Pribusin Inc.

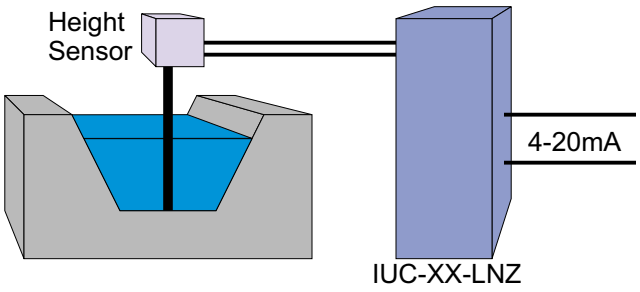
Section 7

Sample Applications

Sample Applications - Go with the Flow

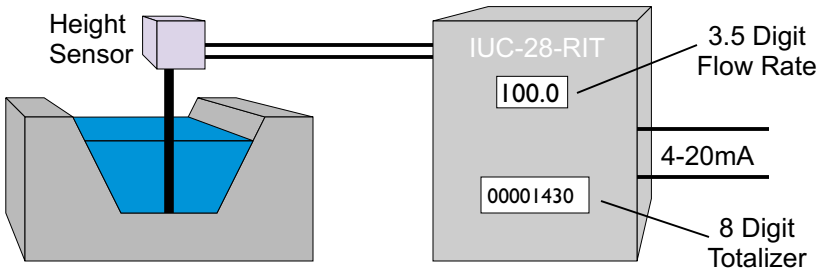
Measuring and controlling flows is a wide-spread applications field. Here are some applications where Pribusin's instruments have excelled.

Example 1: The flow of waste-water over a weir is to be determined and used to control a flow gate. The weir has a float with a sensor that returns a 4-20mA signal indicating the height of water over the weir.



By using a Pribusin Linearizer the height signal from the height sensor is converted to an actual flow signal indicating the amount of water flowing over the weir.

Example 2: Using the above example as a base, we may need to find the total amount of water flowing over that weir (or in a pipe) over a period of, say, a day. This may be used for performance records, billing, etc.



Using the IUC-28-RIT both functions of controlling the water flow and measuring it over a period of time can be accomplished together. The IUC-28-RIT comes in a NEMA4 type enclosure making it ideal for locations exposed to high moisture and occasional splash water.

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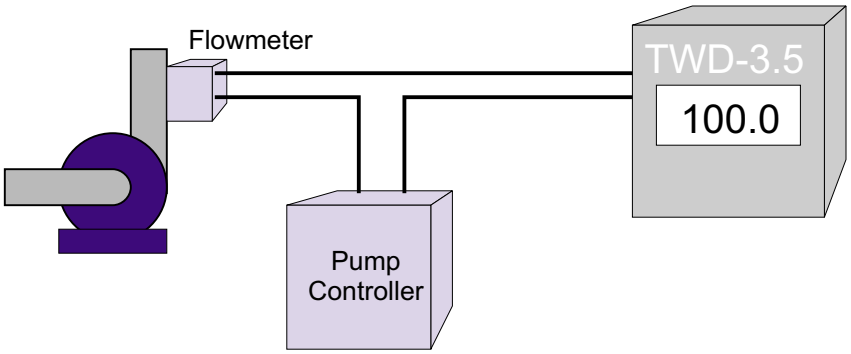
Sample Applications - Displays of Truth

Most control applications never require operator intervention but in some cases it's important that an operator be able to verify the status of a process. For this, a display showing the process signal level can easily be added to the existing circuitry.

Example 1: A flowmeter on a pipe measures the flow rate of a liquid and controls a pump. Under certain circumstances an operator may have to intervene and manually control the pump. But the operator doesn't really know the flow rate under manual control.

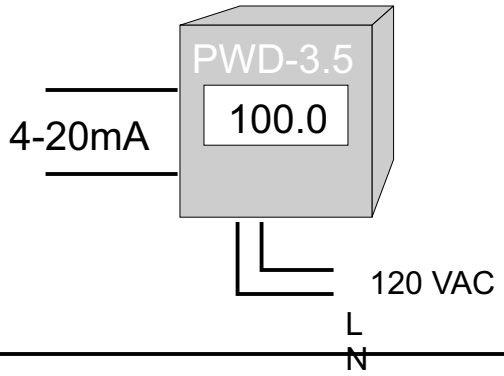


By using a Pribusin Two-Wire Display virtually no modifications are required in the loop other than splicing the display into the loop somewhere. Only 125 ohms of additional load are placed into the loop which is easily handled by most existing loops.

The display can be setup to display any range from 0-1999 complete with 3 decimal points. This makes it very easy to display meanigfull data on a certain process.

Example 2:

If not enough power is available in the loop to run a 2-wire display or if there is no loop an alternative is the TWD-3.5 which is the powered version. It has a built-in 24VDC supply to provide power to a field transmitter.



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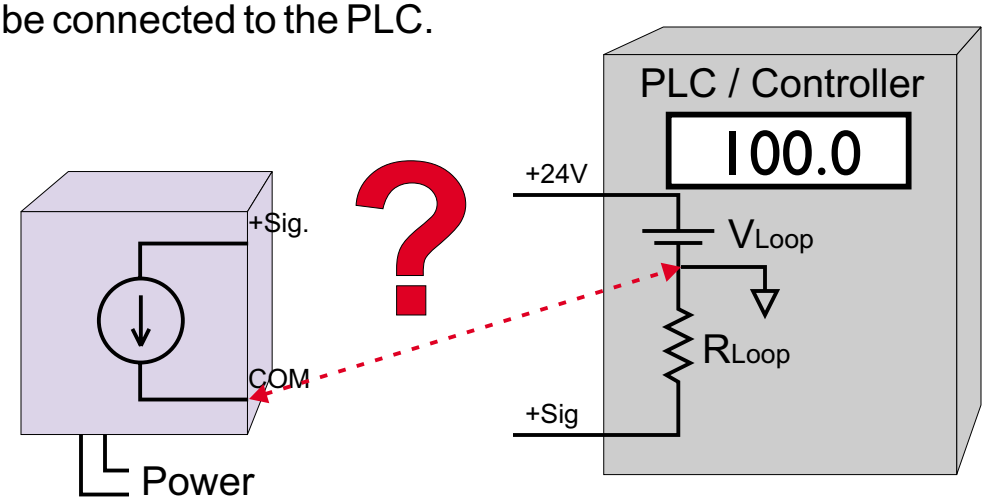
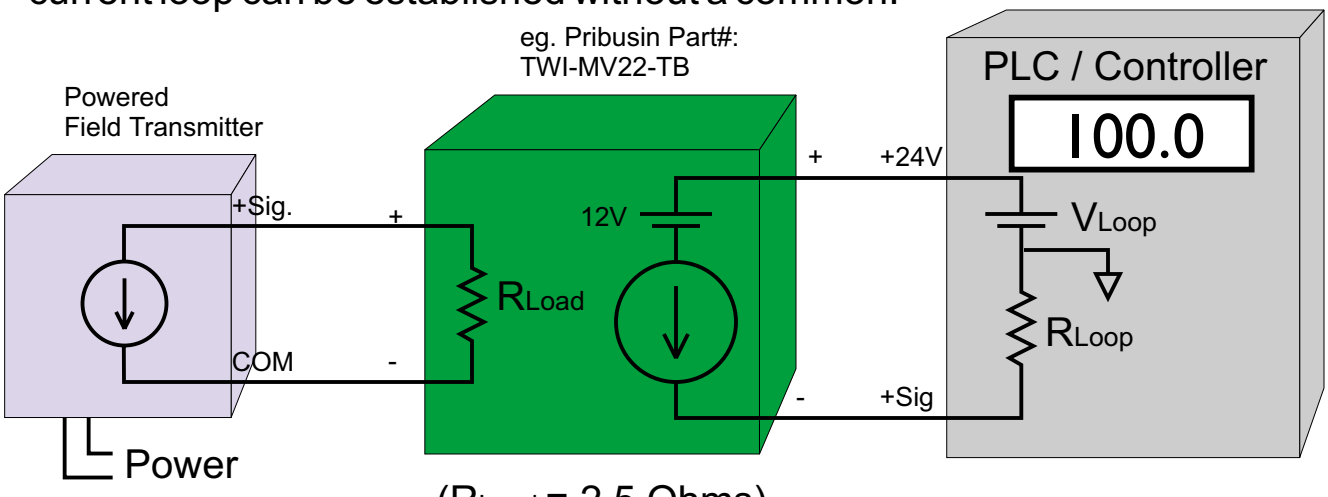
Sample Applications - Taming the PLC

Some PLC's have specialized inputs that can make it difficult to connect certain instruments. The most frequently encountered problem is one where the PLC input is designed to accept a 2-wire instrument only.

Example 1: A PLC has only a 2-wire input with terminals for +24V and +Signal. A powered field transmitter supplies a powered 4-20mA loop and is to be connected to the PLC.



The PLC has no external connection for the signal common. As a result a powered 4-20mA loop cannot be connected because no complete current loop can be established without a common.



(R_{Load} = 2.5 Ohms)

By using Pribusin's TWI-MV22-TB Isolator, the connection can be accomplished while at the same time isolating the two loops. From the PLC side, the TWI-MV22-TB isolator looks like a 2-wire instrument. From the field transmitter side, the isolator looks just like another loop load.

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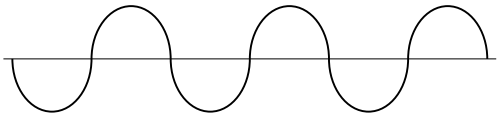
Sample Applications - Power Measurement

Various applications require the monitoring of power consumption. In a motor, for example, current draw is an indication of torque load. To prolong the life of the motor, a limit on the torque load may have to be adhered to. Other applications may require the monitoring of AC line voltage or total power comsumption (watts).

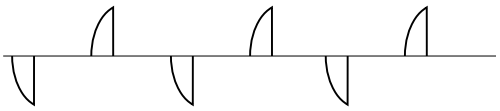
Average vs. RMS

For most loads an average value of voltage or current is sufficient. Applications such as motors, incandescent lights, heaters and linear power supplies have almost pure sine wave power waveforms. The average value provides a good indication of the actual value.

In applications where power switching is used, the resulting waveforms may not be sinusoidal. An average value would provide a poor representation of the actual value. A much better actual value comes from the Root-Mean-Square (RMS) of the waveform.



Pure-sine Wave: use Averaging



Switched Wave: use RMS

Voltage: When measuring voltages greater than 150VAC a potential transformer (P.T.) is required to reduce the voltage to around 120VAC.

Current: When measuring currents in excess of 5 Amps, a current transformer (C.T.) is required to reduce the current to a value of around 5 Amps.

CAUTION:

Current Transformers can be very dangerous if not handled correctly. If the Secondary side is disconnected without first shorting the terminals together, dangerously high voltages will result. These voltages can be several 1000 volts and can be deadly.

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