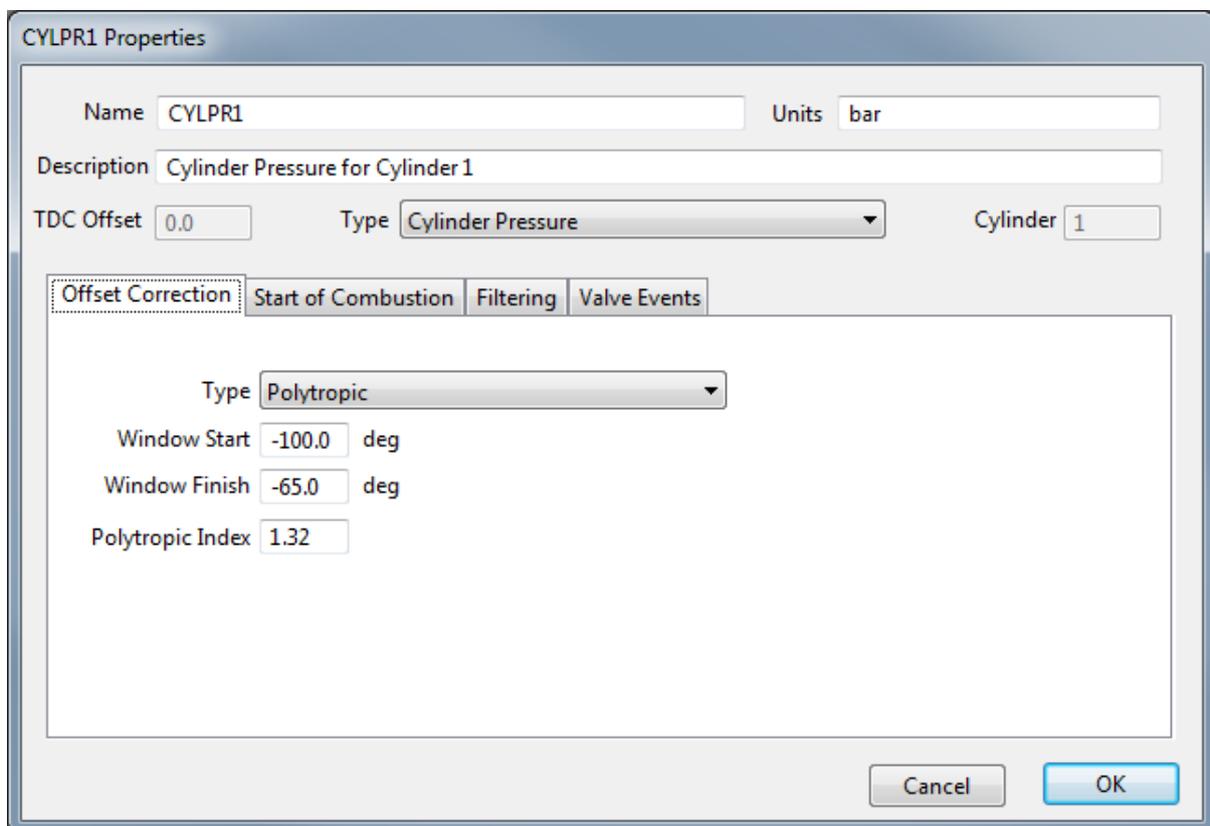**Offset Correction**

Most cylinder pressure transducers are piezoelectric which means in practical terms that they measure rate of change of cylinder pressure rather than absolute pressure. In order to turn the signal into something useful an offset must be calculated and applied to each combustion cycle.

There are two main methods, firstly pegging the cylinder pressure and intake manifold pressures equal to each other at some point during the intake valve event and secondly fitting the initial compression process to a polytropic compression with known index.

To configure the offset correction select "Acquisition" then "Configure DAQ". Select the required channel either by double-clicking on the channel in the list or by highlighting the channel and clicking "Edit". In the "Edit Channel" dialogue select "Properties".

Figure 1: Channel Properties

None

No offset correction is applied. Use this method if the pressure transducer signal requires no offset other than the voltage slope and offset.

Fixed Value

A fixed offset correction in bar is applied. This is the same as applying the offset in the voltage slope and offset configuration.

Polytropic

The initial compression phase, between the intake valve closing and the start of combustion is fitted to a polytropic compression with a specified index.

For a gasoline engine an index value of 1.32 is suggested. For a Diesel engine a value of 1.37 is used.

This offset correction is calculated for every combustion cycle. It has the benefit that no additional parameters need to be recorded. A window between -100 and -65 degrees is recommended.

Reference Channel

This sets the mean pressure of the channel during a window to be that of a reference channel during the same window. Normally the reference channel would be that of the intake manifold pressure. The window would be during the intake valve opening period at a point where the pressure in the cylinder has equalised with that of the intake manifold. An approximate window would be around -300 to -240 degrees.

Mean

This sets the mean pressure of the channel during a window to be that of a fixed reference pressure. Normally this would be a point during the intake valve opening period where the intake manifold pressure could be estimated. An approximate window would be around -300 to -240 degrees.

Reference Channel (Absolute CA)

This works in a similar manner to the "Reference Channel" method except the reference channel window is not moved to account for the TDC offset between the channels. This is useful if you want to peg cylinder pressure signals to each other, where the first cylinder is pegged using one method and the other cylinders assume the same reference pressure. You would do this by using a reference window similar to the polytropic method, -100 to -65 degrees.