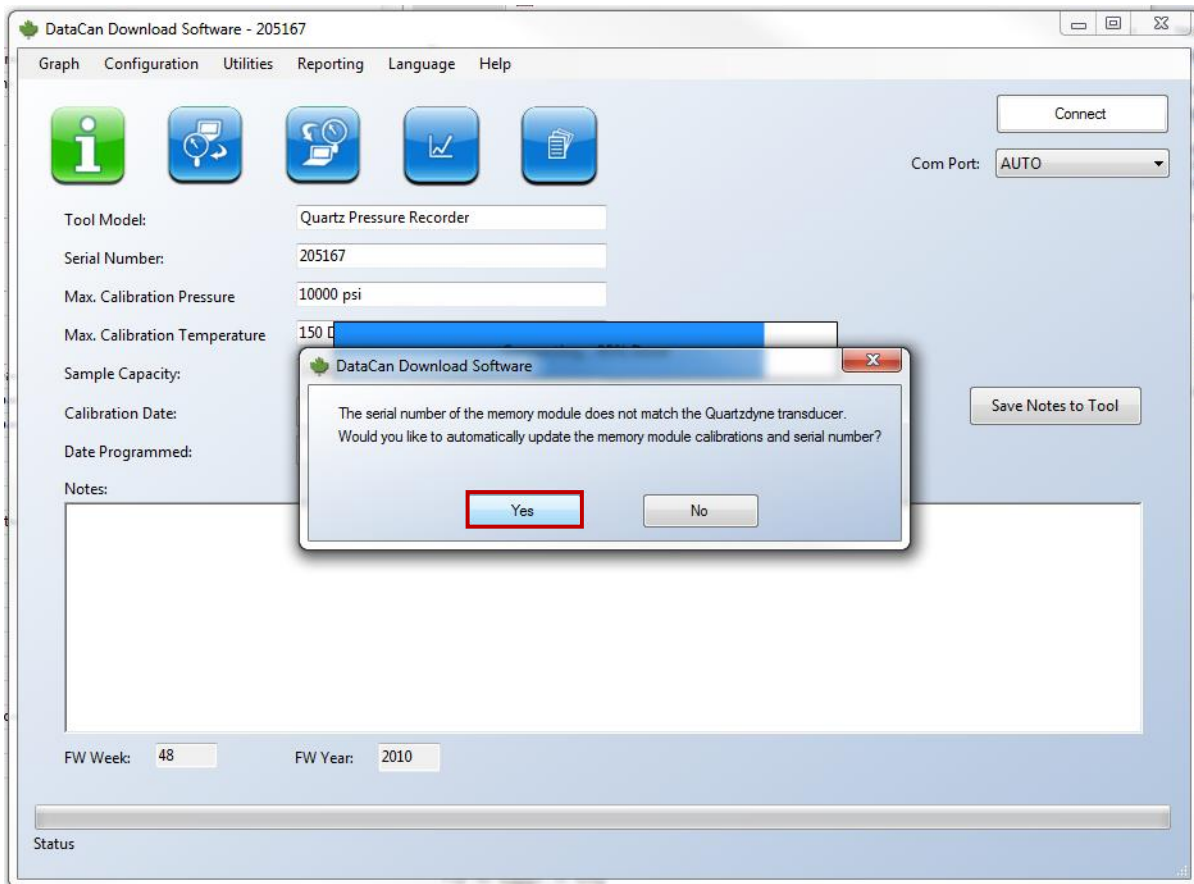
This setting is stored in the software and will be remembered for the next time the software is opened.



## 8.10 Replacing the Memory Module (Quartz Tool Only)

When the memory module is replaced the calibration files and the transducer serial number **MUST** be loaded into the memory module. This is now done automatically by the software on connect. The user must say "Yes" when prompted.

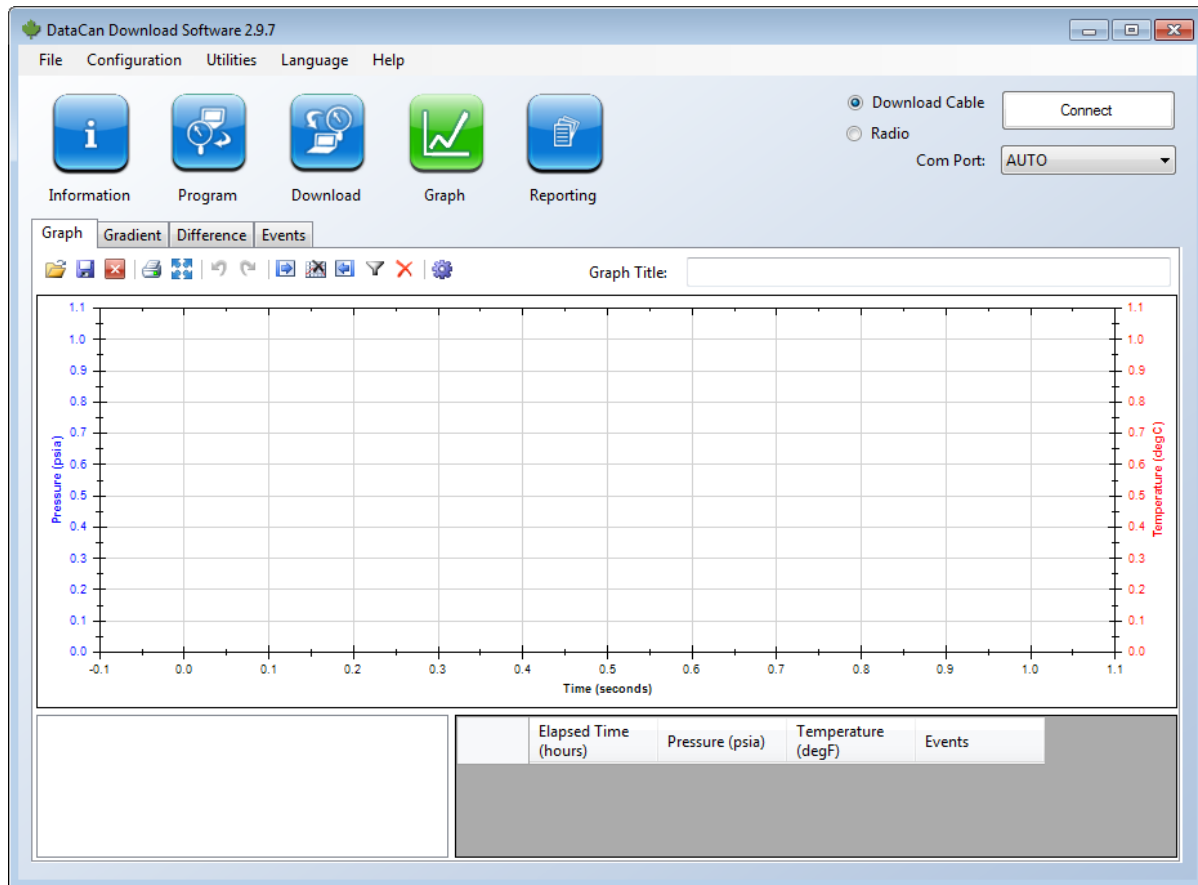
Connect the tool with the new memory module attached to the computer as outlined in Section 5.2. When the software asks if you would like the memory module to automatically be updated, click the "Yes" button. The software will then do everything for you.





## 9 Graph

Enter the Graph section by clicking on the following button.



---

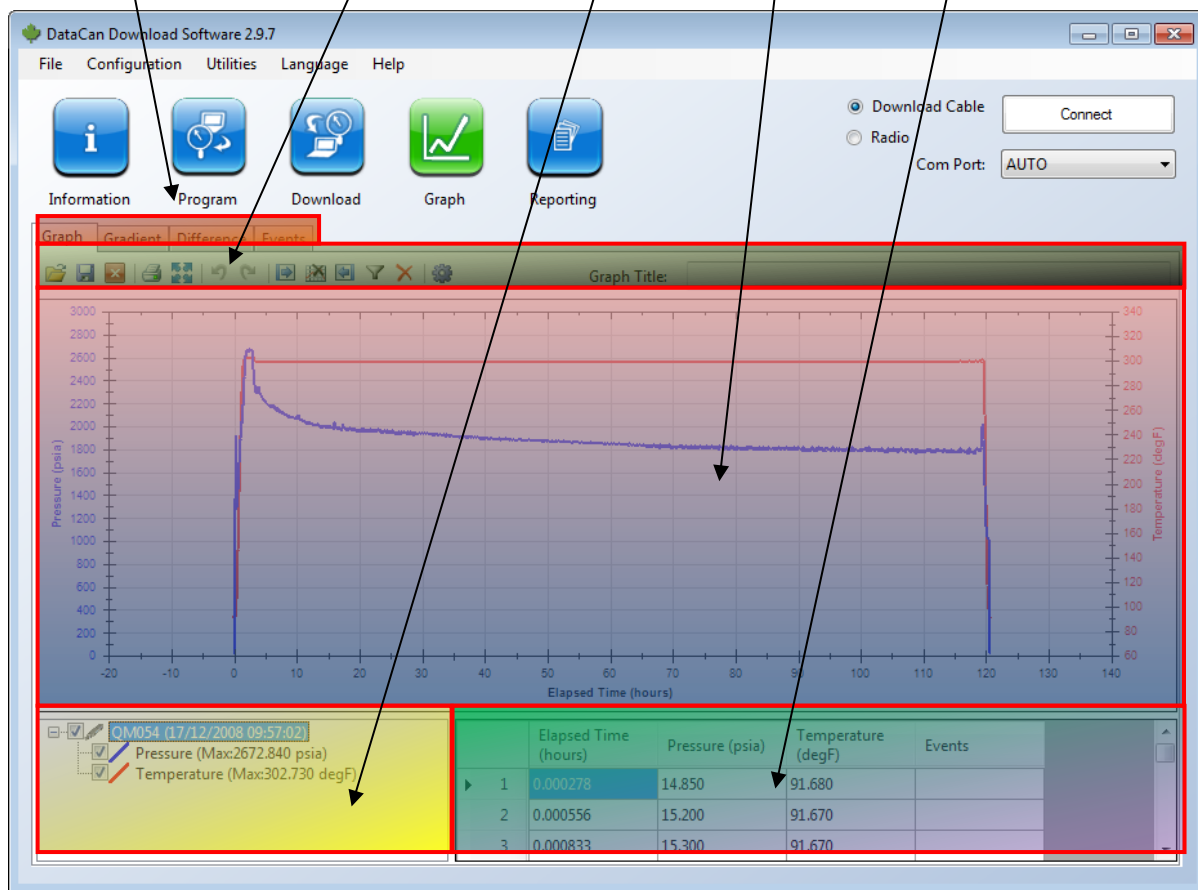
## 9.1 About the Graph

The graphing section is used to manipulate and present data in a graphical format. Here you can:

- Delete portions of the data to remove the beginning and end portions of a job that are not useful.
- Filter the data to reduce the file size.
- View multiple data sets at one time.
- View a difference plot to see if two gauges are tracking each other.
- Zoom in and out of the graph to look at pressure, temperature, acceleration, or other data variances.
- Modify the data to adjust for gauge anomalies.
- Change the start time to align multiple data sets.
- Create a gradient plot and make annotations for a report.

There are 5 main areas of the graphing screen:














1) The view tabs 2) The action buttons 3) The legend 4) The graph 5) The data table.



At any time, you can move your mouse to one of the section boards and adjust the size of each section.

The view tabs allow you to move from the main data graph to the gradient table and gradient graph and to the difference graph.

The action buttons on the top side perform a variety of useful functions. You can select large portions of data to delete or filter. You can move to full screen mode, undo changes you make, and save the data file. Each action button is described as follows:

	Open		Left Boundary
	Save As		Reset Lines
	Close All Graphs		Right Boundary
	Quick Print		Filter
	Full Screen Mode		Delete
	Undo		Units / Settings
	Redo		

The legend is important when graphing multiple plots of data. You can select which data sets to view, you can change the color and size of the respective data curves, and you can adjust the start dates for each data set.

The graphing section displays a graph of the data. The blue curve is defaulted to the pressure data, the red curve is defaulted to temperature data. The pressure scale is automatically generated on the left and the temperature scale is automatically generated on the right. The bottom of the graph shows the time as it was recorded in the data file. A right click of the mouse button over the graph pops up another menu of actions for the user to perform.

The data table at the bottom right side of the graph screen shows a table from the active data file.

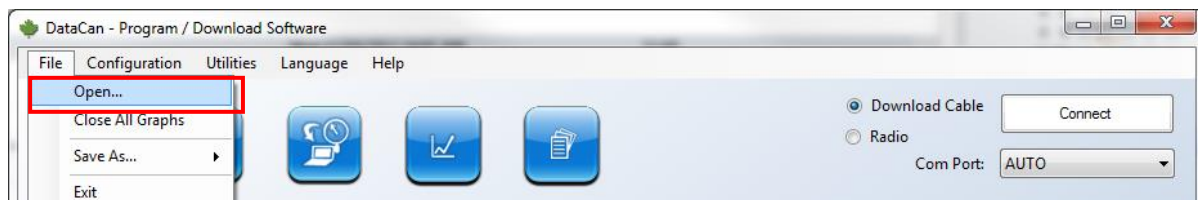
---

## 9.2 Open Graph from Data File

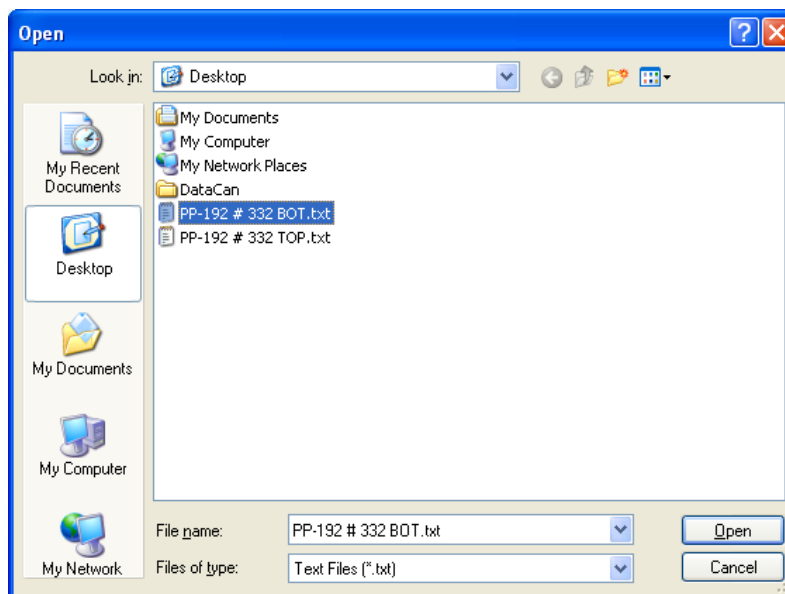
There are two ways that you can load a data set into the graph. First, you can load a graph from a data file located on your computer. Second, you can automatically load the data that you downloaded from your gauge.

You may create a graph from any file that you have downloaded and saved to your computer as previously outlined in downloading section of this manual.


Click on the **Graph** button and go to **File >Open**

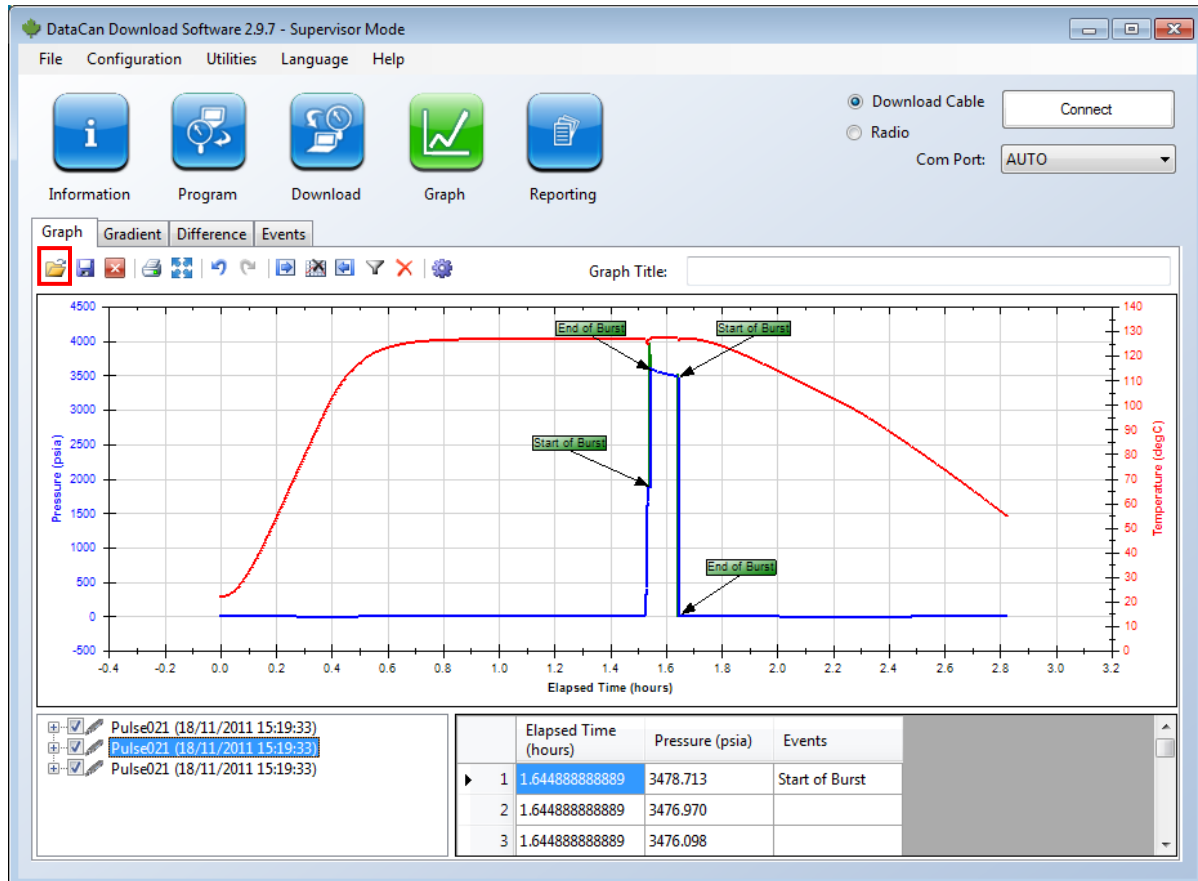


This brings up the browse window. Select the file you want to graph and click **Open**



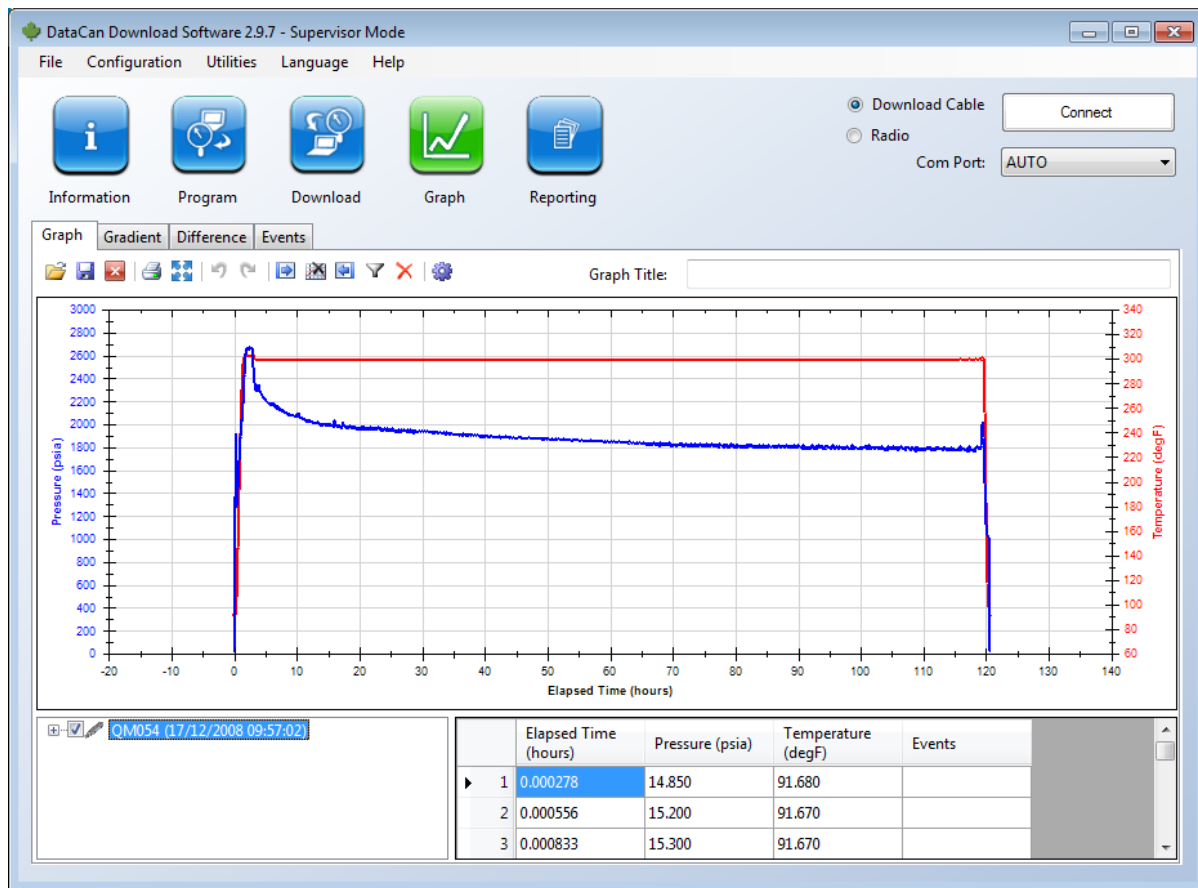
## 9.2.1 Open Graph From Data File – Quick Button

The second way to open a graph is by using the Quick Button  on the top of the graph as highlighted in the image below.



## 9.2.2 Open Graph From Data File – Drag and Drop

The third way to open a graph is to open the folder containing your text file in Windows Explorer. Drag the file from Windows Explorer into the graph screen in the DataCan Download Software.



To add another data file to the graph, repeat the above process. You can add up to 4 different data sets.

## 9.3 Append Data

Two or more data files can be placed one after the other by using the append feature. This occurs when more than one data file are opened with the same gauge serial number(s).

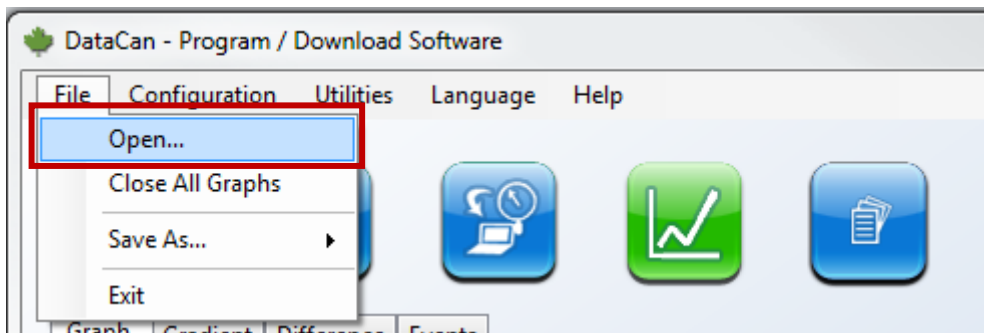
There are two options when appending data:

- 1) **Concurrent Time** – This feature ignores the start time of the appended data. Instead the first data set of appended files is started immediately following the last data set in the first file.

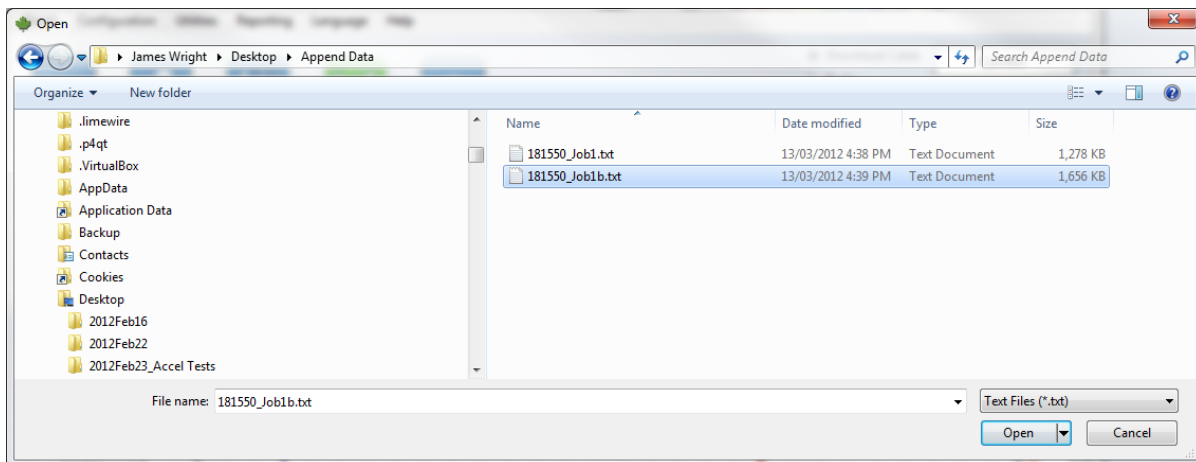
- 2) **Keep Start Times** – All data from each data set retains its original time stamp. If there is a large time gap between the two (or more) data sets, the gap will still remain in the data.

### 9.3.1 Concurrent Time

In the menu, select “File -> Open”. You can either select multiple files with the same serial number or you can repeat the “File -> Open” process to open a second file with the same serial number.

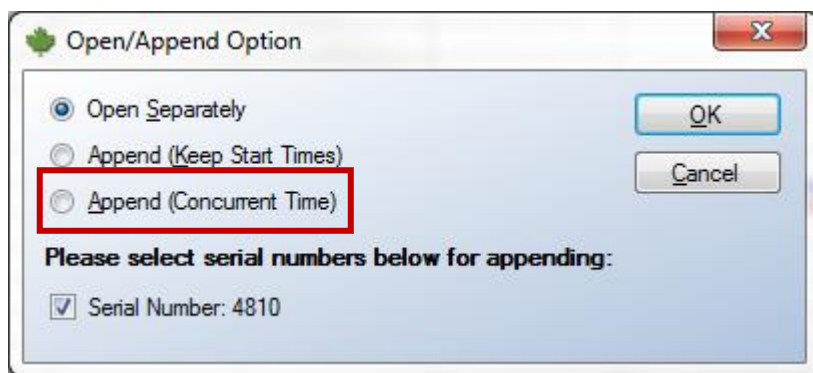


Select the file you would like to append and click the “Open” button.



A new dialog pops up. Click “Append (Concurrent Time)” and click the “OK” button.



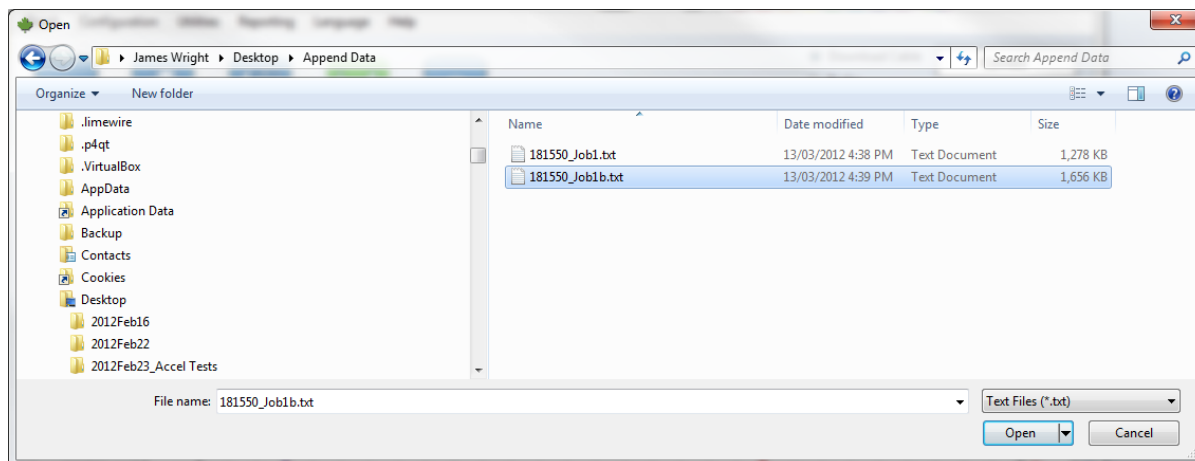


### 9.3.2 Keep Start Times

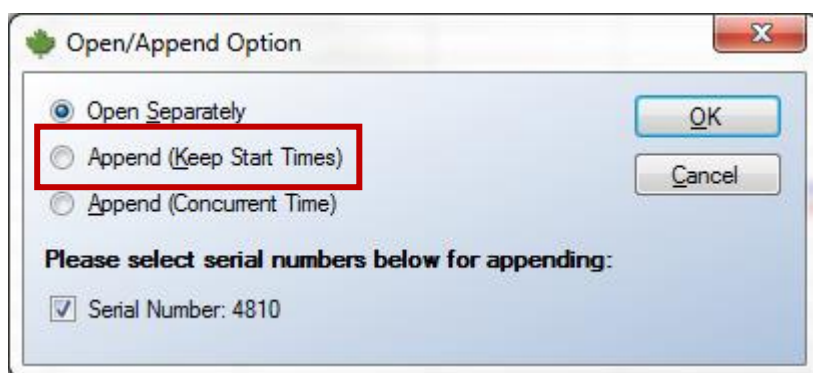
In the menu, select "File -> Open". You can either select multiple files with the same serial number or you can repeat the "File -> Open" process to open a second file with the same serial number.



Select the file you would like to append and click the "Open" button.

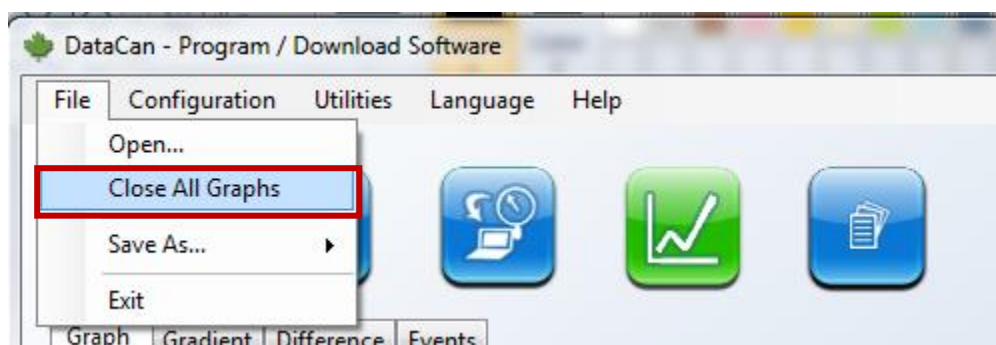


A new dialog pops up. Click "Append (Keep Start Time)" and click the "OK" button.




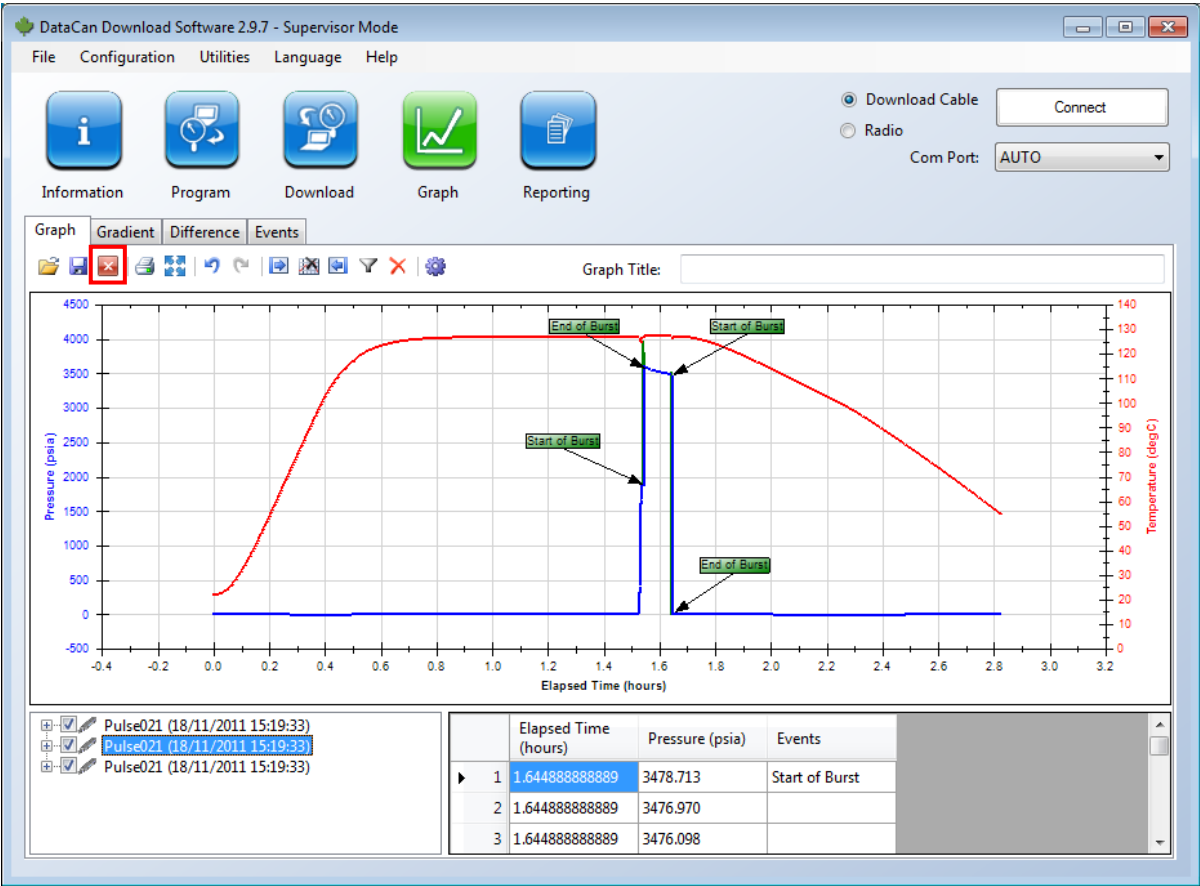
## 9.4 Close All Graphs

To close the graphs that you have opened press **File** and go to **Close All Graphs**.



### 9.4.1 Close All Graphs – Quick Button

Alternatively, you can close all graphs by using the Quick Button  located on the top side of the graph screen.



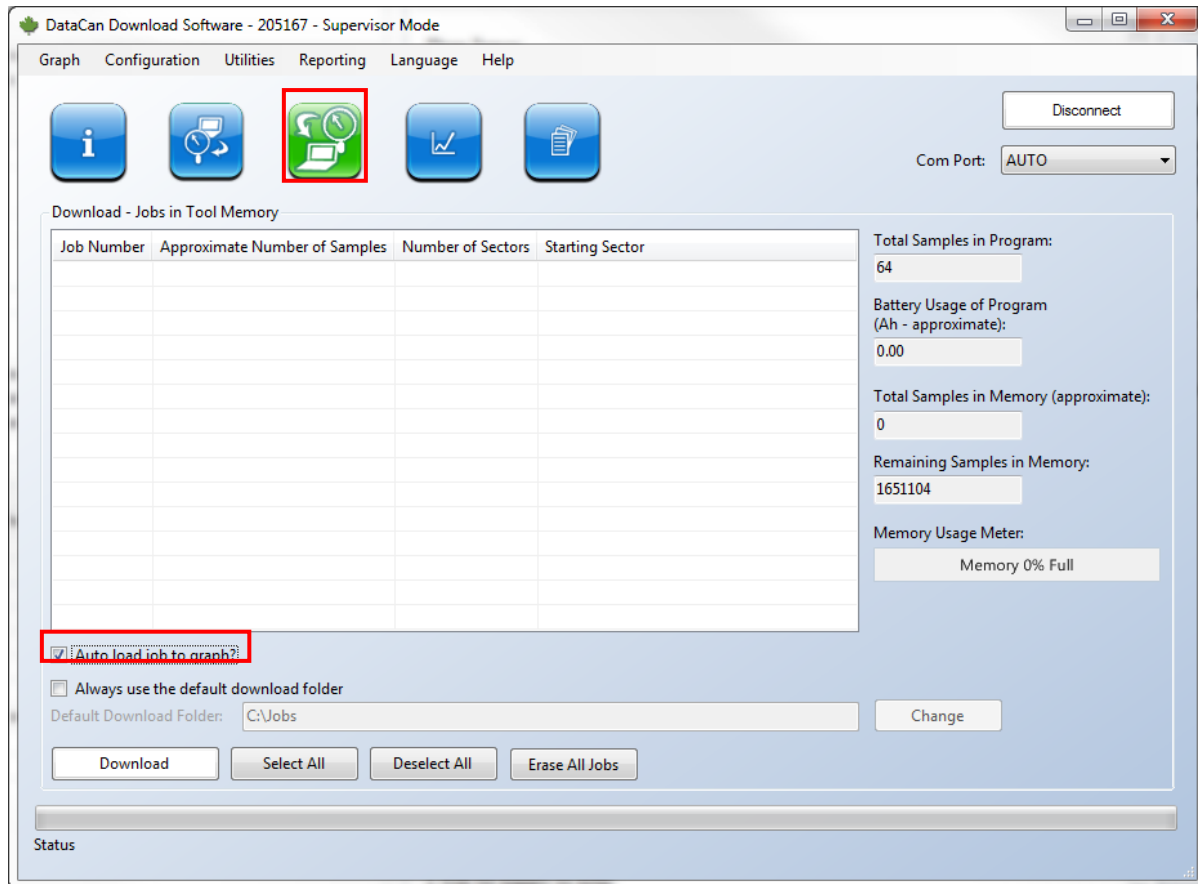
### 9.5 Open Graph Automatically

A graph can automatically be created when the data is downloaded from the tool onto your computer by using the Autograph feature.

By default, the autograph feature is turned off. The reason is that it takes more of your computer processing power to download the data and plot the data at the same time. In most cases, customers download data and then create the graph or report at a different time.

If multiple jobs are downloaded simultaneously only the last job selected In Tool Memory list will be graphed.


This feature is enabled in the “Download” section of the software.

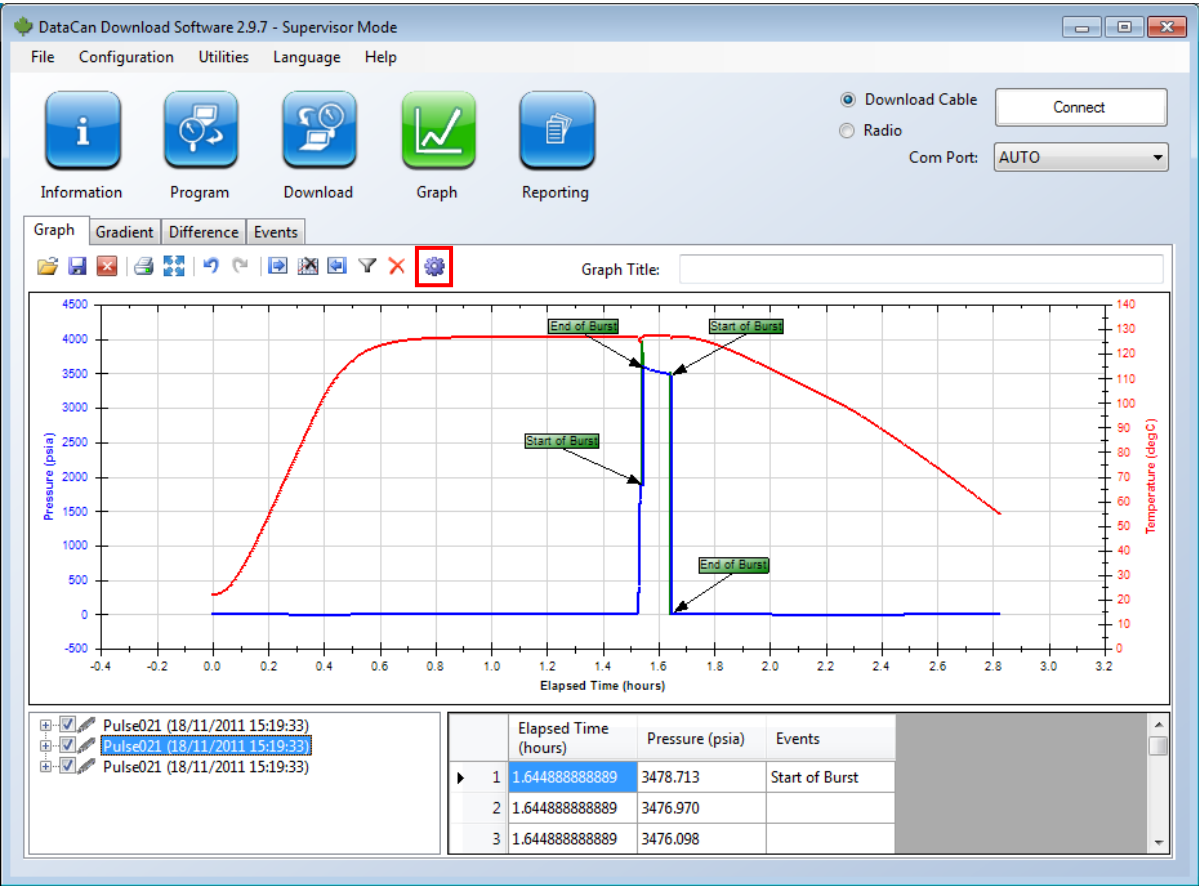


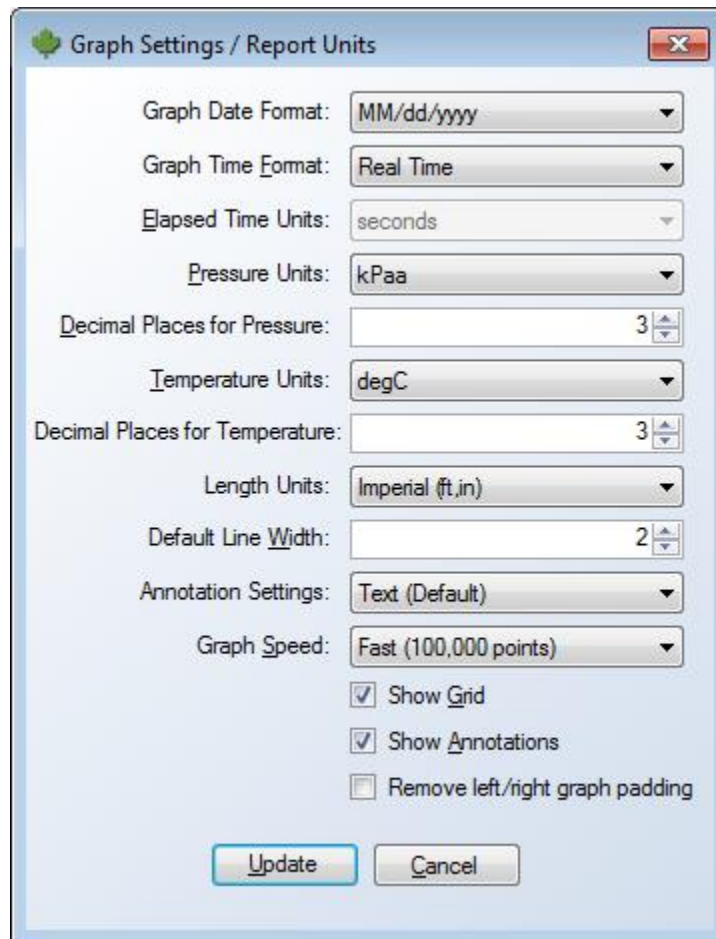
Activate the Autograph feature by selecting the check box beside **Auto load job to graph?**

Once the “Auto load job to graph” option is activated, then the downloaded jobs will automatically appear in the graph screen after the data is downloaded from the tool.

# 9.6 Graph Setup

The graph setup allows you to change the graph units, change data grid and annotations visibility settings. Enter graph setup by clicking the Quick Button  located on the top side of the graph screen as highlighted in the image below.





Change the available options to what suits your jobs needs and click the Update button at the bottom of the tab.

### 9.6.1 Graph Time Format

This option will change both how the graph is displayed as well as the time and date columns stored in the data file.

**Real Time** – The graph axis and data file show a calendar date and clock time.

**Elapsed Time** – The graph axis and data file show the elapsed time, or the time starting when the battery was plugged in (time zero).

**Both** – Date, Real Time and Elapsed Time columns are stored in the data file. The graph time axis is in Real Time.

## 9.6.2 Elapsed Time Units

This can be in either: seconds, minutes, hours or days.

## 9.6.3 Pressure Units and Temperature Units

Change to the desired unit of measurement for pressure or temperature.

## 9.6.4 Decimal Places for Pressure

The number of digitals after the decimal place can be changed for pressure.

## 9.6.5 Length Units

This changes the units used for the depth when using gradient points.

## 9.6.6 Default Line Width

The user can change how thick each plotted line appears.

## 9.6.7 Annotation Settings

This option will change how graph annotations are displayed.

**Text (Default)** – Event text will be shown in the annotation.

**Numeric Annotations** – A number representing the order in which the point appears in the graph. Displaying a number instead of text can minimize the chance of the text overlapping on the graph. The number displayed for each annotation / gradient is the same as the index used in the Events Table.

**Time/Press/Temp/Text** – The event annotation will include the Time, Pressure, and Temperature of the data for the corresponding event, followed by the event text.

Gradients annotations will always contain Depth, Pressure, and Temperature, except when shown as numeric annotations.

### 9.6.8 Graph Speed

When trying to graph large data sets on slower computers it is best to change the “Graph Speed” setting to “Fast”. This draws a maximum of 100000 points for every data set in the graph. If any important data does not show up on the graph because of the filtering, change this graph setting to “Show All Points”.

### 9.6.9 Show Grid

The legend and data table at the bottom of the graph screen can be hidden by unchecking the **Show Grid** checkbox.

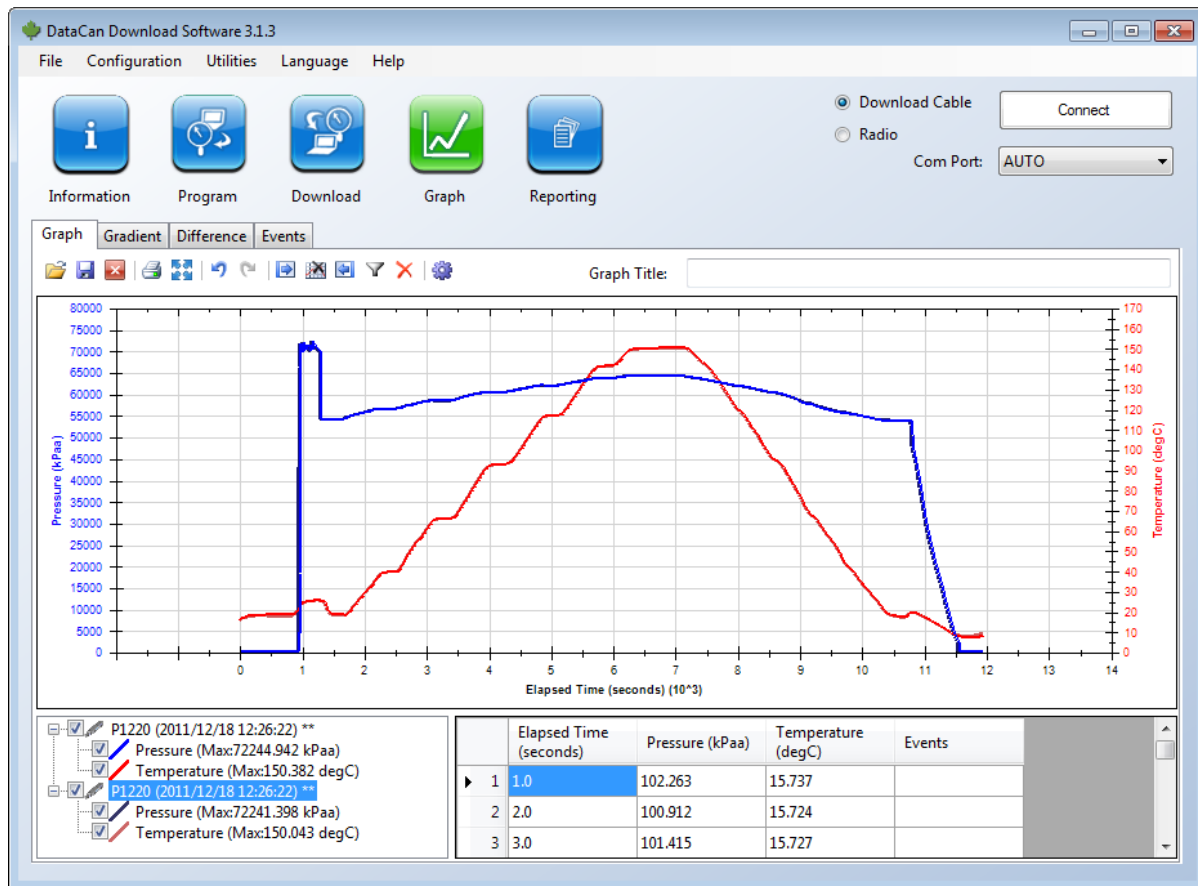
### 9.6.10 Show Annotations

All the annotations and gradient point markers on the graph can be hidden by unchecking the **Show Annotations** checkbox.

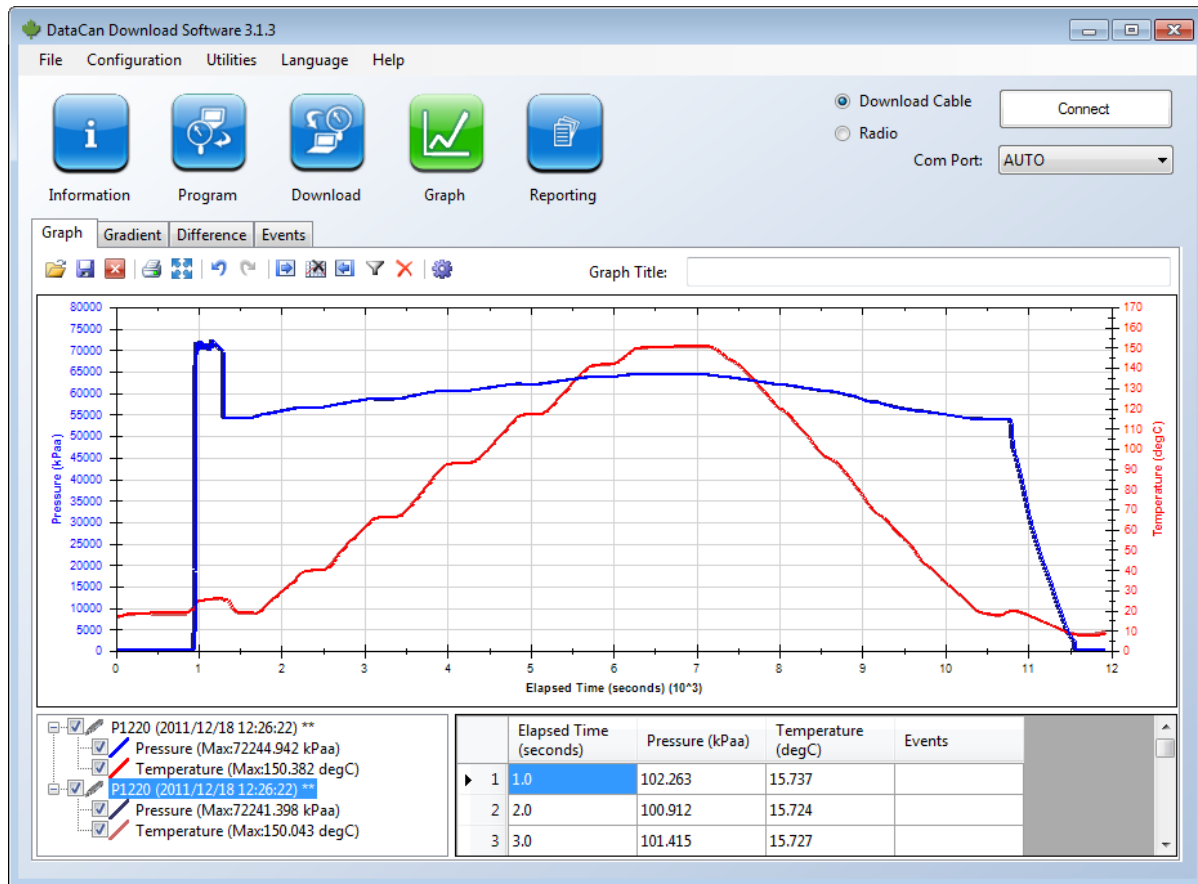
### 9.6.11 Remove Left/Right Graph Padding

If the **Remove Left/Right Graph Padding** box is unchecked, the left and right padding will be added to the graph to center the graph. If checked, the padding will be removed.





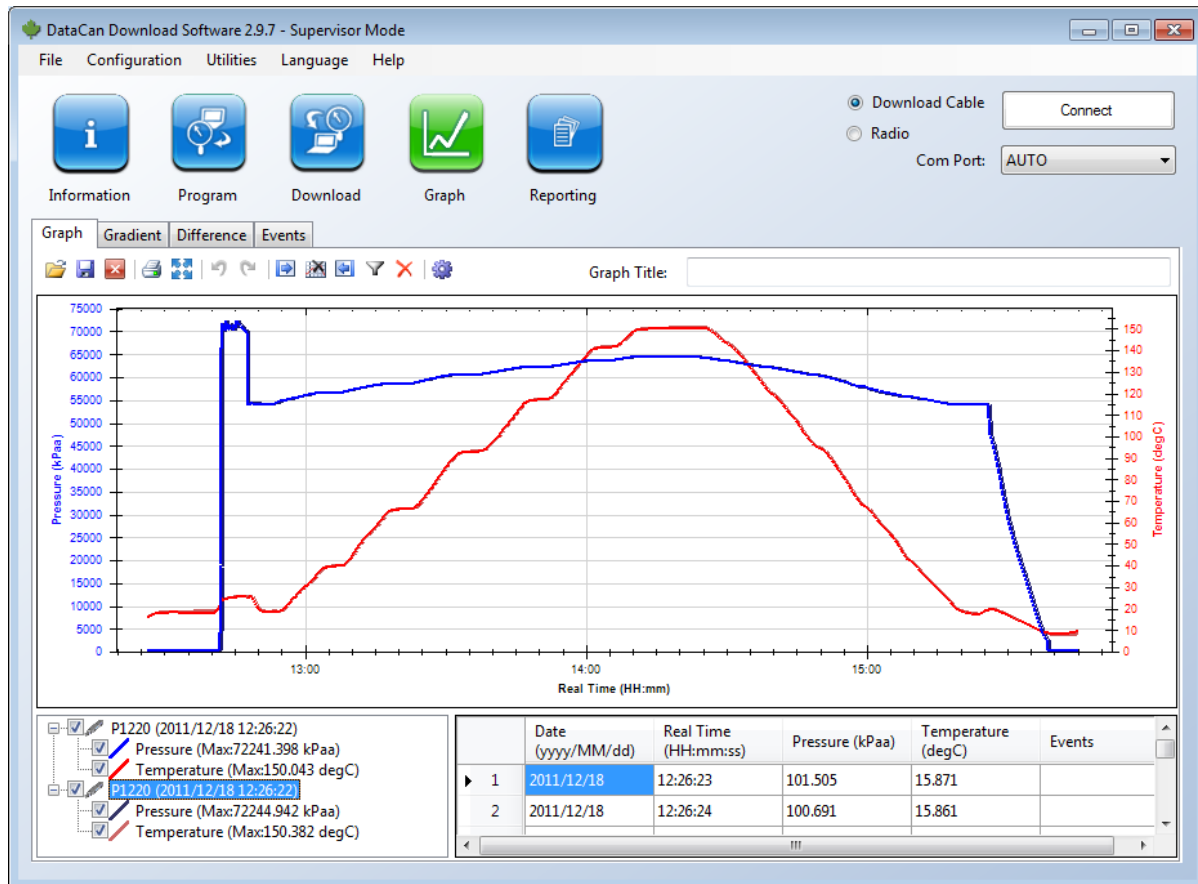
Graph with left/right padding.



Graph without left/right padding.

## 9.7 The legend

When you open multiple data sets, the legend on the bottom left is updated to show all of the data files and their corresponding data columns. In the example shown, we have two data sets, each with two data columns of pressure and temperature.

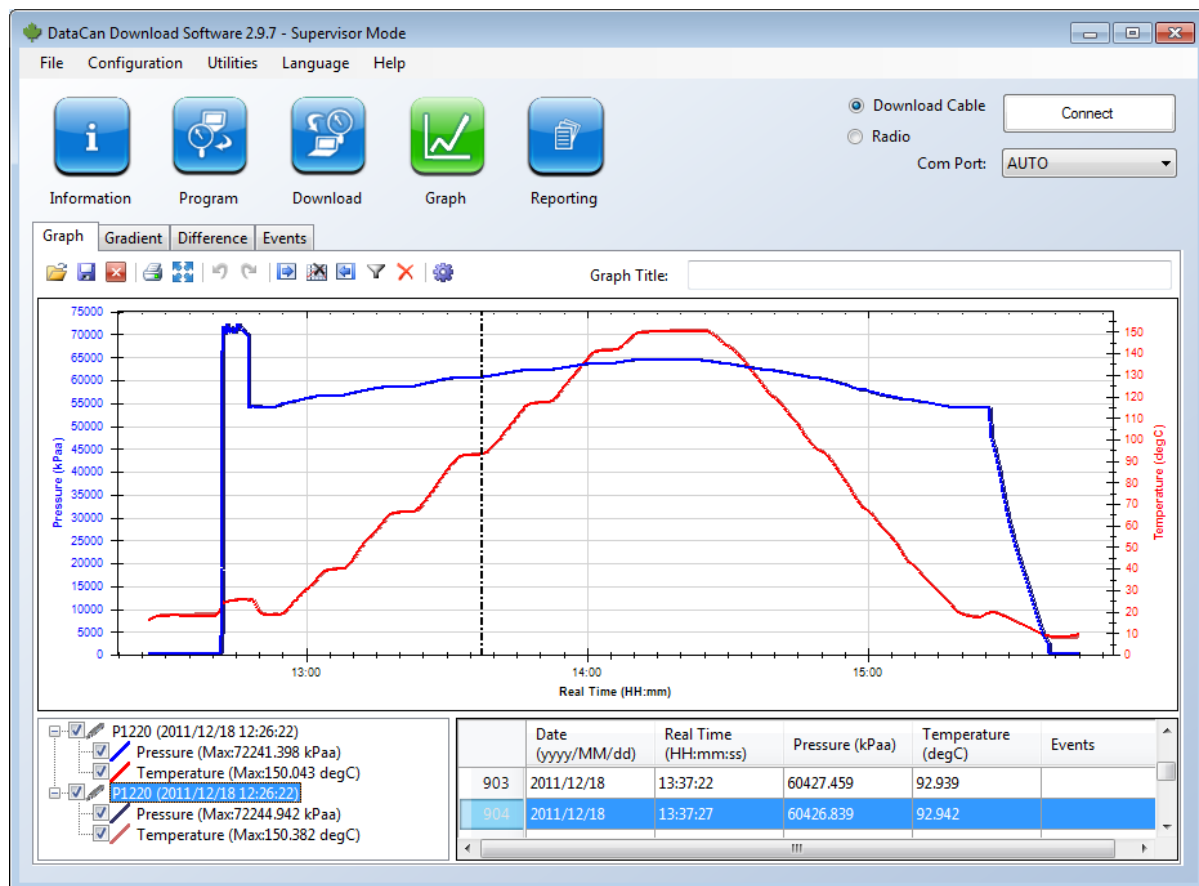


You can click and unclick the boxes next to each legend title. As you do so, the data curve and data column is either shown or not shown on the graph. If you click on the main tool title in the legend, the data table on the bottom right switches to that corresponding tool. In the example above, the data table corresponds to gauge P1220.

## 9.8 The data cursor and data table

A single left click anywhere on the graph will produce a vertical line or cursor where you clicked. At the same time, the data table on the bottom right highlights the row of data corresponding to point you clicked on.

Another way to select a data point is to click the corresponding row on the table located at the left of the screen. The point on the graph will be highlighted by the broken vertical line.



You can use your right and left arrow keys to move the cursor to the left and right on the graph. This action will also scroll up and down the data table.

If you have multiple data sets displayed. The data table shown will correspond to either the last data set that was opened, or the last data set that was clicked on in the legend.

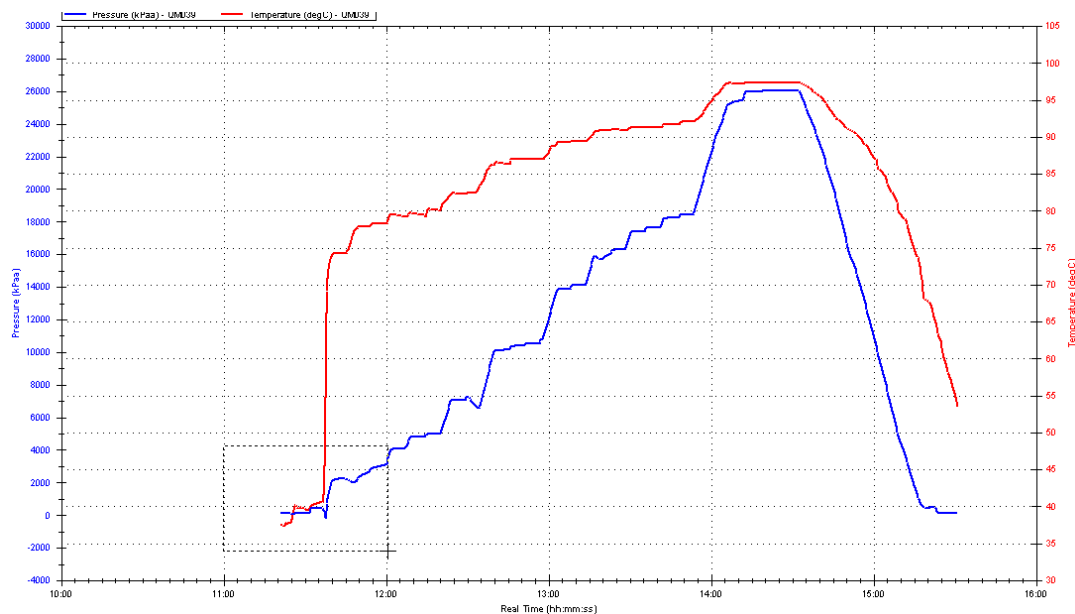
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## 9.9 Zoom and Pan

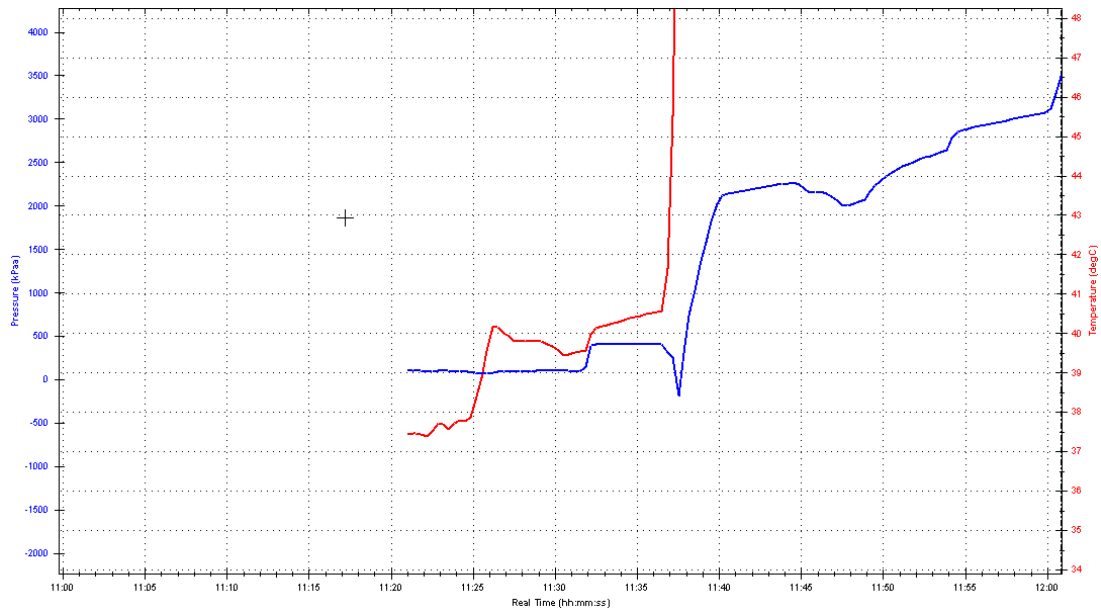
When you hold the **SHIFT** key, the mouse pointer turns into a hand that when clicked will grab the graph, dragging the mouse will pan the image on the screen.

Use your scroll wheel to zoom in and out of the screen.

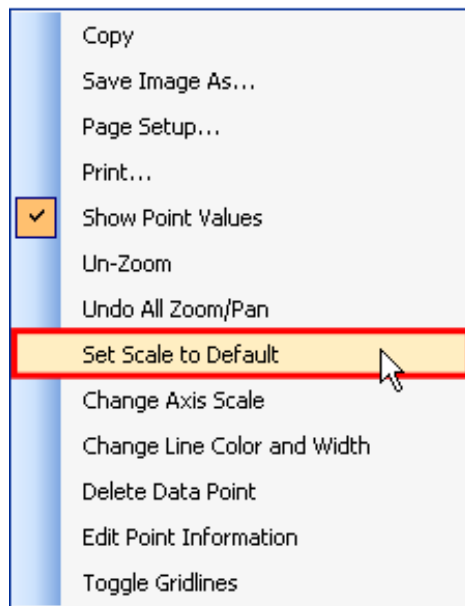
To zoom in on a section of the graph left click and drag the pointer over the area you want to zoom in on.



The graph will now only display the area selected



To return the graph to its original scale right click and select **Set Scale to Default**.



# 9.9.1 Burst Event Auto Zoom

When logging a burst event, the data happens so quickly that can appear as a vertical line on the main graph. The software automatically denotes a “Start of Burst” and an “End of Burst” for easy reference.

By clicking on either the “Start of Burst” or “End of Burst” the software automatically zooms in on that specific burst event so that it better fills the graph window.

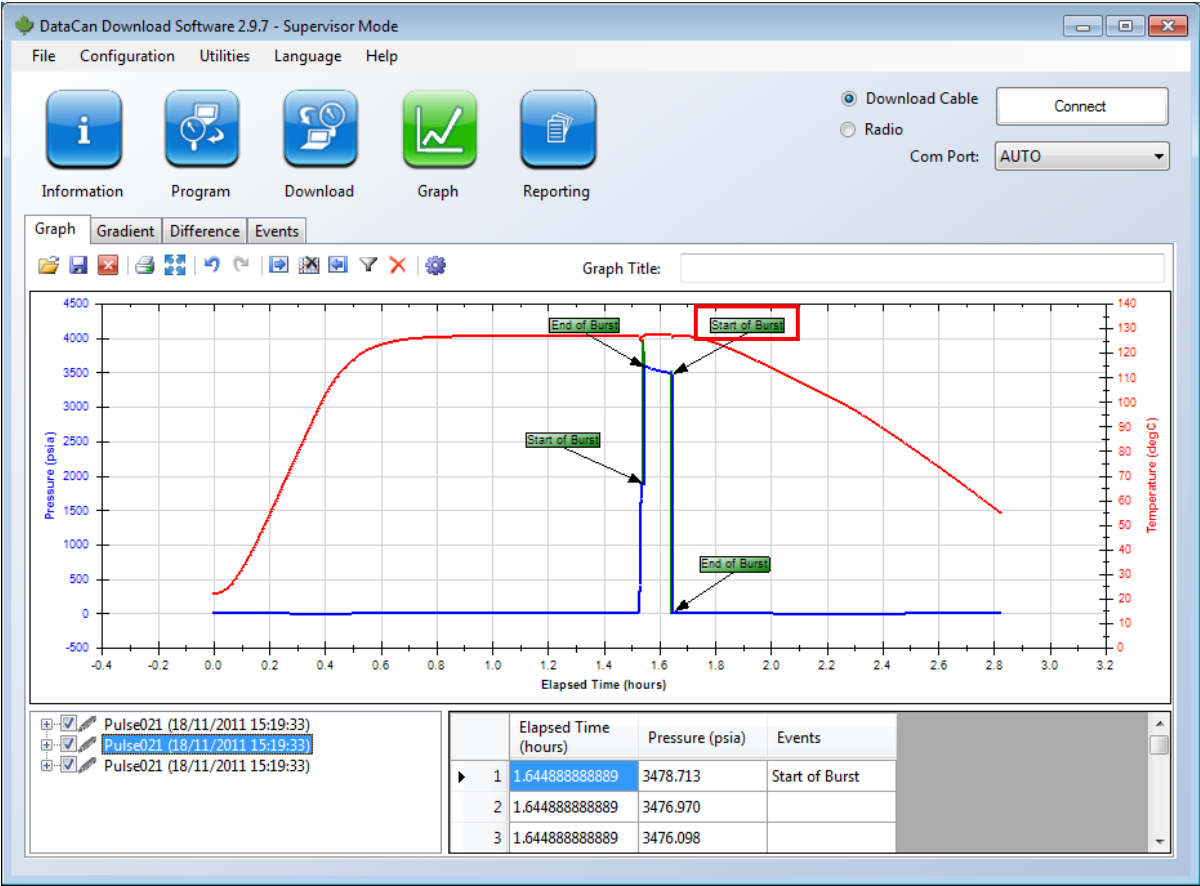


Figure 1 Burst data before automatic zoom.

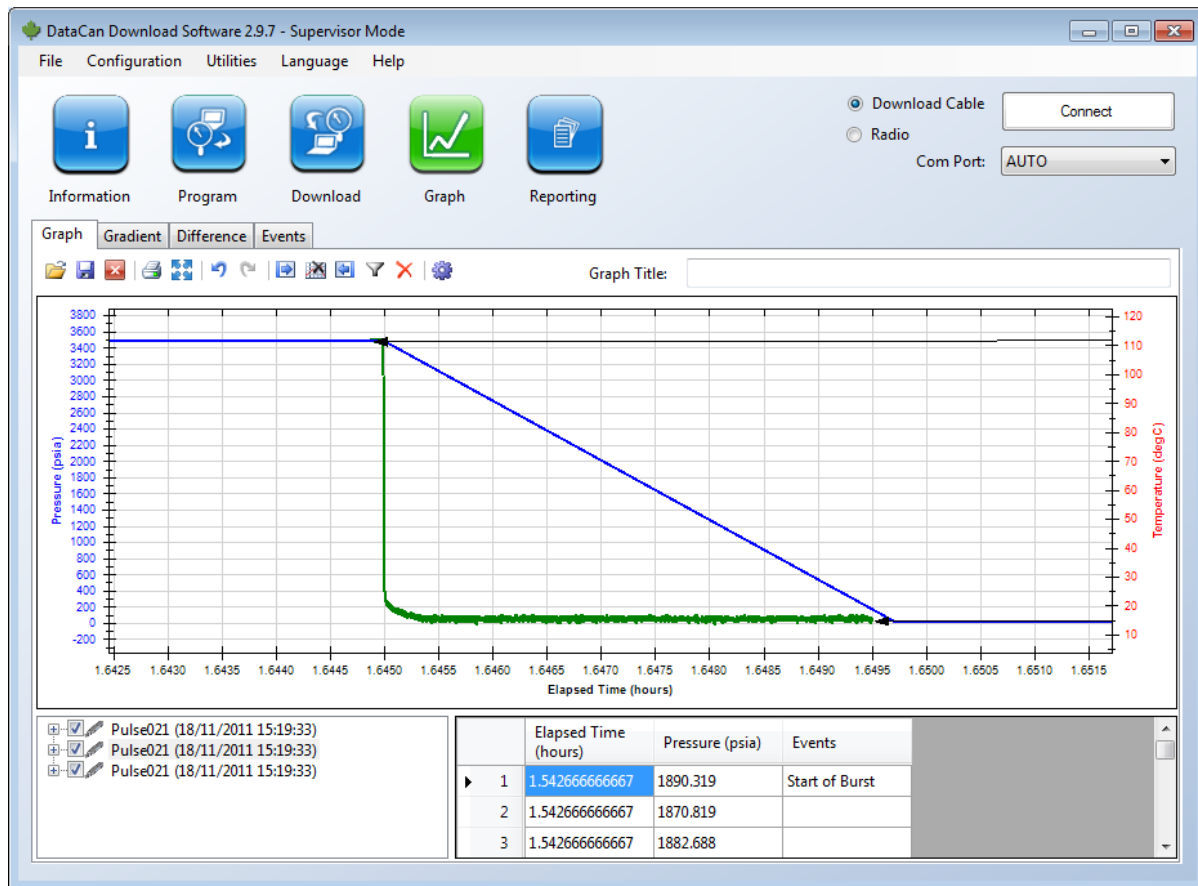





Figure 2 Zoomed data after clicking "Start of Burst" on the second burst event.

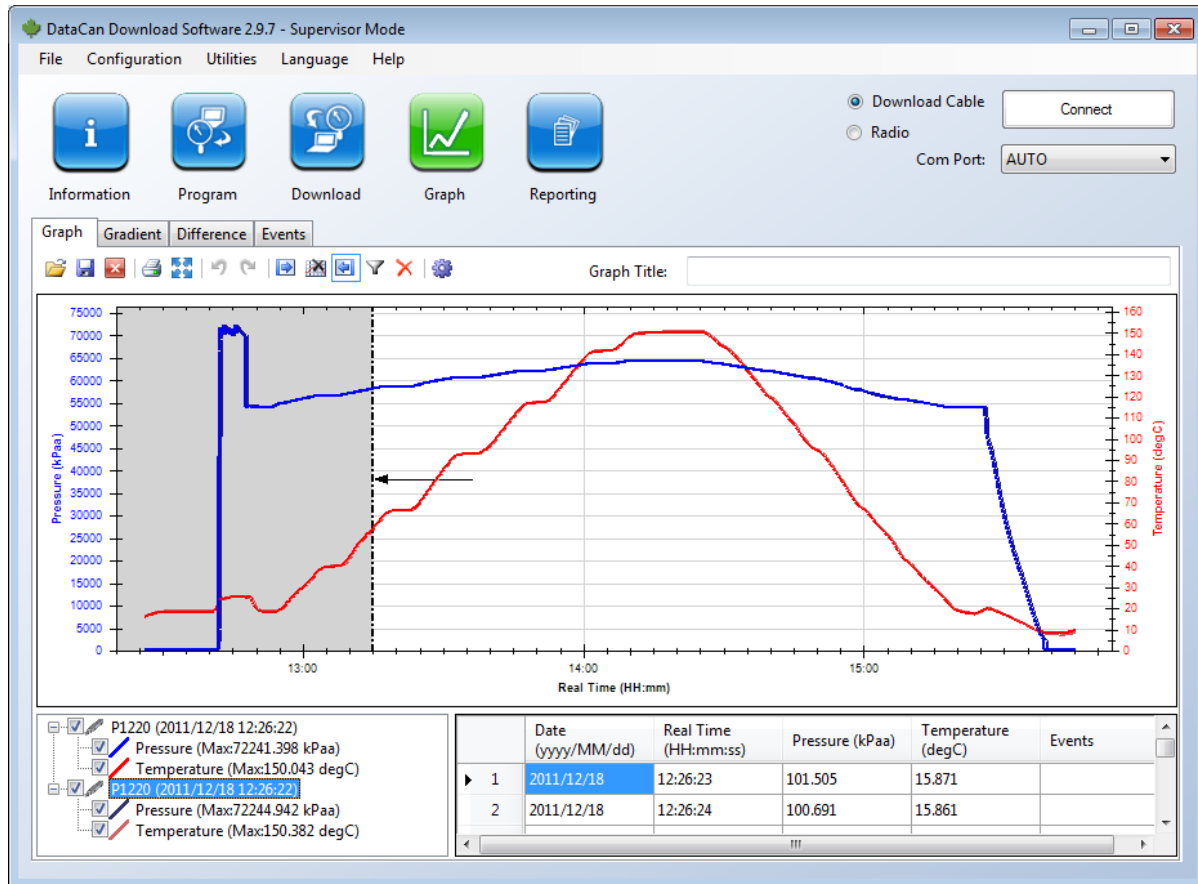
## 9.10 Deleting Data Points

There are a number of ways to delete data using DataCan Download Software. You can select data using the left  and right  boundary buttons and then hit the delete button . You can delete or modify individual data points in the data table. You can highlight rows of data in the data table and delete them.

Left and right boundary lines can be used to delete multiple data points. To delete the start of a job, add a left boundary line and press the delete button. Click on the left arrow action button



(highlighted) then click on the graph where you want to delete the data. The cursor line is drawn where you clicked and the area you chose to delete is highlighted.



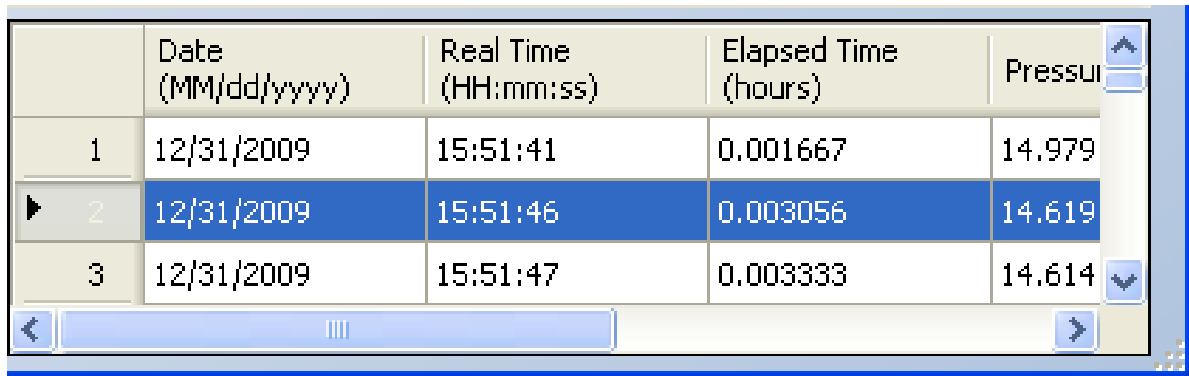
You can then press the **Delete** button on the action menu. A warning will appear.



The selected points will be deleted and the graph scale will be resized to fit the screen.

You can delete the data at the end of the job using the right boundary line button. It is also possible to use the boundary lines to delete data in the middle of the job. This is more useful for filtering data sets.

To delete a single data point, you must select an entire row of data from the data table. A row of data can be selected by clicking on the row number in the data table.



The screenshot shows a data table with five columns: an index column, Date (MM/dd/yyyy), Real Time (HH:mm:ss), Elapsed Time (hours), and Pressure. Row 2 is highlighted in blue. The table is part of a software interface with navigation buttons and a scrollbar.

	Date (MM/dd/yyyy)	Real Time (HH:mm:ss)	Elapsed Time (hours)	Pressure
1	12/31/2009	15:51:41	0.001667	14.979
2	12/31/2009	15:51:46	0.003056	14.619
3	12/31/2009	15:51:47	0.003333	14.614

When you have selected the row, the row is highlighted, press the **Delete** key on your keyboard. The point will be deleted.

---


You will NOT be prompted to confirm the action when using this method, the points will be immediately deleted..

---

This method can also be used to delete multiple data points by holding either **Ctrl** or **Shift** , and selecting multiple data points and pressing the **Delete** key. Alternatively, you can click and hold down on the row number and drag your mouse up and down highlighting multiple rows of data at once, then pressing the **Delete** key.

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## 9.11 Filtering Data Points

If you would like to filter the entire data set, simply press the **Filter** action button  on top.

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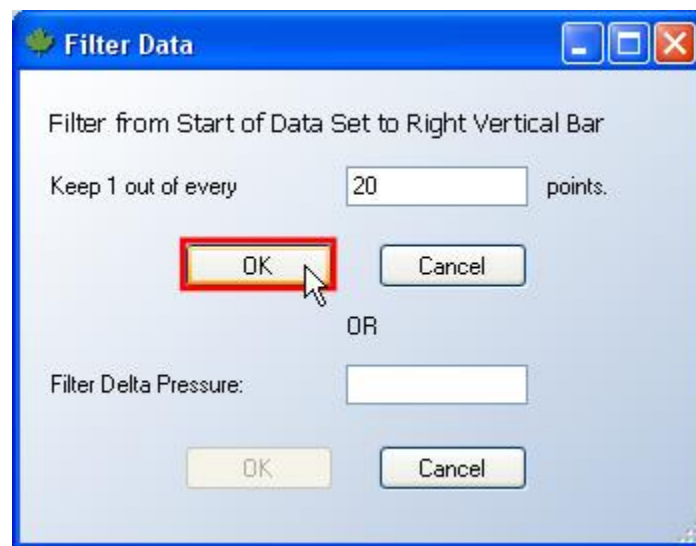
The filter menu appears and gives you two options:

Keep 1 out of every \_\_\_\_ points

Filter Delta Pressure: \_\_\_\_psia.

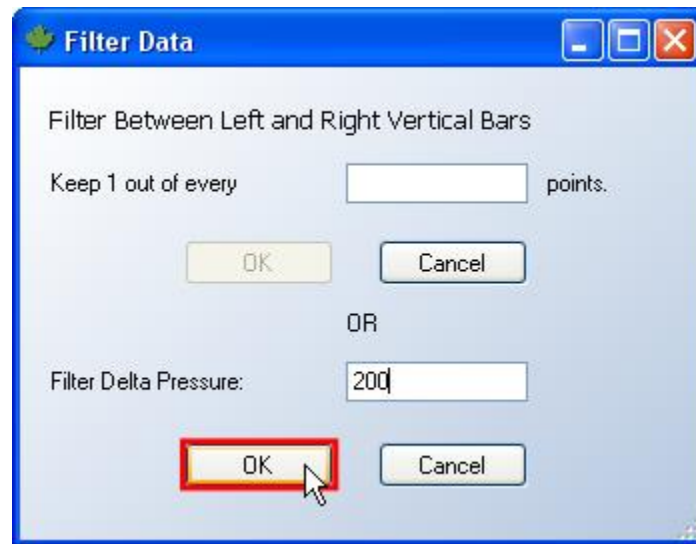
The first filter option will keep one out of every x points where x is a number entered in the blank field provided. This feature is used to simplify the graph and decrease the size of the files used.

Enter the desired value of x and click **OK**. In this example a value of 20 will be entered to demonstrate the feature.

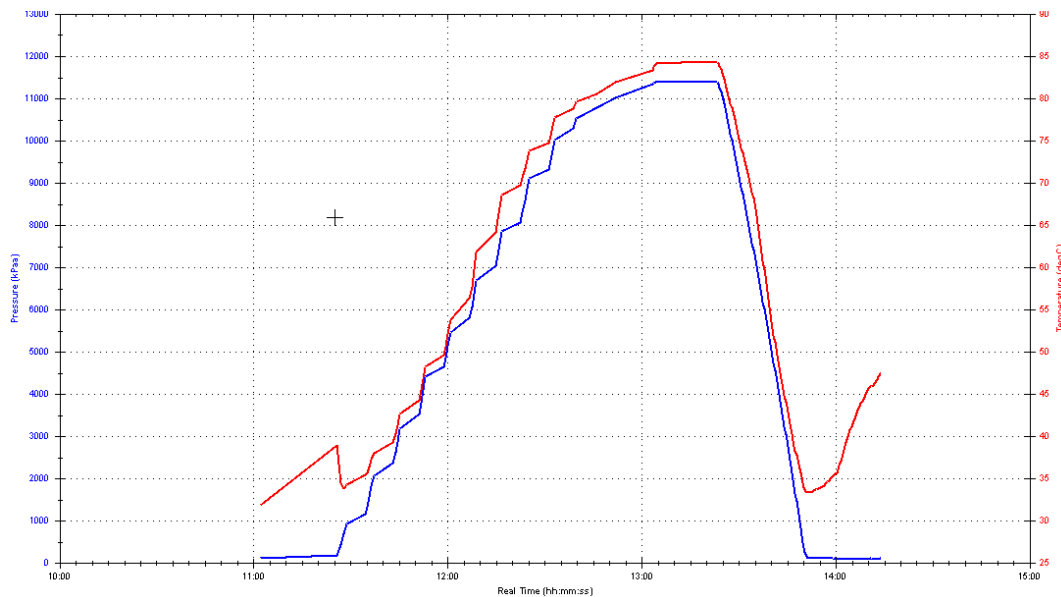


One out of every twenty data points to the left of the filter line will be kept. The rest will be removed from the graph.

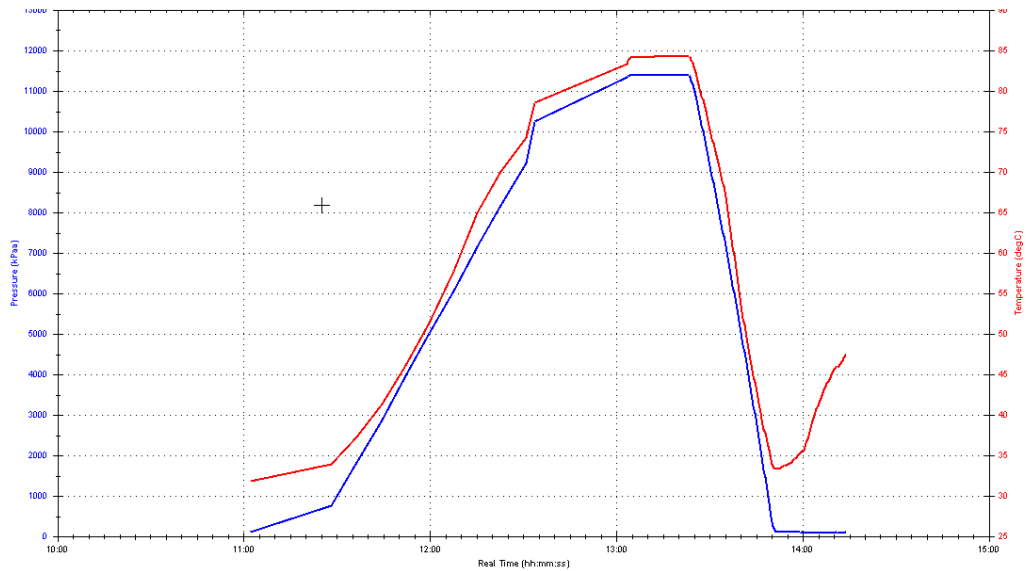
The second filter option will delete data until the difference between the consecutive points in the data is equal to or greater than the value entered in the blank field provided. For example if your data set consisted of 1, 2, 3, 4, 5, 6, 7, 8, 9 10 and a value of 5 was entered the sequence would be filtered to 1,6. Enter the desired delta pressure filter and press **OK**. In this example a value of 200kPa will be entered to demonstrate the feature.



The difference between consecutive points in the selected data will now be at least 200kPa.



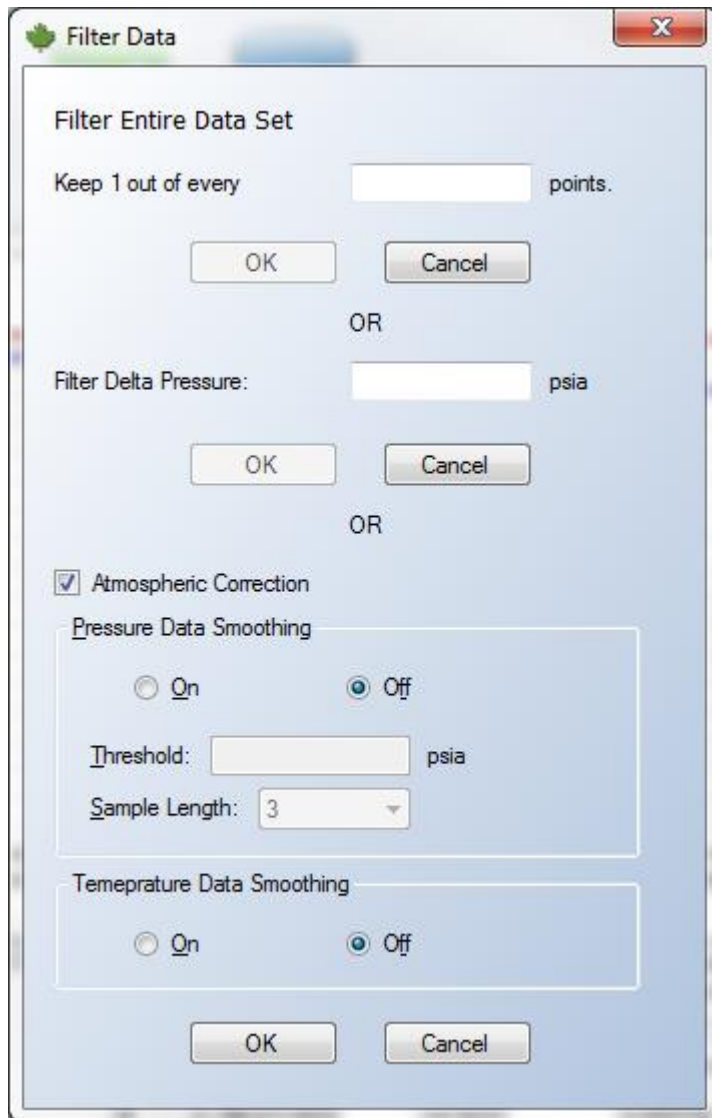
To further illustrate here's what the graph will look like when a value of 1000kPa is used



### 9.11.1 Atmospheric Correction

In Supervisor Mode, Atmospheric Correction can be applied in the “Filter” menu. This will force all pressure values below a certain threshold (this depends upon the sensor type and the maximum rating of the sensor) to read an atmospheric value.

Check the “Atmospheric Correction” check box and then click the bottom “OK” button.

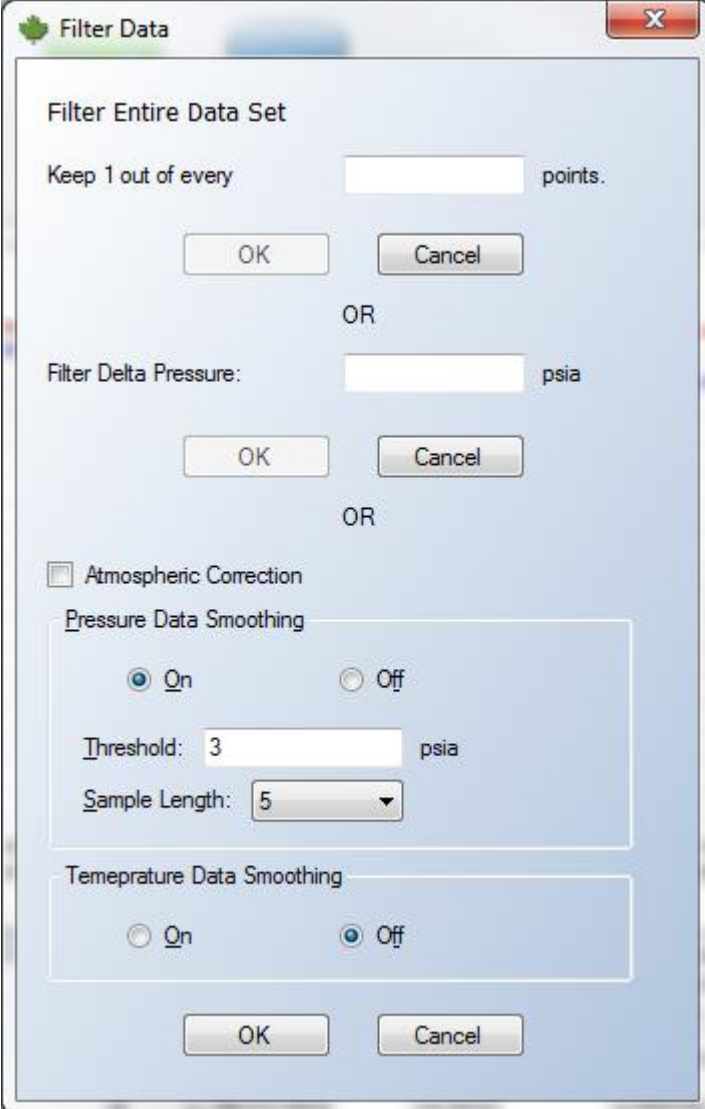


The image shows a 'Filter Data' dialog box with a title bar containing a green leaf icon and a close button. The dialog is divided into three main sections. The first section, 'Filter Entire Data Set', has a label 'Keep 1 out of every' followed by an empty text box and the word 'points.', with 'OK' and 'Cancel' buttons below. The second section, separated by 'OR', is 'Filter Delta Pressure:' followed by an empty text box and 'psia', also with 'OK' and 'Cancel' buttons. The third section, separated by 'OR', starts with a checked checkbox for 'Atmospheric Correction'. Below this is a 'Pressure Data Smoothing' group box containing two radio buttons: 'On' (unselected) and 'Off' (selected). Under these are a 'Threshold:' label with an empty text box and 'psia', and a 'Sample Length:' label with a dropdown menu showing the value '3'. Below the group box is a 'Temperature Data Smoothing' group box with 'On' (unselected) and 'Off' (selected) radio buttons. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

### 9.11.2 Pressure Data Smoothing

In Supervisor Mode, Data smoothing can be applied to the pressure data. When turned “On”, data will be smoothed if the pressure change between “Sample Length” number of points is less than “Threshold” pressure. In this example, if 5 samples in a row have a pressure change of less than 3 psia, then the 5 samples will be smoothed. Data spikes and data large data movements will not be smoothed.

Select Pressure Data Smoothing “On”, set the “Threshold” pressure and the “Sample Length”. Then click the “OK” button.

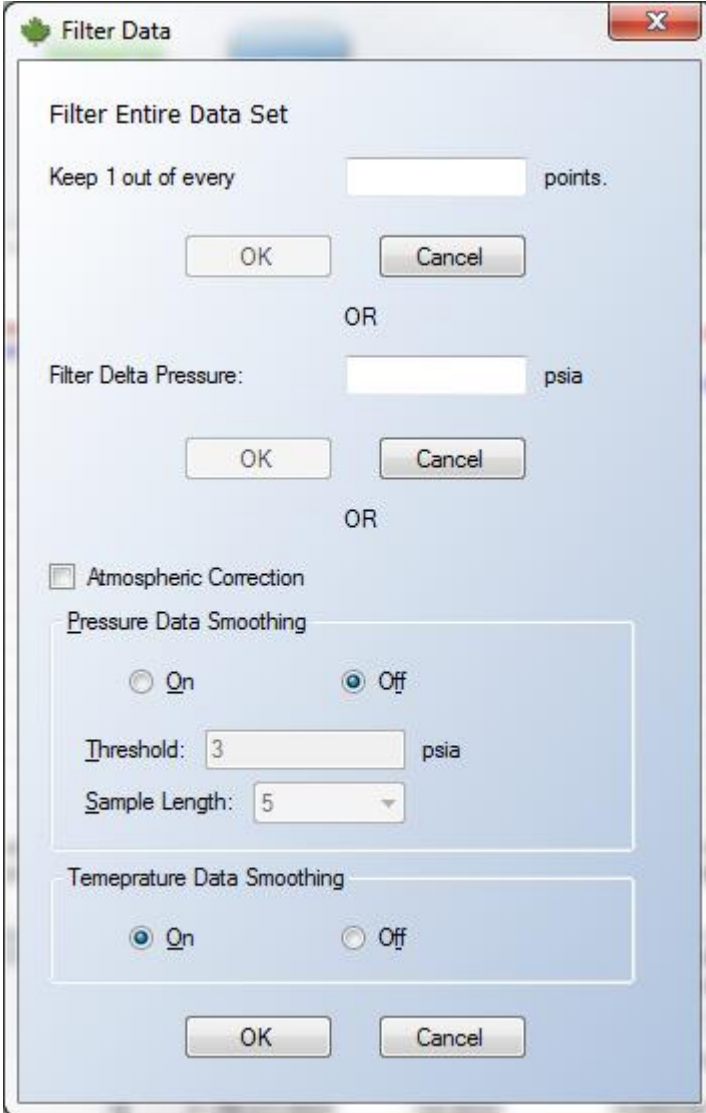


The image shows a "Filter Data" dialog box with a title bar containing a green leaf icon and a close button (X). The dialog is divided into three main sections. The first section, "Filter Entire Data Set", has a label "Keep 1 out of every" followed by a text input field containing "3" and the unit "points.", with "OK" and "Cancel" buttons below. The second section, separated by "OR", has a label "Filter Delta Pressure:" followed by a text input field containing "3" and the unit "psia", with "OK" and "Cancel" buttons below. The third section, separated by "OR", contains a checkbox for "Atmospheric Correction" which is unchecked. Below this is a "Pressure Data Smoothing" section with two radio buttons: "On" (selected) and "Off". Below the radio buttons are two input fields: "Threshold:" with a text input field containing "3" and the unit "psia", and "Sample Length:" with a dropdown menu showing "5". At the bottom of the dialog are "OK" and "Cancel" buttons.

### 9.11.3 Temperature Data Smoothing

Temperature Data Smoothing is similar to Pressure Data Smoothing, except there is no threshold. All temperature data points will have a running average smoothing applied.

Select Temperature Data Smoothing "On". Then click the "OK" button.



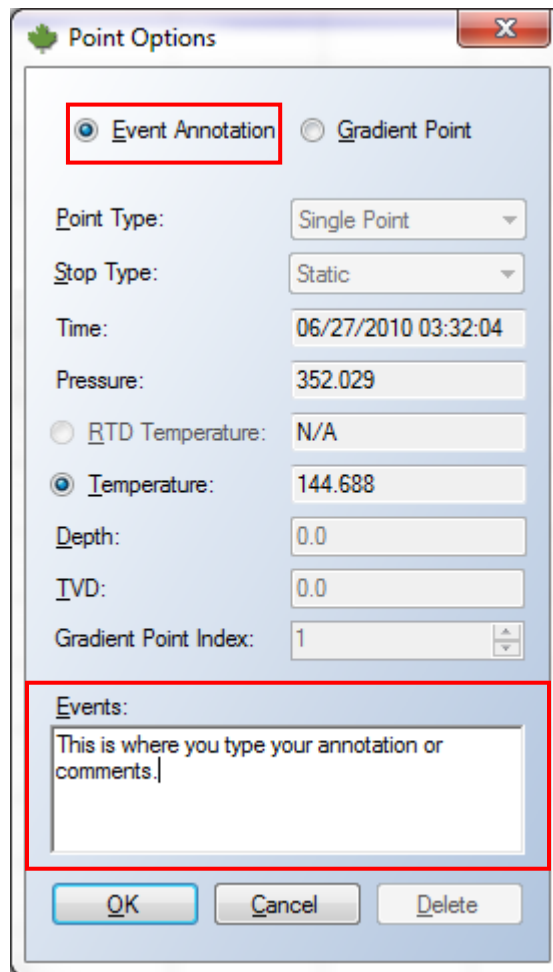
The image shows a "Filter Data" dialog box with a light blue background and a standard Windows-style title bar with a close button (X). The dialog is organized into several sections. At the top, under "Filter Entire Data Set", there is a text input field for "Keep 1 out of every" followed by "points.", with "OK" and "Cancel" buttons below it. This is followed by an "OR" separator. Below that is a "Filter Delta Pressure:" section with a text input field followed by "psia", also with "OK" and "Cancel" buttons. Another "OR" separator follows. The next section is "Atmospheric Correction", which has an unchecked checkbox. Below this is the "Pressure Data Smoothing" section, which contains two radio buttons: "On" (unchecked) and "Off" (checked). Below the radio buttons are two input fields: "Threshold:" with a value of "3" followed by "psia", and "Sample Length:" with a dropdown menu showing "5". The final section is "Temperature Data Smoothing", which contains two radio buttons: "On" (checked) and "Off" (unchecked). At the bottom of the dialog are "OK" and "Cancel" buttons.

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## 9.12 Adding, Deleting and Editing Annotations

DataCan Download Software allows you attach annotations to data points on the graph. Double click the data point where you want to add the annotation. The point options window will appear. Make sure that the "Annotation" radio button is active.





The image shows a 'Point Options' dialog box with a red border. At the top, there are two radio buttons: 'Event Annotation' (selected) and 'Gradient Point'. Below these are several input fields: 'Point Type' (Single Point), 'Stop Type' (Static), 'Time' (06/27/2010 03:32:04), 'Pressure' (352.029), 'RTD Temperature' (N/A), 'Temperature' (144.688), 'Depth' (0.0), 'IVD' (0.0), and 'Gradient Point Index' (1). At the bottom, there is a text area labeled 'Events:' with the placeholder text 'This is where you type your annotation or comments.' and three buttons: 'OK', 'Cancel', and 'Delete'.

Point Options

☒ Event Annotation ☐ Gradient Point

Point Type: Single Point

Stop Type: Static

Time: 06/27/2010 03:32:04

Pressure: 352.029

☐ RTD Temperature: N/A

☒ Temperature: 144.688

Depth: 0.0

IVD: 0.0

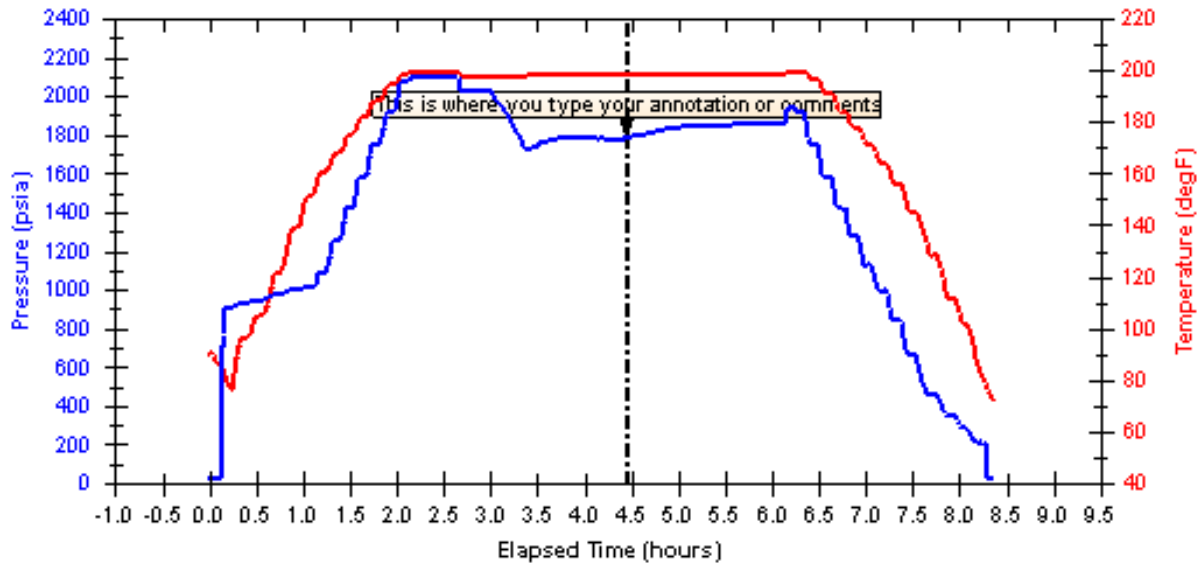
Gradient Point Index: 1

Events:

This is where you type your annotation or comments.

OK Cancel Delete

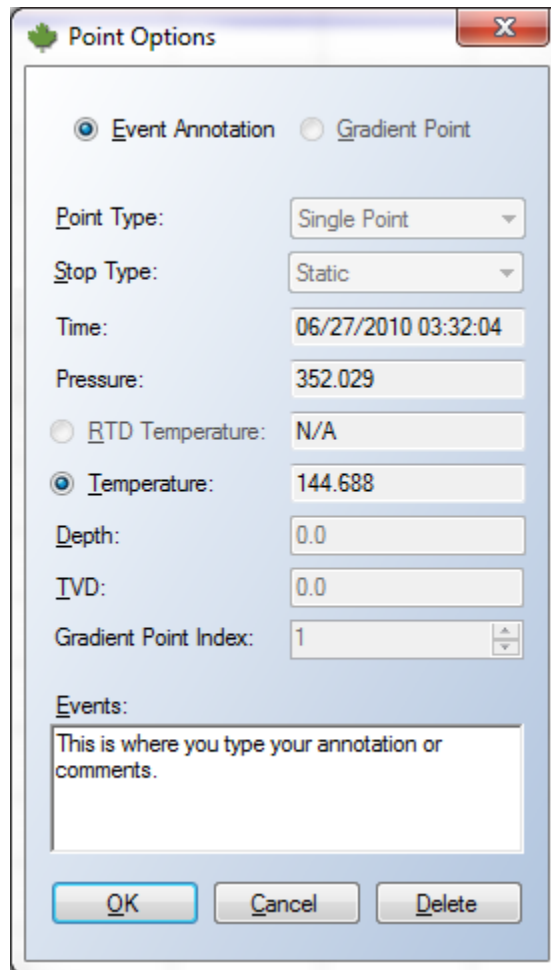
Add the annotation or comments under the events heading. Click **OK**.



The annotation will appear as a note with an arrow pointing to the selected data point.

To move the annotation, point the cursor over the annotation. Press **Ctrl + Left Click** then drag the annotation to where you would like to see it.

To edit or delete an annotation place the cursor over top of it until it turns green. Right click and select **Edit Point Information** from the menu.

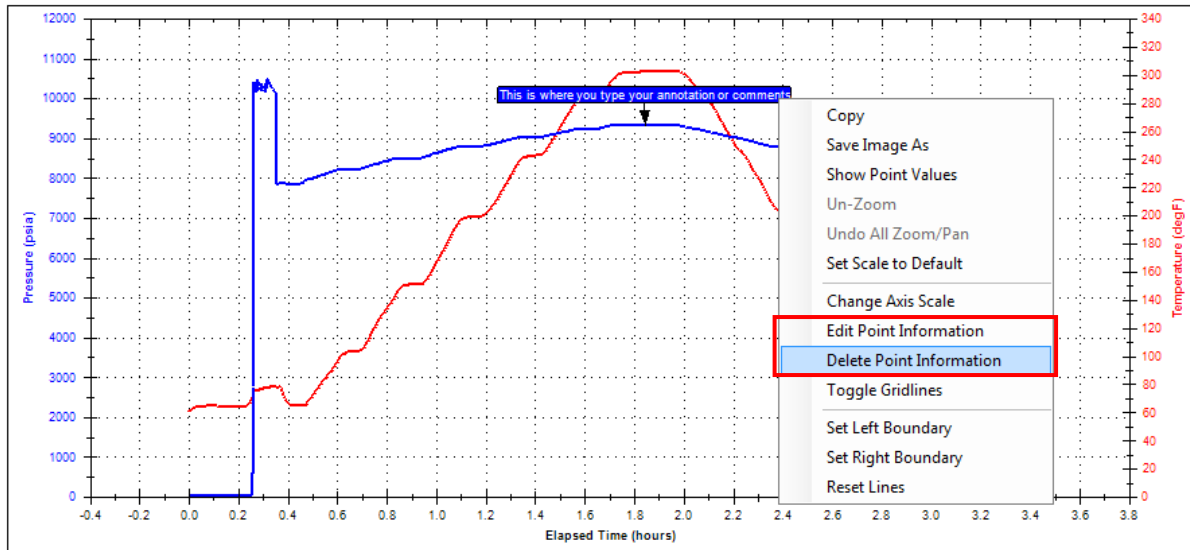


The image shows a 'Point Options' dialog box with a title bar containing a green maple leaf icon and a close button. The dialog has two radio buttons at the top: 'Event Annotation' (selected) and 'Gradient Point'. Below these are several input fields: 'Point Type' (Single Point), 'Stop Type' (Static), 'Time' (06/27/2010 03:32:04), 'Pressure' (352.029), 'RTD Temperature' (N/A), 'Temperature' (144.688), 'Depth' (0.0), 'IVD' (0.0), and 'Gradient Point Index' (1). At the bottom is an 'Events' text area with the placeholder text 'This is where you type your annotation or comments.' and three buttons: 'OK', 'Cancel', and 'Delete'.

Field	Value
Point Type	Single Point
Stop Type	Static
Time	06/27/2010 03:32:04
Pressure	352.029
RTD Temperature	N/A
Temperature	144.688
Depth	0.0
IVD	0.0
Gradient Point Index	1

The point options window will appear. The annotation can be edited and saved by pressing the **OK** button as outlined above. Press the **Delete** button in the point options window to remove the annotation.

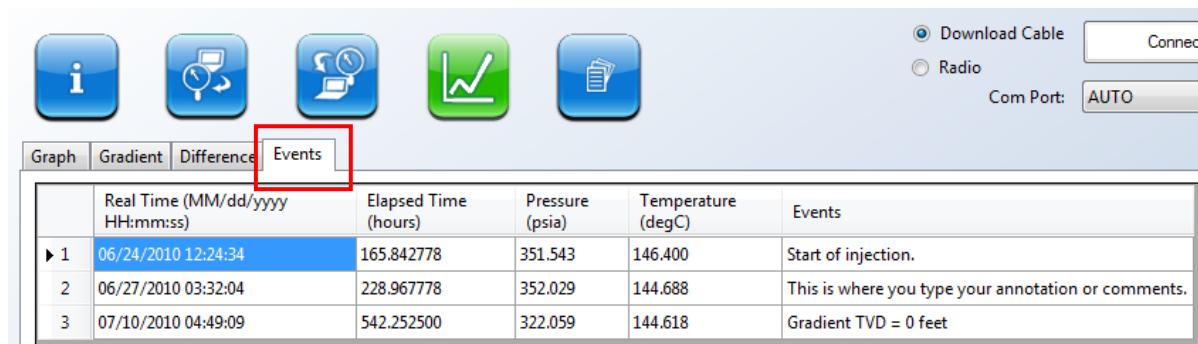
Another way to delete an annotation is to right click on top of it and select **Delete Point Information** from the menu.



---

## 9.13 Events Tab

The Events tab lists all annotations and gradients shown on the graph.




The screenshot shows the software interface with the 'Events' tab selected. The top bar contains five icons: an information icon, a graph icon, a clock icon, a line graph icon, and a document icon. To the right of these icons are connection options: 'Download Cable' (selected), 'Radio', and a 'Connect' button. Below these is a 'Com Port' dropdown menu set to 'AUTO'. The 'Events' tab is highlighted with a red box. Below the tab bar is a table with the following data:

	Real Time (MM/dd/yyyy HH:mm:ss)	Elapsed Time (hours)	Pressure (psia)	Temperature (degC)	Events
▶ 1	06/24/2010 12:24:34	165.842778	351.543	146.400	Start of injection.
2	06/27/2010 03:32:04	228.967778	352.029	144.688	This is where you type your annotation or comments.
3	07/10/2010 04:49:09	542.252500	322.059	144.618	Gradient TVD = 0 feet

---

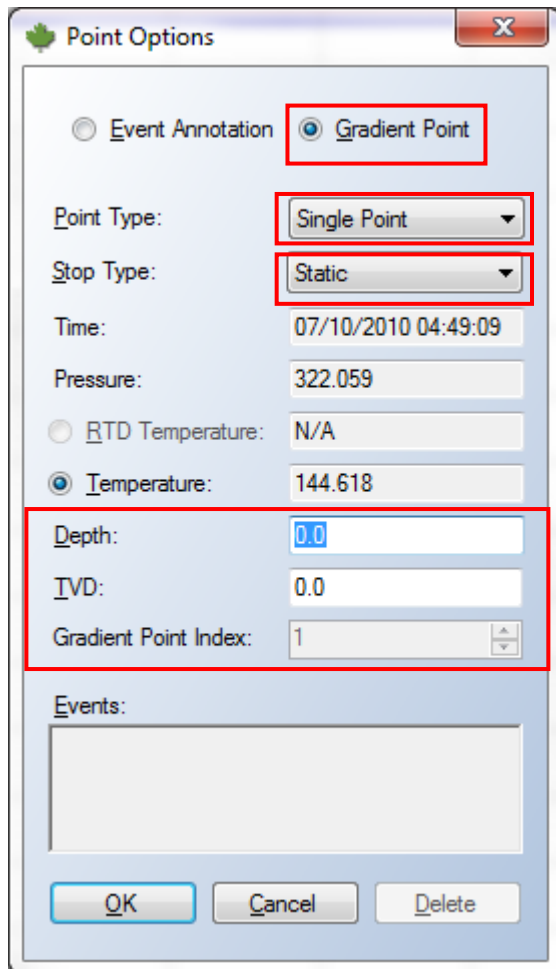
## 9.14 Show Numeric Annotations

Annotation settings are now changed in the graph settings dialog, which can be accessed by pressing the **Units / Settings** button  on the top side of the graph screen. See **Annotation Settings** earlier in this manual for more information.

---

## 9.15 Create a Gradient Plot and Edit Gradient Points

DataCan Download Software allows you to create a gradient plot. Double click the data point where you want to add the gradient point. The point options window will appear. Make sure that the “Gradient Point” radio button is active.



Select the type of gradient point that is required from the drop down list.

**Single Gradient Point** – This is a single point created and stands alone from one gradient stop to another.

**Start Gradient Point** – This creates a start gradient point that will be paired with an end gradient point representing a range on a gradient stop. Both the start and the end gradient points must have the same Gradient Point Index number to be considered a pair. This range can be created on each gradient stop.

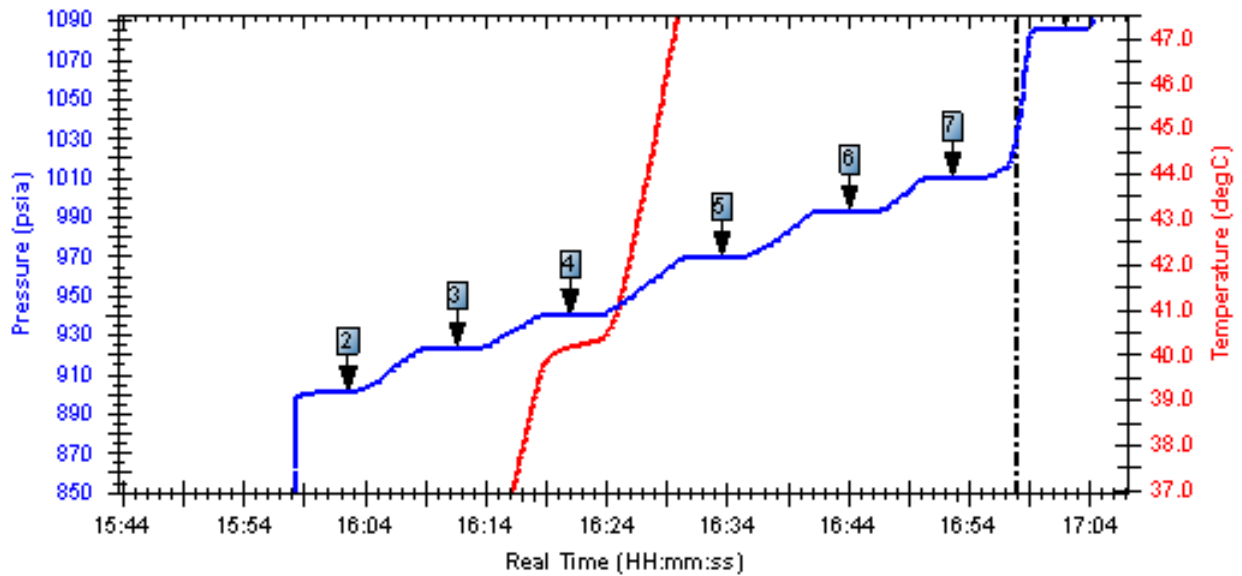
**End Gradient Point** – This creates an end gradient point that will be paired with a start gradient point representing a range on a gradient stop. Both the start and the end gradient points must have the same Gradient Point Index number to be considered a pair. This range can be created on each gradient stop.

Select the Stop Type from the drop down list. The options are “Static” or “Flowing”.

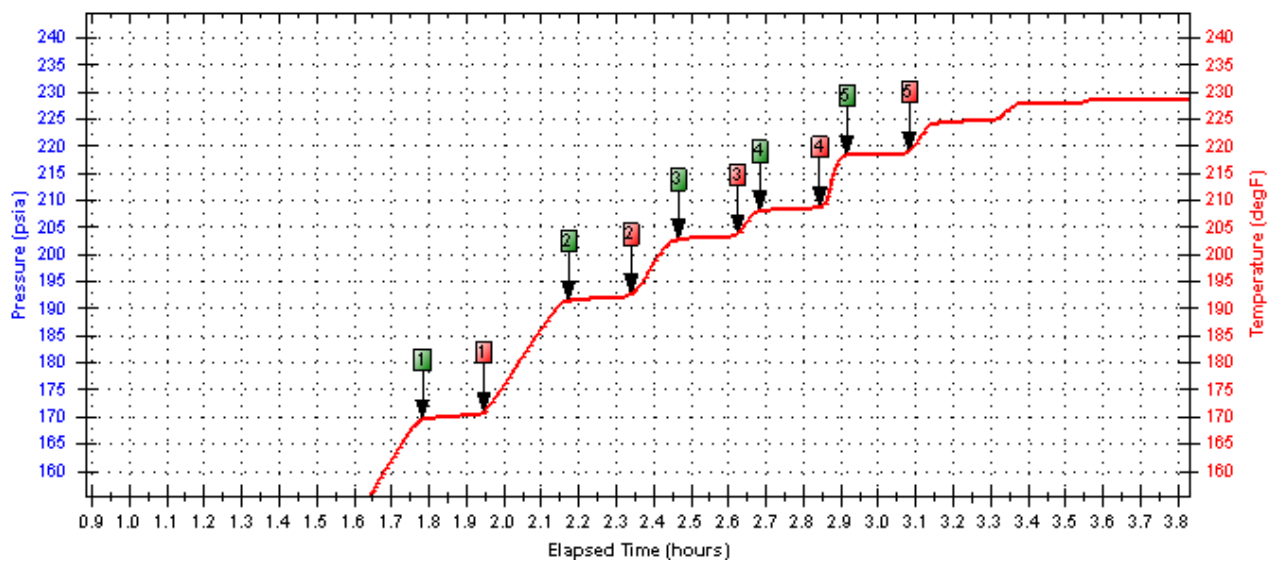
Add the Depth and Total Vertical Depth (TVD) into the Point Options box. Click **OK**. Start and End Gradient Points will have the same TVD and Depth values. The units for depth are set in the “Units” dialog.

Each gradient point is added the to “Gradient” and “Events” tables which are stored in the “Gradient” and “Events” tabs.

Repeat this step as you move from one gradient stop to another. The following diagram displays how Single Gradient Points would be used.



The following diagram displays how Start and End Gradient Points would be used.

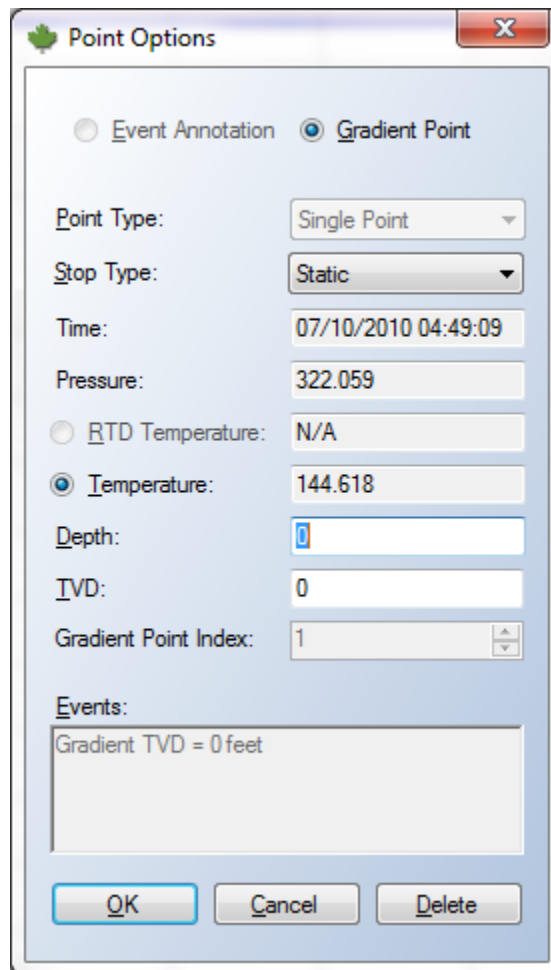


The gradient point will appear as a note with an arrow pointing to the selected data point.

To move the gradient point, point the cursor over the annotation. Press **Ctrl + Left Click** then drag the gradient point to where you would like to see it.



To edit or delete a gradient point step, place the cursor over top of it until it turns orange. Right click and select **Edit Point Information** from the menu.

The image shows a 'Point Options' dialog box with a title bar containing a green leaf icon and a close button. Inside the dialog, there are two radio buttons: 'Event Annotation' and 'Gradient Point', with 'Gradient Point' selected. Below these are several input fields: 'Point Type' (Single Point), 'Stop Type' (Static), 'Time' (07/10/2010 04:49:09), 'Pressure' (322.059), 'RTD Temperature' (N/A), 'Temperature' (144.618), 'Depth' (0), 'TVD' (0), and 'Gradient Point Index' (1). At the bottom, there is an 'Events' section with a text area containing 'Gradient TVD = 0 feet'. Three buttons are at the bottom: 'OK', 'Cancel', and 'Delete'.

The point options window will appear. The annotation can be edited and saved by pressing the **OK** button as outlined above. Press the **Delete** button in the point options window to remove the gradient point.

Once you have entered your gradient points, click on the Gradient View tab at the top left of the graph screen.

	Stop Number	Depth	TVD	Elapsed Time (hours)	Pressure	Pressure Gradient (TVD)	Temperature	Temperature Gradient (TVD)	Events	Pressure Gradient (Log)
1	6	0	0	1.8708	1028.330	0.000000	169.870	0.000000		0.000000
2	7	0	0	2.2403	1071.810	0.000	191.590	0.000		Infinity
3	8	0	0	2.5431	1092.500	0.000	202.880	0.000		Infinity
4	9	0	0	2.7806	1102.660	0.000	208.180	0.000		Infinity
*5										

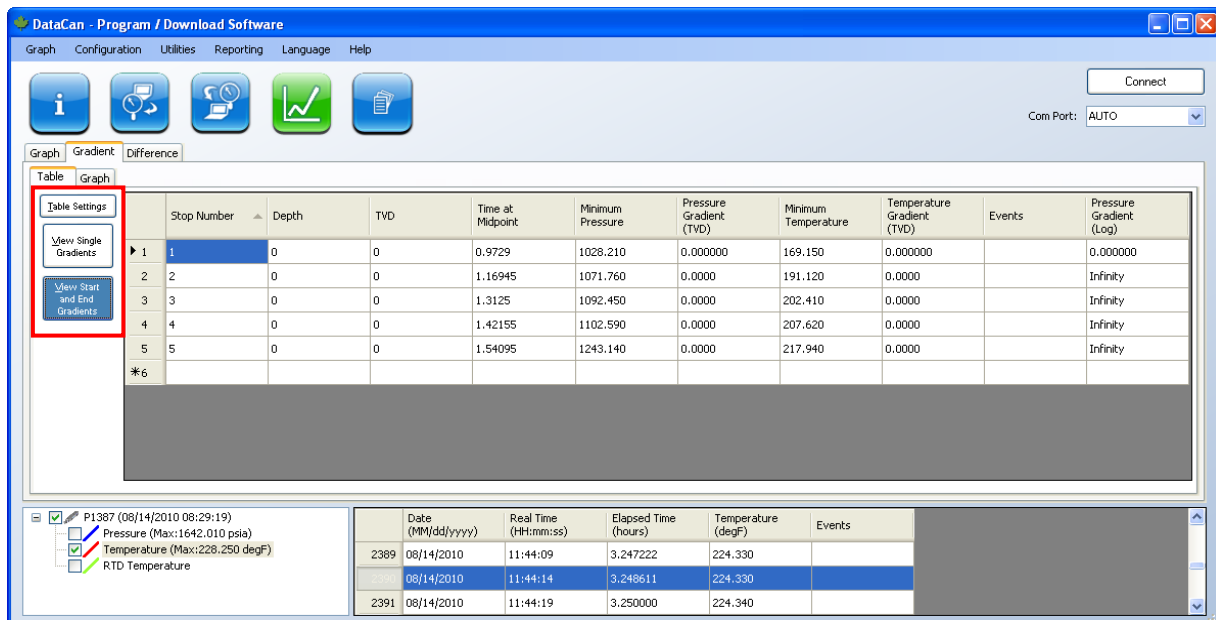
  

	Date (MM/dd/yyyy)	Real Time (HH:mm:ss)	Elapsed Time (hours)	Temperature (degF)	Events
2389	08/14/2010	11:44:09	3.247222	224.330	
2390	08/14/2010	11:44:14	3.248611	224.330	
2391	08/14/2010	11:44:19	3.250000	224.340	

The gradient tab takes you to a table displaying the Stop number, Depth, TVD, Time (Elapsed Time or Real Time), Pressure, Pressure Gradient, Temperature, Temperature Gradient, Events, and Pressure Gradient (Log).

You can click on the cells in the table and edit them manually.

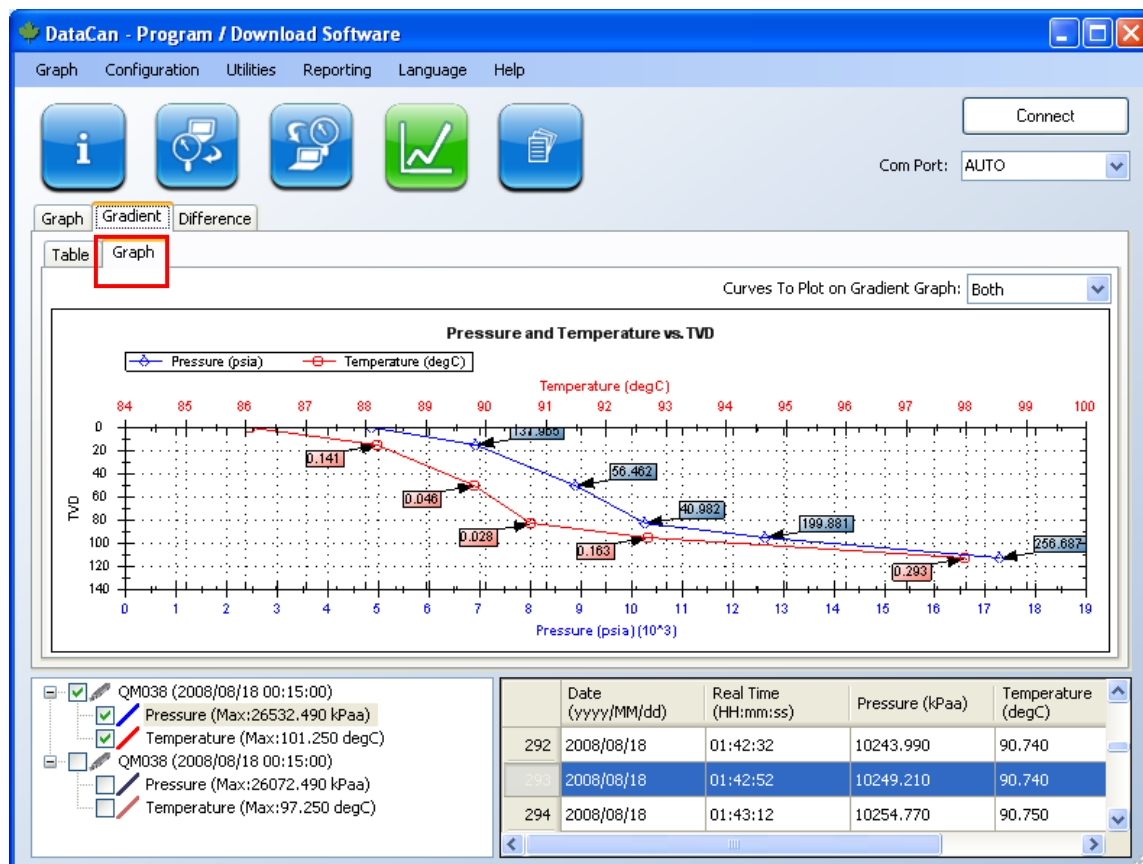
You can toggle from the Single Gradients Table to the Start and End Gradients Table by clicking the buttons on the left.



The "Table Settings" button can be clicked to change the type of values to be displayed when the **Start and End Gradients Table** is displayed.

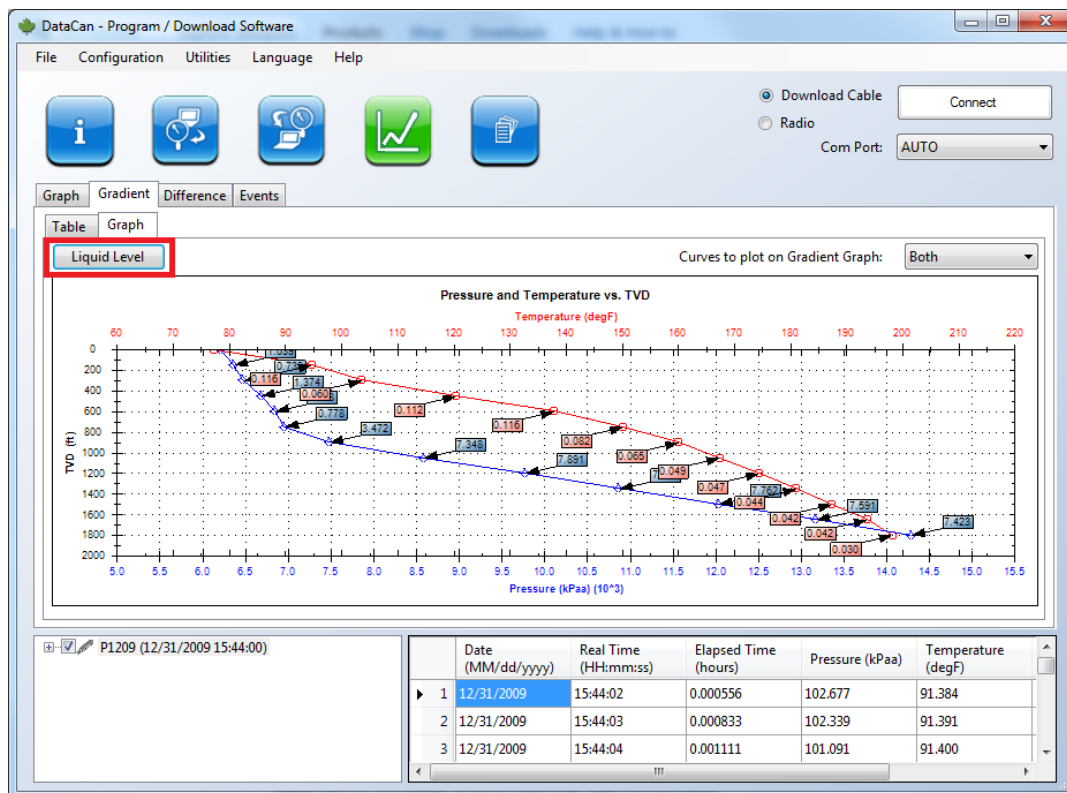


You can toggle from the Table tab to the Graph tab to see the gradient graph. The graph displayed is based on the table view selected under the Table tab.



### 9.15.1 Adding Liquid Level to a Gradient Graph

To add or remove a liquid level indicator from the gradient graph, press the Liquid Level Button



This will bring up the Liquid Level Dialog

**Liquid Level Settings**

☐ Manually Set the Liquid Level

Liquid Level:

Or calculate liquid level using selected gradients:

**Gas Gradients**

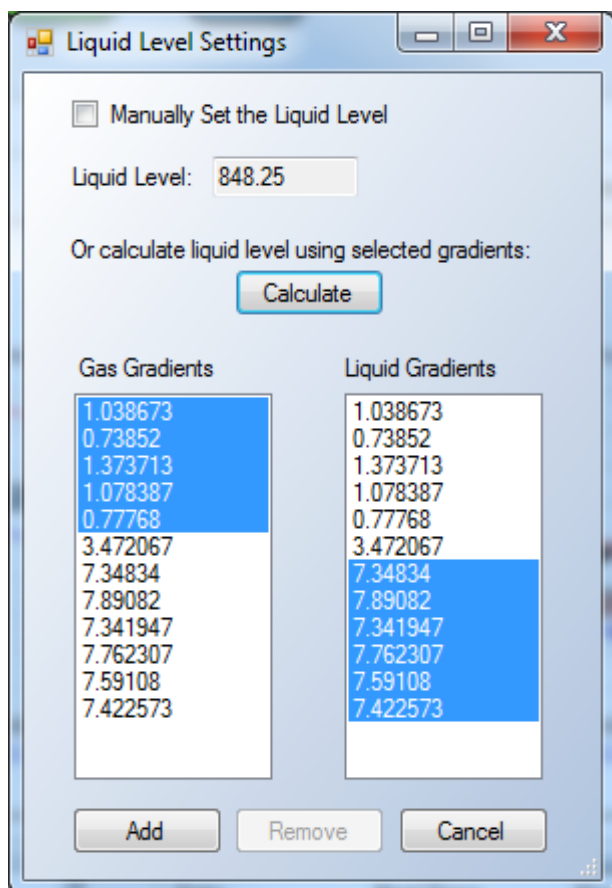
1.038673  
0.73852  
1.373713  
1.078387  
0.77768  
3.472067  
7.34834  
7.89082  
7.341947  
7.762307  
7.59108  
7.422573

**Liquid Gradients**

1.038673  
0.73852  
1.373713  
1.078387  
0.77768  
3.472067  
7.34834  
7.89082  
7.341947  
7.762307  
7.59108  
7.422573

There are two ways to add the liquid level to the graph. If you know the liquid level and wish to enter it manually, check the “Manually Set the Liquid Level” checkbox and enter the level.

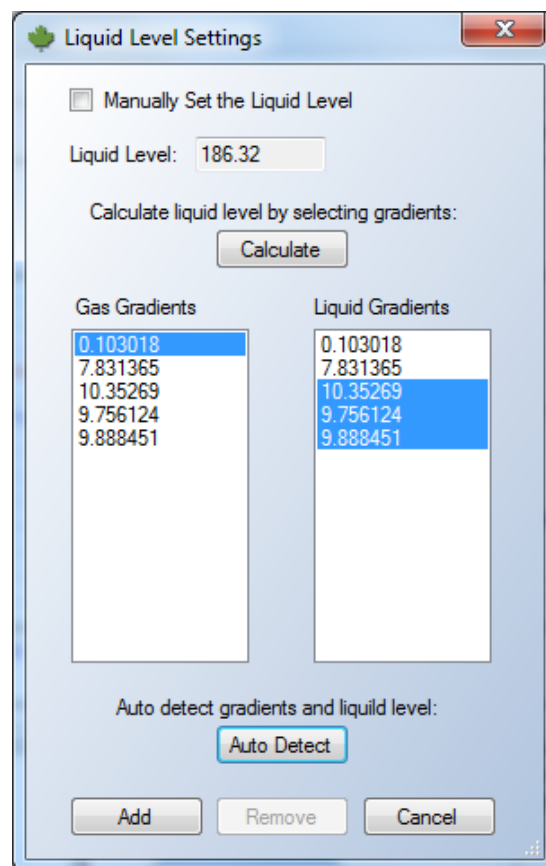
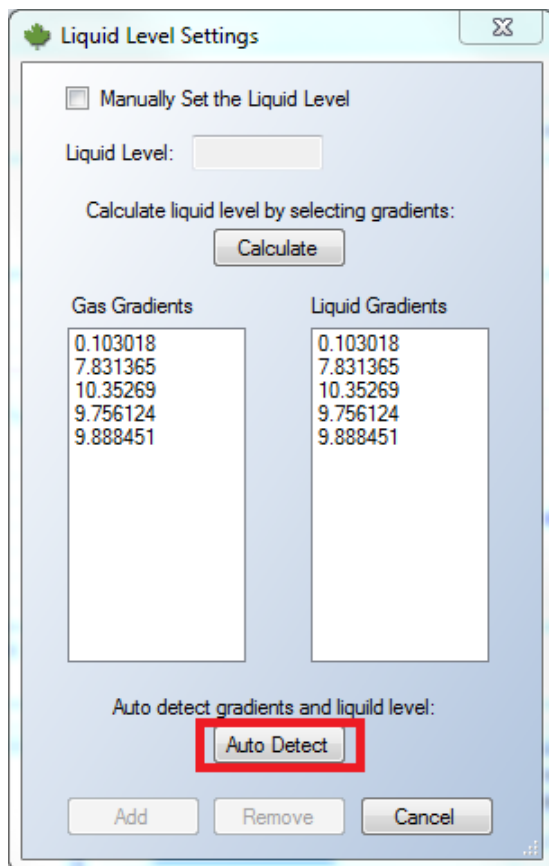
If you want to calculate the liquid level using gradient values, select the gas and liquid gradients out of the gradient lists, and hit the “Calculate” button. The calculated level will appear in the “Liquid Level” textbox.



Pressing 'Add' will add the liquid level indicator to the gradient graph and close the dialog.

If you ever wish to remove the liquid level indicator from the graph, press the “Liquid Level” button to bring up this dialog, and then press the 'Remove' button in the dialog. The remove button will only appear if there is a liquid level indicator on the graph.

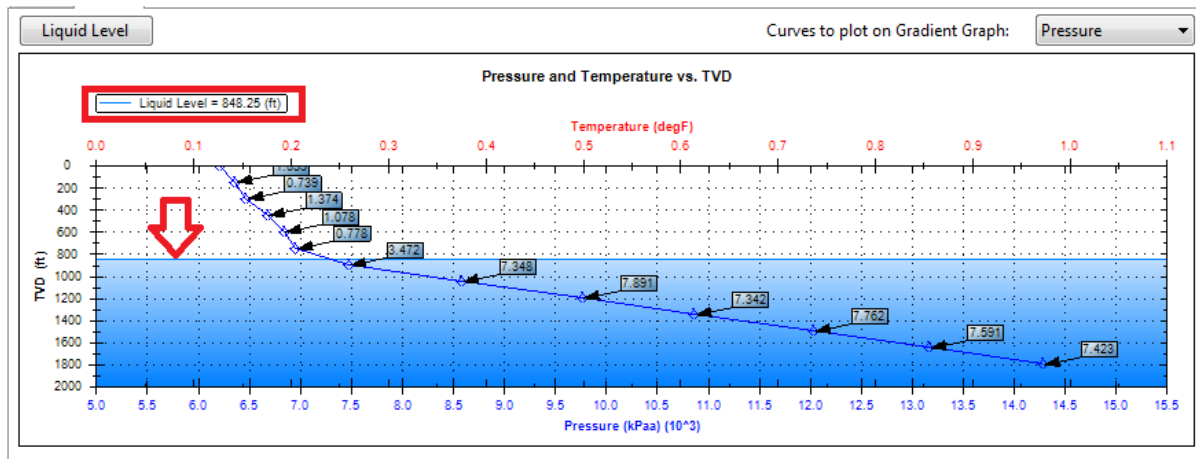
You can also auto-detect the gas and liquid gradients by pressing the Auto Detect button.



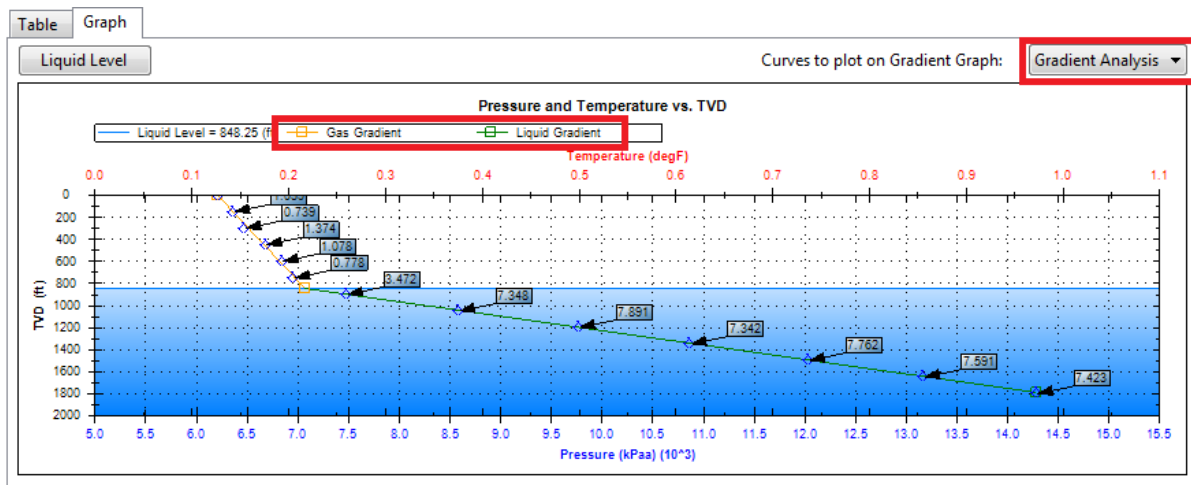
Using known normal ranges for gas and fluid gradients, the software will try to determine the gradients lines and interface point, and will calculate the liquid level using these chosen points.

NOTE: Due to various well characteristics, it is not always possible to accurately determine the liquid level using the Auto Detect method.

When you add the liquid level indicator to the graph, a line will be drawn along the depth axis to indicate the liquid level. The space below that line will be shaded. The liquid level depth will also appear in the graph's legend.

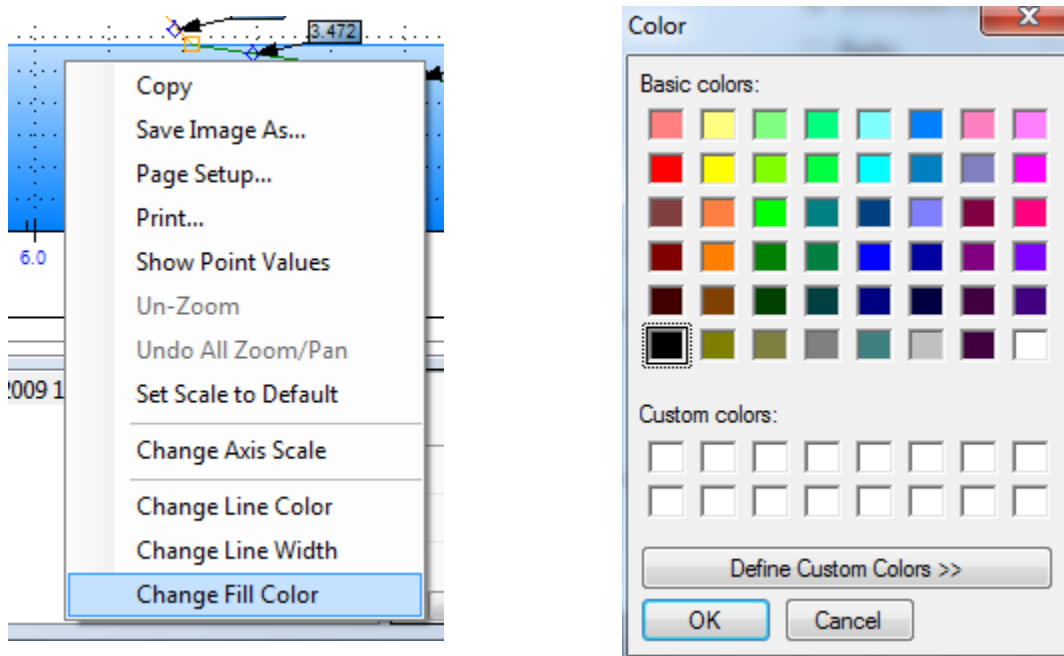


If the liquid level was calculated using a set of gradients (rather than manually entered), an additional gradient graph becomes available, showing the gas and liquid gradient lines alongside the plotted pressure points. This graph can be viewed by selecting the "Gradient Analysis" graph from the dropdown list (this graph is shown by default after the liquid level has been plotted).

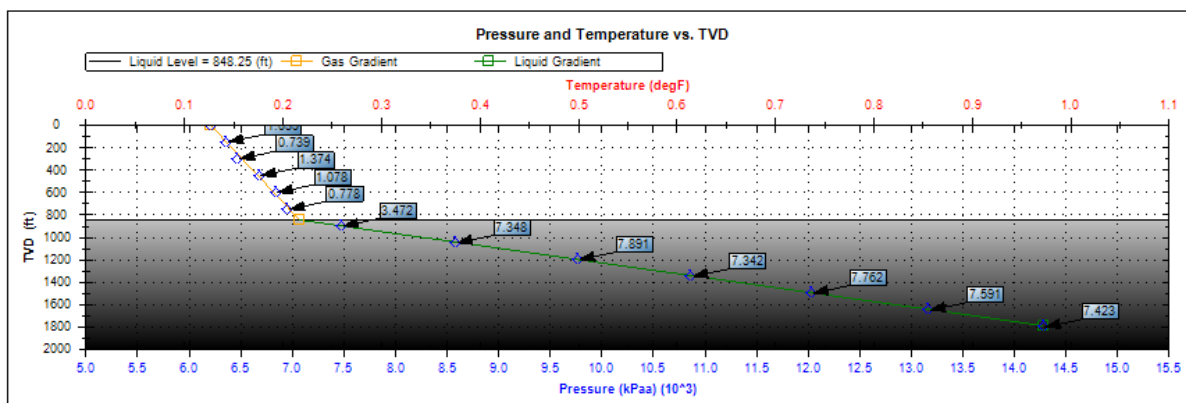




To edit the shading color used to indicate the liquid level, right click anywhere on the gradient graph, and select "Change Fill Color". A color dialog will appear, allowing you to change the liquid level fill color.



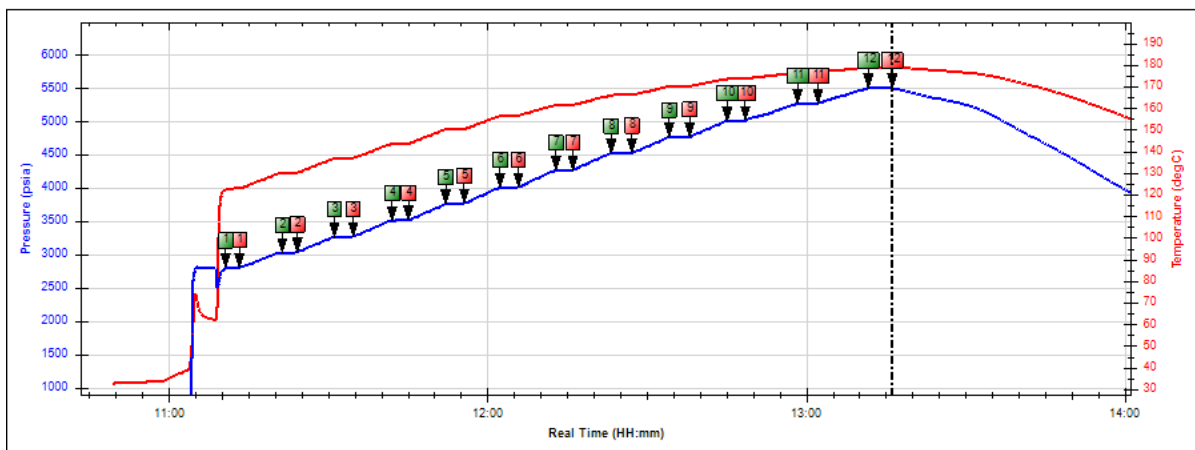
The Liquid Level line and shaded area will appear in the new color scheme:



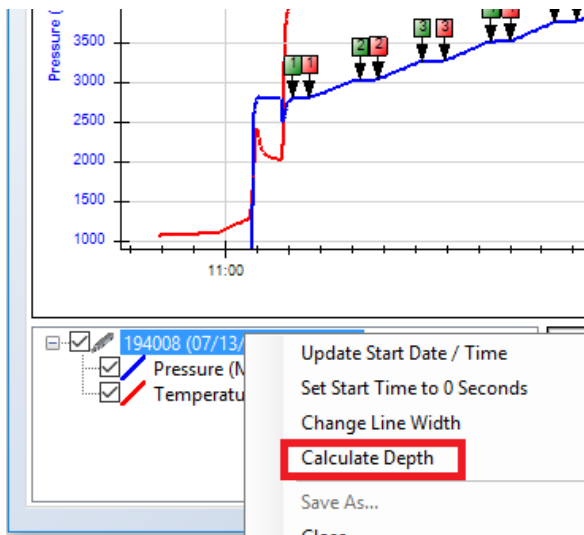
## 9.15.2 Estimating Depth Curve using Gradient Points

A new features starting in Version 3.8.0 is the ability to generate a depth curve using the depths of the gradient points.

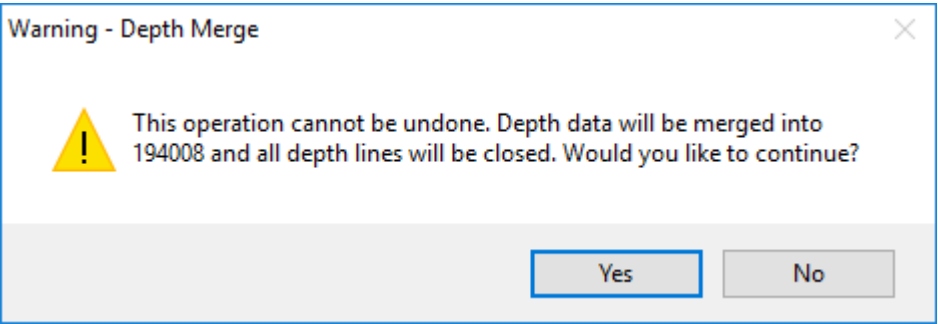
For example, here is a graph which has been annotated with start/stop gradients. The first stop is at 0 feet, and the 12<sup>th</sup> stop is at 5,500 feet.



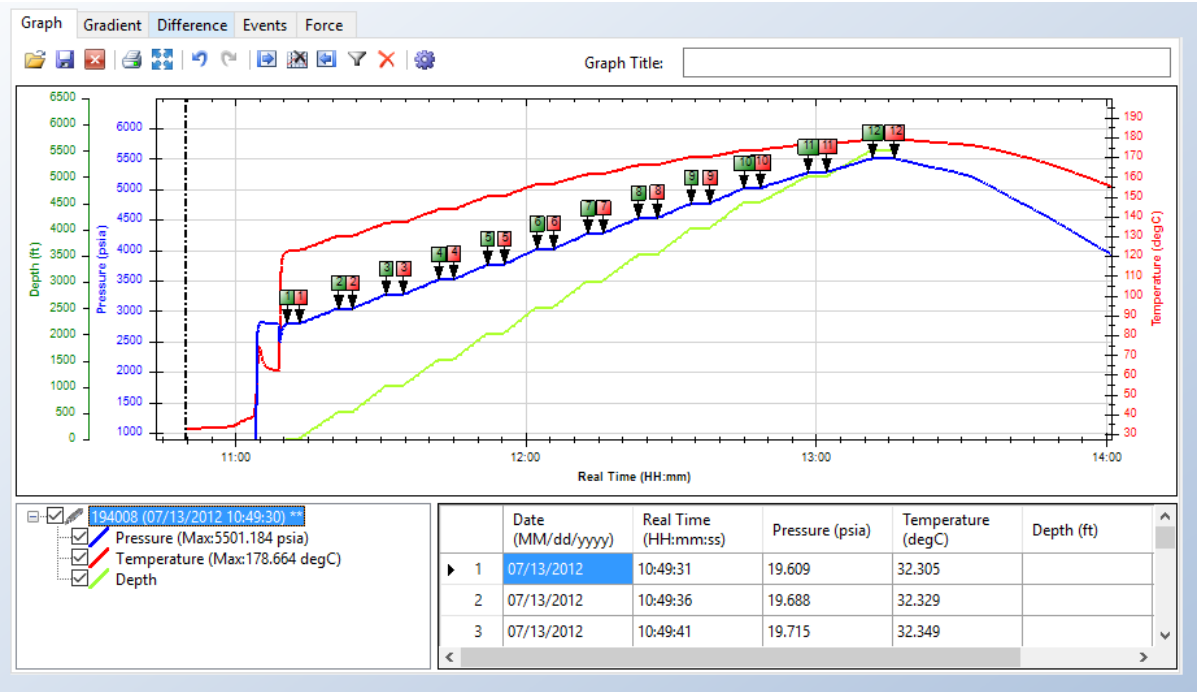
To plot a depth curve using these known depths, right-click on the gauge in the tree on the lower left, then select "Calculate Depth"



This will bring up a warning, indicating that this operation cannot be undone with the undo/redo buttons. Click 'Yes' to continue.



A depth curve will be generated, connecting the known depth points and extrapolating the points in between. The resulting graph will look something like this:



After the depth curve has been generated, you can save this data by hitting the save icon.

---

## 9.16 Adjusting the start time

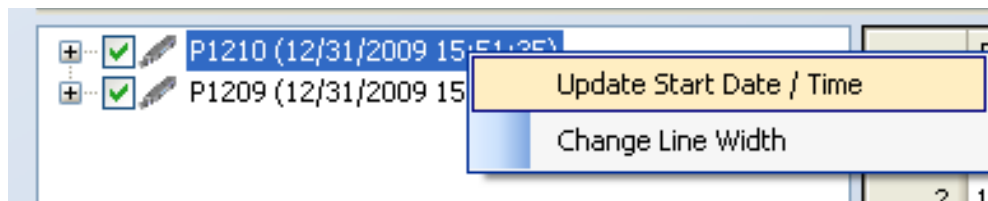
When you have multiple jobs open, it is often valuable to adjust the start times of each file to match.

---

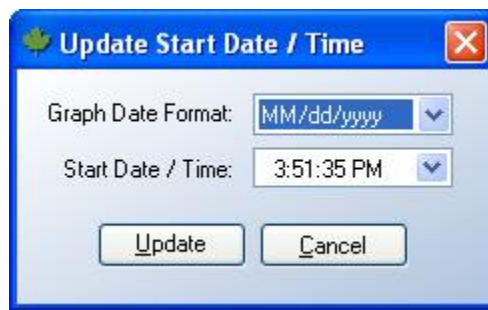
Before you can adjust the start times, you need to make sure that the graph time format is set to "Real Time". You can adjust the graph time format by following the steps in section 9.4 "Graph Set-Up".

---

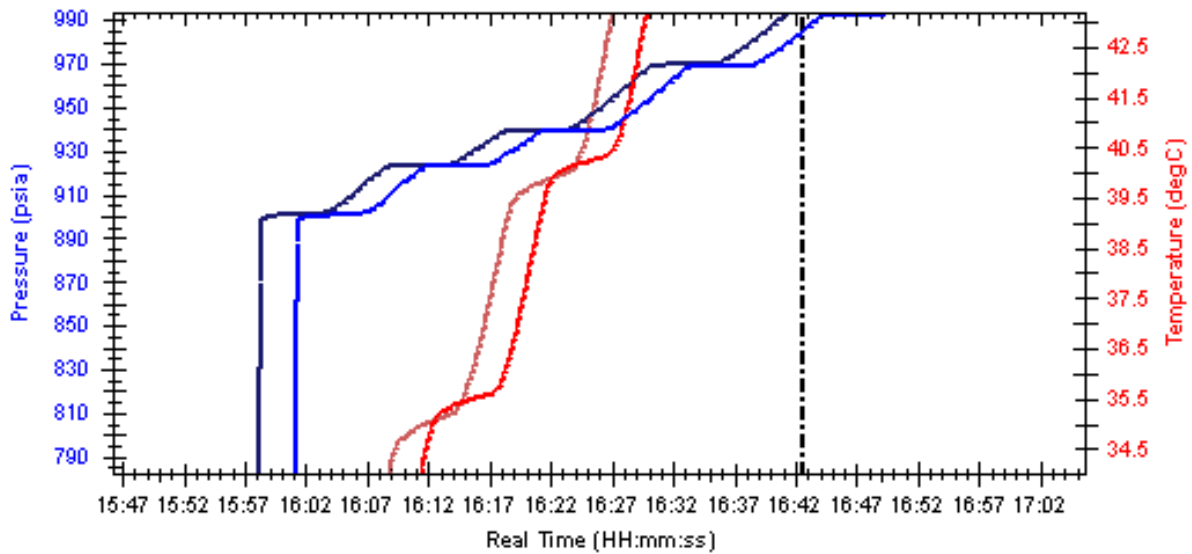
To adjust the start time, right click on the tool title in the legend. A drop down menu will appear. You can select the "Update Start Date/Time".



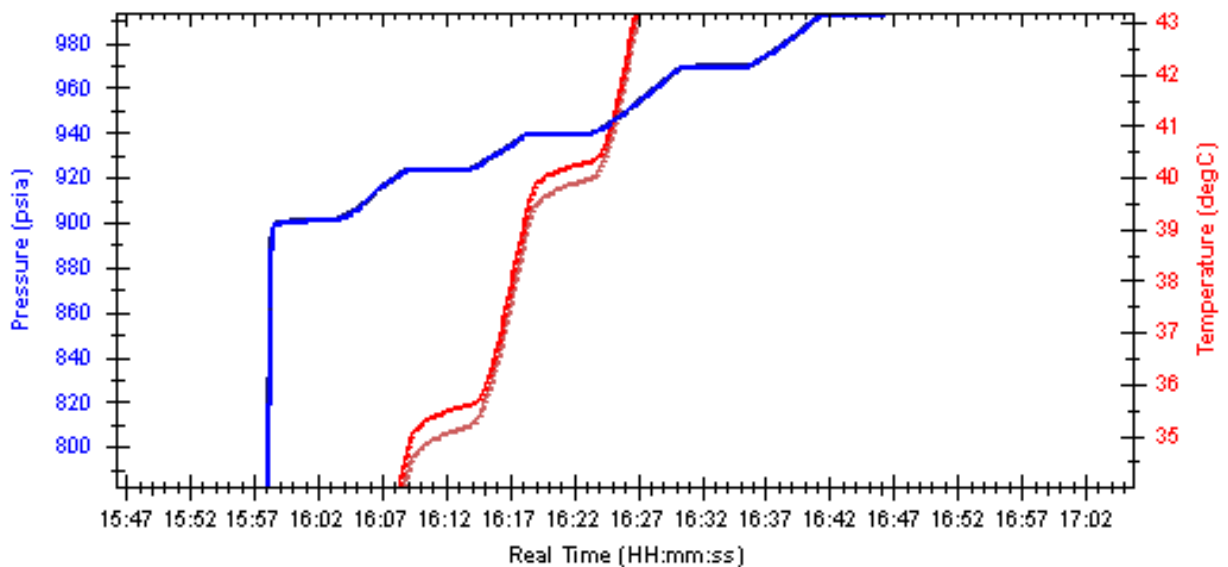
The following operations box will appear. You can toggle the start date/time by a few minutes or seconds to move one graphs start time to match the other graphs.



Here is a graph of two tools before the adjustment.

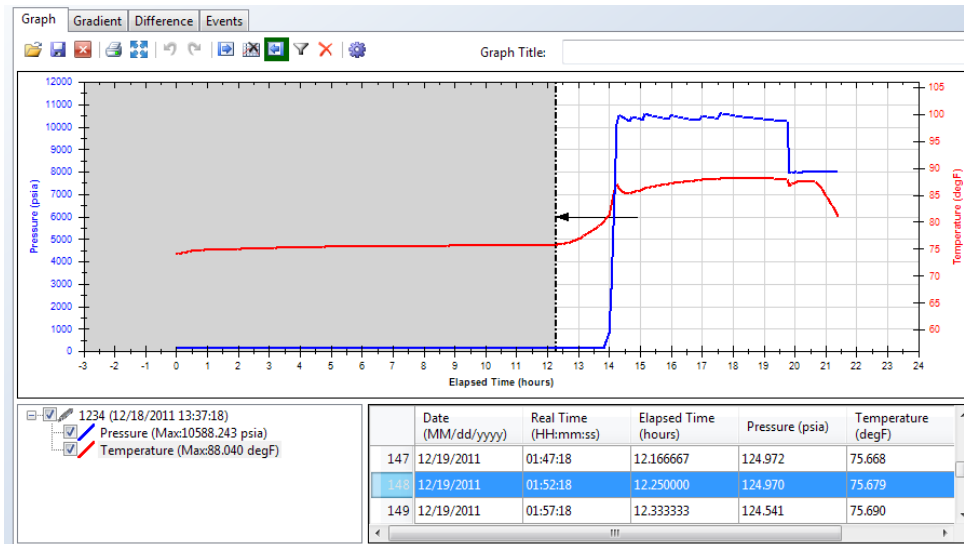


Here is the data after I moved P1210 from a start time of 3:51:35PM to a start time of 3:48:35PM.

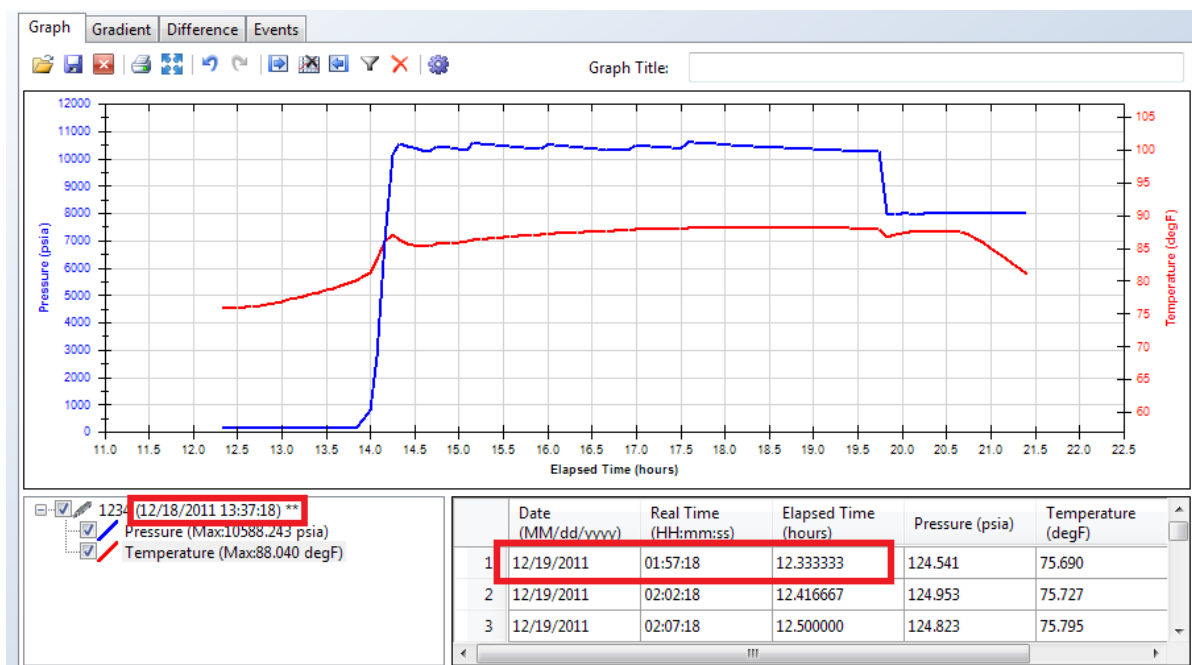


### 9.16.1 Setting Start Time to 0 Seconds

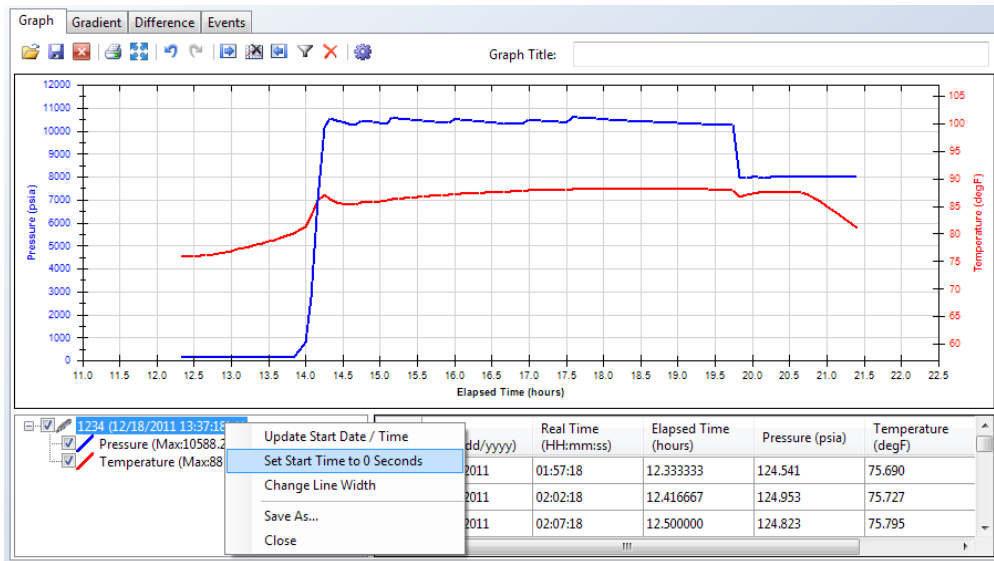
This is a useful function if you have deleted unimportant data at the beginning of the graph, and wish for your remaining data to start at time zero. For instance, if you have the following graph, and you delete the front portion:



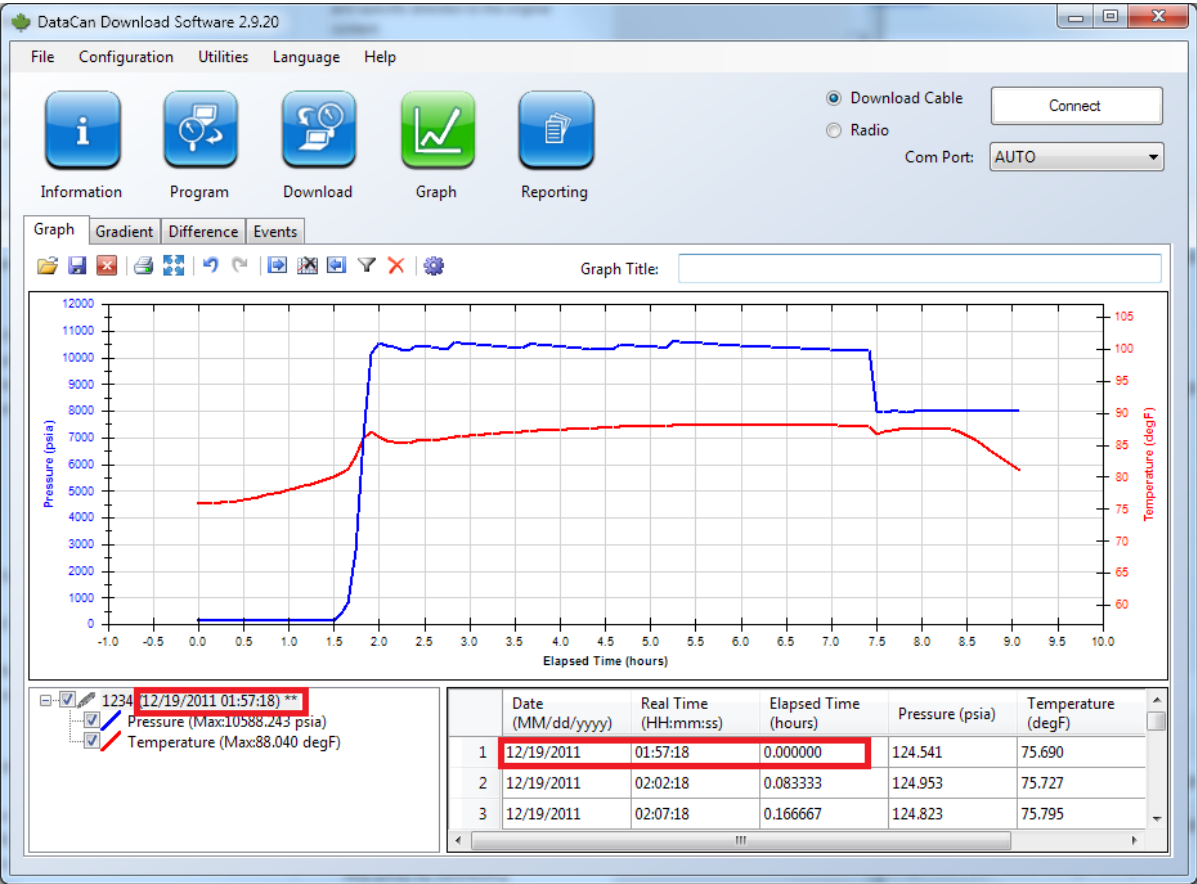
Now you are left with a graph with the same start time as before, but with the first data point not occurring until an elapsed time of over 12 hours.



To have the first data point start at 0, right click on the gauge serial number in the legend in the bottom left corner, and select "Set Start Time to 0 Seconds":



The graph will now look like this:



Elapsed time now starts at hour 0, and the gauge's Start Time has been updated.



---

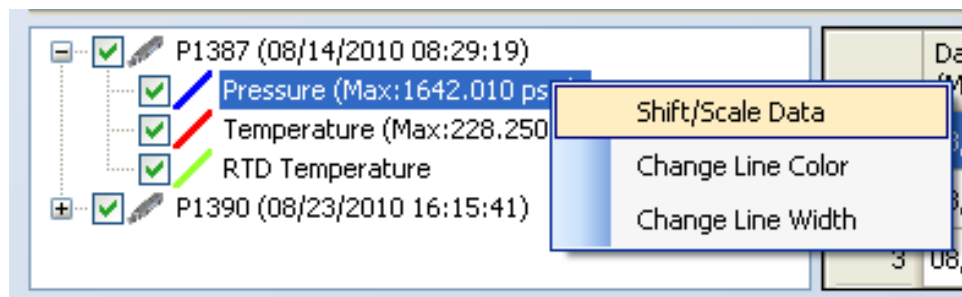
## 9.17 Adjusting the Line Shift/Scale Properties

Each of the curves for a particular data set (job) can be adjusted by a shift and/or scale. This functionality can be used to adjust slightly skewed curves in a graph and can be available only in the Supervisor Mode. (Please refer to the “Supervisor Mode” section of this manual).

Shift refers to a vertical addition or subtraction of the selected curve.

Scale refers to a vertical multiplication of the selected curve.

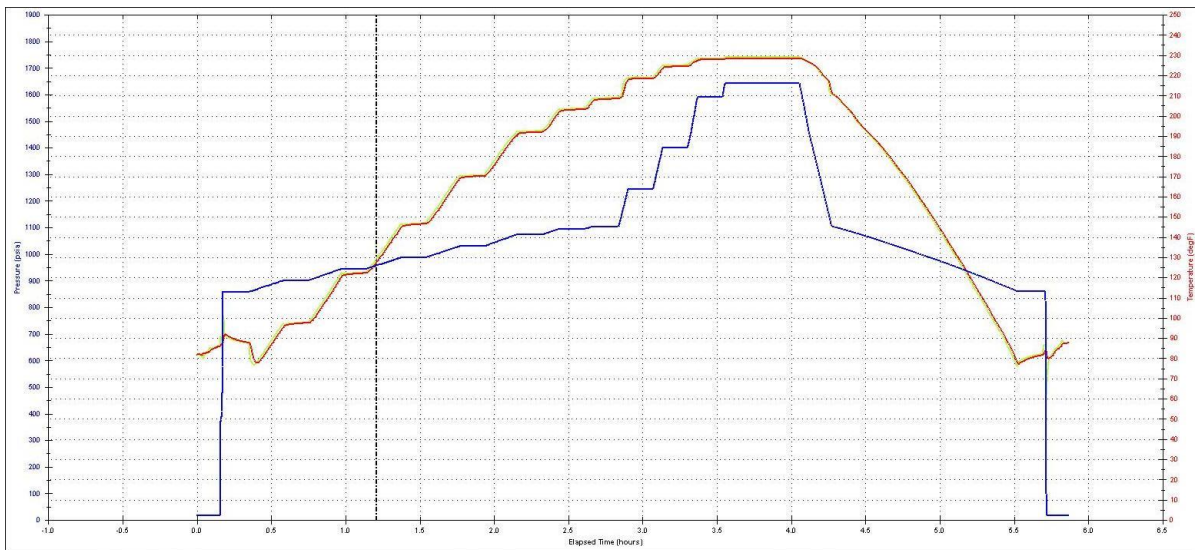
To adjust the shift/scale properties, expand the title for a particular job in the legend and right click on the curve that requires updating. A drop down menu will appear. Select the “Shift/Scale Data” option.



The following properties box will appear. The default value for shift is zero and the default value for the scale is one. The text boxes accept whole or decimal numbers only and cannot remain blank. When desired settings are entered, click the “Update” button. To avoid making any shift/scale changes to the selected line, click the “Cancel” button.



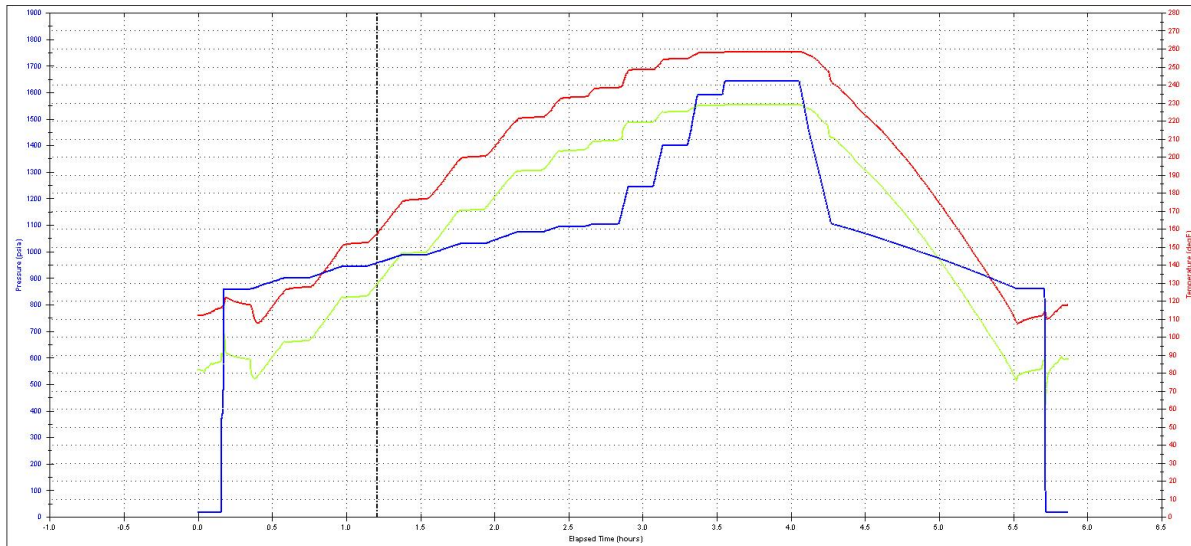
For example, the following image displays the graph before a line shift/scale is applied:



Notice the table below the graph says the Temperature at the point selected is 126.690 degF.

	Date (MM/dd/yyyy)	Real Time (HH:mm:ss)	Elapsed Time (hours)	Pressure (psia)	Temperature (degF)	RTD Temperature (degF)	Events
918	08/14/2010	09:41:34	1.204167	954.390	126.570	128.330	
919	08/14/2010	09:41:39	1.205556	954.680	126.690	128.520	
920	08/14/2010	09:41:44	1.206944	954.880	126.820	128.700	

Now when a shift of 30 is applied to the Temperature curve (i.e. red curve) for this graph the graph appears as follows:



Notice the table below the graph now says the Temperature curve when the same point is selected is 156.690 degF.

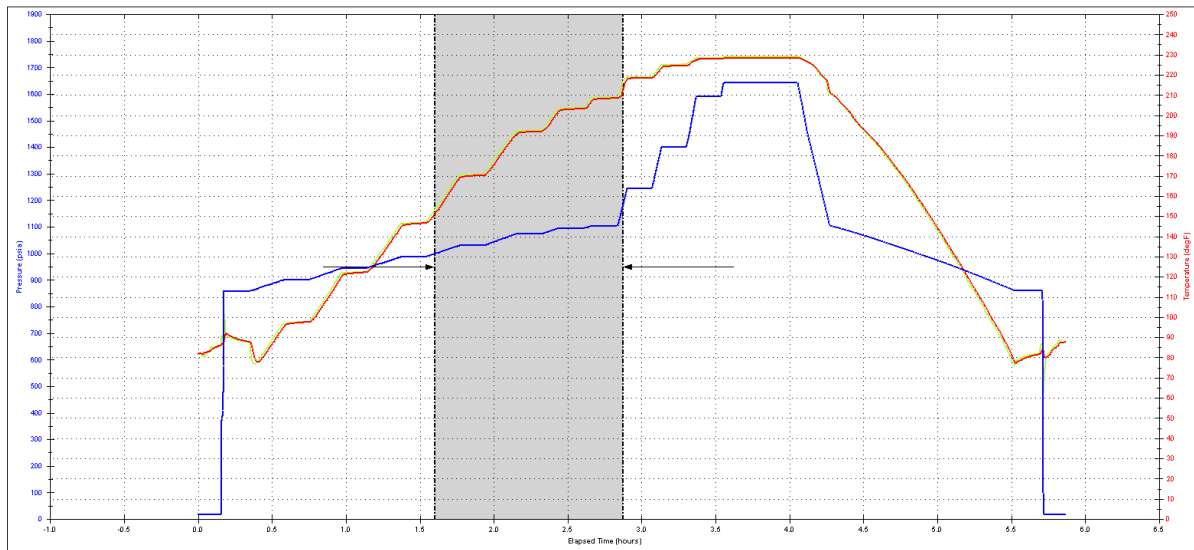
	Date (MM/dd/yyyy)	Real Time (HH:mm:ss)	Elapsed Time (hours)	Pressure (psia)	Temperature (degF)	RTD Temperature (degF)	Events
918	08/14/2010	09:41:34	1.204167	954.390	156.570	128.330	
919	08/14/2010	09:41:39	1.205556	954.680	156.690	128.520	
920	08/14/2010	09:41:44	1.206944	954.880	156.820	128.700	

To scale the selected curve, follow the same procedure as performing a shift except the scale text box needs to be updated.

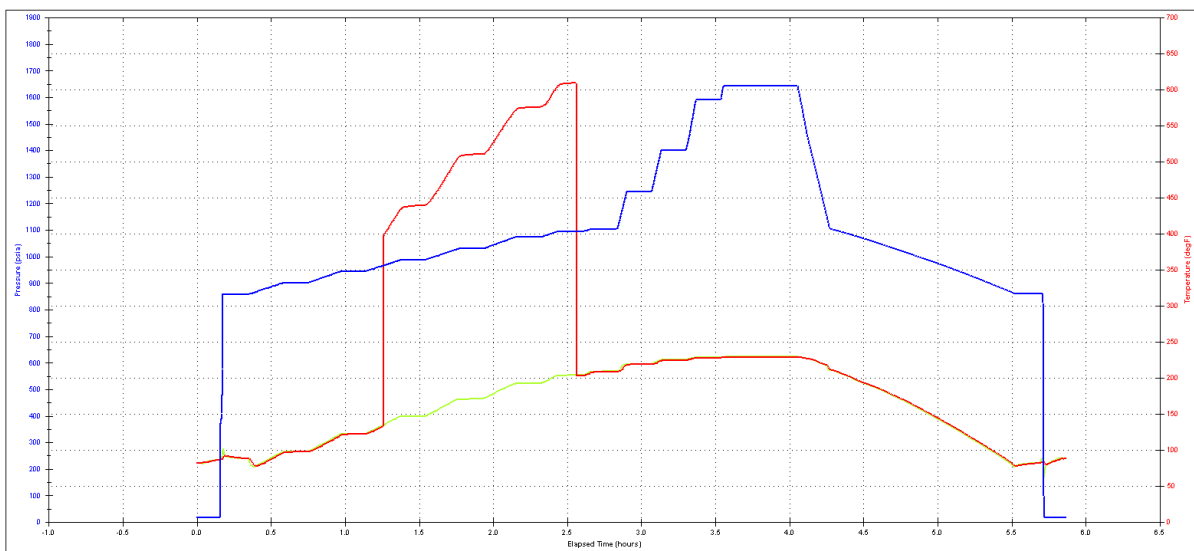
If both the shift and scale text boxes are changed in the properties box, the scale will be performed to the curve FIRST, and then the shift will be applied to the scaled data.

Another useful feature is to be able to apply the shift/scale properties between two points on the graph by using the left and right boundary buttons located in the action buttons area of the screen.

For example, the following graph shows the left and right boundaries (area within boundaries is highlighted in blue) on the graph before a scale change:



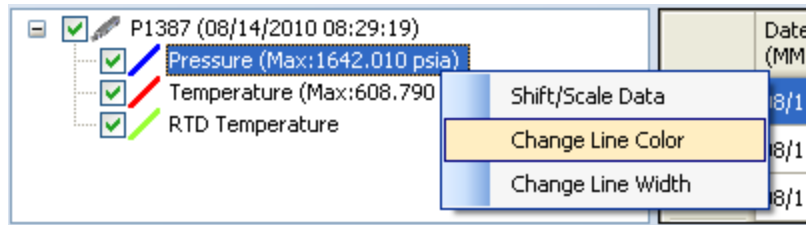
After a scale change of 3 is applied to the red temperature curve, the graph changes in the boundary region and appears as follows:



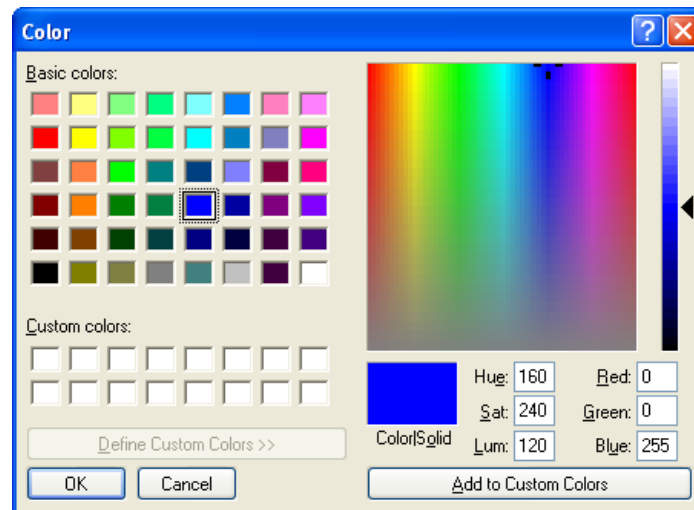
## 9.18 Adjusting the Line Color and Line Width

Each of the curves for a particular data set (job) can be adjusted to have a certain color and line width.

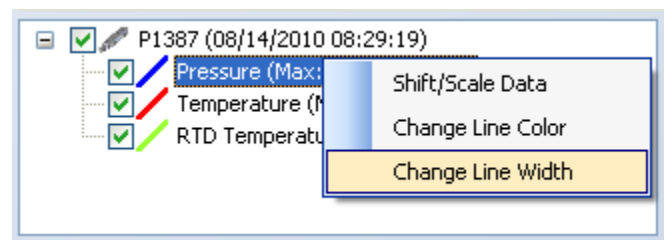
To adjust the line color, expand the title for a particular job in the legend and right click on the curve that requires updating. A drop down menu will appear. Select the "Change Line Color" option.



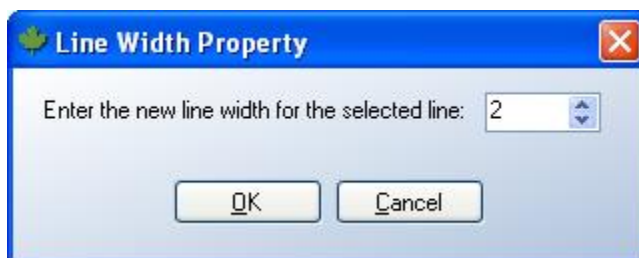
The following color box appears where the desired color can be selected:



To adjust the line width, expand the title for a particular job in the legend and right click on the curve that requires updating. A drop down menu will appear. Select the "Change Line Width" option.




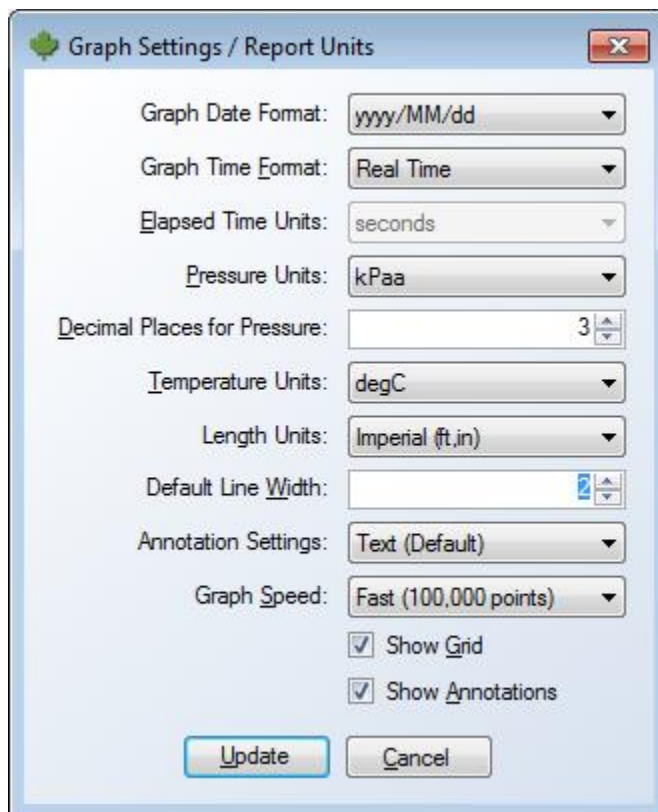
The following line width property box appears where the desired line width can be set:



---

## 9.19 Adjusting the Default Line Width of Curves

By default the line widths of the curves in the graph is set to 2. To change this option, simply click the **Units / Settings** action button  to the top of the graph. Then change the default line width to desired number. The minimum value for the line width is 1 and the maximum is 20.

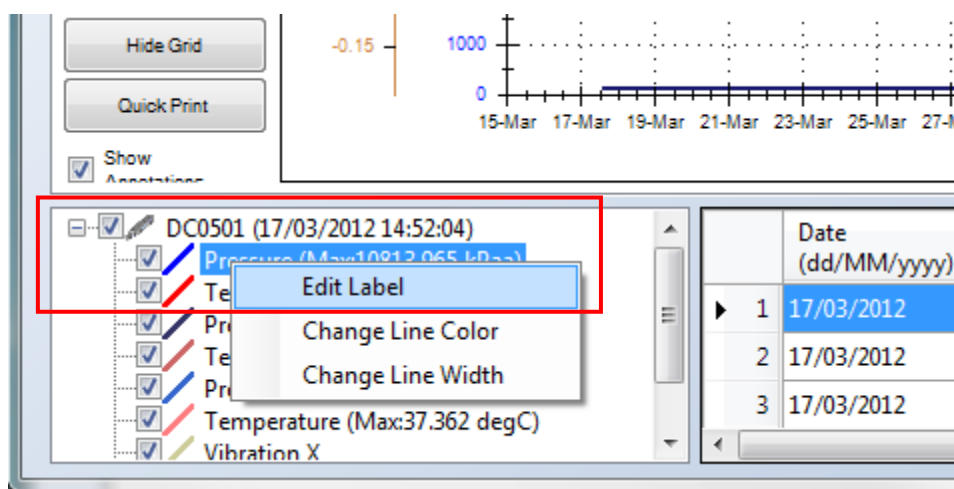


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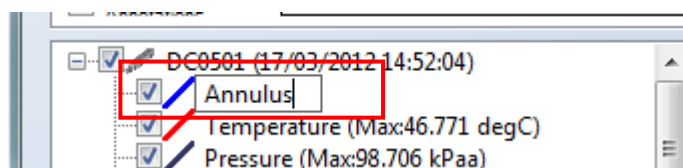
## 9.20 Adding or Changing a Gauge Label

Each gauge in the graph can have a label added. This can be done to show where the gauge was located in the well, like “tubing” or “annulus”. There is one label stored per serial number, so the Pressure, Temperature, Vibration, etc. will each have the same label for one gauge.

To do this, expand the legend to show each reading from the gauge. Right click on one of the readings, such as “Pressure”, and click “Edit Label”.



The user can now type the new label that they want and press ENTER.

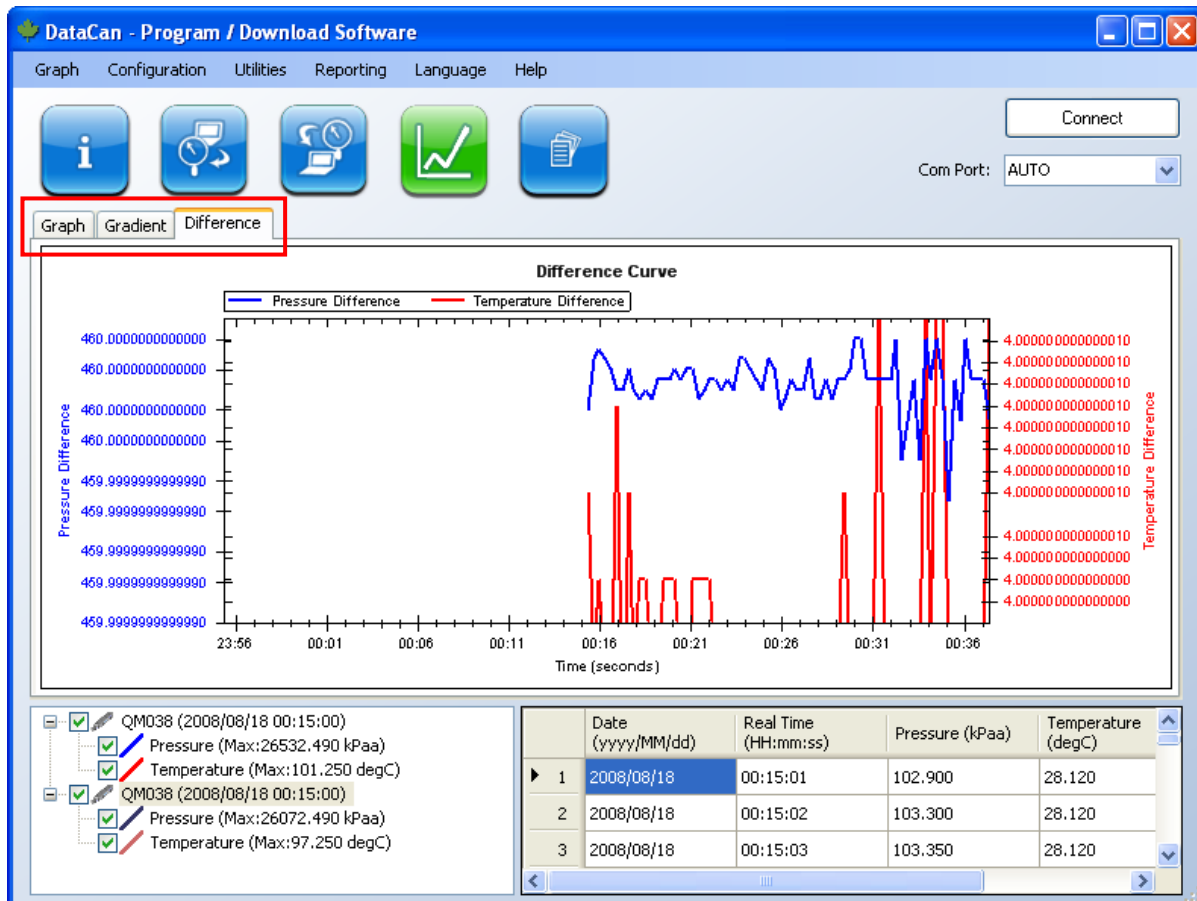


This will change the label in the legend and in the data grid to the right of the legend.

In order for this label to be stored in your data file, make sure to save your file before exiting the program.

## 9.21 View the Difference Curve

When two gauges are plotted at the same time, it is often valuable to see how well each gauge tracks the other. After you have adjusted the gauges start time to match, navigate to the Difference tab.



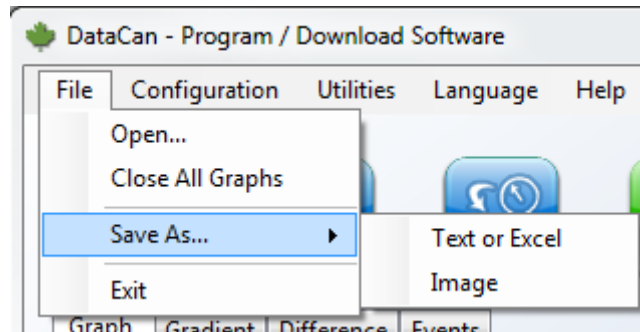


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## 9.22 Save Graphs

DataCan Download Software allows you to save your graph using a number of file formats including: MS Excel ® (97-2003 or 2007), CSV (Comma Separated Value), Space-Delimited, or any number of image files.

There are different methods of saving or capturing your graph image. You can right click anywhere in the graph screen and a pop up menu will appear. Then you can choose to “**Copy**” the image, “**Print**” the image, or “**Save Image As...**” You can also choose to save from the menu bar **File -> Save As...**

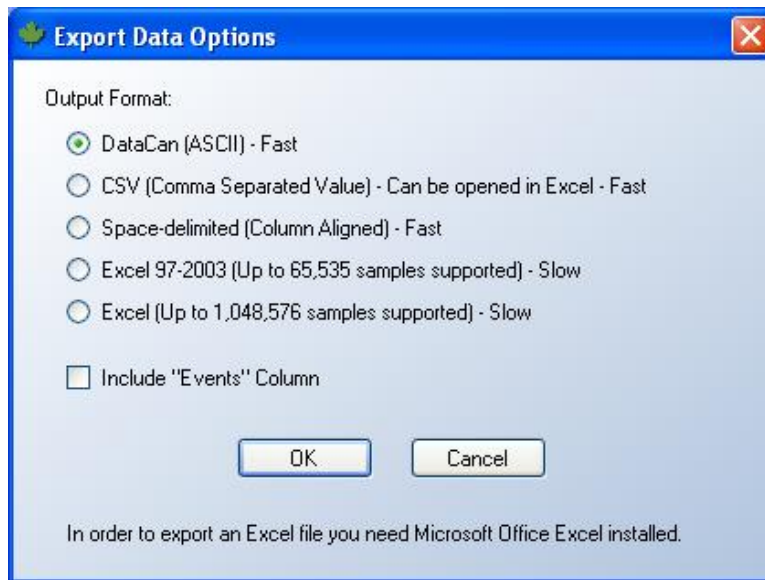



If the “**Text or Excel**” option is selected, a pop up window will appear asking you to enter the output format and whether or not you want an events column in the output file. Enter this information and click **OK**.

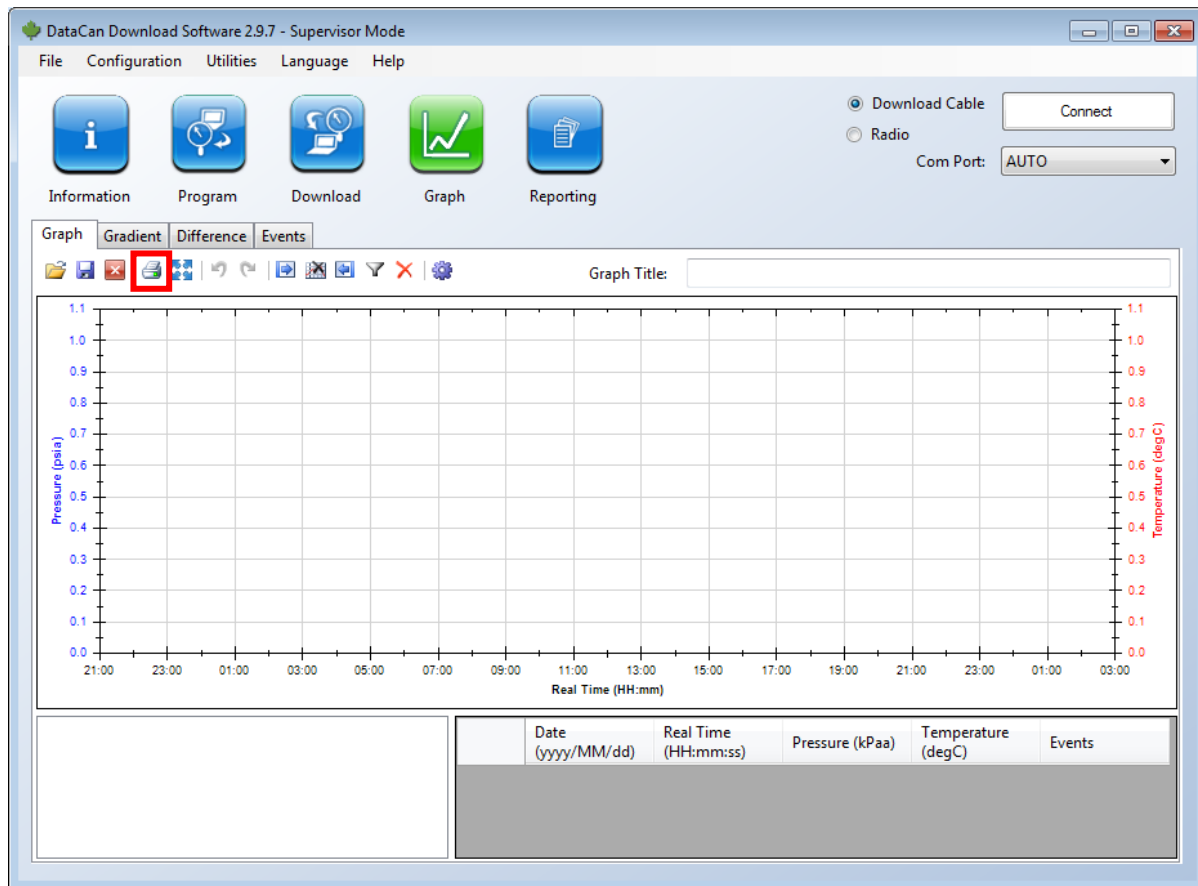
---

Only line curves that have the checkbox checked in the legend will have data exported to the text or excel file.

---

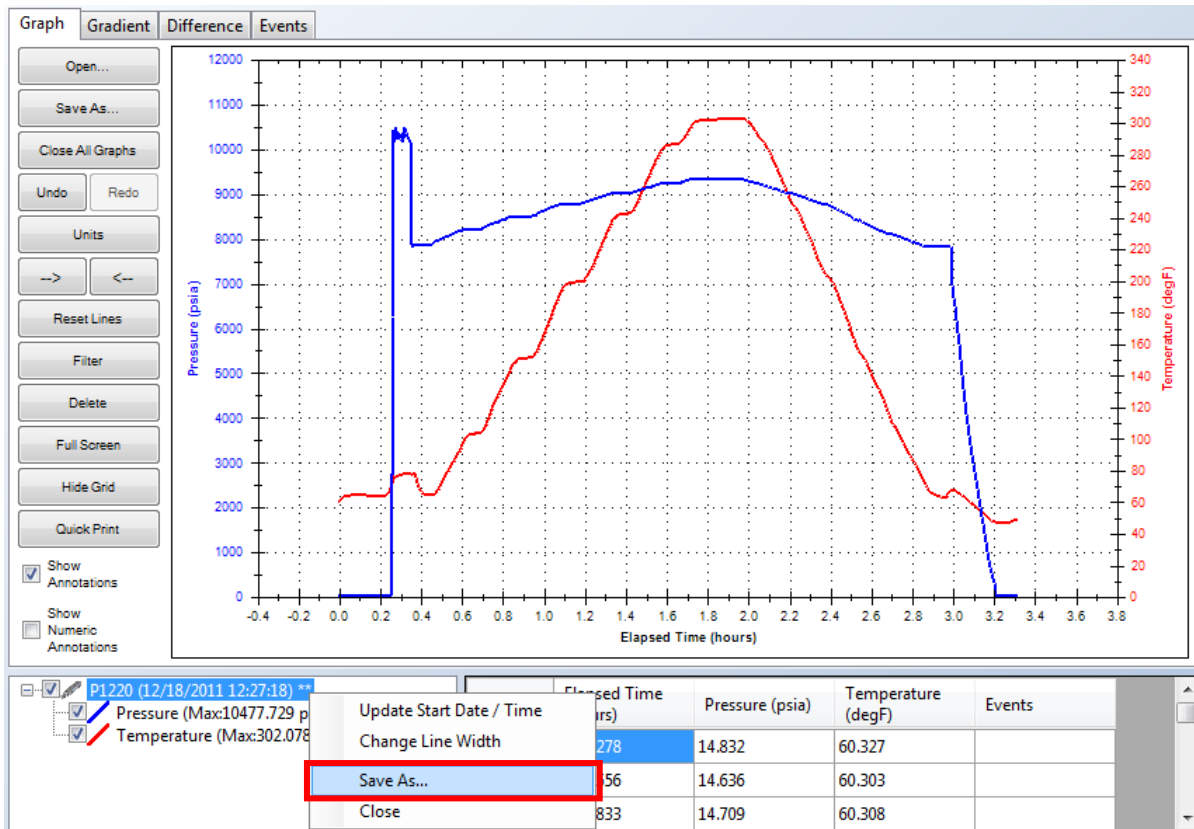


Another option to quickly save or print a graph is to click the **Quick Print** button  located to the top of the graph.



When this button is clicked, a PDF of the graph will be generated and displayed. The PDF file can be saved to a location on the computer or can be printed.

You can also save a graph from the legend on the bottom left. Right click each legend title and select **Save As...** from the menu.





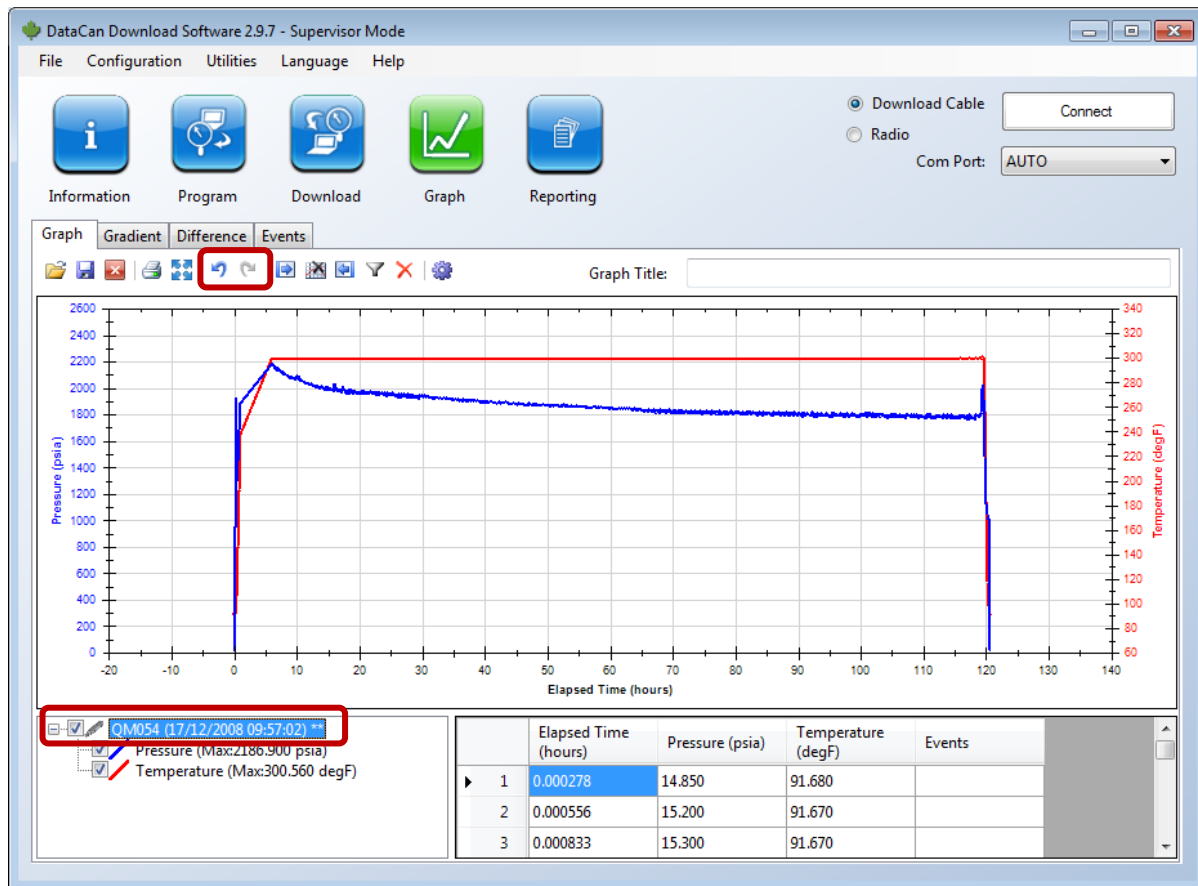
---


## 9.23 Undo Actions

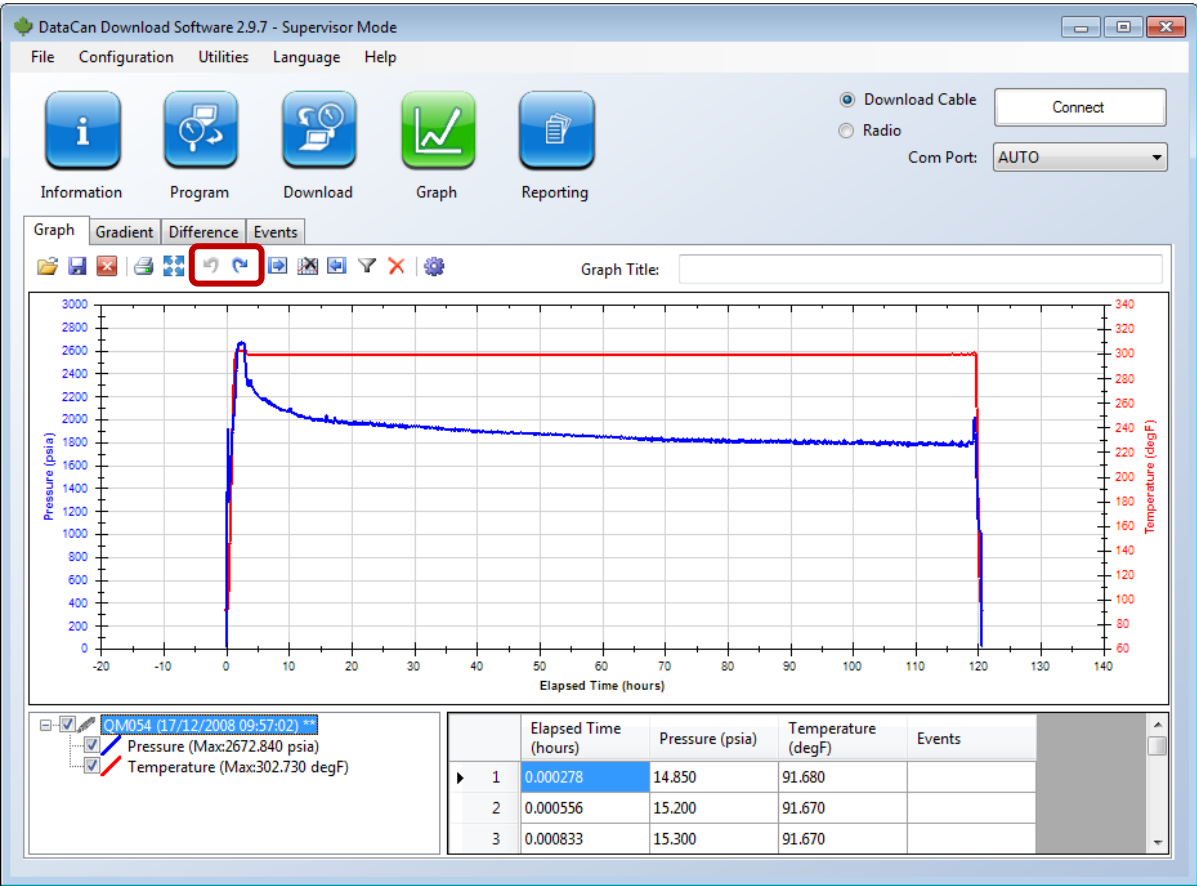
You can undo and redo any actions you make to the data files in DataCan Download Software

### 9.23.1 Undo the last actions that you made



When you make any actions to the data files such as deleting data points, filtering data points, changing the graph units, etc., the **Undo** action button  on the top side of the graph screen is enabled immediately after the action is done. For example, the following image displays the graph after data points deletion is applied at the beginning. Notice the **Undo** action button  is now enabled, and the legend title is marked with \*\* at the end indicating the data has been changed.



To undo the last action, click the **Undo** action  button. Now the graph is back to the state before data points deletion was applied. Another way to undo the last action is by holding down the **Control** and the **Z** key.

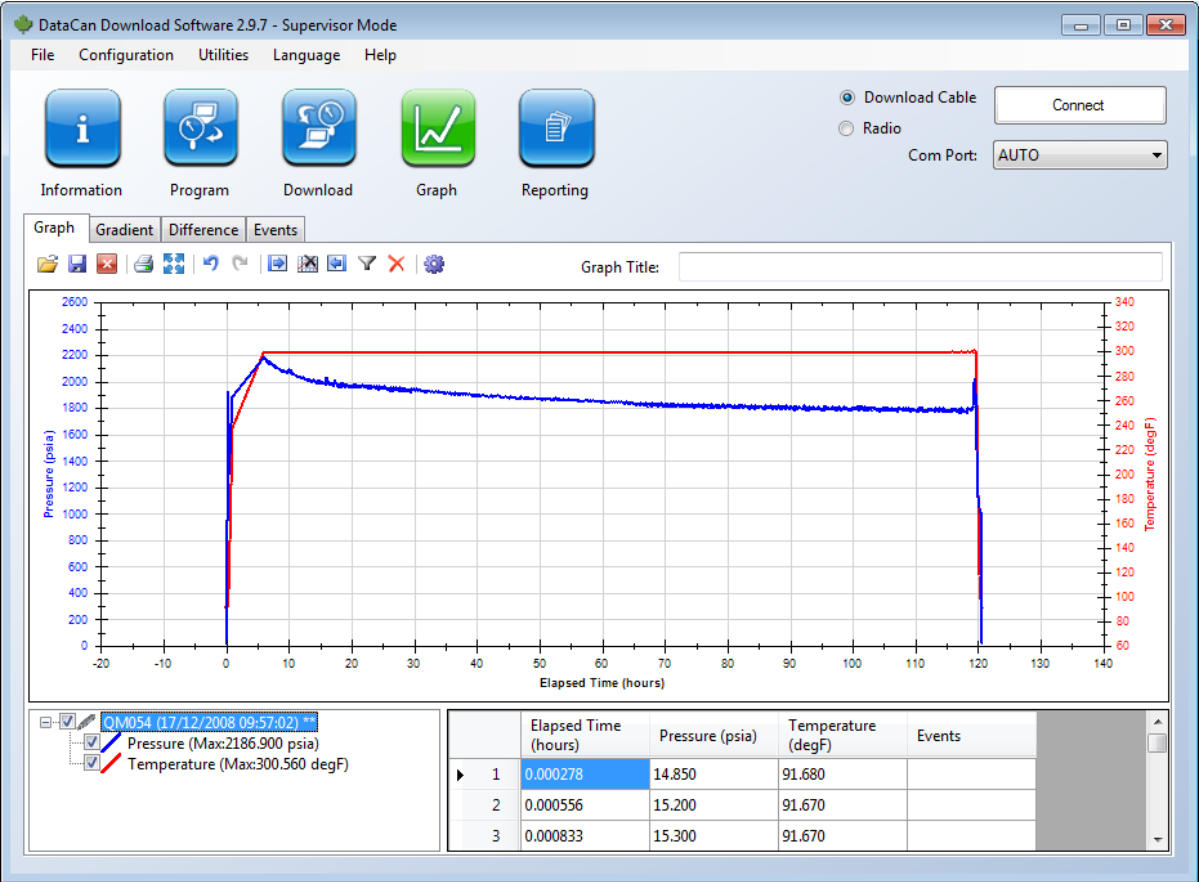


### 9.23.2 Redo actions that you undid

When you undo the last action that you made, the **Redo** action button  on the top side of the graph screen is enabled. To redo an action that you undid by clicking the **Redo** action button . You can also redo an action by holding down the **Control** and the **Y** key.

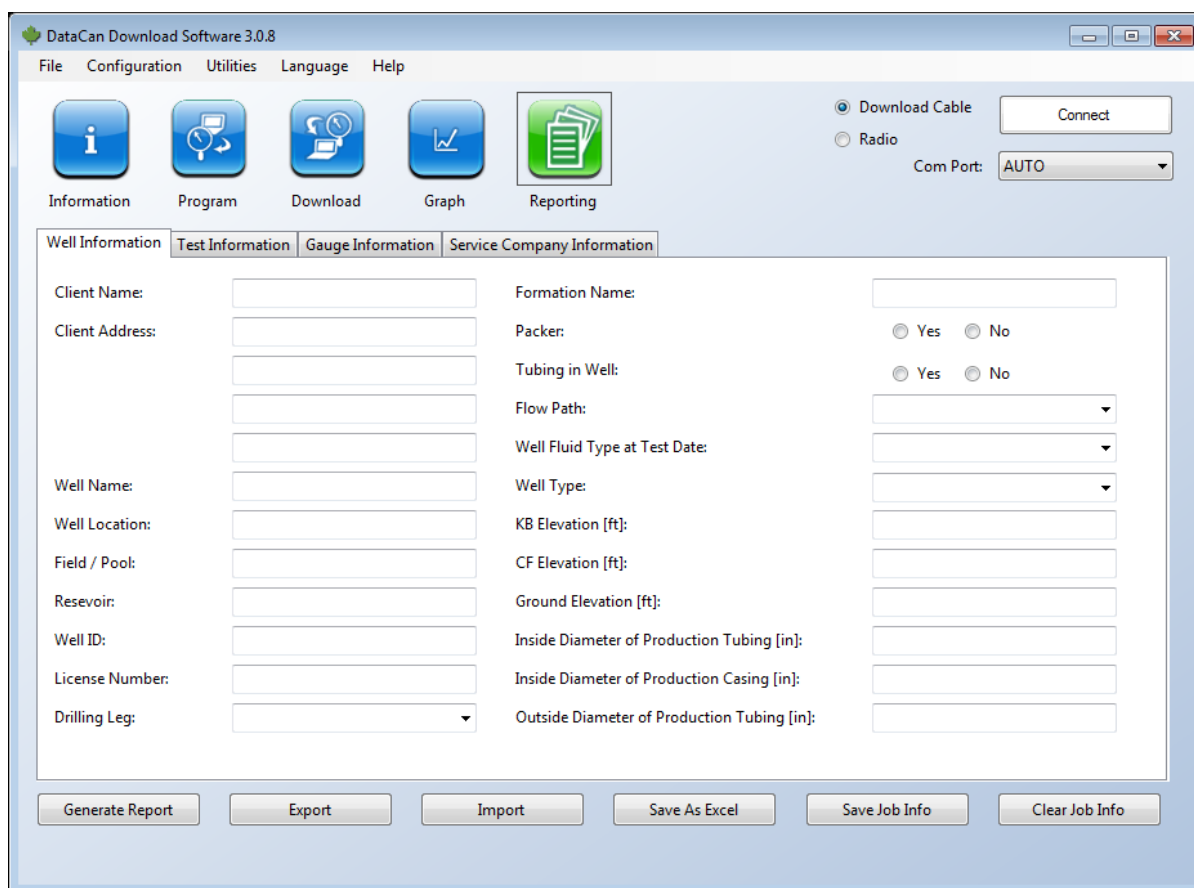


The following image displays the graph after the redo action is done with data points deletion applied.



## 10 Reporting

Enter the Reporting section by clicking on the following icon. Here you can create reports of the data recorded by the gauges.



DataCan Download Software 3.0.8

File Configuration Utilities Language Help

Information Program Download Graph Reporting

☒ Download Cable ☐ Radio Connect

Com Port: AUTO

Well Information Test Information Gauge Information Service Company Information

Client Name:  Formation Name:

Client Address:  Packer: ☐ Yes ☐ No

Tubing in Well: ☐ Yes ☐ No

Flow Path:

Well Name:  Well Fluid Type at Test Date:

Well Location:  Well Type:

Field / Pool:  KB Elevation [ft]:

Reservoir:  CF Elevation [ft]:

Well ID:  Ground Elevation [ft]:

License Number:  Inside Diameter of Production Tubing [in]:

Drilling Leg:  Inside Diameter of Production Casing [in]:

Outside Diameter of Production Tubing [in]:

Generate Report Export Import Save As Excel Save Job Info Clear Job Info

---

## 10.1 Creating A Report

To create a report fill out the appropriate fields in the blank spaces provided.

The screenshot displays the 'DataCan Download Software 3.0.8' application window. The menu bar includes 'File', 'Configuration', 'Utilities', 'Language', and 'Help'. Below the menu is a toolbar with five icons: 'Information' (i), 'Program' (circular arrows), 'Download' (downward arrow), 'Graph' (line graph), and 'Reporting' (document with checkmark). To the right of the toolbar are radio buttons for 'Download Cable' (selected) and 'Radio', a 'Connect' button, and a 'Com Port' dropdown menu set to 'AUTO'. The main area features four tabs: 'Well Information' (active), 'Test Information', 'Gauge Information', and 'Service Company Information'. The 'Well Information' tab contains two columns of input fields. The left column includes: 'Client Name' (text box with 'Client'), 'Client Address' (text box with 'Address'), 'Well Name' (text box with 'Well'), 'Well Location' (text box with 'Location'), 'Field / Pool' (text box with 'Dield'), 'Reservoir' (text box), 'Well ID' (text box with 'ID'), 'License Number' (text box), and 'Drilling Leg' (dropdown menu with '03'). The right column includes: 'Formation Name' (text box with 'Formation'), 'Packer' (radio buttons for 'Yes' and 'No', with 'No' selected), 'Tubing in Well' (radio buttons for 'Yes' and 'No', with 'No' selected), 'Flow Path' (dropdown menu with 'Annular'), 'Well Fluid Type at Test Date' (dropdown menu with 'Oil', 'Gas', 'Water', and 'Crude Bitumen', with 'Gas' selected), 'KB Elevation [ft]' (text box), 'CF Elevation [ft]' (text box), 'Ground Elevation [ft]' (text box), 'Inside Diameter of Production Tubing [in]' (text box), 'Inside Diameter of Production Casing [in]' (text box), and 'Outside Diameter of Production Tubing [in]' (text box). At the bottom of the window are six buttons: 'Generate Report', 'Export', 'Import', 'Save As Excel', 'Save Job Info', and 'Clear Job Info'.

Each tab contains different fields of information.

DataCan Download Software 3.0.8

File Configuration Utilities Language Help

Information Program Download Graph Reporting

Download Cable ☒ Radio ☐ Connect

Com Port: AUTO

Well Information Test Information Gauge Information Service Company Information

Gauge 1

Gauge Serial Number: P1242

Maximum Recorder Range [psia]:

Resolution [% Of Full-Scale]:

Date/Time Gauge On Bottom: 01 01 2008 12:00:00 AM

Date Of Last Calibration: 30 10 2012

Accuracy [% Of Full-Scale]:

Date/Time Gauge Off Bottom: 01 01 2008 12:00:00 AM

Gauge 2

Gauge Serial Number:

Maximum Recorder Range [psia]:

Resolution [% Of Full-Scale]:

Date/Time Gauge On Bottom: 01 01 2008 12:00:00 AM

Date Of Last Calibration: 01 01 2008

Accuracy [% Of Full-Scale]:

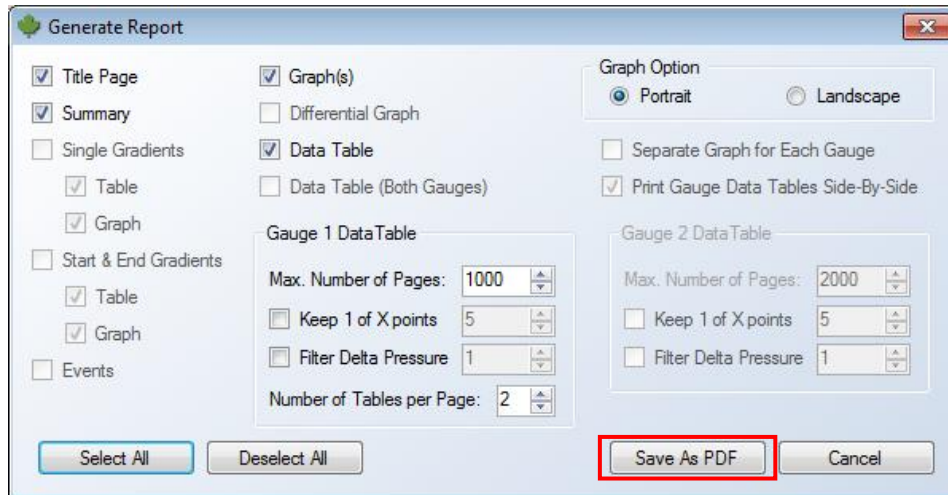
Date/Time Gauge Off Bottom: 01 01 2008 12:00:00 AM

Generate Report Export Import Save As Excel Save Job Info Clear Job Info

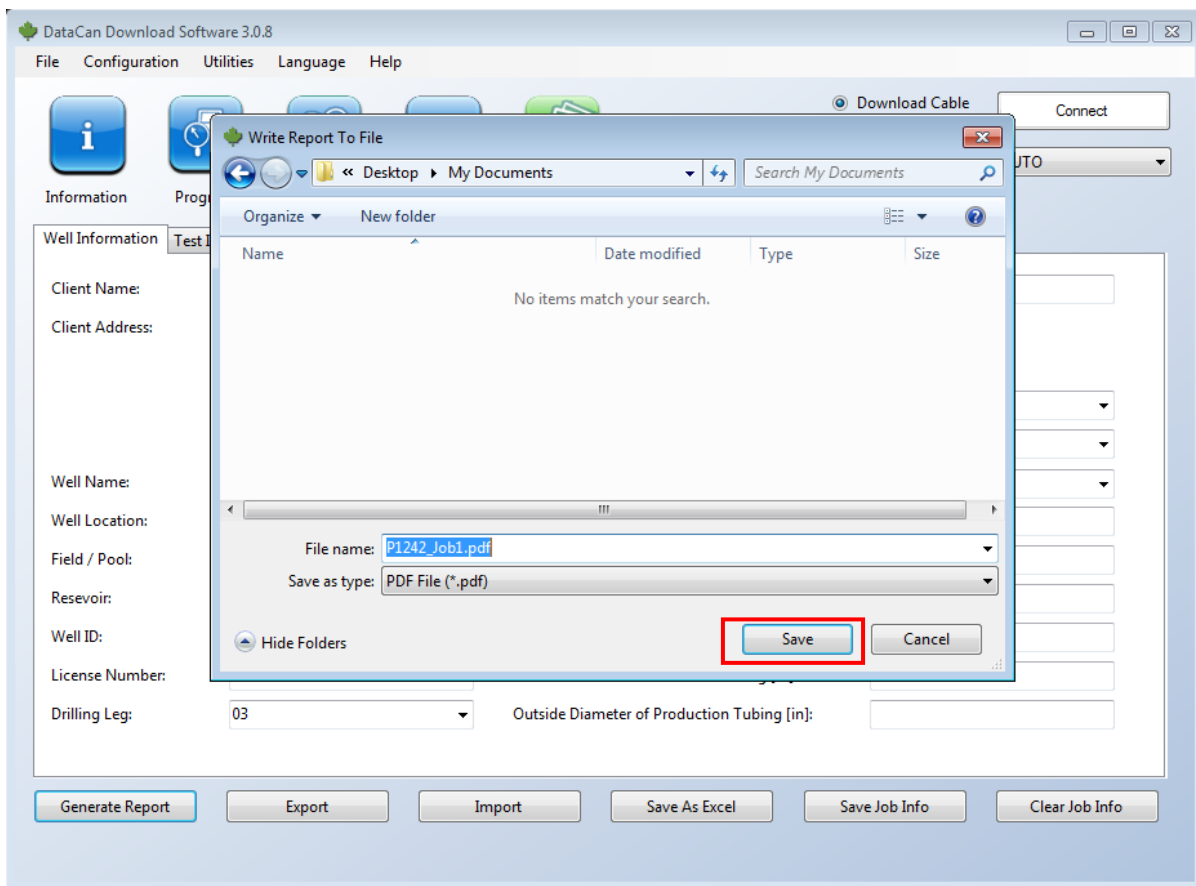
When all of the necessary information has been added to the report press the **Generate Report** button.

The screenshot shows the 'DataCan Download Software 3.0.8' window. At the top, there are menu items: File, Configuration, Utilities, Language, and Help. Below the menu is a toolbar with five icons: Information, Program, Download, Graph, and Reporting. To the right of the toolbar, there are radio buttons for 'Download Cable' (selected) and 'Radio', and a 'Connect' button. Below these is a 'Com Port' dropdown menu set to 'AUTO'. The main area has four tabs: 'Well Information' (selected), 'Test Information', 'Gauge Information', and 'Service Company Information'. The 'Well Information' tab contains two columns of input fields. The left column includes: Client Name (Client), Client Address (Address), Well Name (Well), Well Location (Location), Field / Pool (Dield), Reservoir, Well ID (ID), License Number, and Drilling Leg (03). The right column includes: Formation Name (Formation), Packer (Yes/No), Tubing in Well (Yes/No), Flow Path (Annular), Well Fluid Type at Test Date, Well Type, KB Elevation [ft], CF Elevation [ft], Ground Elevation [ft], Inside Diameter of Production Tubing [in], Inside Diameter of Production Casing [in], and Outside Diameter of Production Tubing [in]. At the bottom, there are five buttons: 'Generate Report' (highlighted with a red rectangle), 'Export', 'Import', 'Save As Excel', and 'Save Job Info'. A 'Clear Job Info' button is also present on the far right.

A pop up window will appear. Select what you want to be included in the report and press the **Save As PDF** button.



Select a location to save the report and press the **Save** button.



Another pop up window will ask you if you want to view the report. If you click yes the PDF report will appear.

---

## 10.2 Changing Units

The “Units” tab has been removed. To change units, either use the “Units” dialog in the graph, or if you are connected to a gauge, use the “Change Units” option in the “Configuration” menu.

---

## 10.3 Saving and Loading Job Information

To create a job file which stores the job information entered, fill out the required fields and press the **Save Job Info** button.

The screenshot shows the 'DataCan Download Software 3.0.8' window. The 'Well Information' tab is active, displaying a form with the following fields and options:

- Client Name:** Client
- Client Address:** Address
- Well Name:** Well
- Well Location:** Location
- Field / Pool:** Dield
- Reservoir:**
- Well ID:** ID
- License Number:**
- Drilling Leg:** 03
- Formation Name:** Formation
- Packer:** Yes (radio), No (radio, selected)
- Tubing in Well:** Yes (radio), No (radio, selected)
- Flow Path:** Annular (dropdown)
- Well Fluid Type at Test Date:**
- Well Type:**
- KB Elevation [ft]:**
- CF Elevation [ft]:**
- Ground Elevation [ft]:**
- Inside Diameter of Production Tubing [in]:**
- Inside Diameter of Production Casing [in]:**
- Outside Diameter of Production Tubing [in]:**

At the bottom of the window, there are several buttons: 'Generate Report', 'Export', 'Import', 'Save As Excel', 'Save Job Info' (highlighted with a red box), and 'Clear Job Info'.

A pop up window will appear and tell you the information has been saved successfully. Press **OK**.

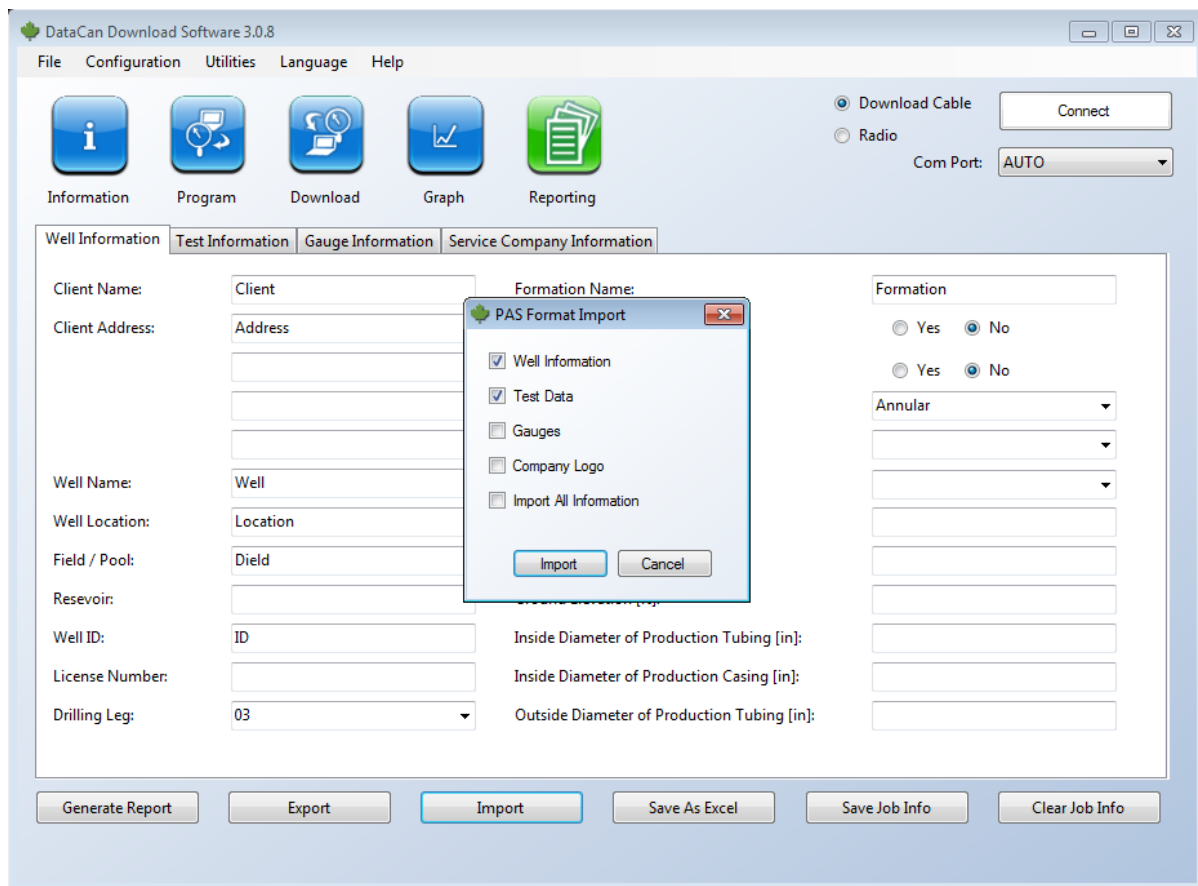
The job information can be loaded by pressing the **Import** button.

The screenshot shows the 'DataCan Download Software 3.0.8' application window. The interface includes a menu bar (File, Configuration, Utilities, Language, Help) and a toolbar with icons for Information, Program, Download, Graph, and Reporting. On the right, there are radio buttons for 'Download Cable' (selected) and 'Radio', along with a 'Connect' button and a 'Com Port' dropdown menu set to 'AUTO'. The main area features four tabs: 'Well Information' (selected), 'Test Information', 'Gauge Information', and 'Service Company Information'. The 'Well Information' tab contains two columns of input fields. The left column includes fields for Client Name, Client Address, Well Name, Well Location, Field / Pool, Reservoir, Well ID, License Number, and Drilling Leg. The right column includes fields for Formation Name, Packer, Tubing in Well, Flow Path, Well Fluid Type at Test Date, Well Type, KB Elevation [ft], CF Elevation [ft], Ground Elevation [ft], Inside Diameter of Production Tubing [in], Inside Diameter of Production Casing [in], and Outside Diameter of Production Tubing [in]. At the bottom of the window, there is a row of buttons: 'Generate Report', 'Export', 'Import' (highlighted with a red rectangle), 'Save As Excel', 'Save Job Info', and 'Clear Job Info'.

Select the location of the job file and press the **Open** button.

Enter what job information you want to be included and press the **Import** button.





The fields will now contain the information saved in the job file.

You can also save the job information as a CSV file for use in Excel by pressing the **Save As Excel** button.

The screenshot shows the 'DataCan Download Software 3.0.8' application window. The 'Well Information' tab is active, displaying a form with the following fields and controls:

- Client Name:** Client
- Client Address:** Address
- Well Name:** Well
- Well Location:** Location
- Field / Pool:** Field
- Reservoir:**
- Well ID:** ID
- License Number:**
- Drilling Leg:** 03
- Formation Name:** Formation
- Packer:** Yes (radio), No (radio, selected)
- Tubing in Well:** Yes (radio), No (radio, selected)
- Flow Path:** Annular
- Well Fluid Type at Test Date:**
- Well Type:**
- KB Elevation [ft]:**
- CF Elevation [ft]:**
- Ground Elevation [ft]:**
- Inside Diameter of Production Tubing [in]:**
- Inside Diameter of Production Casing [in]:**
- Outside Diameter of Production Tubing [in]:**

At the bottom of the window, there are several buttons: 'Generate Report', 'Export', 'Import', 'Save As Excel' (highlighted with a red rectangle), 'Save Job Info', and 'Clear Job Info'. The 'Save As Excel' button is the one mentioned in the text for saving job information as a CSV file.

## 10.4 Exporting Job Information

To export a job file, fill out the required fields and press the **Export** button. Unlike saving job information, exporting will allow choosing the filename where the job information entered will be stored. This feature is useful when you want to create a template for different job information. To import the already created job information template, click the **Import** button.

The screenshot displays the 'DataCan Download Software 3.0.8' application window. The interface includes a menu bar (File, Configuration, Utilities, Language, Help) and a toolbar with icons for Information, Program, Download, Graph, and Reporting. On the right, there are options for 'Download Cable' (selected) and 'Radio', along with a 'Connect' button and a 'Com Port' dropdown set to 'AUTO'. The main area features four tabs: 'Well Information' (active), 'Test Information', 'Gauge Information', and 'Service Company Information'. The 'Well Information' tab contains two columns of input fields. The left column includes fields for Client Name, Client Address, Well Name, Well Location, Field / Pool, Reservoir, Well ID, License Number, and Drilling Leg. The right column includes fields for Formation Name, Packer, Tubing in Well, Flow Path, Well Fluid Type at Test Date, Well Type, KB Elevation [ft], CF Elevation [ft], Ground Elevation [ft], Inside Diameter of Production Tubing [in], Inside Diameter of Production Casing [in], and Outside Diameter of Production Tubing [in]. At the bottom, a row of buttons includes 'Generate Report', 'Export' (highlighted with a red rectangle), 'Import', 'Save As Excel', 'Save Job Info', and 'Clear Job Info'.

You can also clear the entire job information page by clicking the **Clear Job Info** button.

The screenshot displays the 'DataCan Download Software 3.0.8' application window. The interface includes a menu bar (File, Configuration, Utilities, Language, Help) and a toolbar with icons for Information, Program, Download, Graph, and Reporting. On the right, there are radio buttons for 'Download Cable' (selected) and 'Radio', along with a 'Connect' button and a 'Com Port' dropdown menu set to 'AUTO'.

The main area features four tabs: 'Well Information' (active), 'Test Information', 'Gauge Information', and 'Service Company Information'. The 'Well Information' tab contains two columns of input fields:

- Left Column:** Client Name (Client), Client Address (Address), Well Name (Well), Well Location (Location), Field / Pool (Dield), Reservoir, Well ID (ID), License Number, and Drilling Leg (03).
- Right Column:** Formation Name (Formation), Packer (Yes/No, No selected), Tubing in Well (Yes/No, No selected), Flow Path (Annular), Well Fluid Type at Test Date, Well Type, KB Elevation [ft], CF Elevation [ft], Ground Elevation [ft], Inside Diameter of Production Tubing [in], Inside Diameter of Production Casing [in], and Outside Diameter of Production Tubing [in].

At the bottom, there is a row of buttons: 'Generate Report', 'Export', 'Import', 'Save As Excel', 'Save Job Info', and 'Clear Job Info'. The 'Clear Job Info' button is highlighted with a red rectangular border.

---

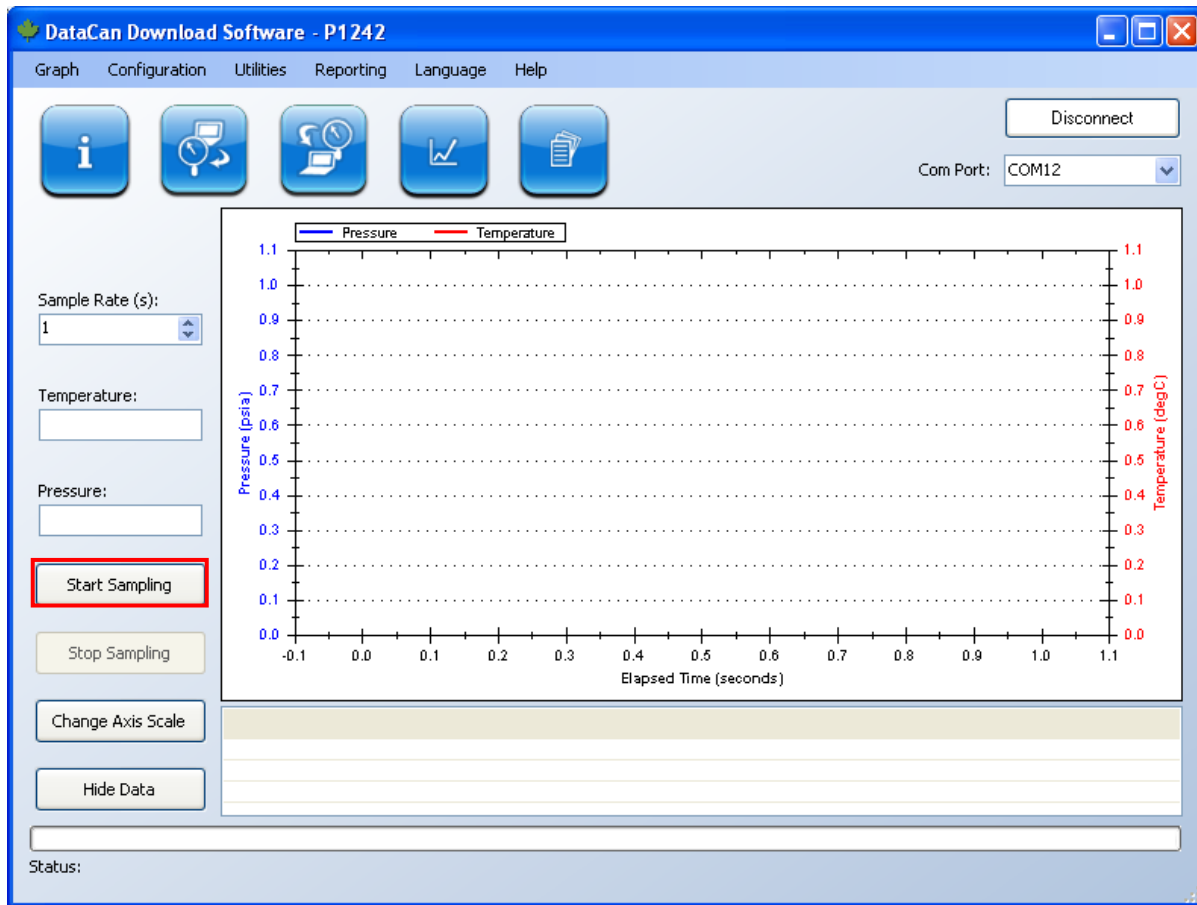
# 11 Real Time Logging

The real time logging feature is used for live data logging in conjunction with the permanent surface system or surface logger. It will create a text file saved to the computer while logging. Real time logging is found under the **Utilities** tab.

The screenshot shows the 'DataCan Download Software - P1242' window with the 'Utilities' tab selected. The window has a menu bar with 'Graph', 'Configuration', 'Utilities', 'Reporting', 'Language', and 'Help'. Below the menu bar are five icons: an information icon, a clock with a circular arrow, a laptop with a clock, a line graph, and a document. On the right side, there is a 'Disconnect' button and a 'Com Port' dropdown menu set to 'COM12'. The main area contains several input fields: 'Tool Model' (Piezo Pressure Recorder), 'Serial Number' (P1242), 'Max. Calibration Pressure' (3000.019 psi), 'Max. Calibration Temperature' (155.02 DegC), 'Sample Capacity' (1 000 000), 'Calibration Date' (July 12, 2010), and 'Date Programmed' (July 28, 2010). Below these is a 'Notes' section with a large text area. At the bottom, there are 'FW Week' (26) and 'FW Year' (2009) fields, followed by a 'Status:' label and a long empty text box.

Field	Value
Tool Model	Piezo Pressure Recorder
Serial Number	P1242
Max. Calibration Pressure	3000.019 psi
Max. Calibration Temperature	155.02 DegC
Sample Capacity	1 000 000
Calibration Date	July 12, 2010
Date Programmed	July 28, 2010
FW Week	26
FW Year	2009

To begin logging press the **Start Sampling** button. A configuration window will pop up.

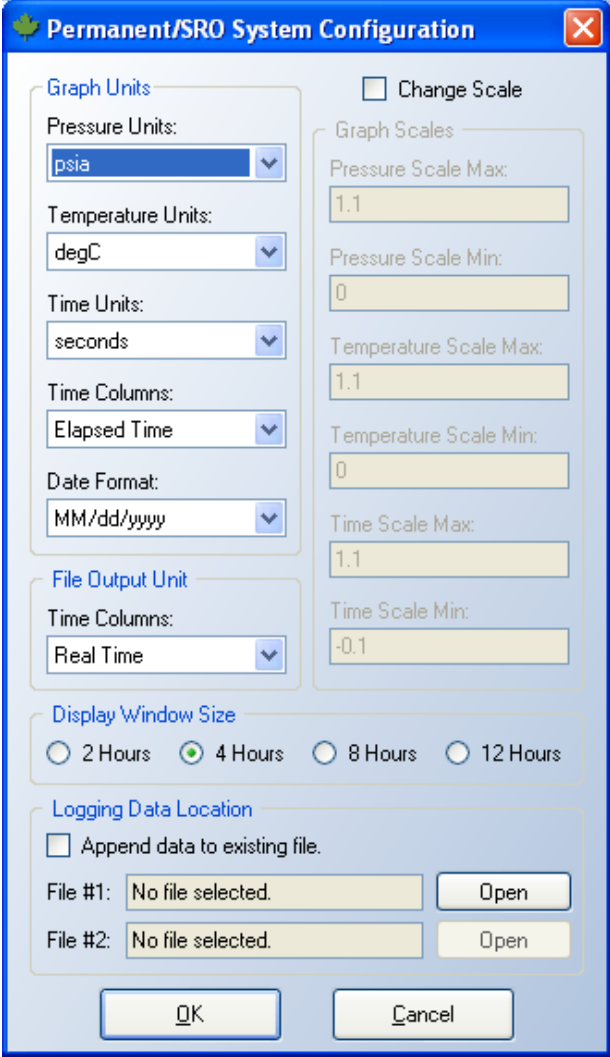


You have the option to change the units for time, pressure, and temperature and the format of time and date. It also allows the user to choose which time format will appear in the file generated. The data file can be saved in one or two locations if preferred.

The display window size is the max amount of time that will be displayed. When this is reached the old data will be eliminated and only the current window size of data is shown. If the user's computer is too slow to handle that amount of time an error message will show and it will automatically scale smaller.

If the **Append data to existing file** box is checked then the data will be added to whatever existing text file is chosen.

The graph will auto scale as data is recorded but the scale can be changed by checking the **Change Scale** box. When all the information is filled out press **OK**.

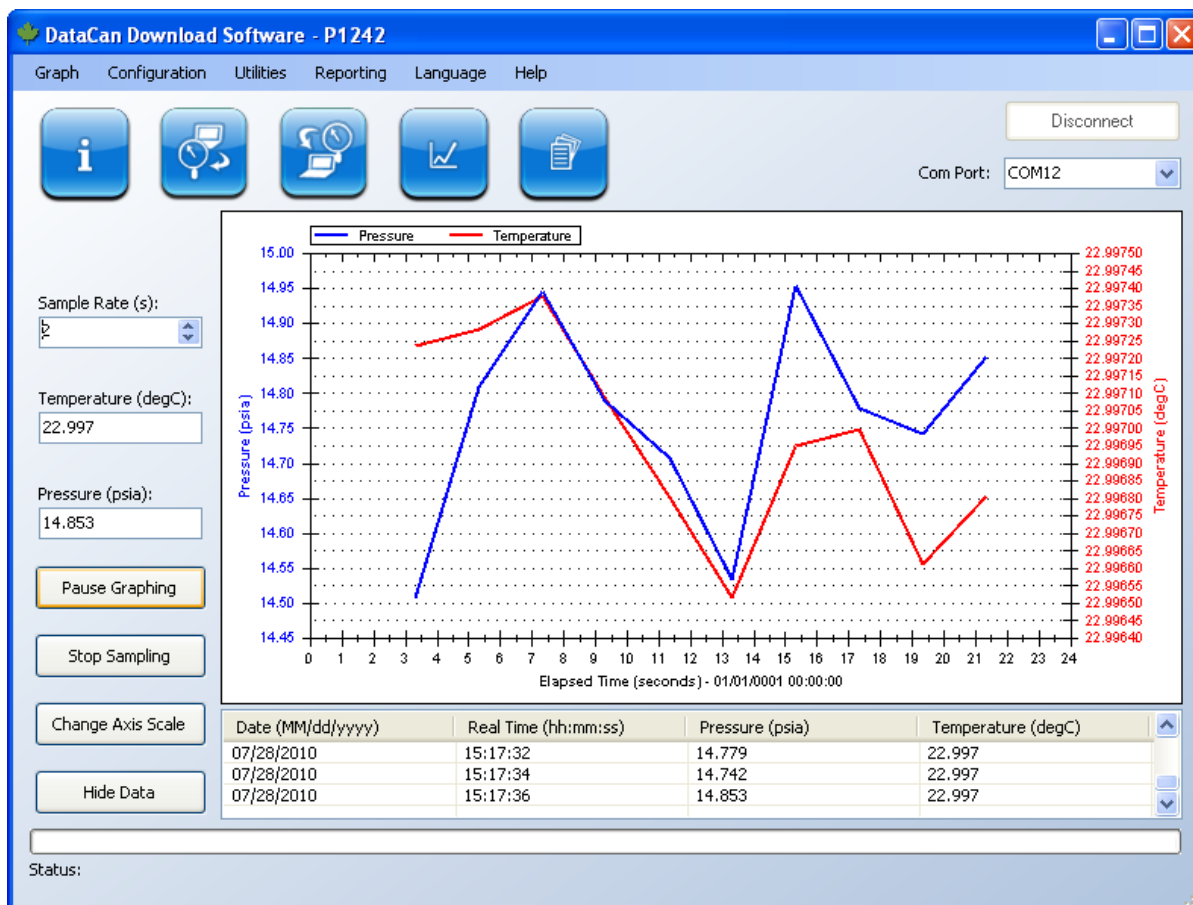


The image shows a software configuration window titled "Permanent/SRO System Configuration". It contains several sections for user input:

- Graph Units:** Includes dropdown menus for Pressure Units (set to "psia"), Temperature Units (set to "degC"), Time Units (set to "seconds"), Time Columns (set to "Elapsed Time"), and Date Format (set to "MM/dd/yyyy").
- Change Scale:** An unchecked checkbox.
- Graph Scales:** A group of input fields for scaling the graph data:
  - Pressure Scale Max: 1.1
  - Pressure Scale Min: 0
  - Temperature Scale Max: 1.1
  - Temperature Scale Min: 0
  - Time Scale Max: 1.1
  - Time Scale Min: -0.1
- File Output Unit:** A dropdown menu for Time Columns set to "Real Time".
- Display Window Size:** Radio buttons for 2 Hours, 4 Hours (selected), 8 Hours, and 12 Hours.
- Logging Data Location:** An unchecked checkbox for "Append data to existing file." Below it are two file selection fields, "File #1" and "File #2", both showing "No file selected." with "Open" buttons.

At the bottom are "OK" and "Cancel" buttons.

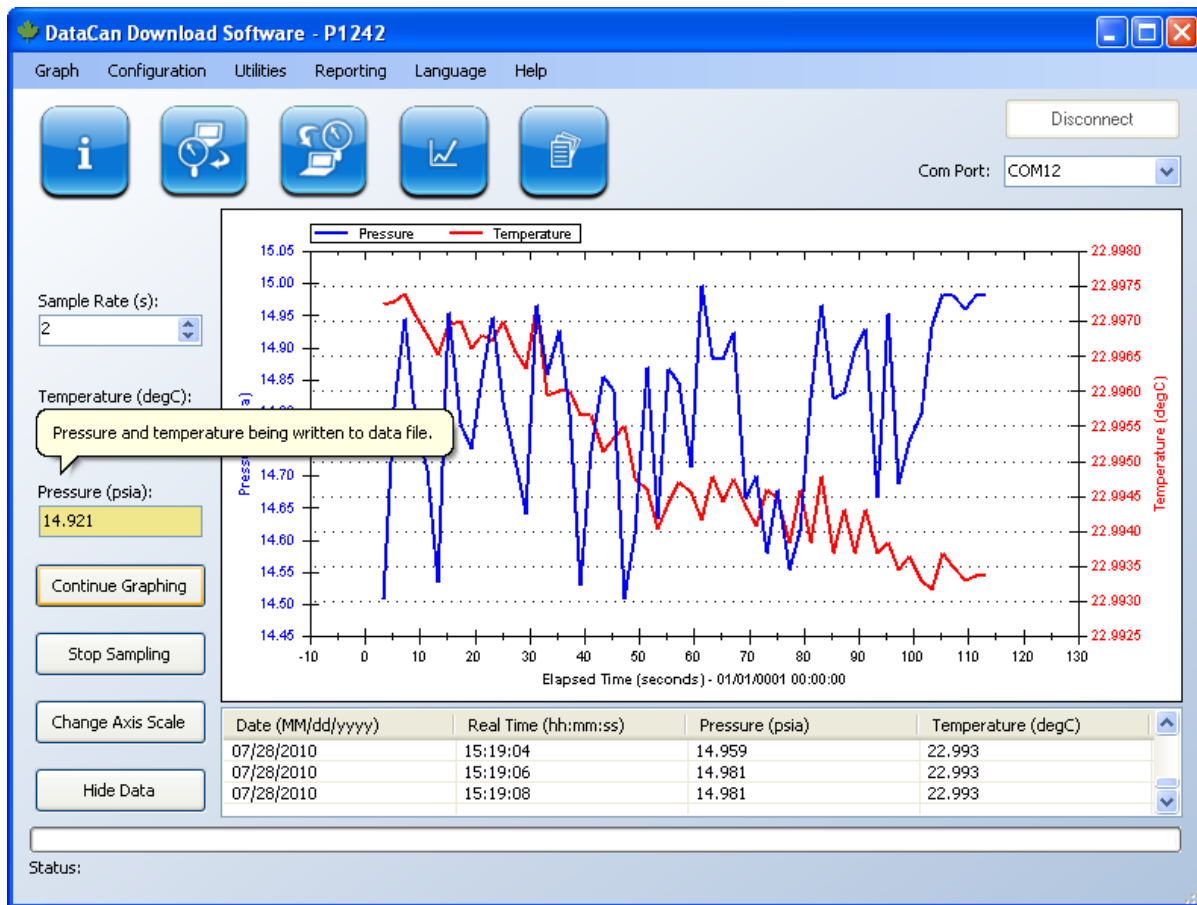
The graph will now begin generating and the real time pressure and temperature will be displayed on the left. Below the graph is a chart showing all the data that is being saved to file. The user can hide this and show just the graph by pressing **Hide Data**.



The sample rate can be adjusted using the arrows in the sample rate box or by typing in a number.

Pressing the **Pause Graphing** button will stop the graphing temporarily while still writing the data to file. To continue press the same button which will now say **Continue Graphing**. When the graphing is continued it will show all the data that was recorded while it was paused. Pausing the graph will also cause the data chart below the graph to stop updating temporarily. The real time temperature and pressure values on the left will change to a yellow color and continue updating while the graph is paused.

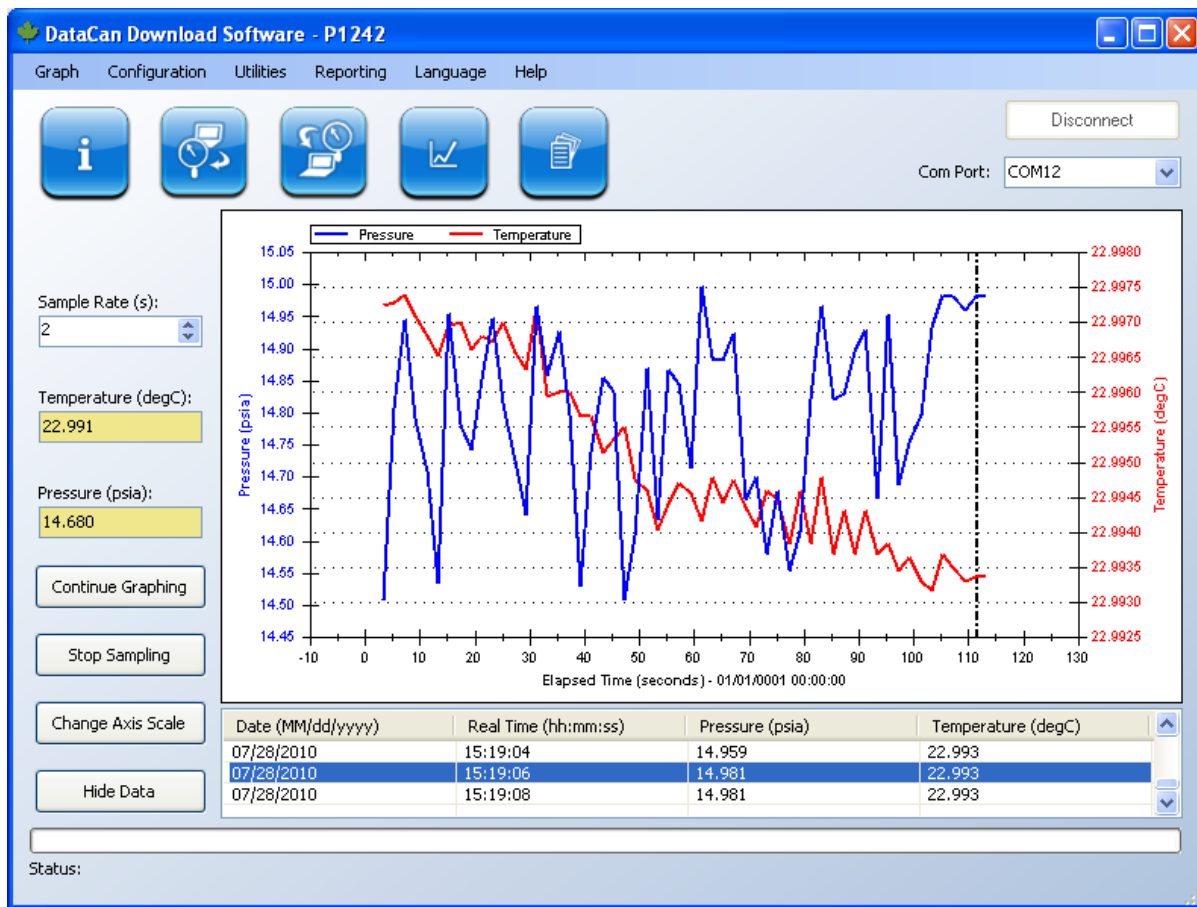




While the graph is paused the user can now zoom, pan and use the features available from right clicking. These are done the same way as in Diagnostics. These features are only available when the graph is paused.

The axis scale can be changed by pressing the **Change Axis Scale** button or by right clicking and selecting Change Axis Scale.

When the graph is paused the user can also select certain points on the graph and have them highlighted in the data chart below the graph. When a point is selected a dotted line will run vertically through it. As well, if a row of data is selected the line will appear on the graph for that point.



To stop recording data press the **Stop Sampling** button and click **Yes** when it asks if you want to stop logging.

---

## 11.1 Surface Box

### 11.1.1 Switching Gauges

**When a different down hole gauge is used (a different serial number), the calibration files for that gauge must be updated in the surface box.**

Refer to the “Load Calibration Files” section further down for a detailed description on how this is accomplished.

### 11.1.2 Operating Sequence

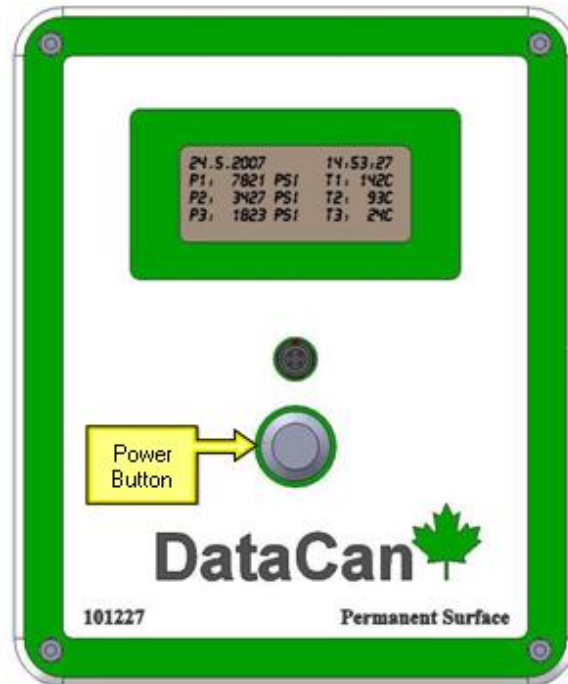
In general, the following sequence of events is required to operate a DataCan memory pressure gauge:

- Wire the Surface Box as outlined in Section 15.4.2.
- If necessary tune the Surface Box as outlined in Section 15.4.3.
- Program the surface box using DataCan Download Software as outlined previously in this manual
- Disconnect the surface box from the DataCan Communication Cable.
- Ensure tool specs meet requirements for the job. Assemble tool as outlined in the tool manual.
- Run the tool down hole.
- Reconnect the DataCan Communication Cable to the Surface Box and computer to download and process the data.

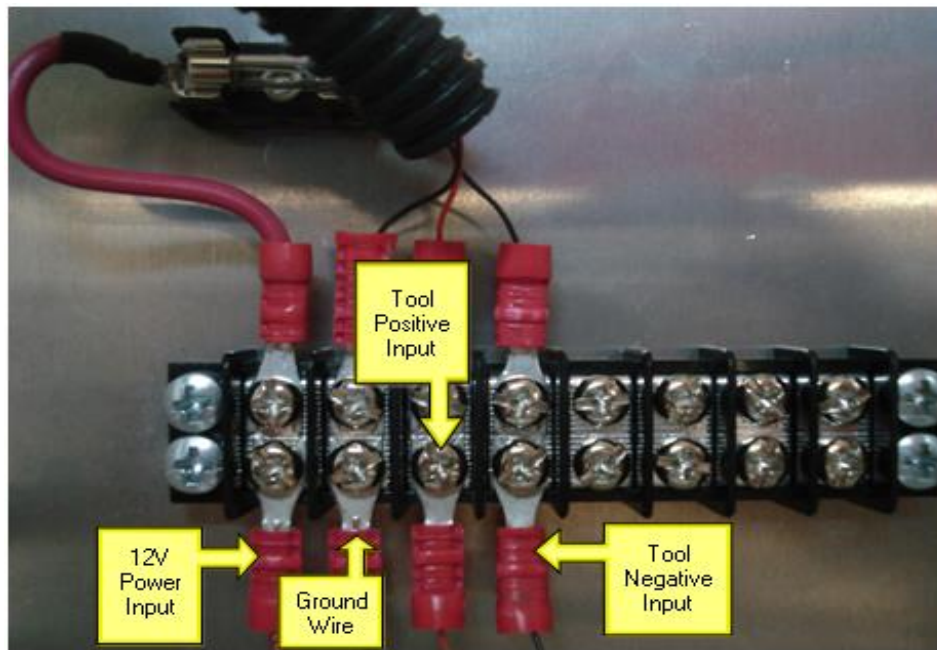
### 11.1.3 Surface Box Tool Assembly

The following sequence of events is required to assemble a DataCan permanent surface box:

- Ensure the power is off. The switch shown below will be in the outward (flush) position.



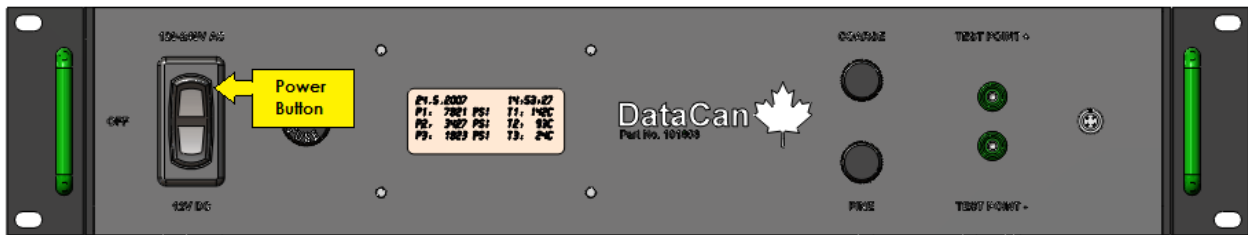
- Connect 12V power supply and tool inputs to the terminal strip as shown below.



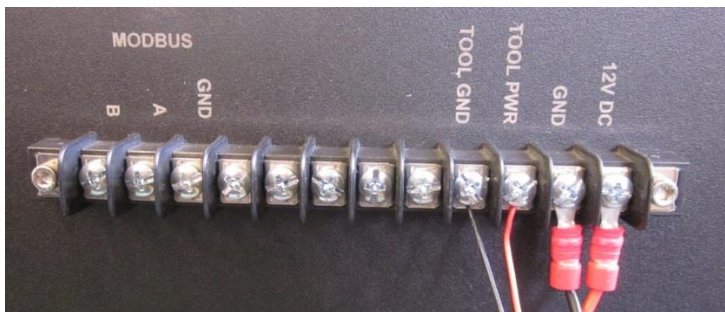
- Turn the system on by pressing the power button to the inward position. Wait 10 seconds for the firmware to activate. If the display is blinking then the system is running. If the display is NOT blinking then the system needs to be tuned as outlined in the next section.

The following sequence of events is required to assemble a DataCan Rack Mount surface box:

- Ensure the power is off. The switch on the left of the box will be in the middle position.



- Connect the 12V power supply and tool inputs to the terminal strip OR connect to 120-240V AC current instead of 12V DC, both of which are shown below.

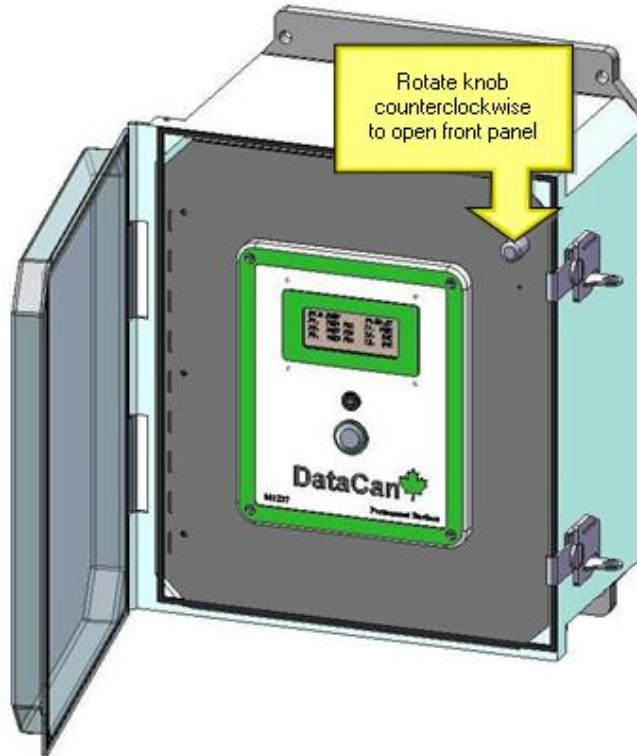


Turn on the system by either clicking the switch upwards for 120-240V AC, or downwards for 12V DC, depending on how the surface box is connected to the power supply. If the display is blinking then the system is running. If the display is NOT blinking, then the system needs to be tuned as outlined in the next section.

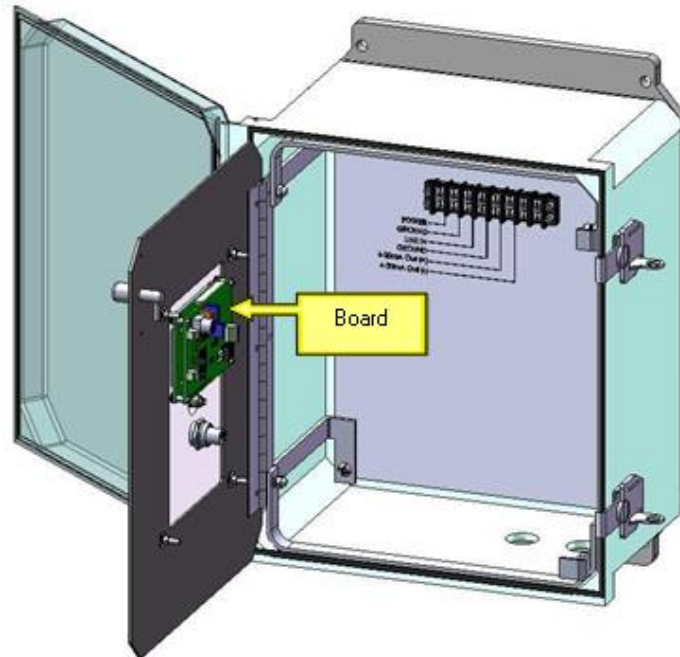
### 11.1.4 Tuning the System

For the permanent surface box:

- Open the front panel by rotating the knob shown below counterclockwise.



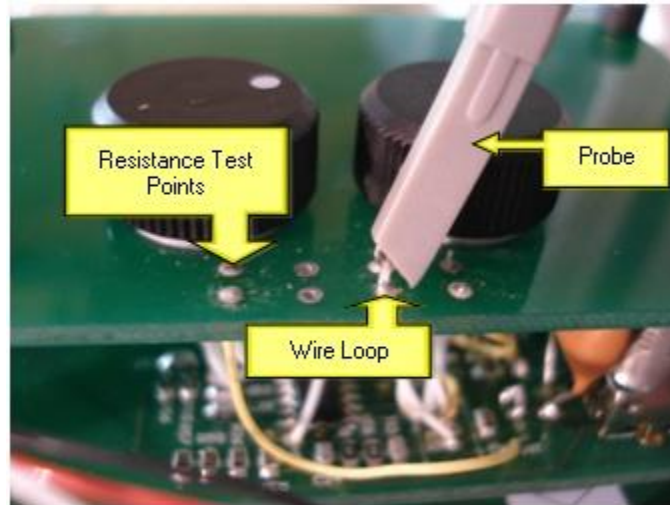
- Locate the circuit board inside the surface box.



- Locate the potentiometer knobs on the circuit board. Turn the knobs counterclockwise as far as they will go to set the resistance to zero.



- Connect the oscilloscope to the board by connecting the probe to the wire loop (shown below) that is located below the potentiometer knobs. Connect the alligator clip to any ground wire.



- The resistance test points are provided to determine the resistance value of both potentiometers for future use.

For the Rack Mount surface box:

- Use the two knobs located at the front of the surface box labeled COARSE and FINE to tune the system. Turn the knobs counterclockwise as far as they will go to set the resistance to zero.



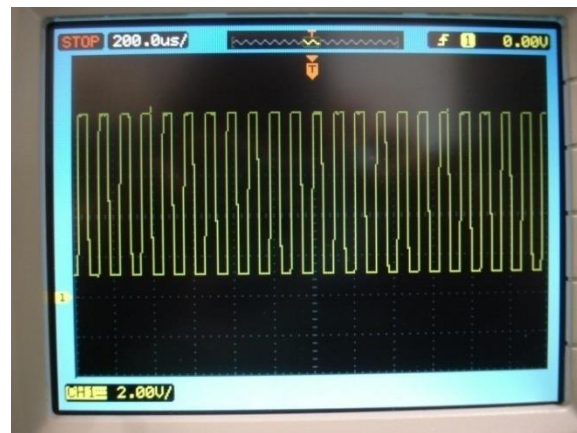
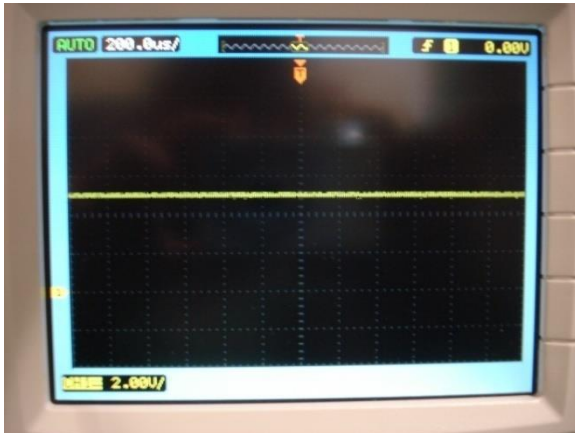
- Connect the oscilloscope to the connections labeled TEST POINT+ and the ground to TEST POINT- as shown below.



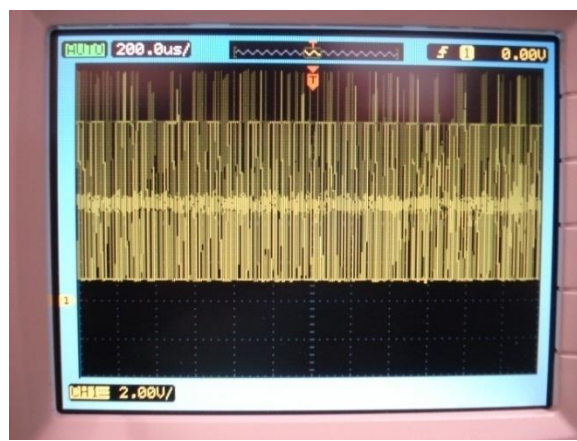
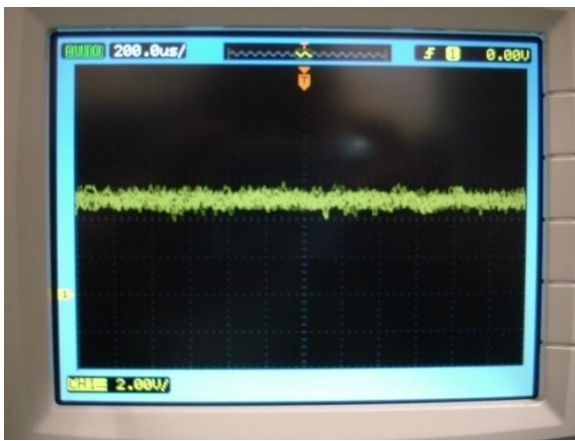
For both Permanent and Rack Mount surface box:

- The first potentiometer knob (on the left for the regular surface box and on the top labeled COARSE for the Rack Mount surface box) is the Stage 1 potentiometer. Rotate the first potentiometer knob until a square-wave signal is produced (shown below).
- The second potentiometer knob (on the right for the regular surface box and on the bottom labeled FINE for the Rack Mount surface box) is the Stage 2 potentiometer. As you rotate this potentiometer, the stage two gain will increase. Once the signal is large enough, the display will begin to blink. This indicates the system is recording samples from the down-hole tool. If the gain is increased too much the signal will distort (shown below) and no samples will be received.

### Correct Signal After Tuning

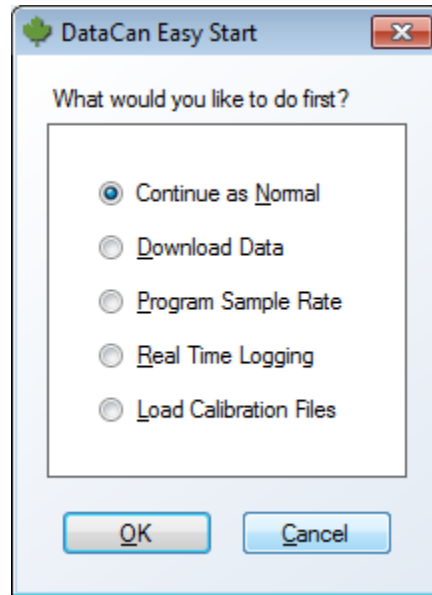


### Over-Correction Of Signal After Tuning



## 11.1.5 Using the Software

Open the DataCan Download Software and connect to the surface box. A pop-up window will appear to give you easier access to software features.



**Continue as Normal** closes the window. It has the same effect as clicking the **Cancel** button.

**Download Data** moves to the Download page where data can be downloaded from the memory.

**Program Sample Rate** switches to the Program page for programming single or multiple rates.

**Real Time Logging** lets you perform real time sampling.

**Load Calibration Files** loads a new calibration file. (See next section)

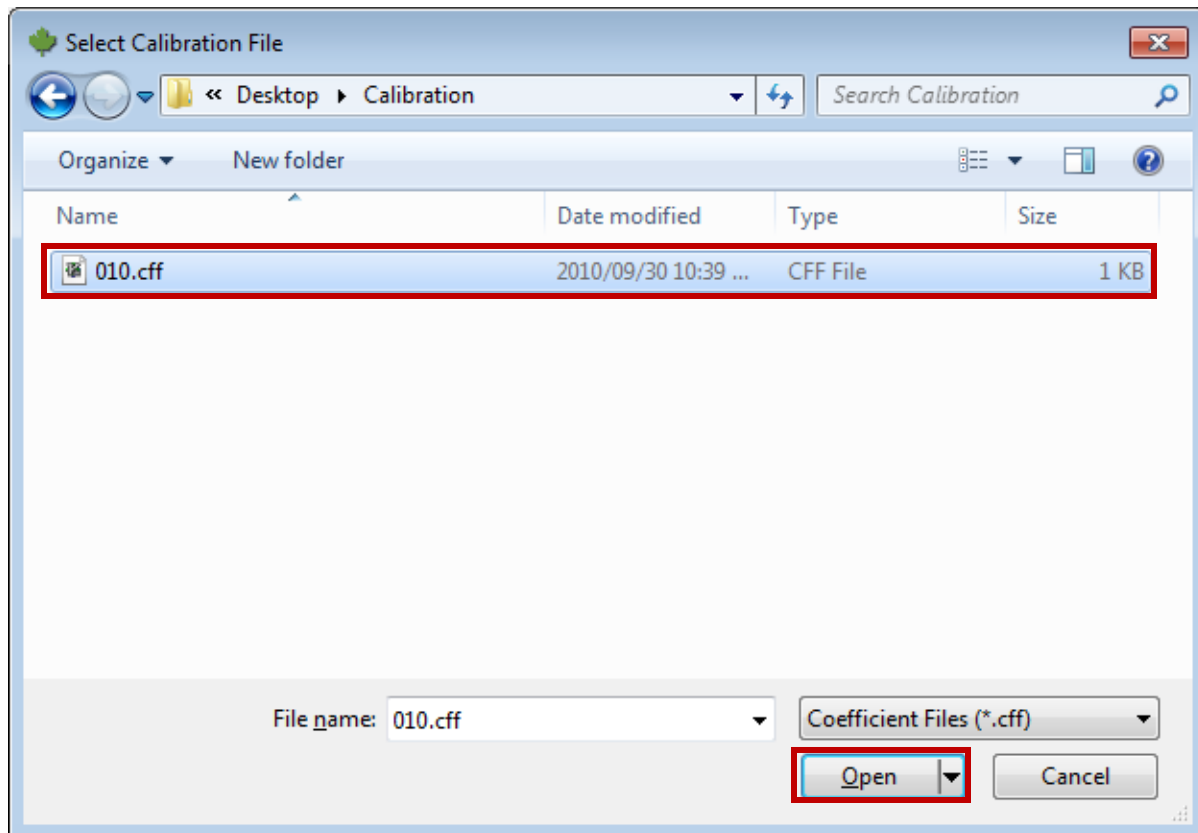
### 11.1.6 Load Calibration Files

To load a new calibration file, click the **Load Calibration Files** option from the **DataCan Easy Start** window after connecting to the surface box. Then the following window will appear to navigate files. Click the OK button to load a new calibration file.

---

Note: In order to use a different serial number for the system, you must load a new calibration file.

---



### 11.1.7 Finding the Modbus Address

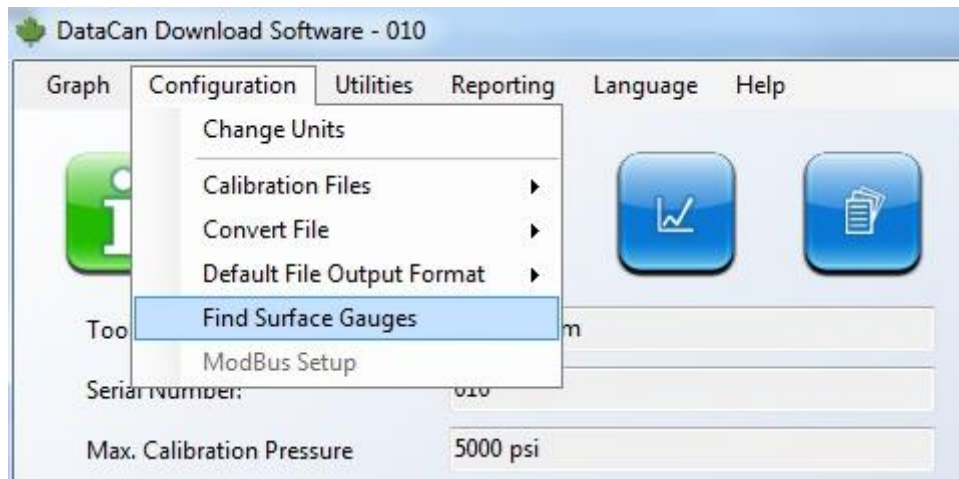
The Modbus address of the surface box can be found on the "Info" page at the bottom.



### 11.1.8 Find Surface Gauges

In order for the main unit to recognize that there are surface gauges connected to it, the “Find Surface Gauges” routine must be run in the software.

In the menu, click “Configuration -> Find Surface Gauges”



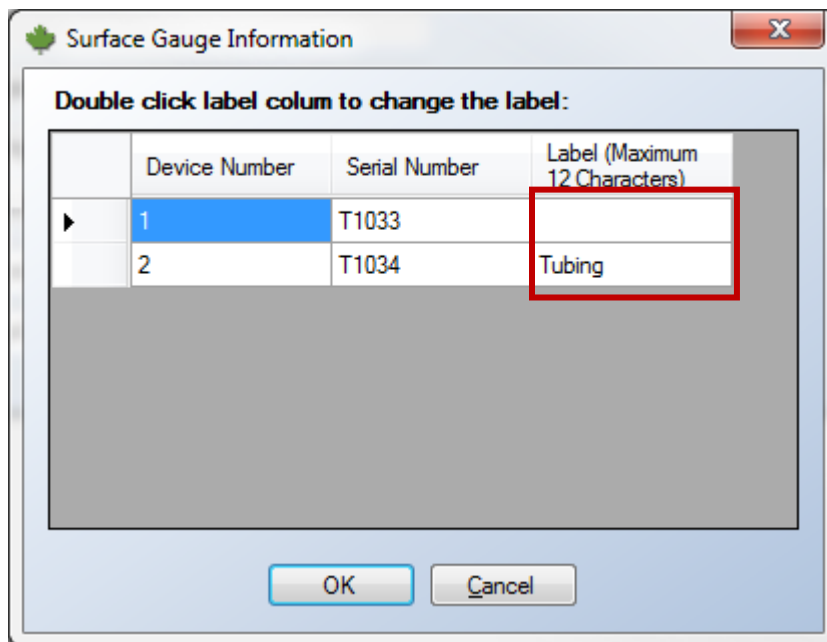
The routine will run automatically. If any surface gauges are found, a dialog appears showing the serial numbers of each gauge connected.

If no gauges are found, the following dialog will appear.



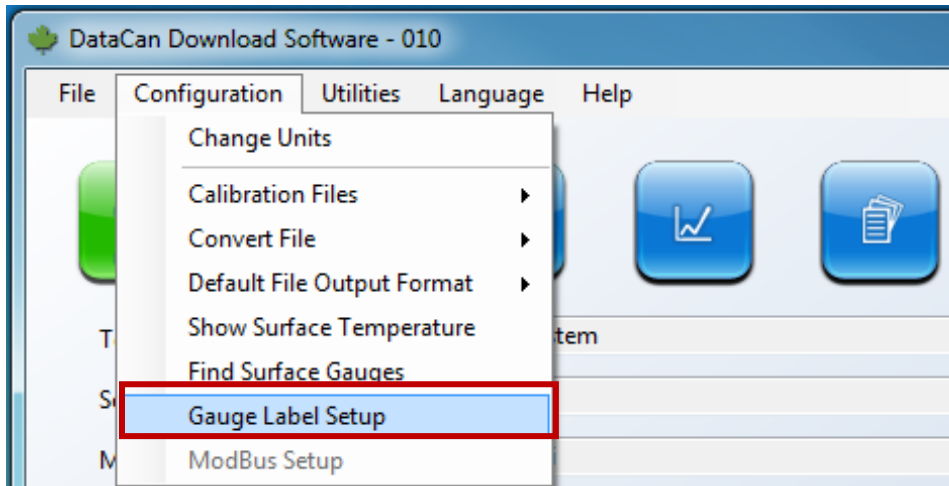
If gauges are found, the user has the option to change the label for each surface gauge. This label will appear in the downloaded file and in the graph. The labels are stored in the memory of the main surface unit, so you can download the data from a different computer and still have the same labels for each surface gauge.

To add or change a label for a surface gauge, click in the correct box under "Label" and type the label(s) that you want. Then click the "OK" button.

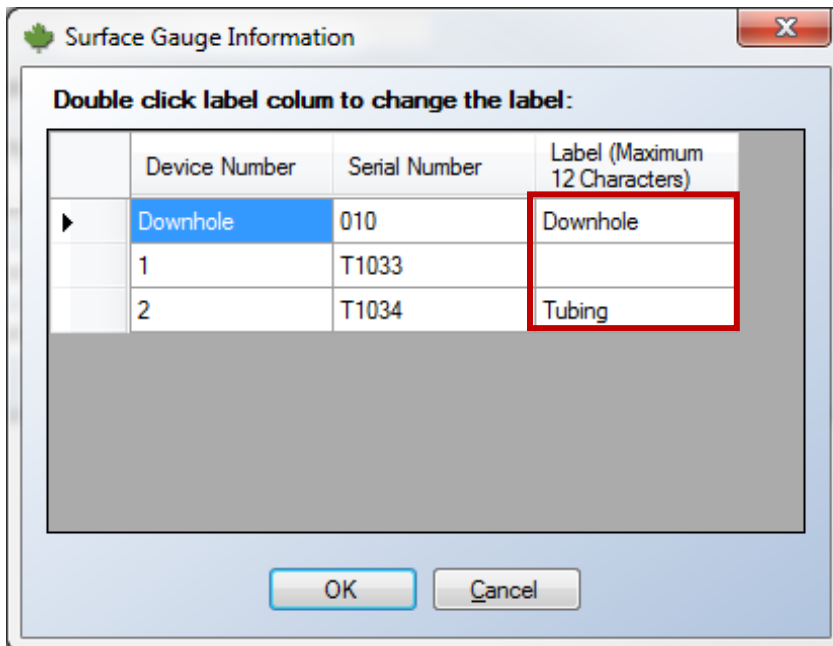


### 11.1.9 Change Gauge Labels

If the user would like to attach a label, such as "tubing" or "annulus", to either a downhole or surface gauge, this can be done in the menu by clicking **Configuration -> Gauge Label Setup**.



A dialog will appear listing the downhole and surface gauges. You can change the label by clicking in the appropriate box and typing the new label. When complete, click the "OK" button.

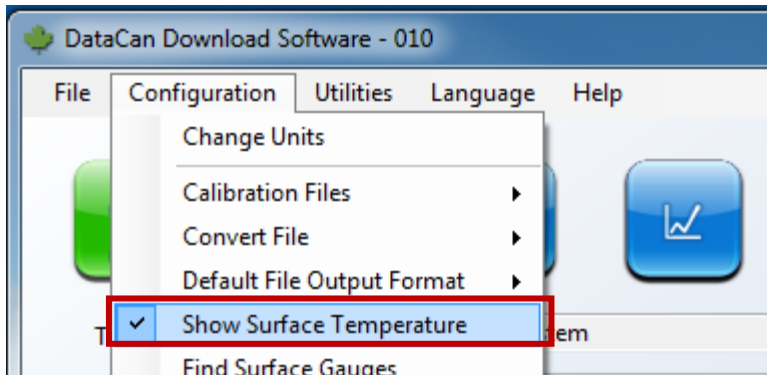


The "Device Number" column will display "Downhole" for the downhole gauge, and a number (1, 2, etc.) for the Modbus address of each surface gauge. The "Serial Number" column shows the serial number of each attached gauge.

### 11.1.10 Show or Hide Surface Gauge Temperature

For surface pressure gauges, the temperature reading from these gauges can be shown or hidden when downloading. The default is to have this data hidden.

To change whether it is shown or hidden, in the menu, click **Configuration -> Show Surface Temperature**. When this is enabled, a checkmark will appear beside the selection.



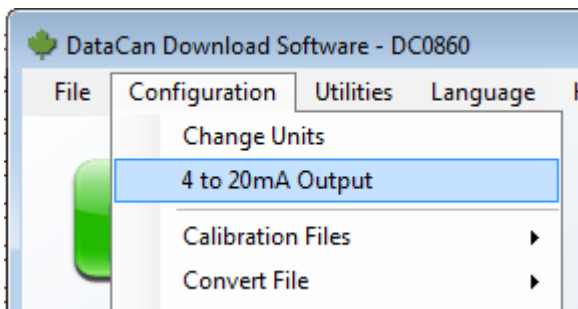
### 11.1.11 Set up 4 to 20 mA Output

Absolute Maximum Voltage in the 4 to 20 mA loop: 36V

Minimum Voltage: 8 V

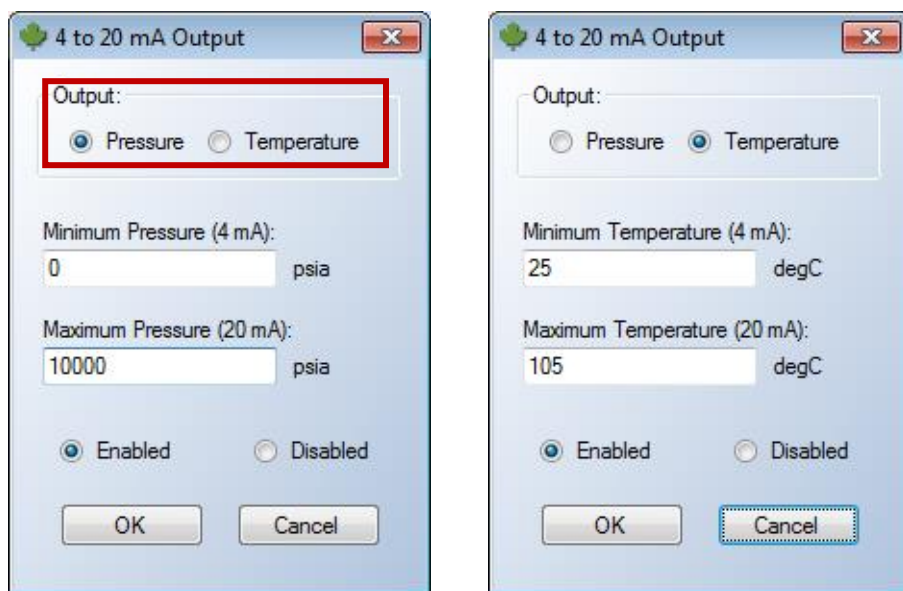
Recommended Voltage: 12 to 24 V

The setup page is found in the **Configuration** menu under **4 to 20mA Output**.





The 4 to 20 mA Output can be set up to output based upon the temperature or the pressure reading. Select the appropriate radio button to use either pressure or temperature.



The value representing 4 mA and the value representing 20 mA are set in the appropriate boxes. As an example, if 0 psia was set as the low value (4 mA) and 10 000 psia was set as the high value (20 mA), when the downhole gauge has a pressure of 5 000 psia, the output would be 12 mA. When complete, click the **OK** button to save this to the surface box.

---

## 11.2 Wellhead Logger

### 11.2.1 Installation

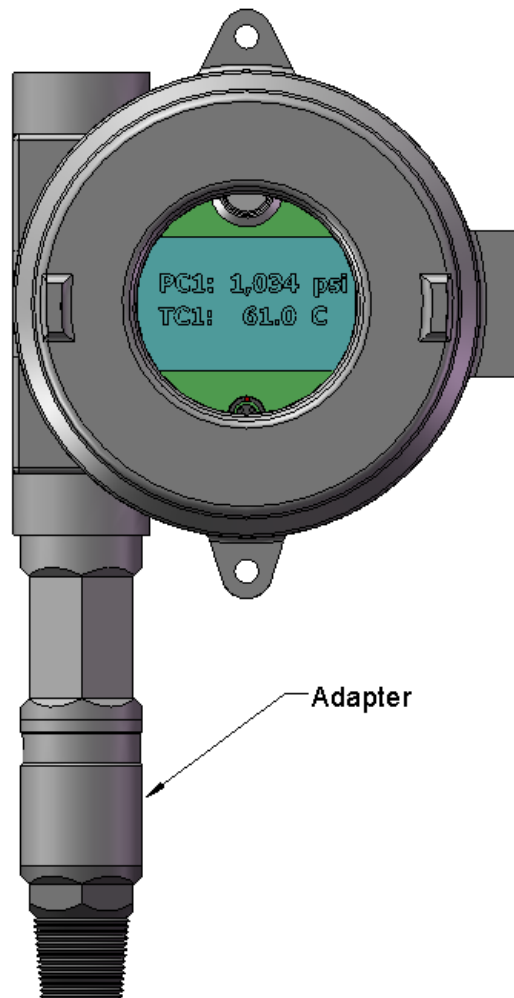
The DataCan wellhead logger is shipped with an adapter ( $\frac{1}{2}$ " NPT,  $\frac{1}{4}$ " NPT or Autoclave) that allows it to be mounted almost anywhere.

- Thread the adapter to the wellhead logger using the appropriate size of wrench

---

Note: Failure to use a wrench for attaching fittings and mounting the logger can result in damage to the logger.

---



- Using a wrench, attach the wellhead logger assembly to the pressure source

### 11.2.2 Operating the Wellhead Logger

- Unscrew the front face of the Kilark case.

- Connect the logger to a computer using the DataCan communication cable. Program the surface box using DataCan Download Software as outlined previously in this manual
- Press the on/off switch located above the display. When the LED light on the button is green the logger is turned on.
- Replace the front of the Kilark case
- The display will show the real time pressure and temperature data while the logger records this data.
- To obtain data remove the front of the case again and connect the logger to a computer. Download the data using the procedure outlined previously in this manual (Section 7.7)

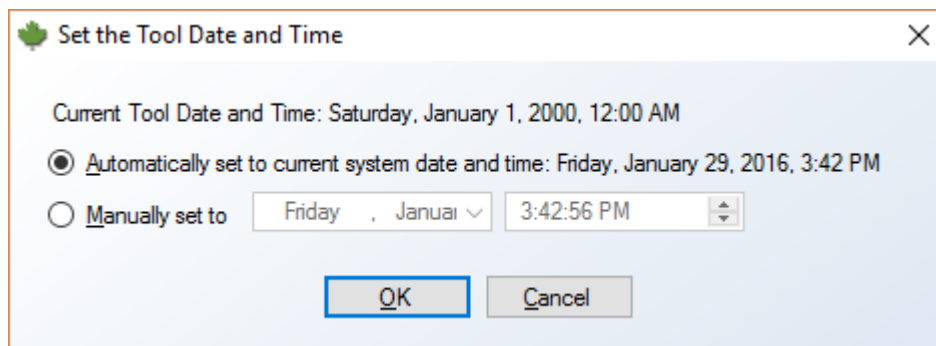
---

## 11.3 Bubble Tube Thermocouple Wellhead Logger

### 11.3.1 Software Setup

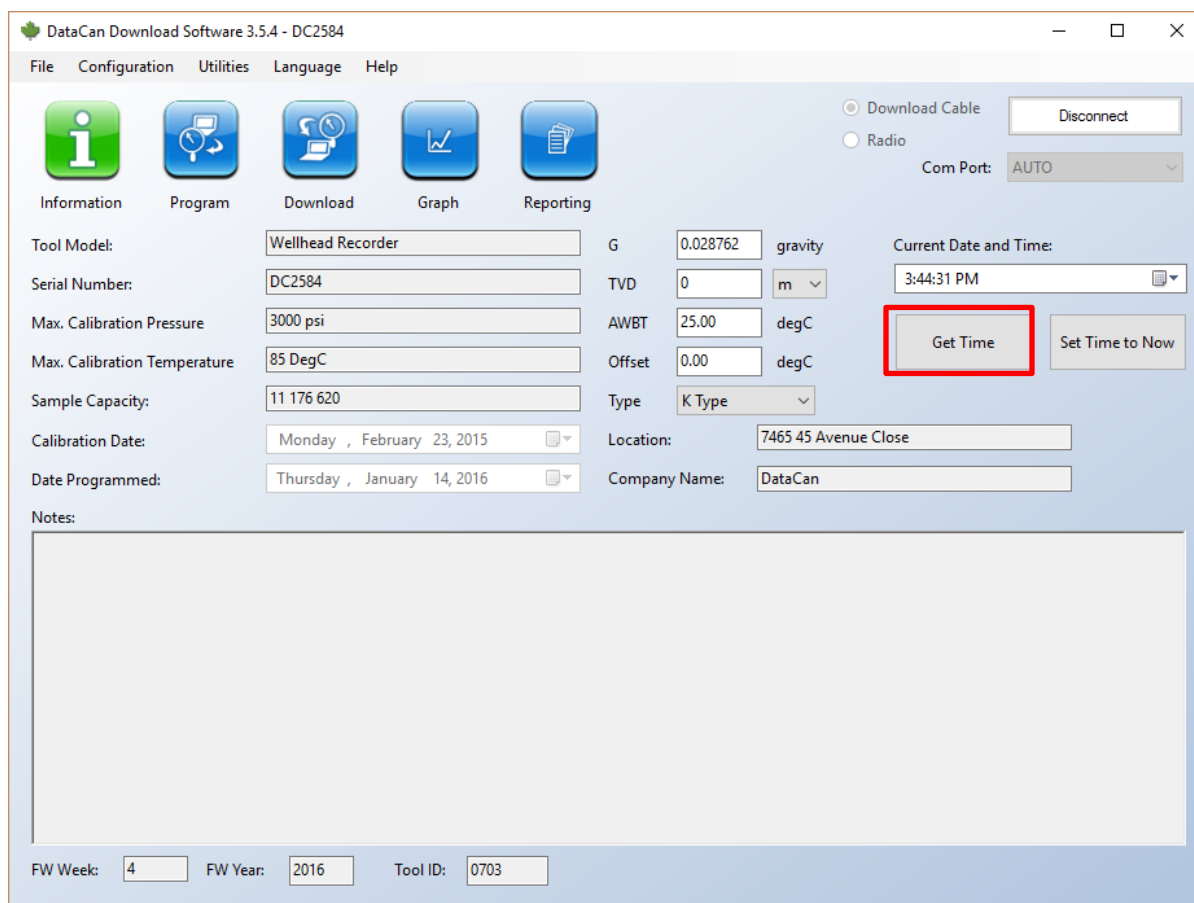
Connect the gauge to a DataCan Download cable, then connect to the DataCan Download software.

On connect, when prompted, set the time and date to now by clicking "OK".



### 11.3.2 Information Page Setup

To test the real time clock chip, press "Get Time" a few times and make sure the time / date are correct and that the time is incrementing properly.



Put the DataCan Download software into Supervisor Mode (press "CTRL+SHIFT+D" on your keyboard). Program the default values of: G = 0.028762, TVD = 0 m, AWBT = 25 degC, Offset = 0 degC and "K Type" for the thermocouple type. Press the "Save Notes to Tool" button to store this information to the gauge memory.

DataCan Download Software 3.5.4 - DC2584 - Supervisor Mode

File Configuration Utilities Language Help

Information Program Download Graph Reporting

Download Cable Radio Com Port: AUTO Disconnect

Tool Model: Wellhead Recorder G 0.028762 gravity

Serial Number: DC2584 TVD 0 m

Max. Calibration Pressure: 3000 psi AWTB 25.00 degC

Max. Calibration Temperature: 85 DegC Offset 0.00 degC

Sample Capacity: 11 176 620 Type K Type

Calibration Date: Monday, February 23, 2015 Location: 7465 45 Avenue Close

Date Programmed: Thursday, January 14, 2016 Company Name: DataCan

Notes:

FW Week: 4 FW Year: 2016 Tool ID: 0703 Save Notes to Tool

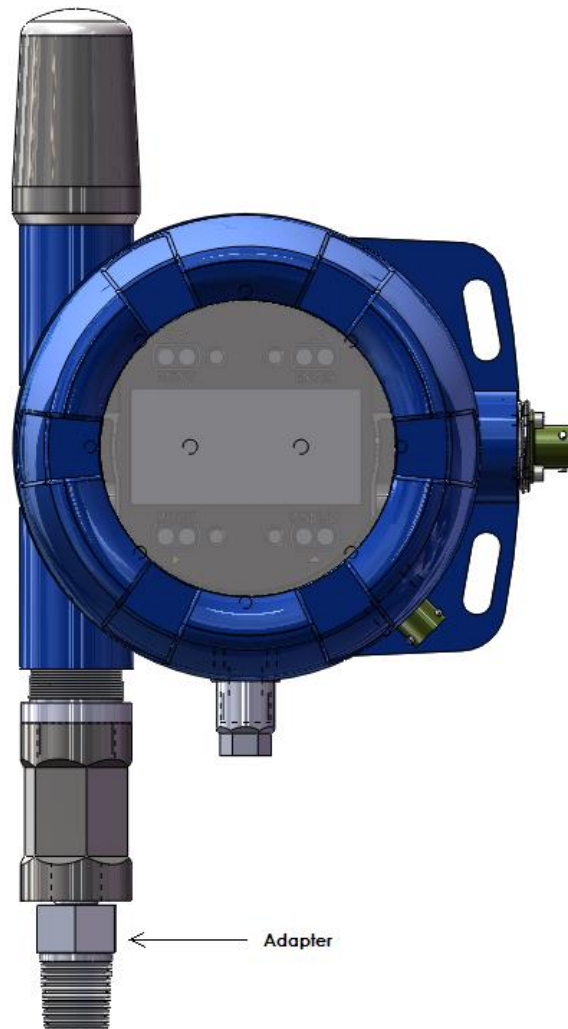
## 11.4 Multi-Channel Surface Logger

### 11.4.1 Installation

The DataCan multi-channel surface logger is shipped with an adapter (1/2" NPT, 1/4" NPT or HF4) that allows it to be mounted almost anywhere.

- Thread the adapter to the wellhead logger using the appropriate size of wrench

**Note:** Failure to use a wrench for attaching fittings and mounting the logger can result in damage to the logger.



- Using a wrench, attach the wellhead logger assembly to the pressure source

### 11.4.2 Operating the Surface Logger (Without Radio)

- Connect the surface logger to a computer using the DataCan surface logger communication cable. Program the surface box using DataCan Download Software as outlined previously in this manual.
- Install transmitters to pressure source using appropriate wrench. Plug the cables into the side of the surface logger and into the transmitters.

- Press the button labeled On/Off located below the display. When the LED light on the button is green the logger is turned on.
- The display will show the real time pressure and temperature data for all channels while the logger records this data.
- To obtain data plug the DataCan surface logger communication cable into the port located below the display and a USB port on a computer. Download the data using the procedure outlined previously in this manual (Section 7.7)

### **11.4.3      Operating the Surface Logger (With Radio)**

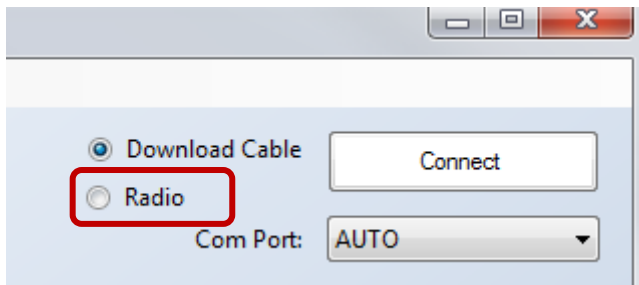
- Connect the surface logger to a computer using the DataCan surface logger communication cable. Program the surface box using DataCan Download Software as outlined previously in this manual.
- Install transmitters to pressure source using appropriate wrench.
- Press the button labeled On/Off located below the display. When the LED light on the button is green the logger is turned on.
- The display will show the real time pressure and temperature data for all channels while the logger records this data.
- To obtain data plug the DataCan wireless Zigbee receiver into a USB port on a computer. Download the data using the procedure outlined previously in this manual (Section 7.7)
- At times it may be necessary to turn off all wireless transmissions on the well site. To disable radio transmission on the surface logger press the button labeled Transmission On/Off, located below the display.

### 11.4.4 Connecting the Radio in the software

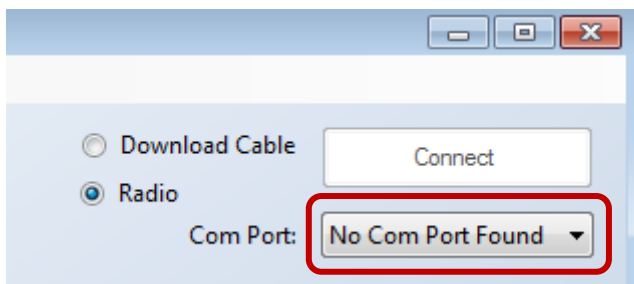
Connect the DataCan Wireless Zigbee Receiver to your computer.



Click the **Radio** option near the **Connect** button to find all connected wireless communication cables.



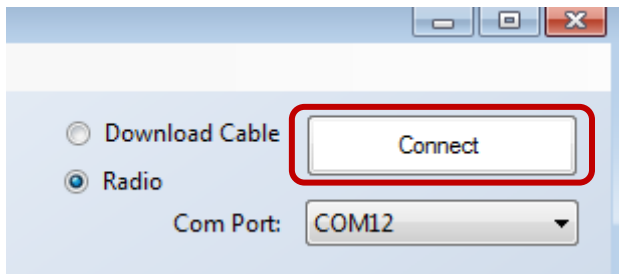
The COM port for the wireless receiver is automatically detected by the software. If no COM ports are found, please consult installing the drivers in DataCan Download Software Installation and try again.



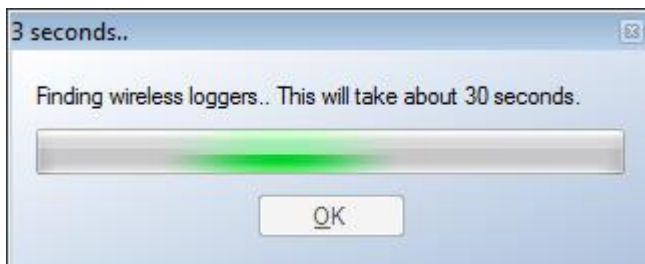


### 11.4.5 Wireless Logging

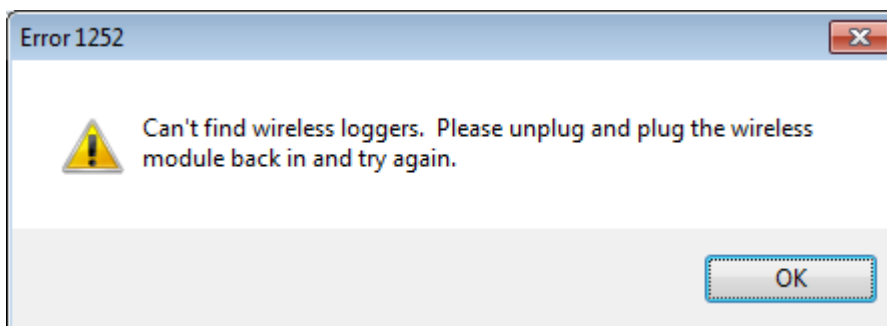
If the COM port is successfully detected by the software, simply press the **Connect** button to search all wireless logger(s) nearby. Please make sure that the DataCan Download Cable is unplugged before pressing the **Connect** button since wireless communication is disabled when the DataCan Download Cable is plugged to the logger.



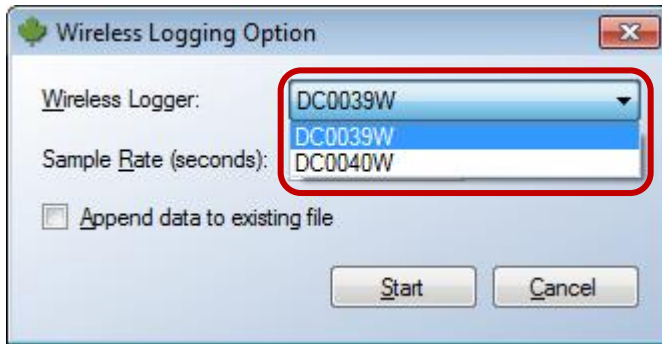
After clicking the **Connect** button, the following dialog will appear. It usually takes less than 30 seconds to find all wireless logger(s). However, depending on your wireless signal, it may take up to one minute.



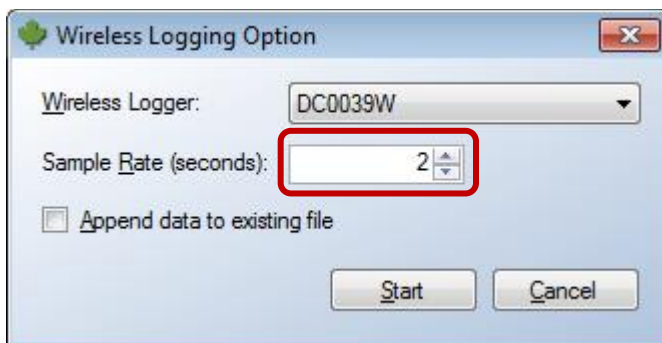
If no wireless loggers are found, the following dialog will appear.



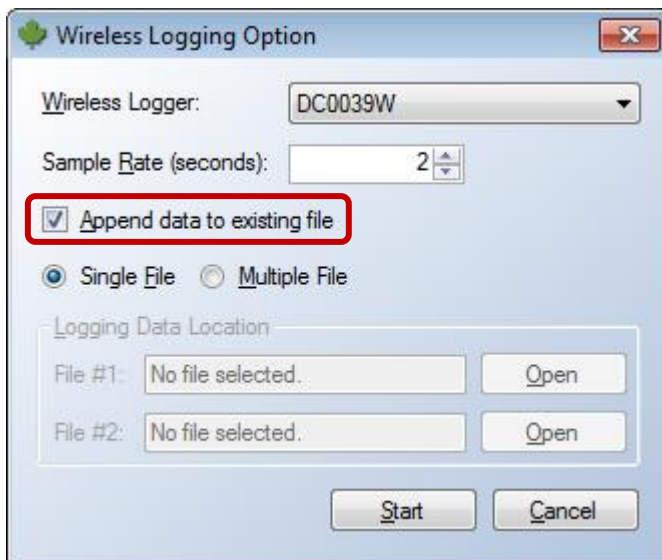
If wireless logger(s) are found, you have the option to select which logger you like to obtain data from.



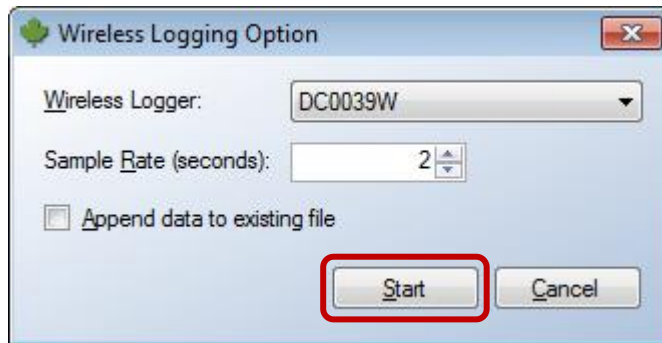
It also allows you to change the sample rate using the arrows in the sample rate box or by typing in a number from 2 seconds to 30 seconds.



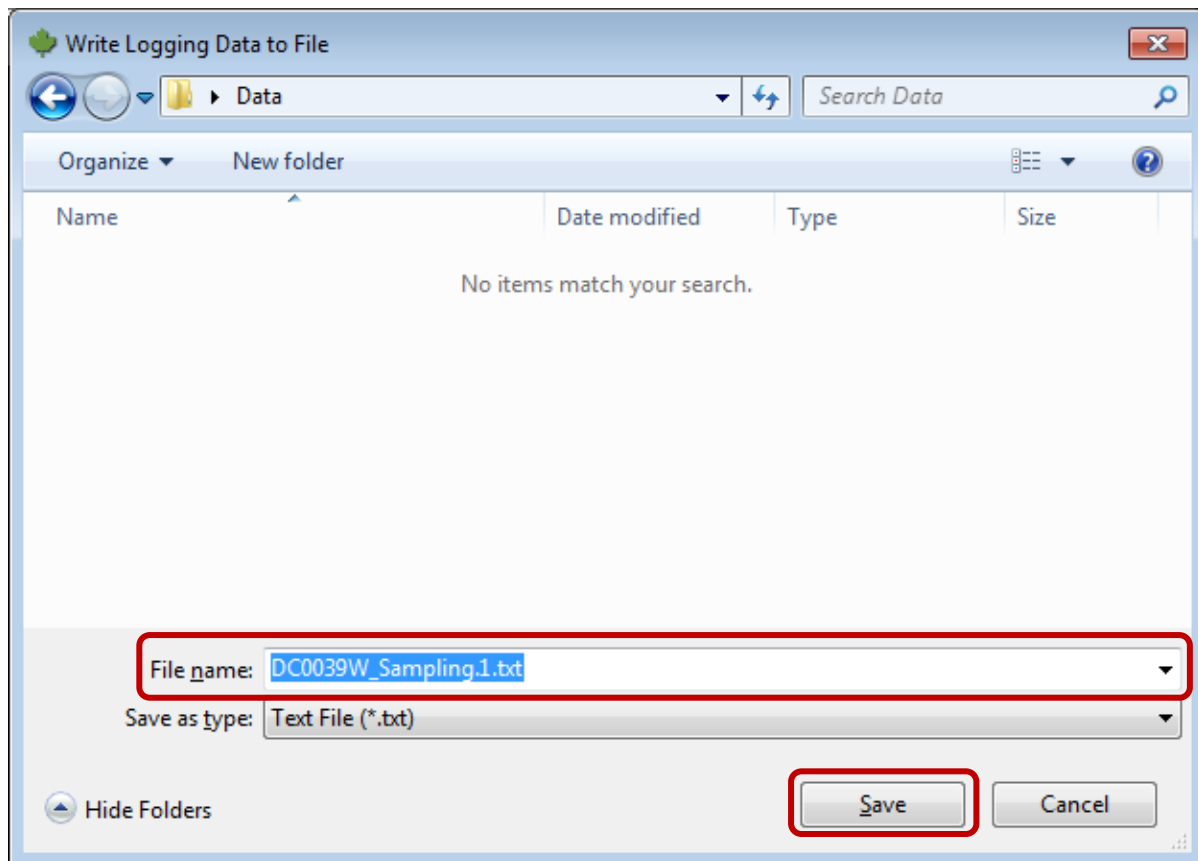
If the **Append data to existing file** box is checked, then the data will be added to whatever existing text file is chosen.



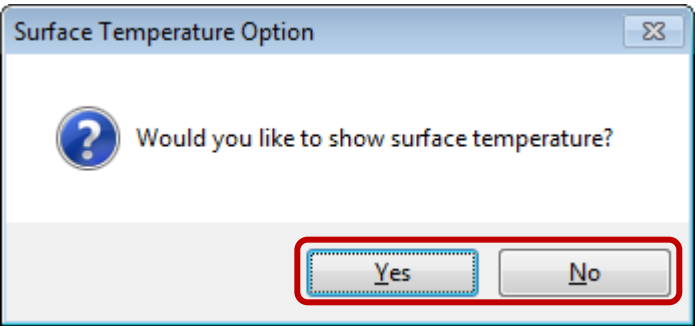
If you are ready to start collecting data from the logger wirelessly, simply click the **Start** button.



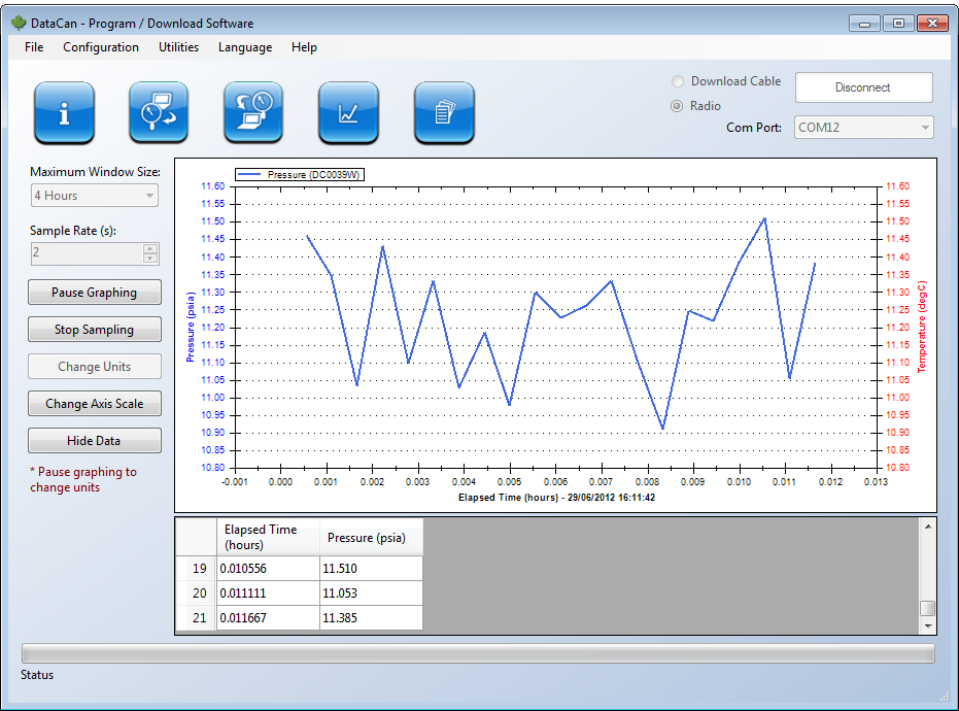
After clicking the **Start** Button with **Append data to existing file** unchecked, the following dialog will appear for you to choose the text file to which data will be added.



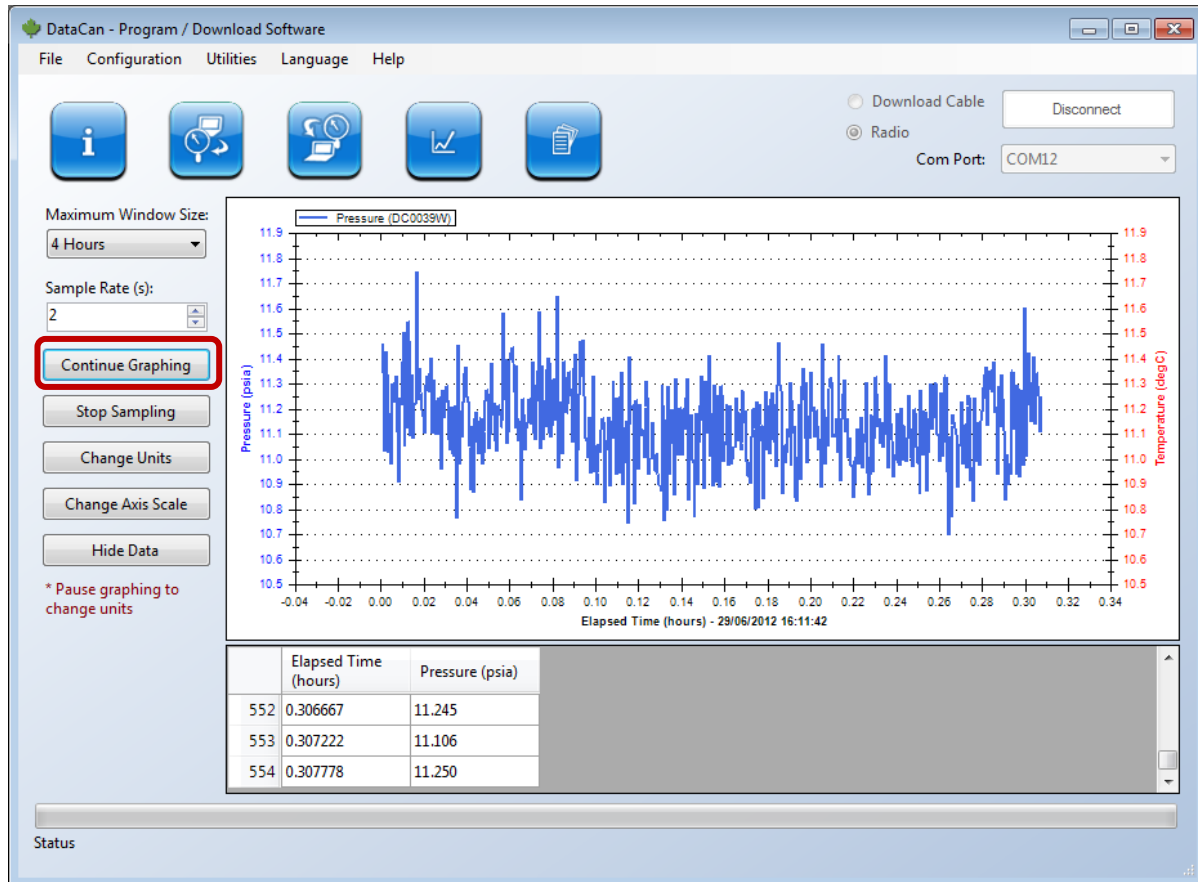
Finally, choose if you like to show surface temperature by clicking the **Yes** or **No** button. If you choose not to show surface temperature, only pressure data will appear in the graph and data chart.



The graph will now begin generating from the wireless logger. Below the graph is a chart showing all the data that is being saved to file. The user can hide this and show just the graph by pressing **Hide Data**.

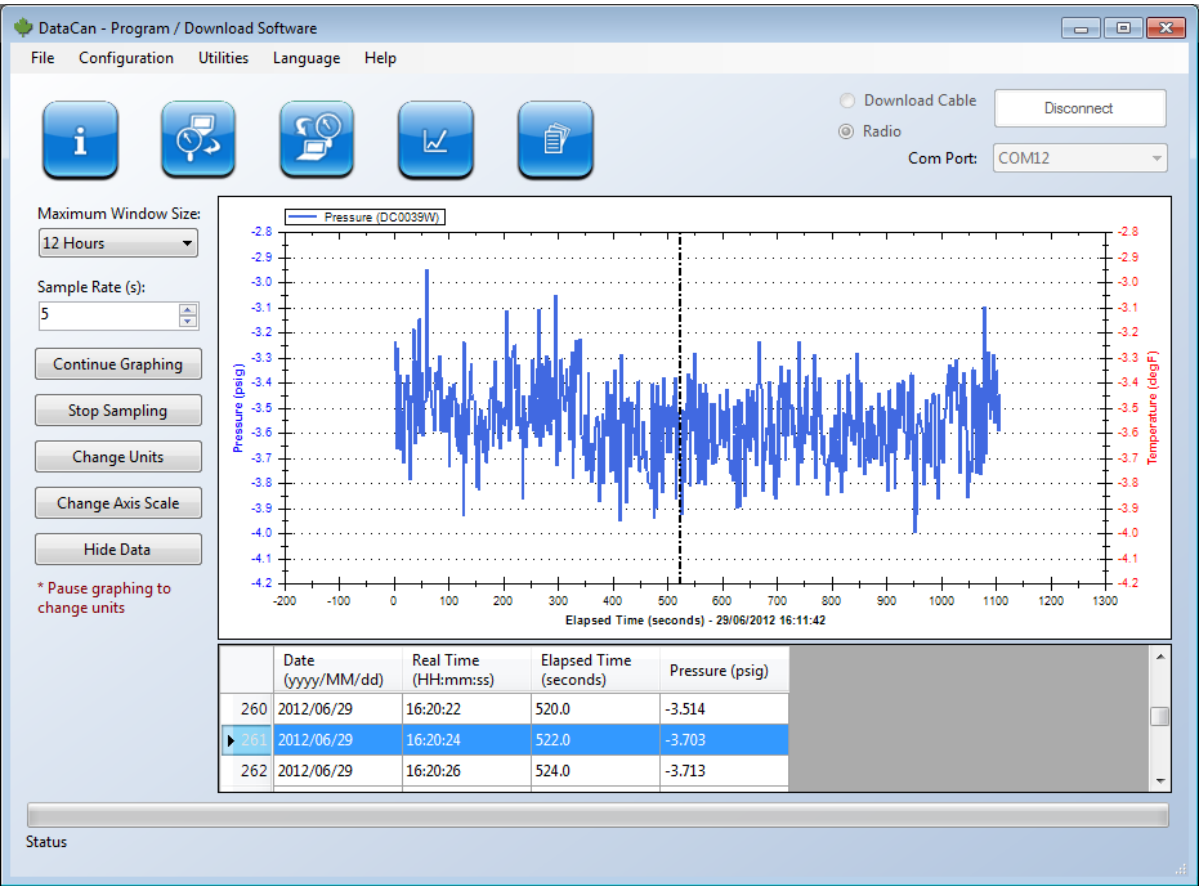


Pressing the **Pause Graphing** button will stop the graphing temporarily while still writing the data to file. To continue, press the same button which will now say **Continue Graphing**. When the graphing is continued it will show all the data that was recorded while it was paused. Pausing the graph will also cause the data chart below the graph to stop updating temporarily.



While the graph is paused, you can now zoom, pan, and use the features available from right clicking. You also have the options to change the **Sample Rates**, **Units**, **Maximum Window Size**, and **Axis Scale**. The **Maximum Window Size** is the maximum amount of time that will be displayed in the graph. When this is reached the old data will be eliminated and only the current window size of data is shown. Although the graph shows the maximum amount of time you have selected, the data file will contain all data from the beginning of logging to the end.

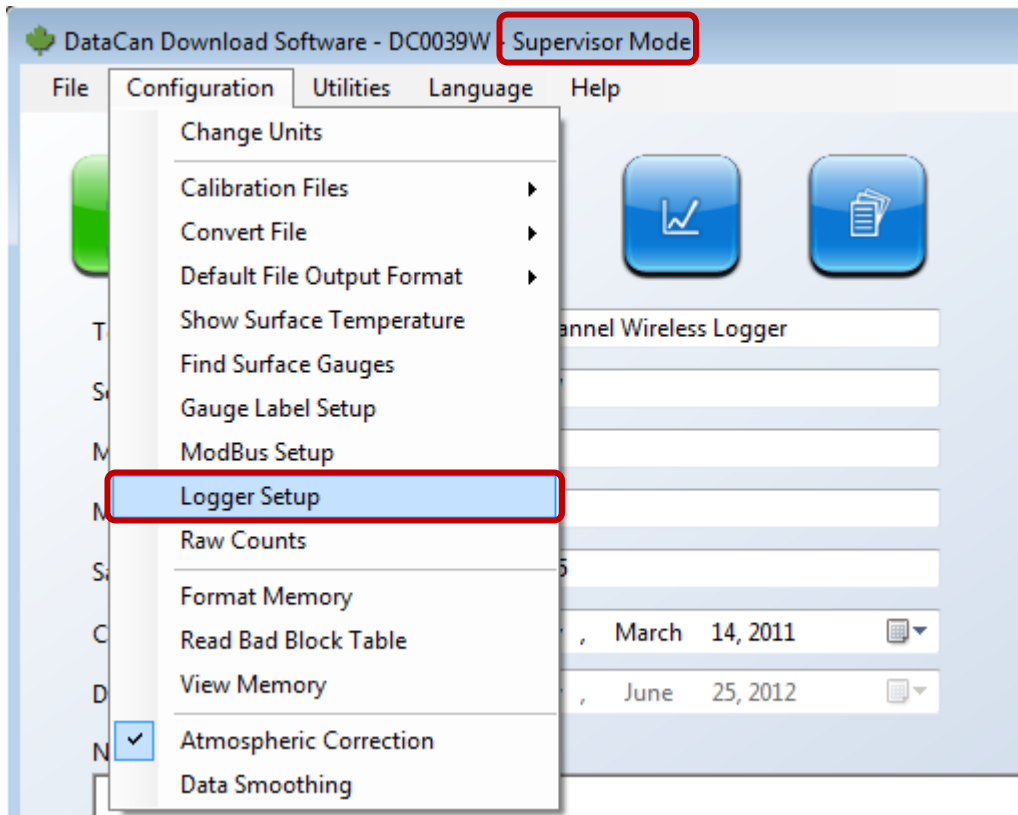
Furthermore, you can also select certain points on the graph and have them highlighted in the data chart below the graph. When a point is selected a dotted line will run vertically through it. As well, if a row of data is selected the line will appear on the graph for that point.



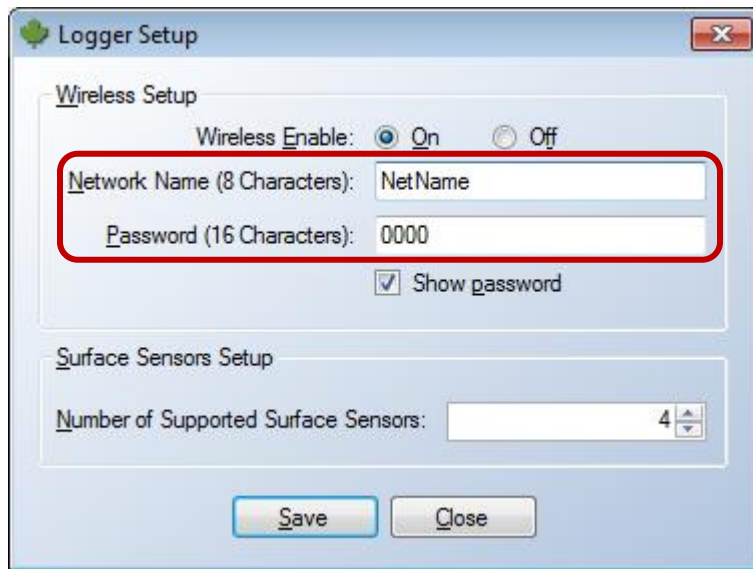
To stop recording data press the **Stop Sampling** button and click **Yes** when it asks if you want to stop logging.

## 11.4.6 Wireless Logger Setup

To change the logger setup, connect the logger to the software, then enter **supervisor mode** by pressing **Ctrl + Shift + D** simultaneously on the keyboard. Next, select the **Logger Setup** option from the **Configuration** menu bar at the top.



The following dialog box will appear:



Choose the 8-character long wireless network name that uniquely identifies your wireless network. Also, choose the 16-character long password that will be used to encrypt data transmission. Next, hit the **Save** button to save the changes in the tool memory.

---

**Note: The setup will take effect after resetting the tool power. Reset the tool power by turning it off and turning it back on.**

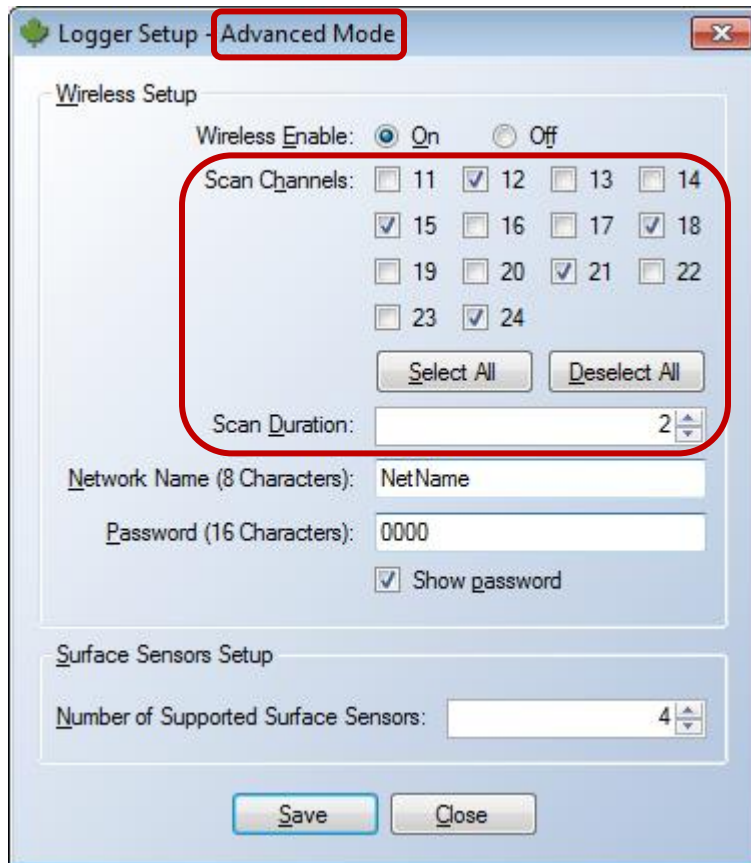
---

In order for the wireless logger to function properly, the **Wireless Enable** option should be on, and the **Number of Supported Surface Sensors** should be set to 4.

Now, write down your network name and password somewhere because the same network name and password should be assigned to the DataCan Wireless ZigBee Receiver for wireless communication to function properly. The next section will describe how to setup the DataCan Wireless ZigBee Receiver.



You can also change the preferred operating channel number(s) used for the wireless network in **advanced mode**. To switch to **advanced mode**, press **Ctrl + Shift + Alt + A** simultaneously on the keyboard.



The software will use the channel numbers 12, 15, 18, 21, and 24 by default. The “good” operating channel will be determined from the list of **Scan Channels** when forming the wireless network. The **Scan Duration** is the exponent value to calculate the time to spend on determining the operating channel for the network to operate from the list of scan channels. Determining the operating channel time is measured as:  $(\text{Number of Scan Channels}) * (2 ^ \text{Scan Duration}) * 15.36$  milliseconds. By default, the software will use 2 as scan duration.

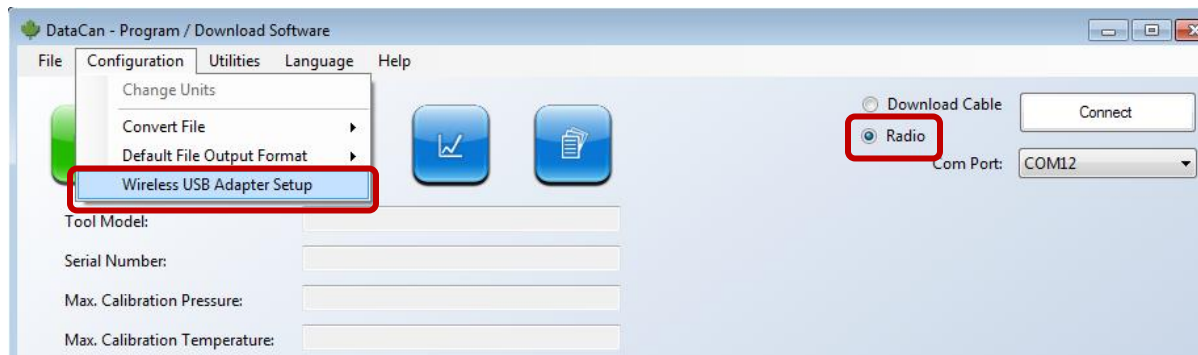
With 5 scan channels and 2 scan duration, it will spend about 307.2 milliseconds ( $= 5 * (2 ^ 2) * 15.36$  milliseconds) on determining the operating channel. Determining the operating channel time longer than 400 milliseconds could cause slow searching time for wireless loggers. Thus, it is best to keep the number of scan channels at most 5 and scan duration at most 2 or 3 depending on the number of scan channels.

Please use the default values if unsure. Also make sure to use the same values for the DataCan Wireless ZigBee Receiver if you change these values.

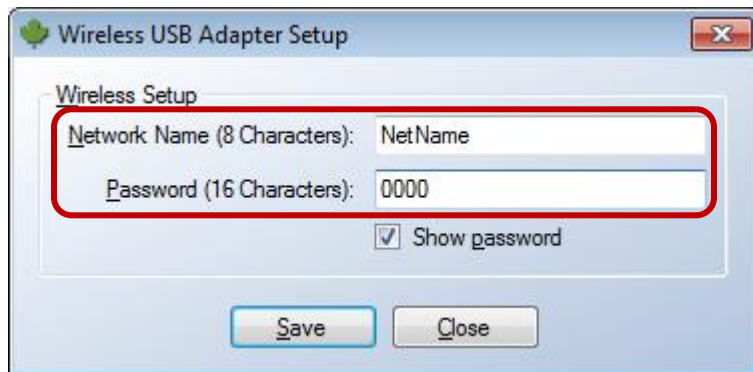
## 11.4.7 DataCan Wireless ZigBee Receiver Setup

To change the DataCan Wireless ZigBee Receiver Setup, disconnect the logger from the DataCan Download Cable and unplug the cable. Next, connect the DataCan Wireless Zigbee Receiver to your computer and click the **Radio** option near the **Connect** button, then select the **Wireless USB Adapter Setup** option from the **Configuration** menu bar at the top.

**Note:** There is no need to click the **Connect** button to change the DataCan Wireless ZigBee Receiver Setup.

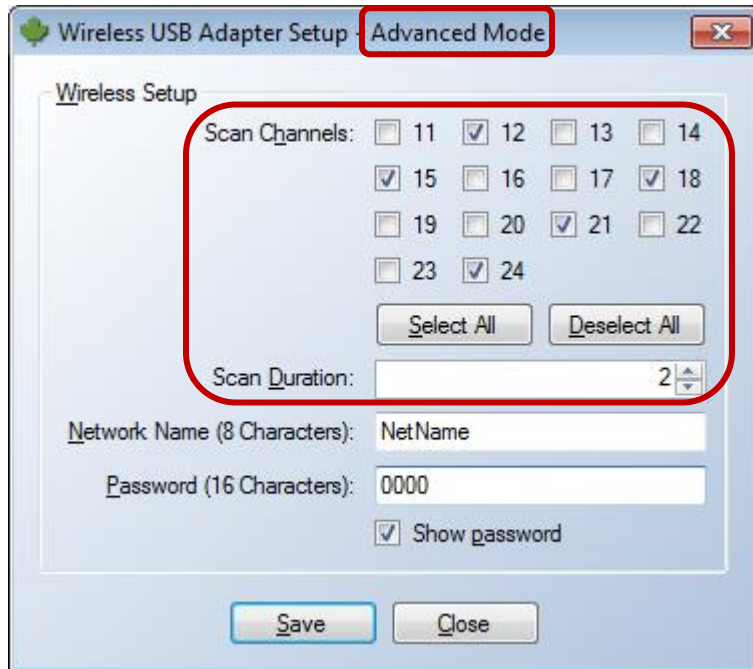


The following dialog box which is similar to the Logger Setup will appear:



Now, use the same network name and password that were used for the Wireless Logger Setup in the previous section, then hit the **Save** button to save the changes in the DataCan Wireless ZigBee Receiver. Please make sure that the wireless logging works after modifying the network name and password.

If you changed the **Scan Channels** and **Scan Duration** for the Wireless Logger Setup in the previous section, the same values should be used to setup the DataCan Wireless ZigBee Receiver as well. To change the Scan Channels and Scan Duration, enter **advanced mode** by pressing **Ctrl + Shift + Alt + A** simultaneously on the keyboard.



### 11.4.8 List of ZigBee Wireless Channels

The table below shows the list of channels available for ZigBee wireless in the 2.4 GHz band. The highlighted rows are the default channels that the software will use.

Channel Number	Frequency
11	2.405 GHz
<b>12</b>	<b>2.410 GHz</b>
13	2.415 GHz
14	2.420 GHz
<b>15</b>	<b>2.425 GHz</b>
16	2.430 GHz
17	2.435 GHz

Channel Number	Frequency
<b>18</b>	<b>2.440 GHz</b>
19	2.445 GHz
20	2.450 GHz
<b>21</b>	<b>2.455 GHz</b>
22	2.460 GHz
23	2.465 GHz
<b>24</b>	<b>2.470 GHz</b>