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Technical Note 16

Converting the output of a 4-20mA signal from a PXD Transducer or the Level TROLL

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A 4-20mA capable device such as the In-Situ manufactured PXD-261, PXD-461, and Level TROLL can be connected to a number of online systems and will accept of a wide range of voltages:

PXD-261, PXD-461: 11.6-40 V DC
Level TROLL: 8-36 V DC

In some cases, however, it may be necessary to adjust the output of the 4-20 mA signal.

While it is possible to convert the output of the signal (from 4-20mA to 1-5mA for example) it is important to note that the PXD transducers and the Level TROLL contain a self-regulating power circuit which will try to maintain a constant 4-20mA output regardless of the voltage input and/or resistance on the line, assuming that the voltage requirements of the units are met (i.e. the internal power circuit will work to overcome any additional resistance on the line to supply the standard 4-20mA signal). Therefore, simply adding resistance to the line is not enough to change the signal output while too much resistance may reduce the input power causing the unit not to function.

This aspect of a 4-20mA unit ensures a highly accurate reading even with extremely long runs of cable, but makes it more complicated to modify the signal output. The following example illustrates how to change the output of the standard 4-20mA signal to 1-5mA. Small adjustments of the resistors values may be needed to maintain a ratio suitable to control the signal output. When selecting the resistor values, keep in mind the following formula:

$$\frac{R_m \text{ (Can vary. Typically 50-100}\Omega)}{R_1} = 3$$

Where:
R_1 = Resistance of the cable (Ω)
R_m = Resistance of the meter (Ω)
Ω = Ohms

Figure 1 illustrates the circuit that is required to change the 4-20mA output signal to 1-5mA.

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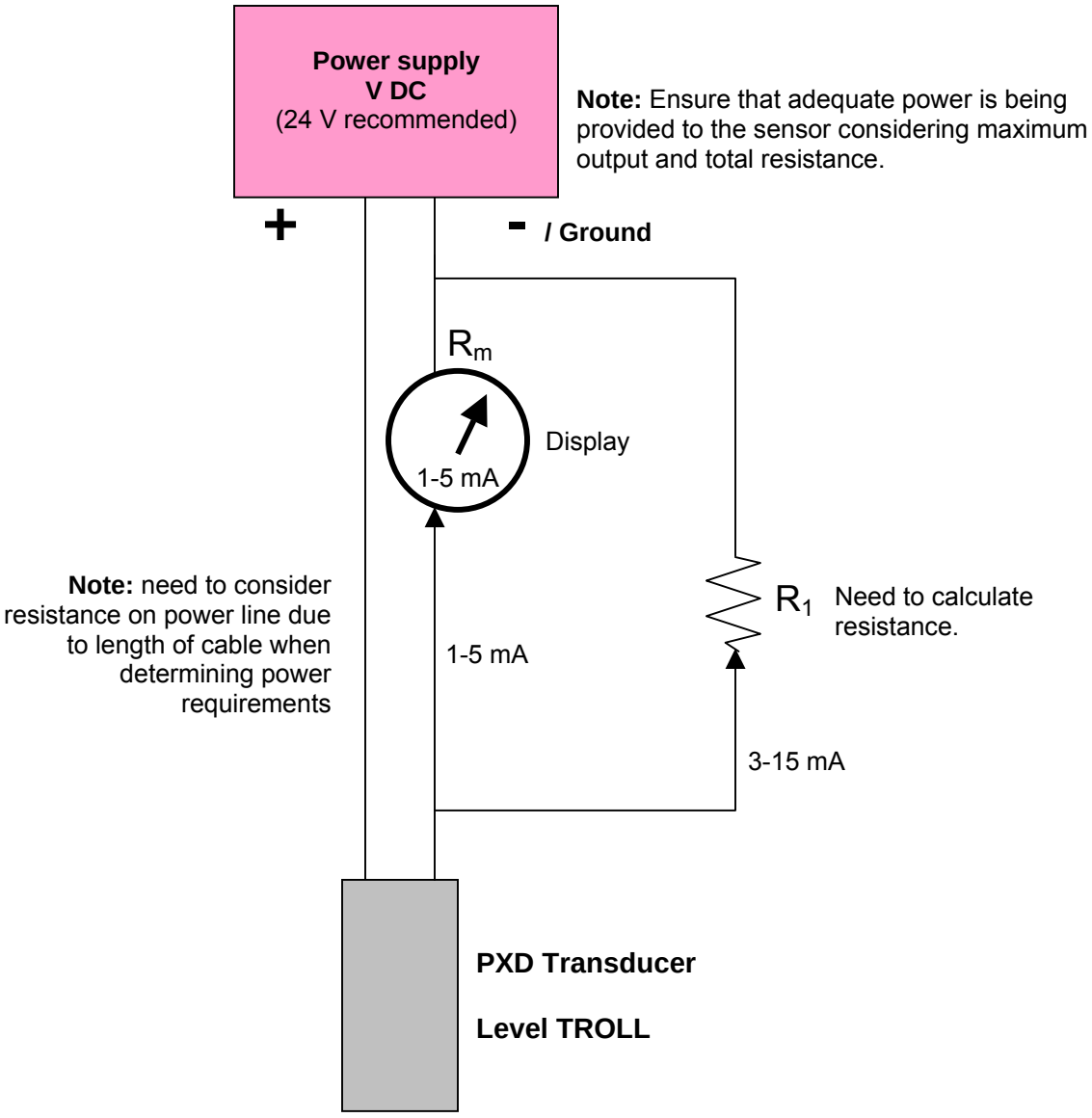

Figure 1

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