



WATER & SOIL

Setting Full Scale & zero offset for PTX 1830

In order to measure the 4-20 mA output of the PTX 1830 the current from the sensor is passed through a 100 ohm precision resistor and the voltage across this resistor measured.

To calculate the DataHog full scale and zero offset figures for your PTX 1830 you should proceed as follows.

The PTX 1830 sensor will be supplied with a calibration certificate giving the output of the sensor.

$$4 \text{ - } 20 \text{ mA} \quad = \quad 0 \text{ - } 10.00 \text{ mH}_2\text{O}$$

This means that the sensor range is

$$16 \text{ mA} = 1000.0 \text{ cm H}_2\text{O}$$

So the sensor sensitivity is $1000.0/16 \text{ cm H}_2\text{O per mA}$
 $= 62.5 \text{ cm H}_2\text{O per mA}$

The current from the sensor is passed through a 100 ohm resistor in the datalogger. So the sensitivity for the DataHog calculations is

$$\begin{aligned} & 62.5/100 \text{ cm H}_2\text{O per mV} \\ & = 0.625 \text{ cm H}_2\text{O per mV} \end{aligned}$$

So the full scale value for the DataHog would be

$$\begin{aligned} & (0.625 / \text{Gain}) * 2000 \quad (\text{see page 19 of} \\ & \quad \text{manual}) \\ & = 1250.0 \text{ cm H}_2\text{O} \end{aligned}$$

Note that the gain of the DataHog has been set to 1 (Gain code 00)

The zero offset of the sensor is 4 mA (that is the output of the sensor when the input to the sensor is zero).

Since the current from the sensor is passed through a 100 ohm resistor then the zero offset for the purposes of the DataHog calculation is

$$\begin{aligned} & 4 * 100 \text{ mV} \\ & = 400 \text{ mV} \end{aligned}$$

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So the zero offset value for the DataHog would be

$$400 * \text{Gain} * 9.5 \text{ (See page 19 of manual)}$$
$$= 3800$$

The sign of the offset is +

Since there may be a small offset in the sensor and logger system before immersion then for best accuracy this can be measured by the logger.

This has been done for the supplied sensor and the offset found to be +3808. This represents a 0.5 cm difference from the ideal zero offset of 3800.

The same procedure can be followed for any PTX 1830 sensor by using the appropriate figure for the sensor output.

