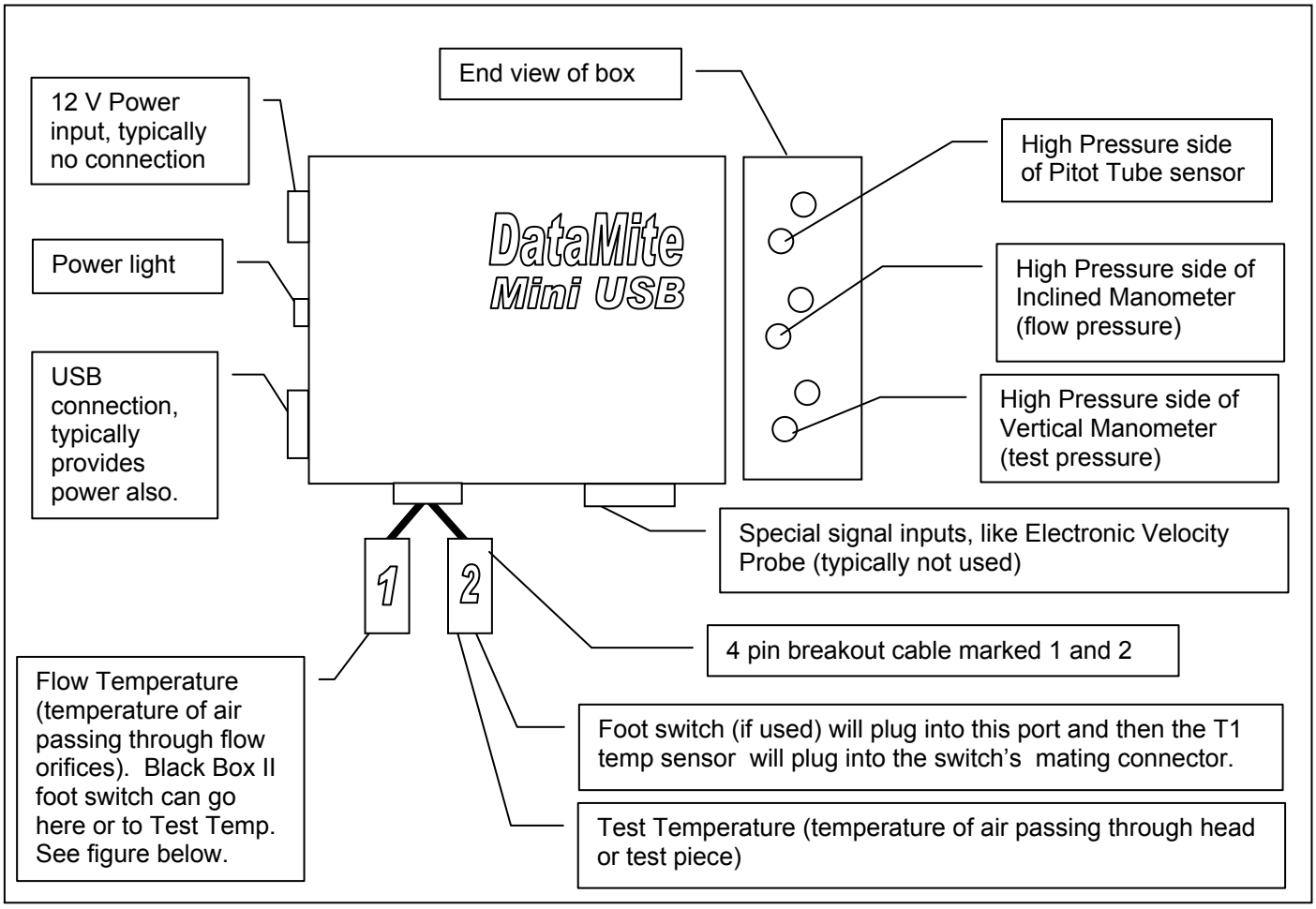
Check page 5 for “factory calibration”

Performance Trends’ “Mini USB”

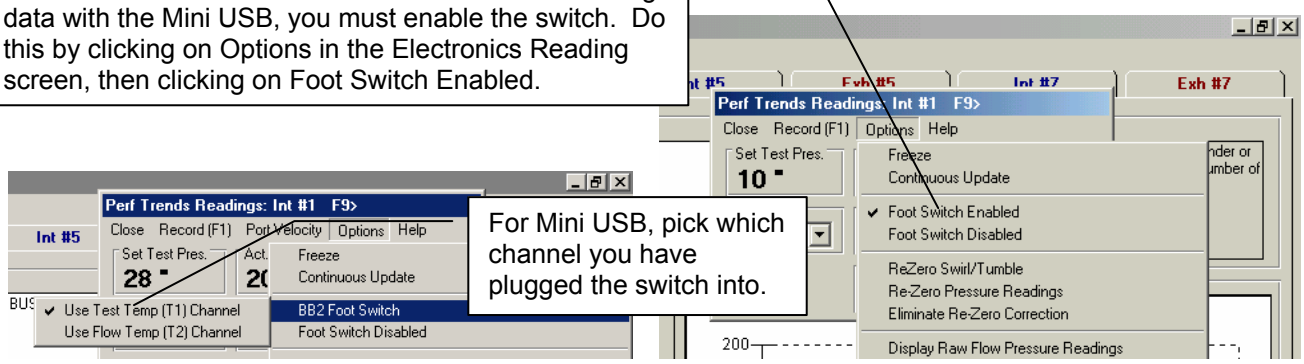
Instructions for Hookup to Flow Bench

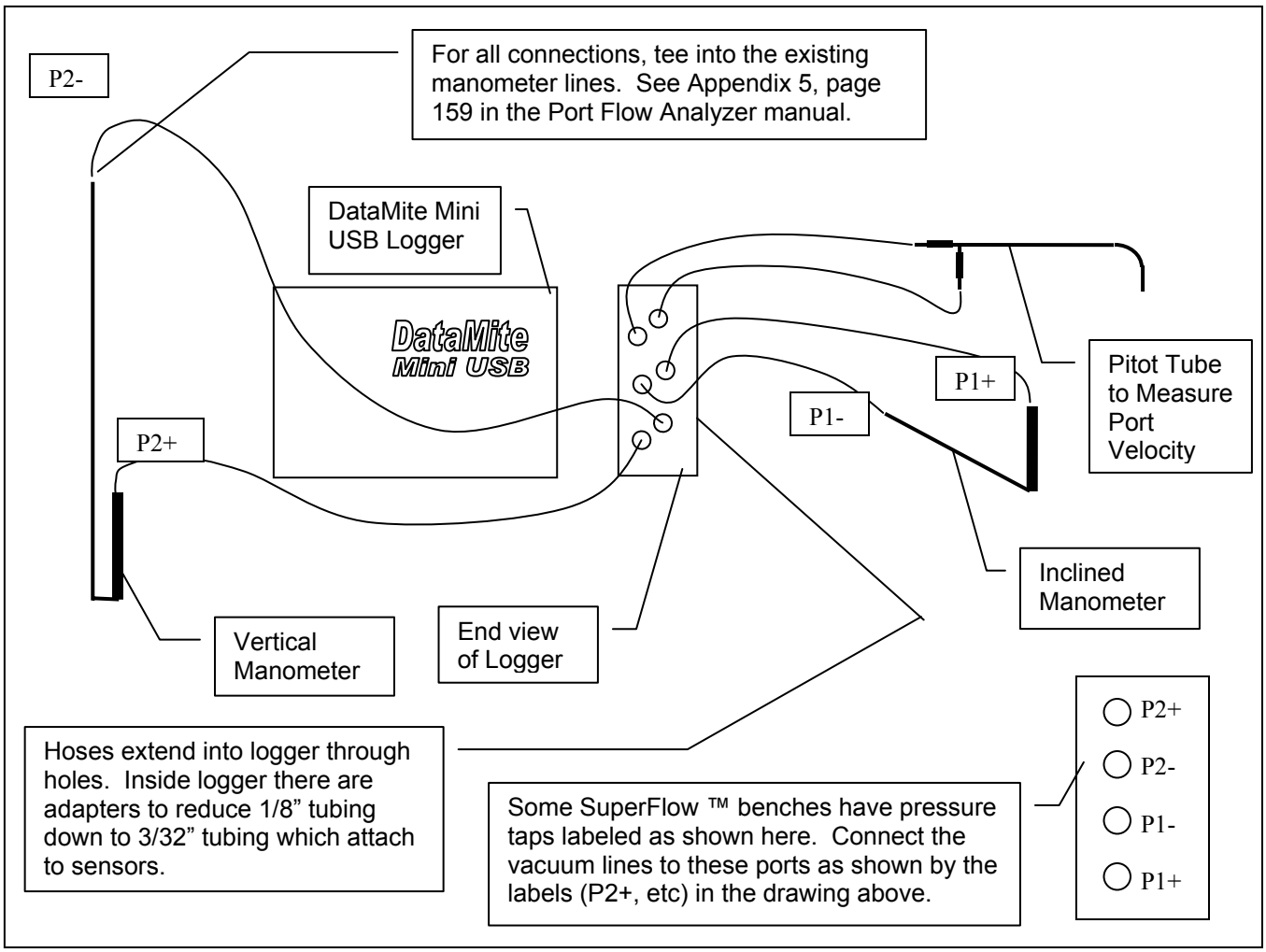
Performance Trends’ “Mini USB” data logger will record data from your flow bench to greatly enhance your flow bench testing. The 2 figures below give an explanation of the various connections to the Mini USB, and how it hooks up to a typical SF 110, 600 or 300 or custom style flow bench.



Enable Foot Switch

To enable the use of a foot or hand switch for recording data with the Mini USB, you must enable the switch. Do this by clicking on Options in the Electronics Reading screen, then clicking on Foot Switch Enabled.

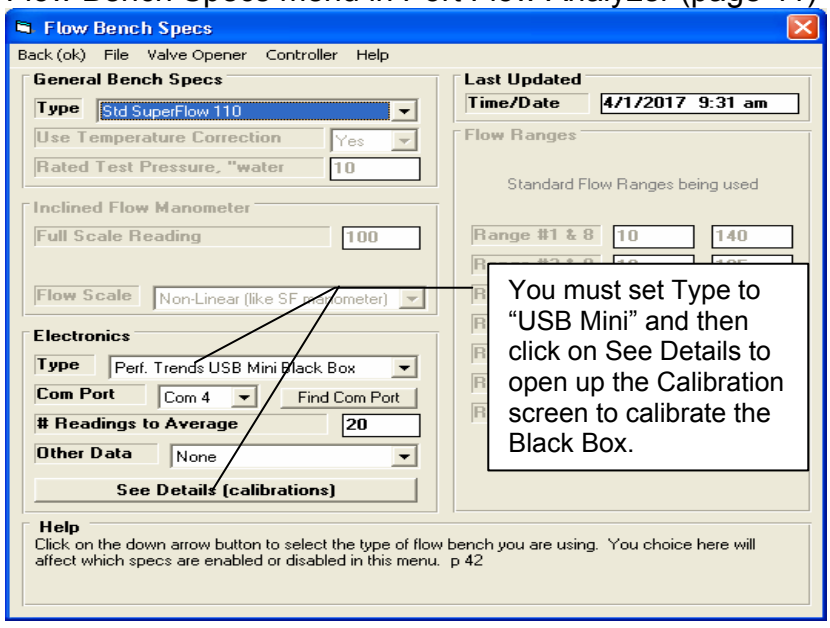




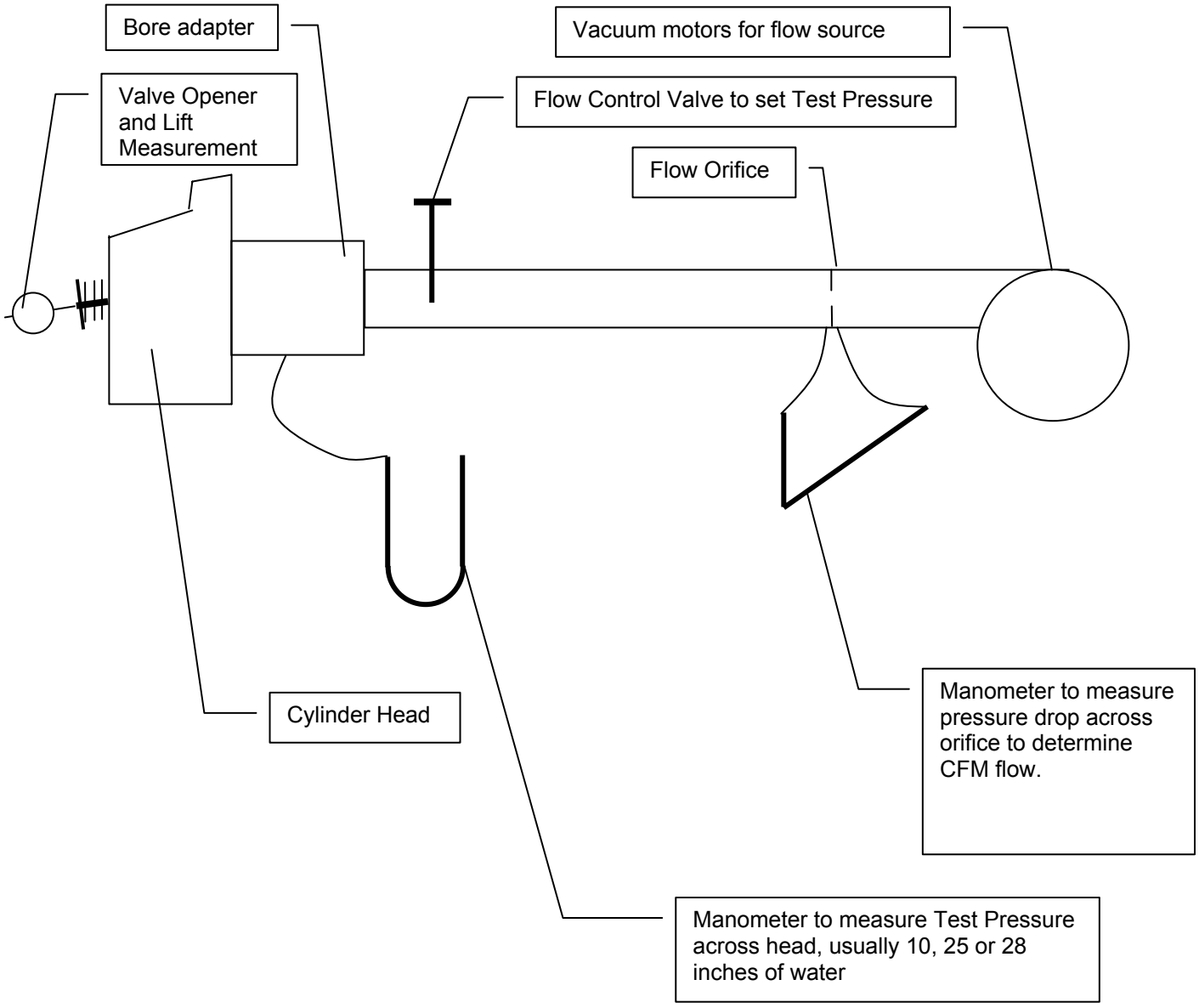
After you hook up the Mini USB, you must enter the calibration numbers listed on page 5 of this document. Rarely, you may want to do your own calibration, following the procedure outlined in Appendix 5, starting on page 159.

You must specify that you are using a Mini USB Type of Electronics in the Port Flow Analyzer as shown in the menu to the right. You must also click on the "See Details (calibrations)" button to calibrate the sensors to match the manometers on your bench. See Page 41 in manual.

Flow Bench Specs menu in Port Flow Analyzer (page 41)



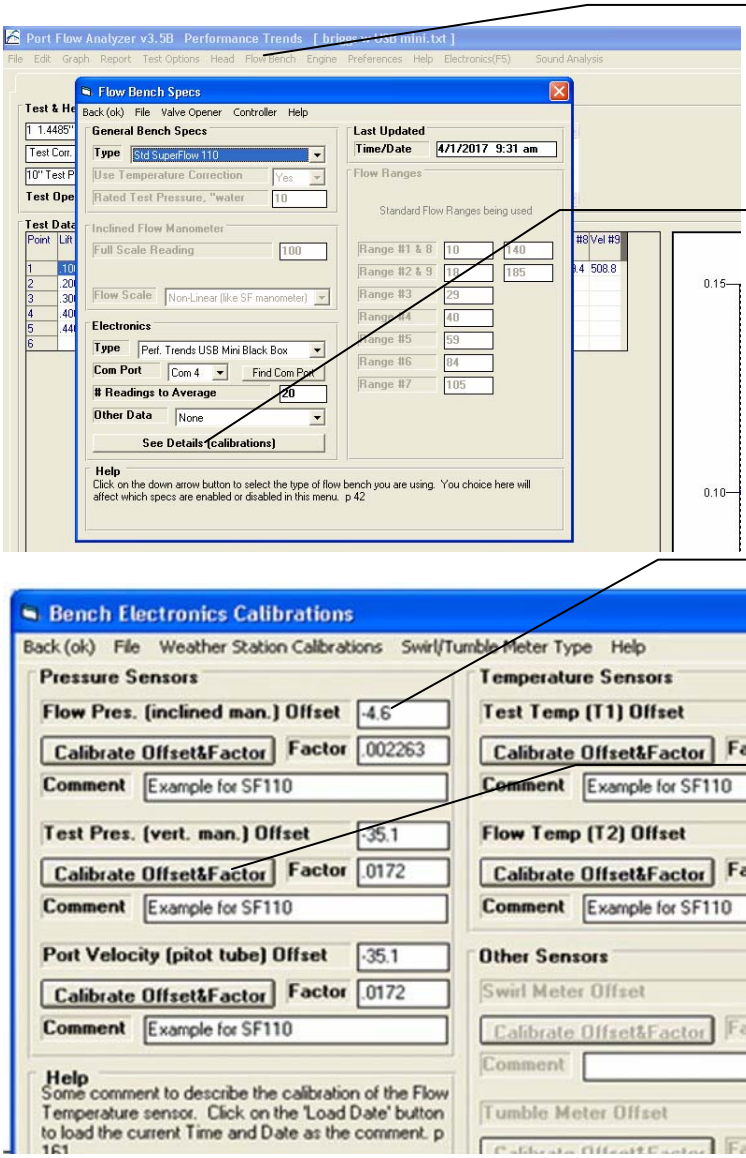
Schematic of Typical Custom Flow Bench



For more information, visit www.performancetrends.com and check out:

Port Flow Analyzer (software and flow bench accessories)
Swirl Meter
Tumble Fixture

Black Box Setup in Port Flow Analyzer Software



Click on Flow Bench at top of Main Screen to bring up Flow Bench specs screen shown here.

Click on See Details (calibrations) to enter typical calibrations for sensors in Mini USB.

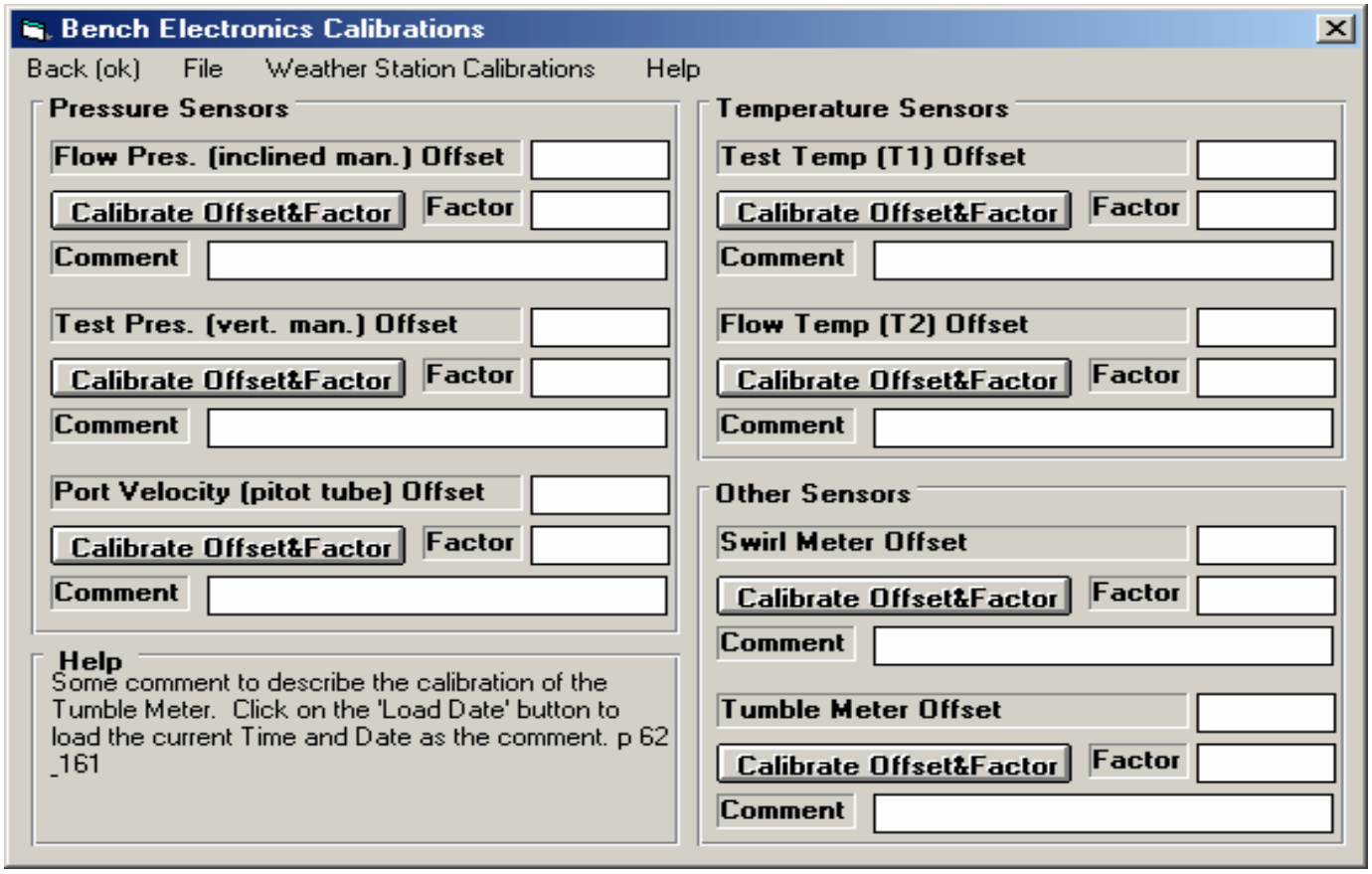
Enter both the Offset and Factor for the sensors you are using. See the table below for typical calibration values.

Unless you are familiar with calibrating sensors, it is typically best to use the factory calibrations provided in this booklet. If you feel comfortable calibrating sensors, click on the Calibrate Offset & Factor button for the different sensors and follow the instructions given by the program.

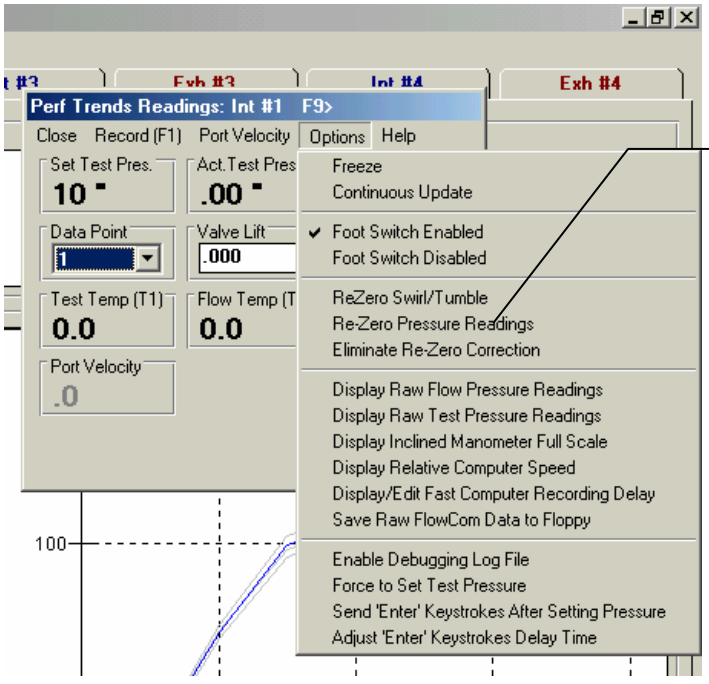
Typical Mini USB calibration numbers for a Custom and some SuperFlow Benches include:

	Offset	Factor
(Non-linear SuperFlow type manometers)		
Flow Pres, SF110 (% scale, 0.3 psi sensor)	-4.6	.002263
Flow Pres, SF300/600 (% scale, 1.0 psi sensor)	-2.6	.001267 for SF600 .00286 for SF300
Test Pres (0.3 psi pn 7002 sensor)	-10.2	.005
Test Pres (1.0 psi pn 7007 sensor)	-35.1	.0172
Test Pres (3.6 psi pn 7025 sensor)	-113	.055
Test Temperature /Flow Temperature	35	.0335 (updated 3/27/19)

Factory (typical) Calibration for Mini USB SN _____



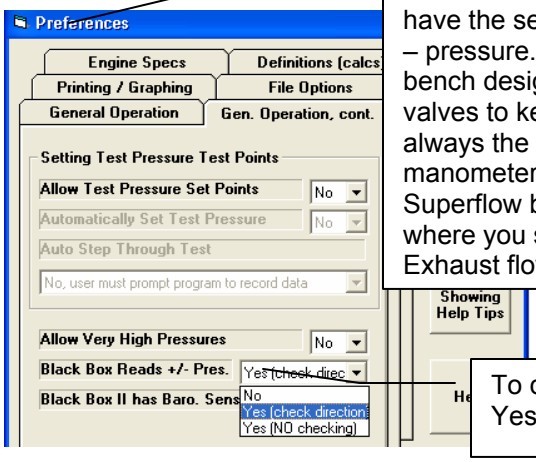
Enter the calibration numbers above for your Mini USB to get a typical “factory” calibration.



During testing, you can click on Options, then click on one or both of the “ReZero” options to better “fine tune” the factory calibration. Using a factory calibration from the numbers above and then using the “ReZero” options is generally sufficient for most testing.

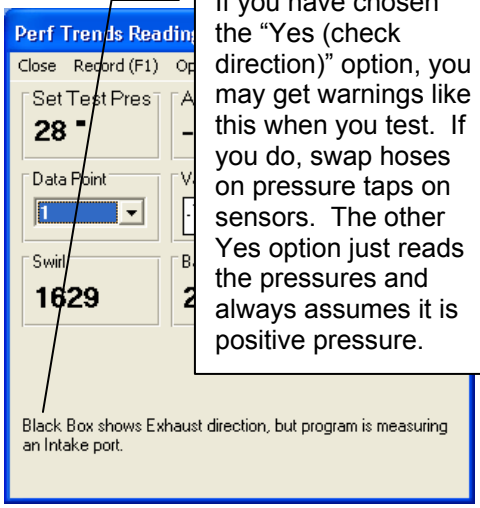
NOTE: Non-repeatability is often due to constantly changing (recalibrating) the calibration numbers in the screen above. Using the “ReZero” option should only improve the repeatability and keep data accurate.

Mini USB (Black Box) Reading Positive and Negative Pressure

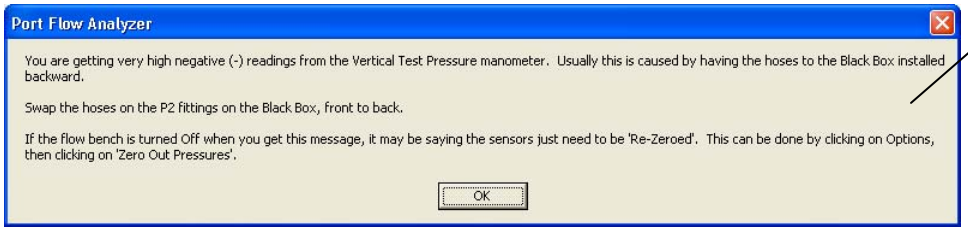


A Preference in the program lets you have the sensors measure both + and – pressure. This lets you simplify your bench design. Otherwise you need valves to keep the high pressure side always the high pressure side of the manometers and sensors, like in a Superflow bench, or swap hoses where you switch from Intake to Exhaust flow direction.

To do this, choose either Yes option in Preferences.

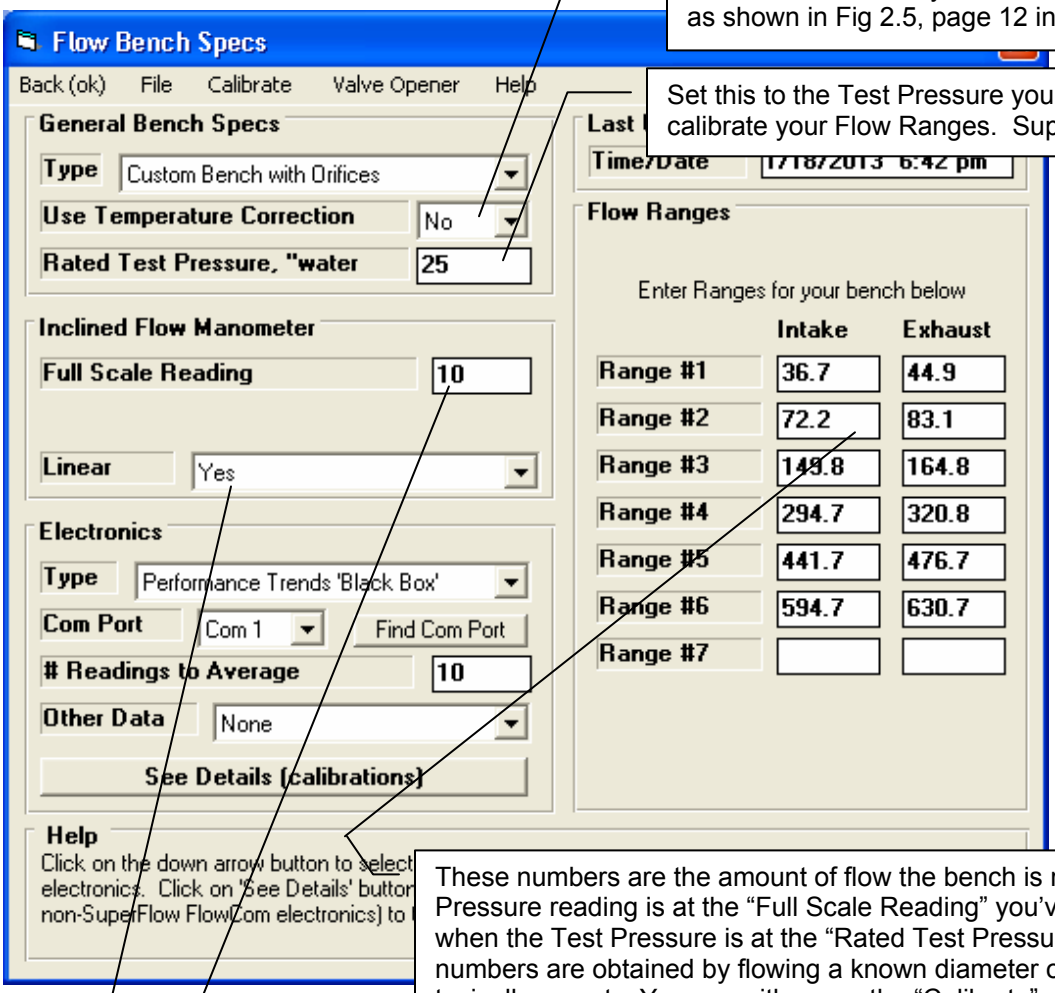


If you have chosen the “Yes (check direction)” option, you may get warnings like this when you test. If you do, swap hoses on pressure taps on sensors. The other Yes option just reads the pressures and always assumes it is positive pressure.



Here’s another type of message you may get as the program checks to see if the pressure readings make sense.

Typical Custom “Do it yourself” Bench Settings



Choose “No” unless you have a “blower centered” bench as shown in Fig 2.5, page 12 in the Port Flow manual.

Set this to the Test Pressure you are using when you calibrate your Flow Ranges. SuperFlow uses 25”.

These numbers are the amount of flow the bench is measuring when your Flow Pressure reading is at the “Full Scale Reading” you’ve entered on this screen, when the Test Pressure is at the “Rated Test Pressure” on this screen. These numbers are obtained by flowing a known diameter orifice where the head typically mounts. You can either use the “Calibrate” option at the top of this screen, or by filling out the worksheet at the end of Appendix 2, page 150 in the Port Flow manual to determine these numbers.

Set this to the maximum reading you will see on the Flow Pressure (inclined) manometer. If you are not trying to match an inclined manometer (no manometer is present), enter the maximum pressure you will measure with the Flow Pressure sensor. This maximum pressure should be in the same units as the Flow Pressure sensor is calibrated in. For example, if you enter the factory calibration numbers which are in Inches of Water (page 4), then this will be the maximum Inches of Water pressure you will likely see for Flow Pressure. In the screen above, it is set to 10” water if we used the factory calibration numbers. NOTE: If you go above the Full Scale Reading, the program will still calculated flow, so this entry is not critical.

Set this to Yes unless you are trying to match some special “non-linear” manometer like what SuperFlow uses on their benches. See examples below:

Linear Scale: | ‘ | ‘ | ‘ | ‘ | ‘ | Non Linear Scale: || | | ‘ | ‘ | ‘ | ‘ |