Pressure sensor interface.

In this application an interface is described to digitise a bridge type pressure sensor by means of the UTI and a low cost PIC processor. A duty cycle output can be used to generate an analogue output signal. Due to the calibration option almost each type of pressure sensor can be applied with an accuracy of much more then 0.1 %.

Overall System description.
By means of the UTI the sensor bridge is digitised. In the PIC controller the digital output is calculated by means of the three signal method. The pressure value is measured about every 100 ms. And the result is calculated according to a second-order equation : $Y= a.x^2+b.x+c$. Every calculated result is also available as 20 MHZ 10-bit PWM output. This output is low-pass filtered to get an analogue output. The digital output is transferred into a RS232 signal format(19.200 baud).

Calibration.
In order to calibrate the sensor the user has to write the coefficients of the equation (a, b and c) into the flash data memory of the micro. For calibration and calculation a small programme is available. This calibration can be performed on each "position" of the full range.

Evaluation software.
For demonstration purposes a small programme is available. Please contact our sales department.

Costprice and performance.
The described system only can be considered as a concept. With this example it is very easy to build a pressure sensor (or other bridge type sensor) with both a analogue and a digital output. Due to the calibration possibilities, linearisation and range definition are simple. This calibration can of course also be automised. Considering the cost-price it can be stated that only two major components are needed; the UTI and the PIC controller. Therefore a volume production-cost-price estimation of less then USD 10.00 is realistic.

For more information please contact us or our nearest dealer.
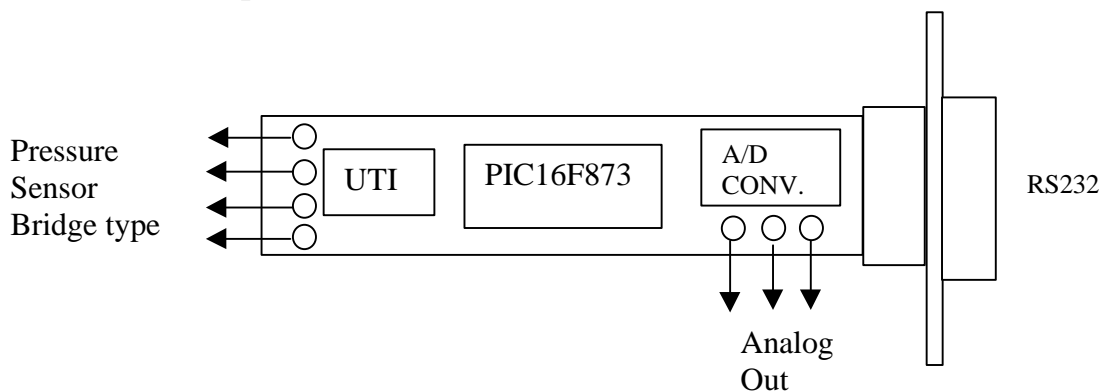
Pressure sensor interface board.

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