

Pribusin Inc.

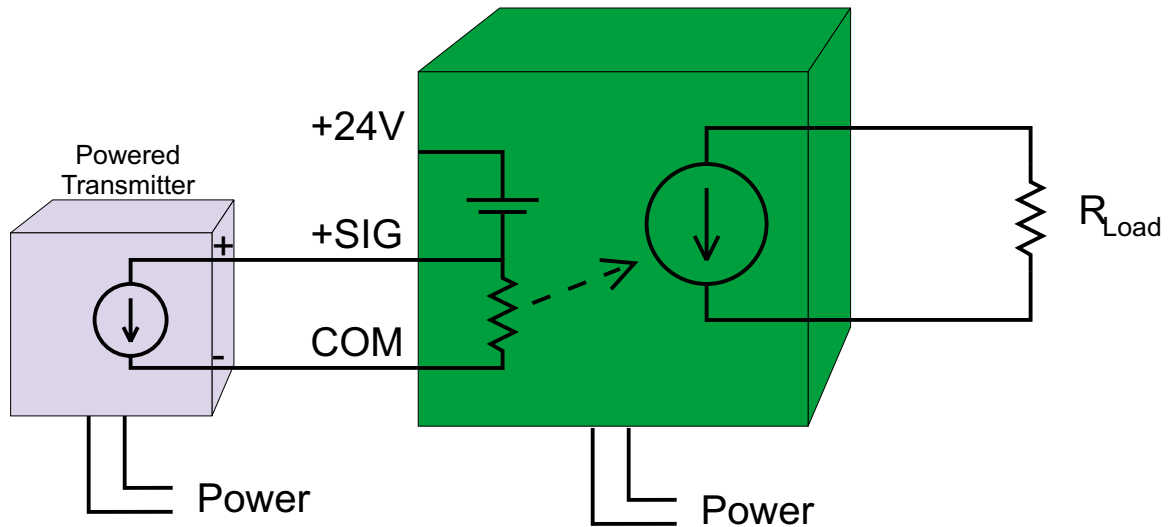
Section 2

Isolation

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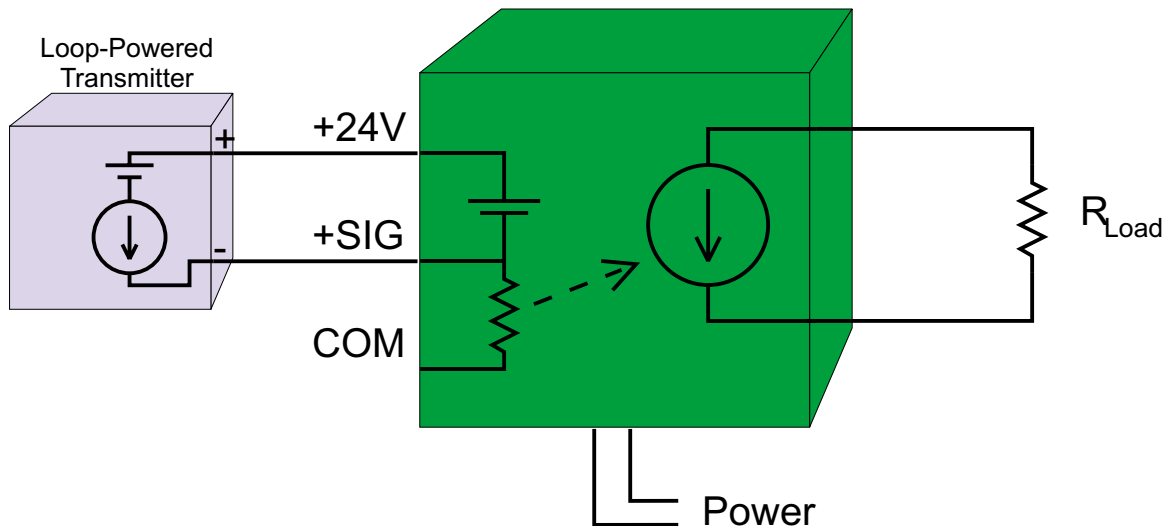
Isolator Types - Powered & Loop-Powered

1. Powered Isolators (eg. IUC, ITC): Normal Connection:



The 'Standard Connection' of a powered isolator requires the field transmitter to be powered on its own providing a powered 4-20mA loop. The input impedance (Z_{in}) of the isolator is independent of the output loop load (R_{Load}).

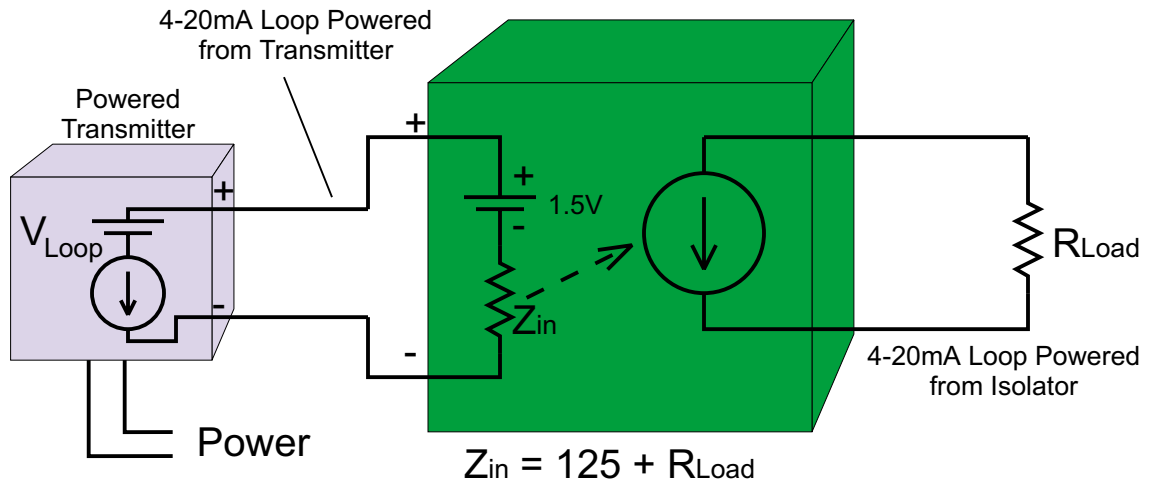
2. Powered Isolators (eg. IUC, ITC): Two-Wire Connection:



The 'Two-Wire Connection' of a powered isolator requires the field transmitter to be unpowered and obtain its power from the 4-20mA input loop of the isolator. The input impedance (Z_{in}) of the isolator is independent of the output loop load (R_{Load}).

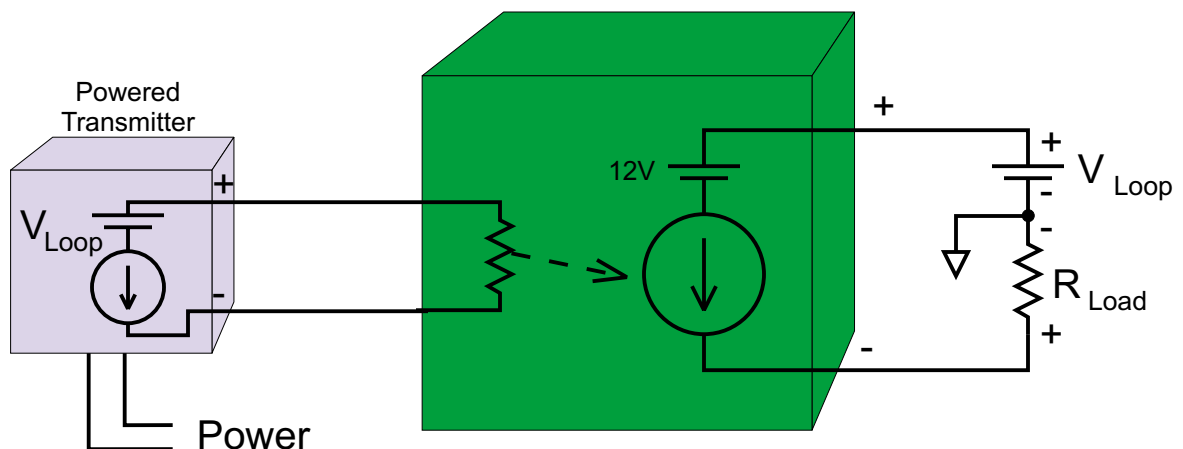
Isolator Types - Powered & Loop-Powered

3. Input-Loop-Powered Isolators (eg. TWI-22 & TWI-22-TB)



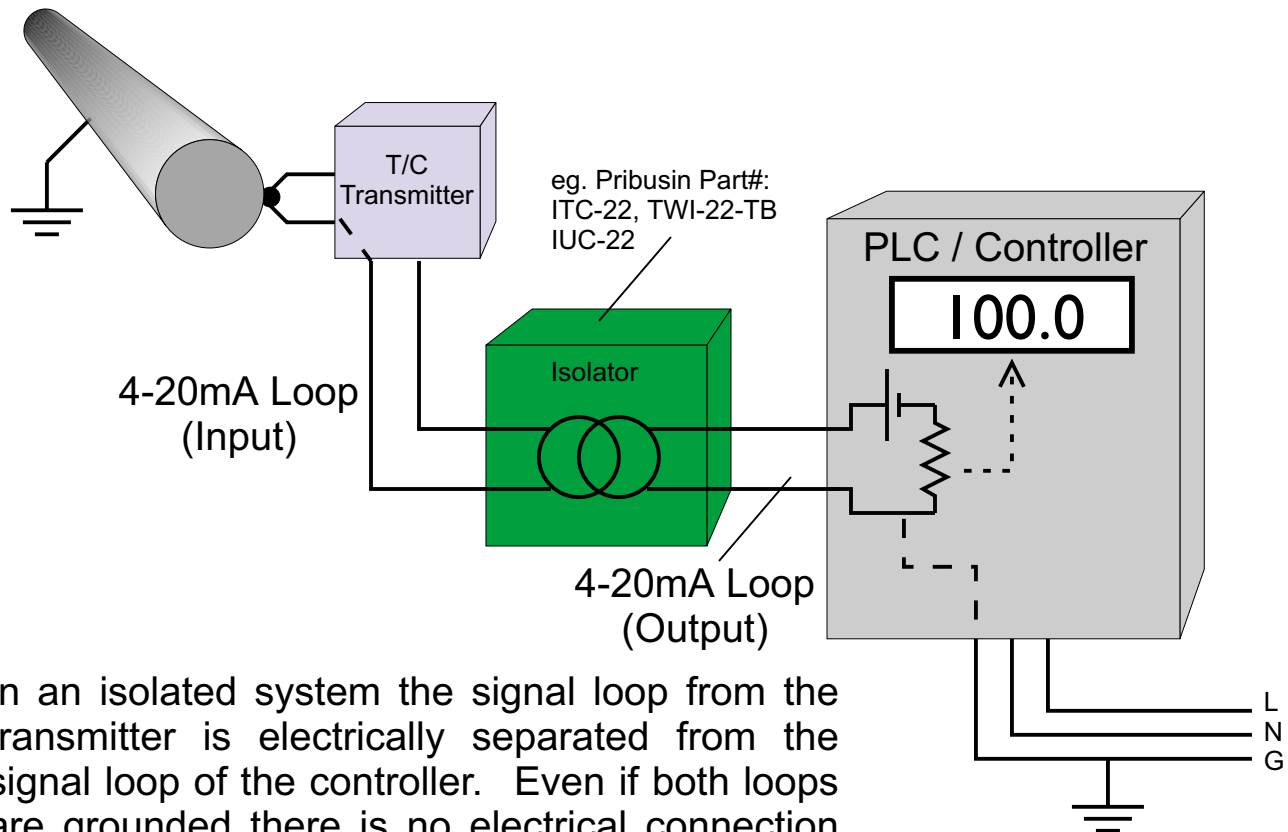
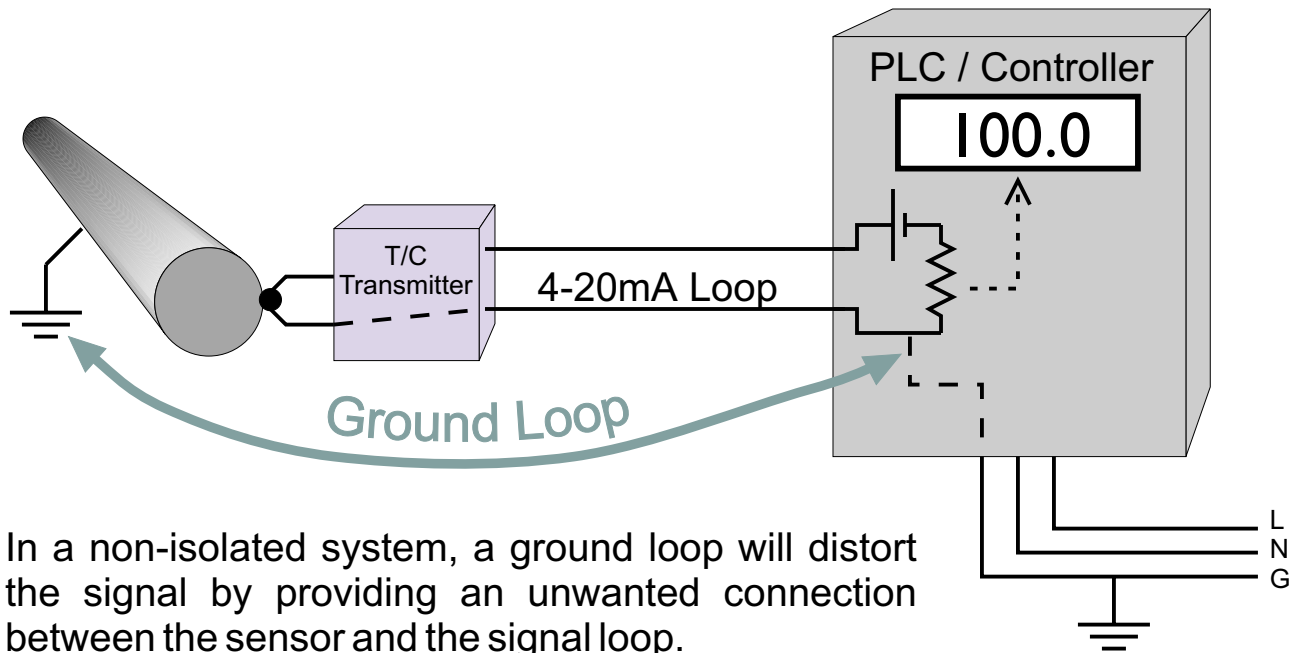
In an Input Loop Powered Isolator the output loop is powered from the input loop. This means that the load in the output loop (R_{Load}) is reflected onto the input loop (Z_{in}) plus some resistance for the isolator itself. Be sure the input loop has enough drive. The isolator's loop drive is also limited.

4. Output-Loop-Powered Isolators (eg. TWI-MV22)

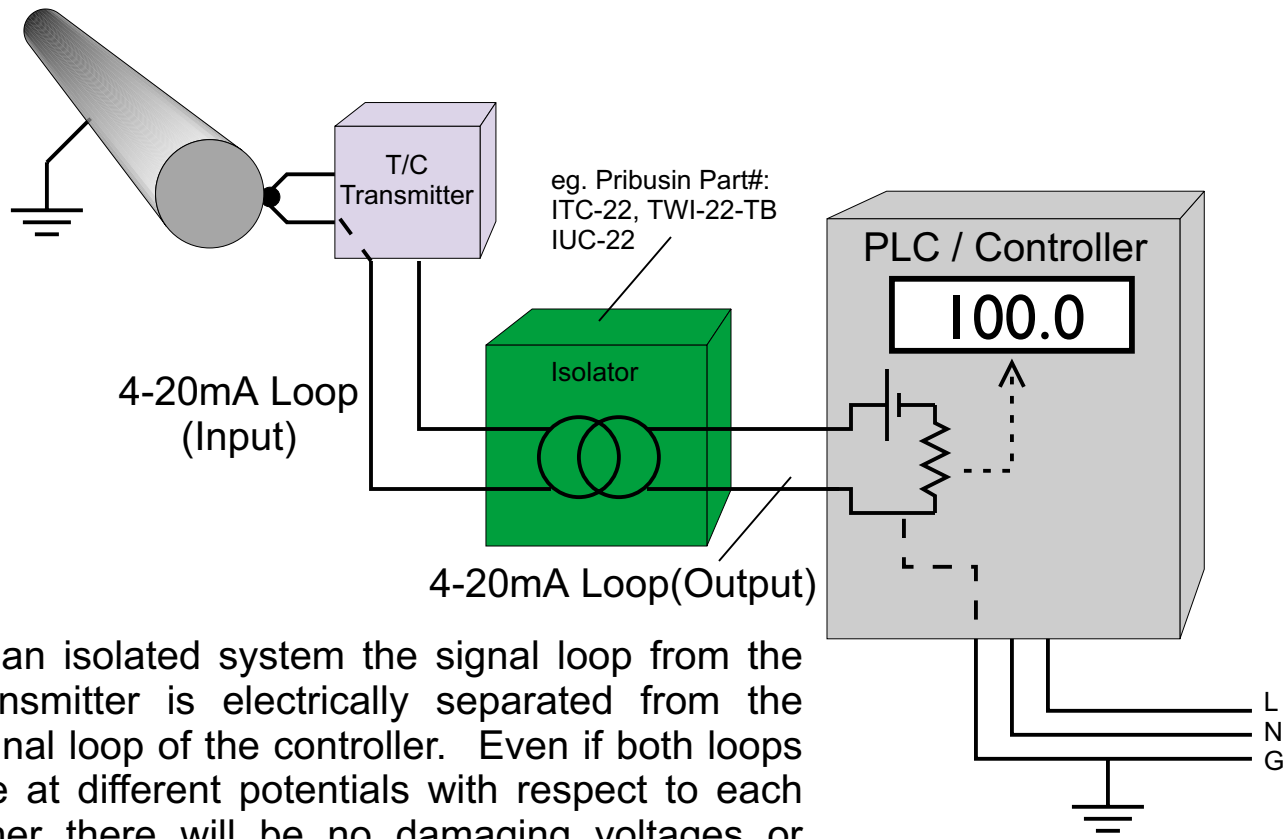
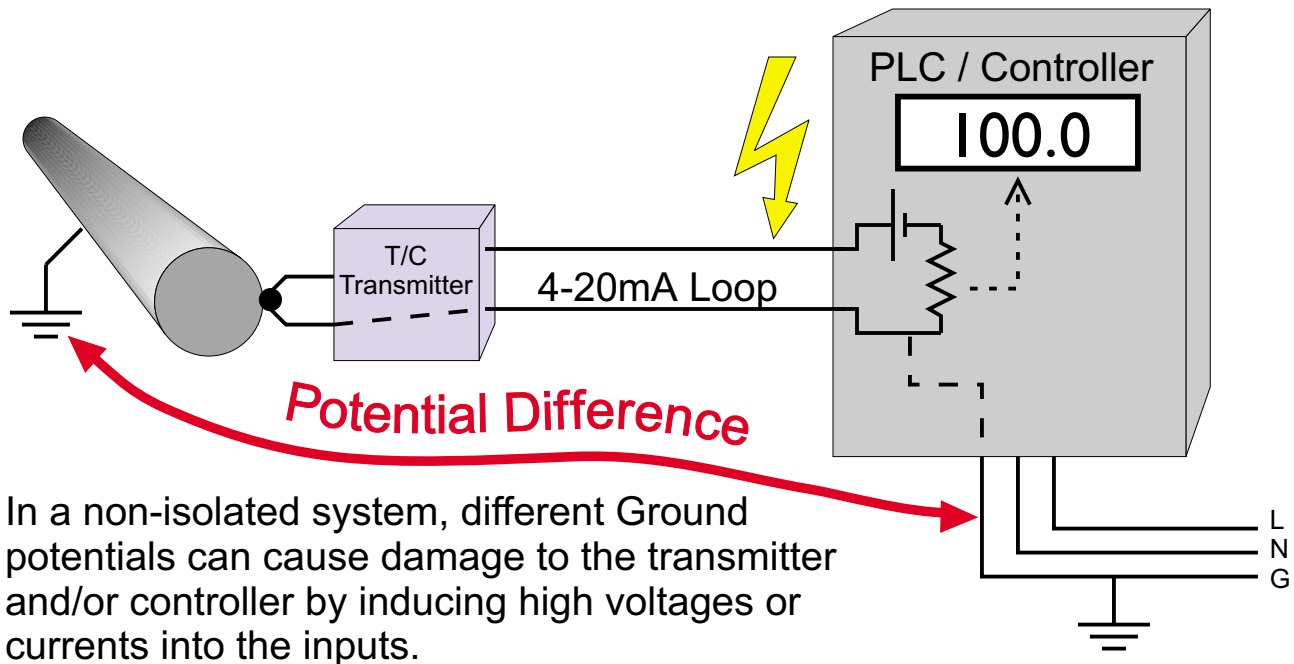


In an Output Loop Powered Isolator the input comes from a powered field transmitter. A minimum of 12 Volts is required to operate the isolator. The -ve output is connected to the +ve input to the controller (R_{Load}). Sometimes the common -ve connection between V_{Loop} and R_{Load} is not even available at the controller end.

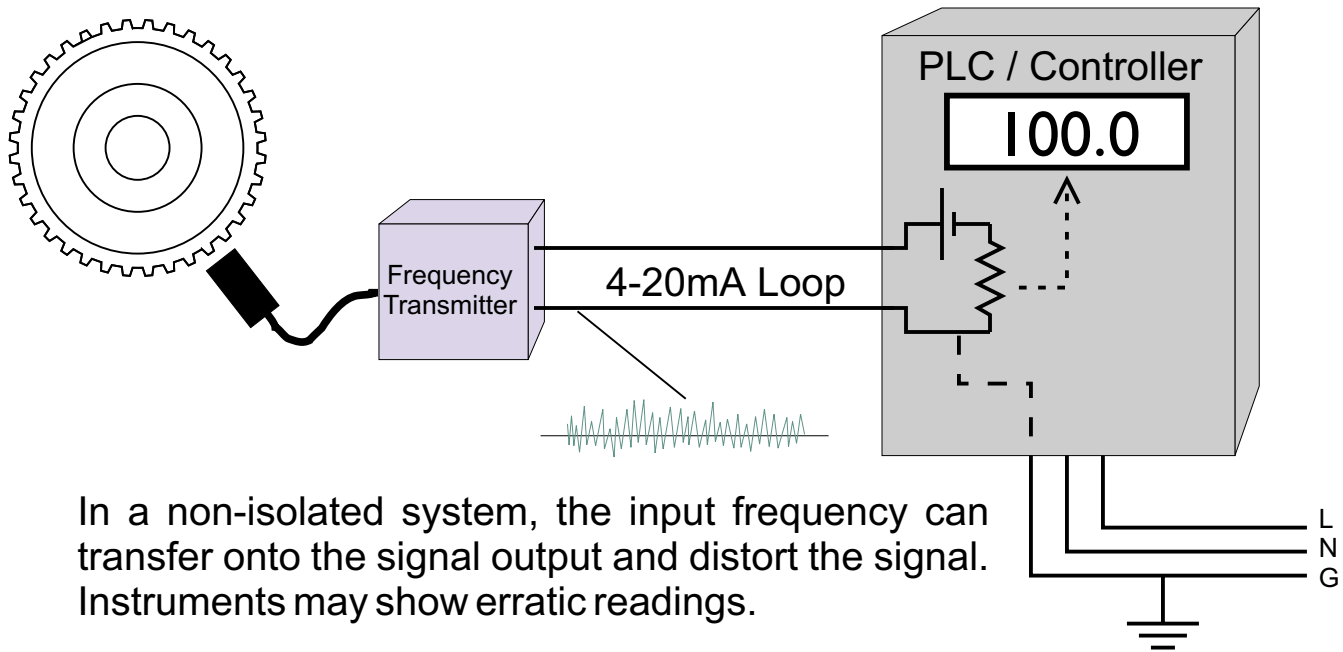
Isolation Example #1 - Ground Loops



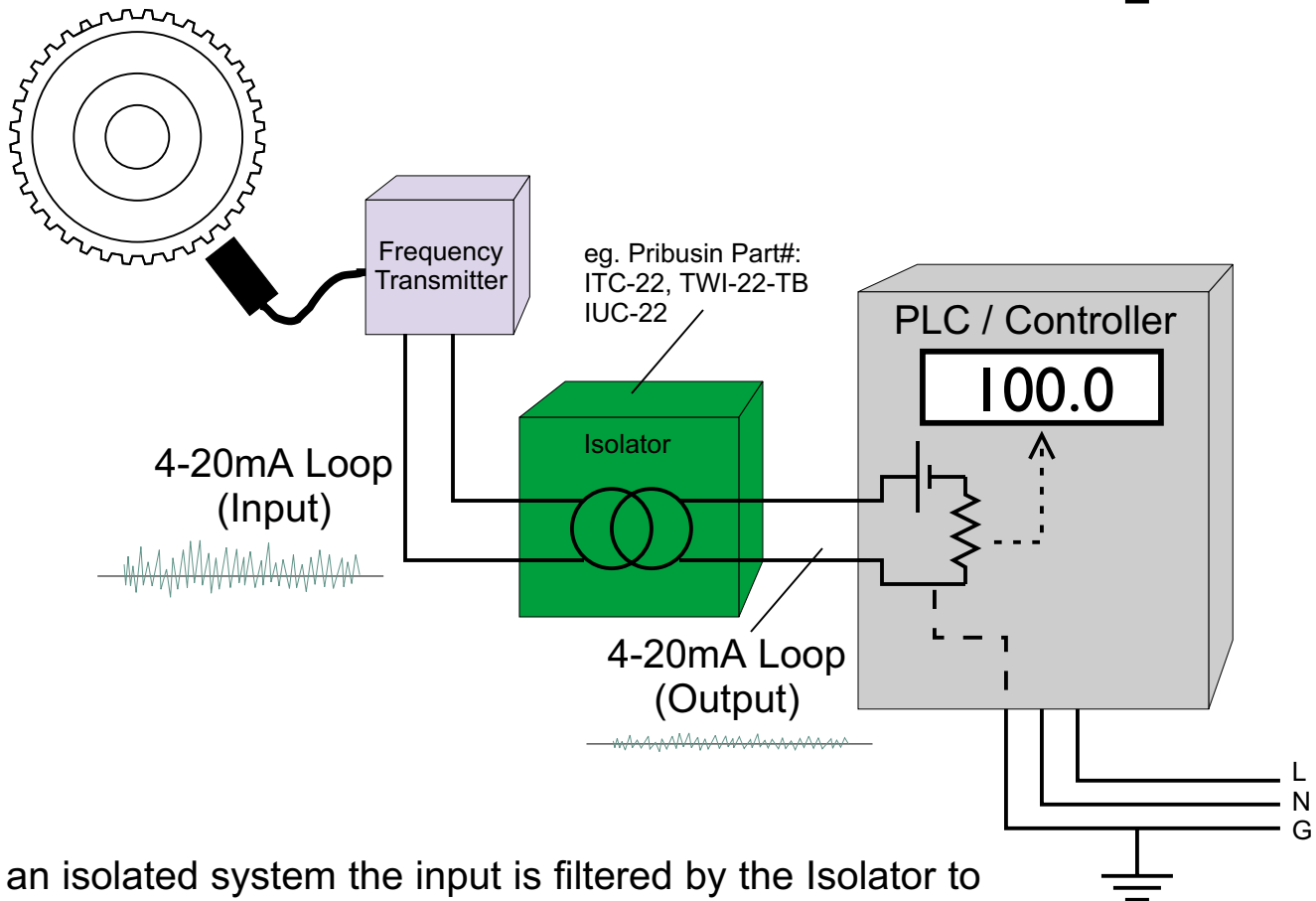
Isolation Example #2 - Ground Potentials



Isolation Example #3 - Electrical Noise



In a non-isolated system, the input frequency can transfer onto the signal output and distort the signal. Instruments may show erratic readings.



In an isolated system the input is filtered by the Isolator to prevent electrical noise from transferring to the output. Electrical noise filtered out includes *Common Mode* signals and *Differential Mode* signals.