

Pressure Transducer Calibration



Introduction

To obtain accurate data with a pressure transducer there are a number of steps required prior to collecting data.

Before starting, there needs to be consideration of the appropriate voltage and pressure range, zeroing of the transducer and amplifier and very importantly calibration of the system.

Amplifier and Transducer Setup

1. The transducer and amplifier must be zeroed before calibrating or recording signals. All transducers produce a small offset which needs to be removed before calibration. Bridge Amplifiers and transducers should be connected and turned on a few minutes before calibration.
2. If using fluid filled transducers the dome should be filled with fluid prior to calibration and the tap open to air. You must make sure there are no air bubbles within the dome prior to calibration.
3. If using a Millar Pressure catheter attach the catheter to the bridge amp using the appropriate AEC cable. Pre-soak the tip of the catheter in sterile water or saline for 30 minutes prior to balance (zeroing) and calibration.

Hardware and Software Setup

4. In Chart, open the Bridge Amp Dialog from the Channel pop up menu and click on the Zero button. During the zeroing, which can take up to 20 seconds, make sure that the transducer is not moved.
5. Care must be taken when determining an appropriate range for your pressure transducer. If the range is too large, the resolution will be poor and small fluctuations will not be seen. Conversely, if the range is too small, the signal will go out of range and you will lose data. Most transducers (on 10 V excitation) have an output of ~ 3.5 mV/100 mmHg.
6. To select the correct range, connect the transducer to a manometer and increase the pressure to above that which you expect to record. For example, if you know your signal will not go over 180 mmHg, increase the pressure to 200 mmHg. Read off the mV value in Chart for that pressure and set the range to 20% above that. For example, if the mV reading for 200 mmHg is 8 mV, set the range to 10 mV.

Transducer Calibration

7. It is recommended that this be done before every experiment. Use a manometer to record two levels of pressure. For example if the nominal pressure to be measured is 120 mmHg, record a pressure at 90 mmHg and another at 150 mmHg.
8. For fluid filled transducers increase the pressure using a manometer
9. For Millar Pressure Catheters the following equipment is required (see Fig 1):
 - Mercury (or equivalent) manometer
 - T-piece with plastic dome (like Touhy Borst Adapter)
 - Millar catheter
 - Syringe
10. Insert the tip of the catheter into the plastic dome (as in Fig 1). Start recording in Chart and increase the pressure using the syringe.

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Units Conversion

11. Select an area of the recording which contains the two known pressure levels and click on Units Conversion. The Units Conversion Dialog will display the recording that was selected (as in Fig. 2).
12. Units Conversion
 - a. Select part of the recording for the first pressure value in the preview window and click on Point 1 (the voltage in mV for that pressure will be entered into the left-hand box).
 - b. Type in the known pressure value this selection represents in the right hand box.
 - c. Repeat the above steps for the second pressure recording for Point 2.
 - d. Select the units mmHg from the pop up list.

Note: The Units Conversion is intended for use in linear ranges. If the signal is non-linear, download the free Multipoint Calibration Extension (Win & Mac) for Chart v5 from our software section at www.adinstruments.com.

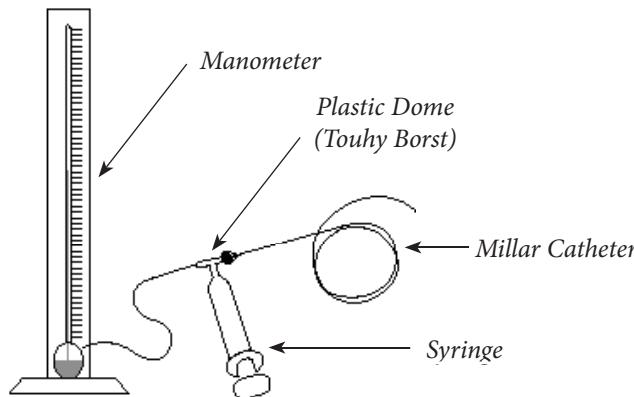


Figure 1

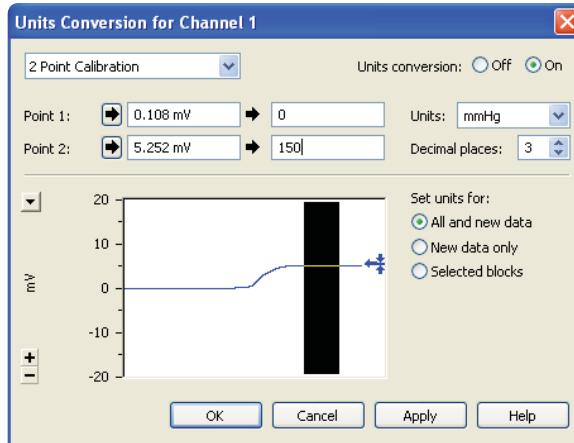


Figure 2