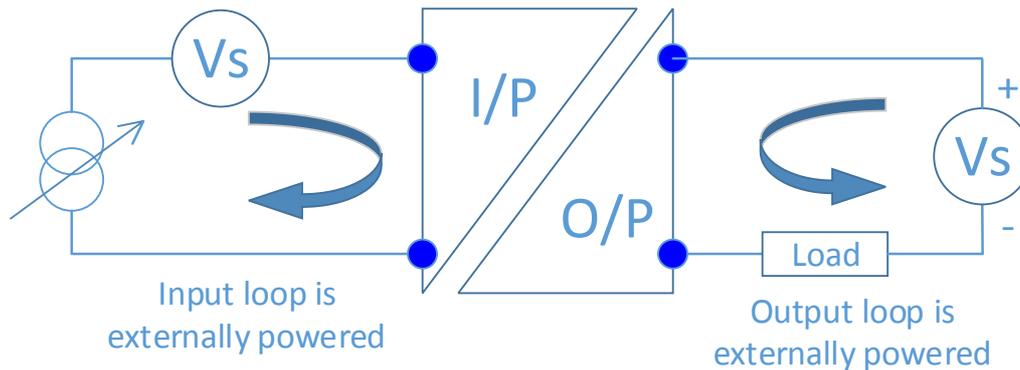


SEM1020 Application notes

Simple loop isolation using a SEM1020 loop powered isolator

Basic block diagram for SEM1020



The most common uses for the SEM1020

- To provide access to or to duplicate an existing loop without introducing any ground loop effects
- To allow connection between: -
 - A sensor with a powered output loop
 - A sensor on a PSU powered loop with an indicator or loop monitoring equipment that is also providing the power to drive the loop from its input pins.
- To isolate and reduce noise being fed into the input of the monitoring equipment.
- To boost a signal over a long run or where the volt drop on the loop for new equipment added would be too much for the loop power supply to drive.

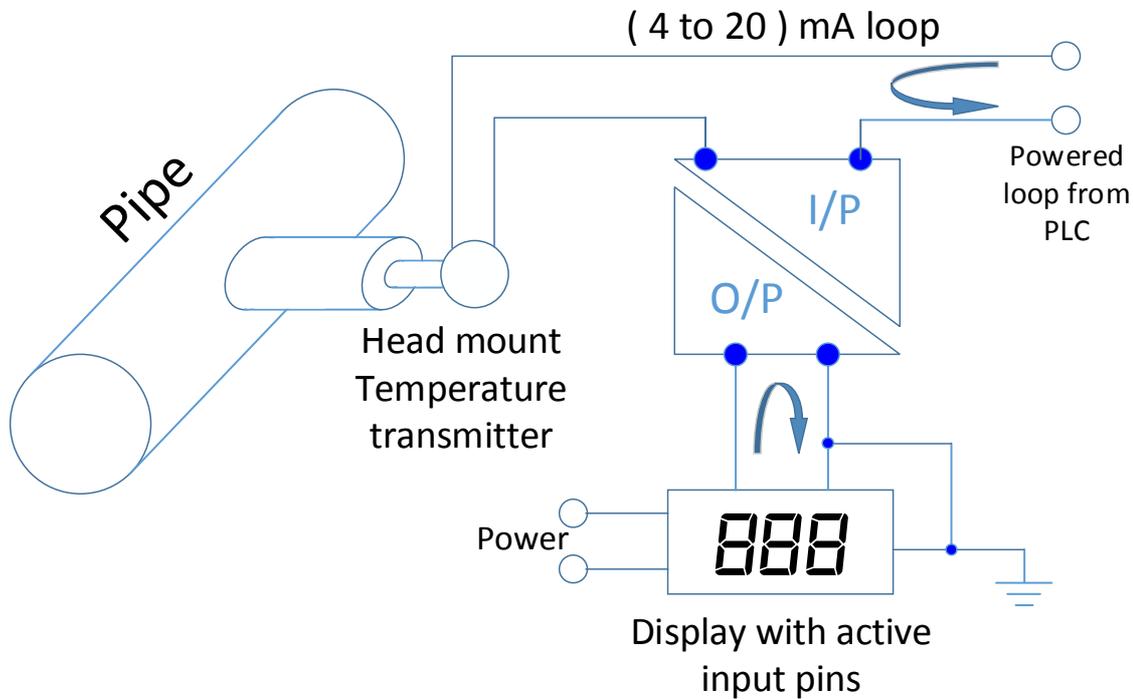
Most analogue (4 to 20) mA loops are grounded at a single point to reduce noise. Problems can occur when there is more than one grounding point because earth potentials will not be the same, and currents will flow between earth points causing errors or noisy signals.

If the (4 to 20) mA signal is connected to multiple instruments which have non isolated inputs this can also cause problems. A simple way to remove ground loops is to use signal isolators.

Sometimes poor isolation or low impedance to earth through sensors can give an undesired path to earth and cause errors. Isolating the temperature transmitter from the monitoring/control equipment such as a PLC or display can help remove this type of problem. This can occur with any type of sensor where some of the loop signal current can find a path to earth.

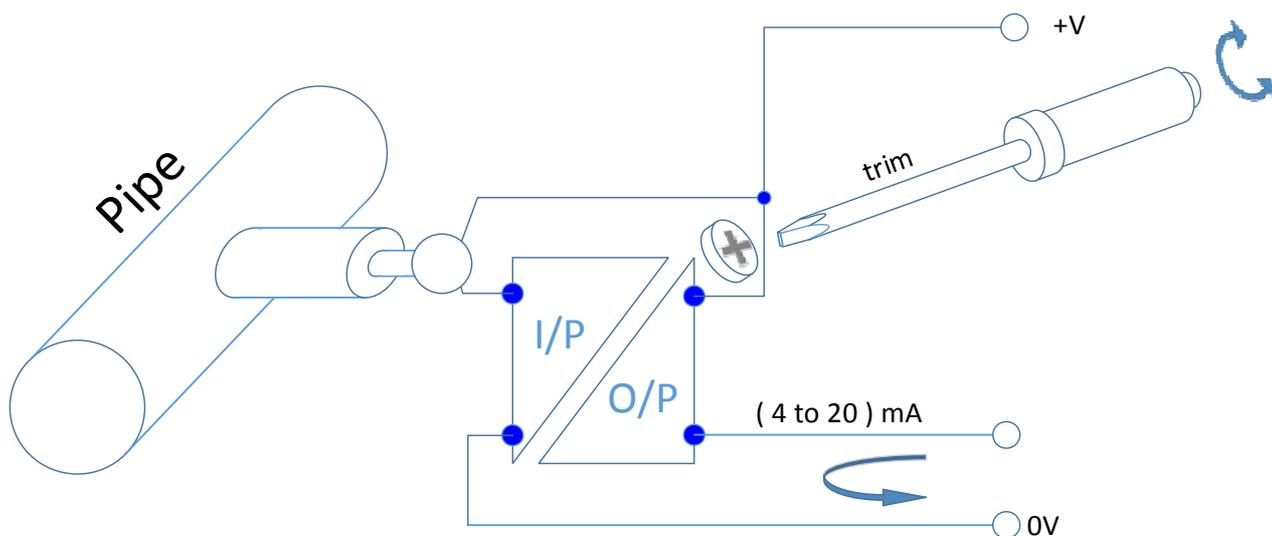
SEM1020 Application notes

Isolating an additional instrument on a (4 to 20) mA control loop



In this example the SEM1020 is used to connect a display with active input pins to a powered (4 to 20) mA control loop.

Fine trim using a SEM1020

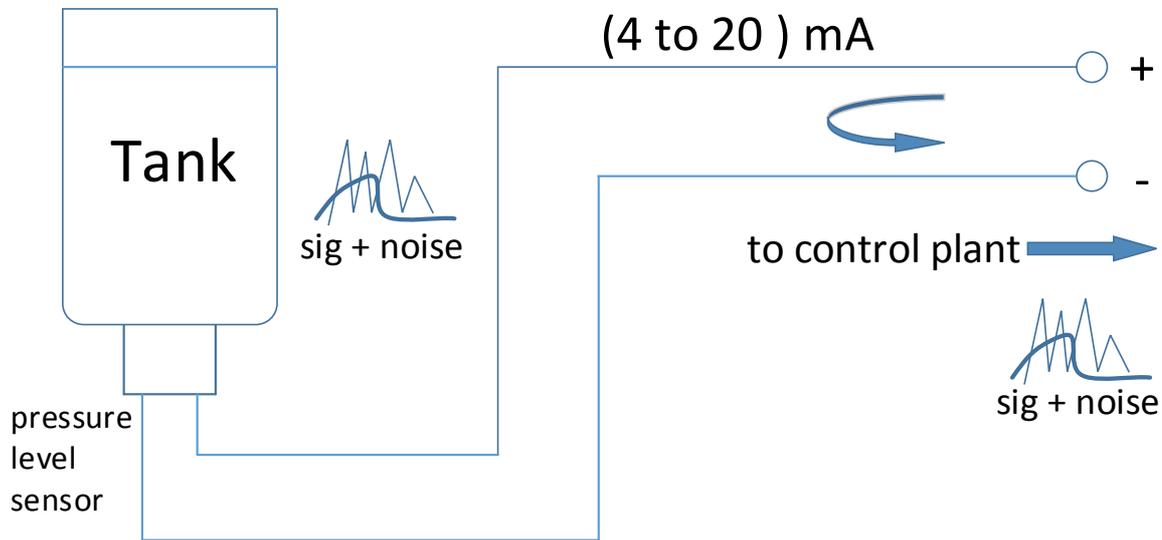


In this example the SEM1020 is used to add a fine trim to the (4 to 20) mA loop control signal from a temperature sensor that has no trim option.

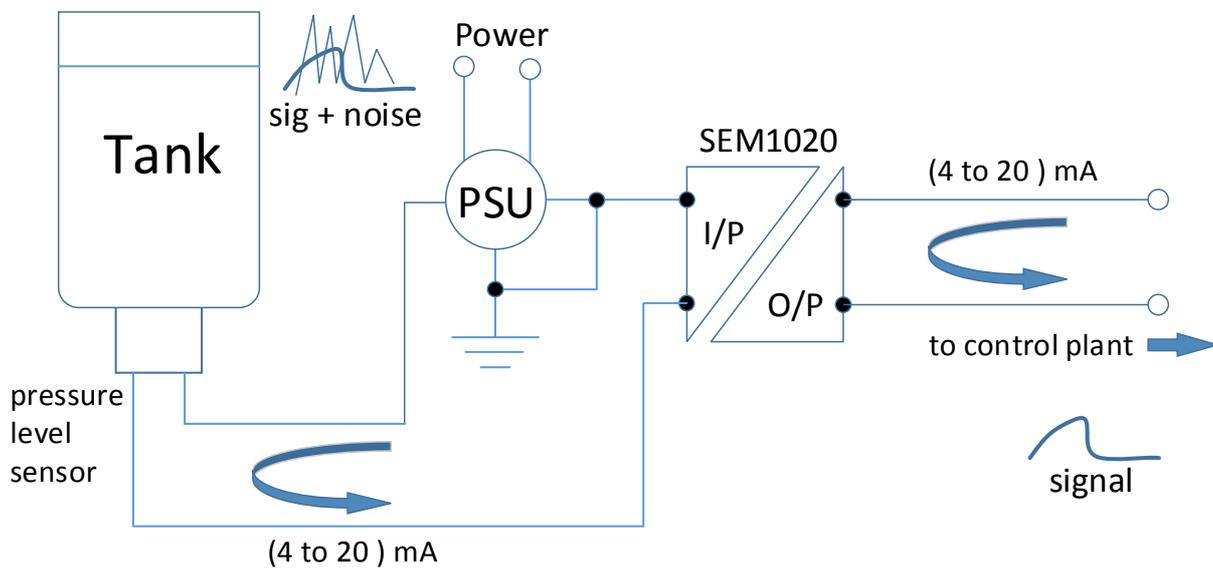
SEM1020 Application notes

The SEM1020 can be used to block noise from being transferred to the control system

Without a SEM1020



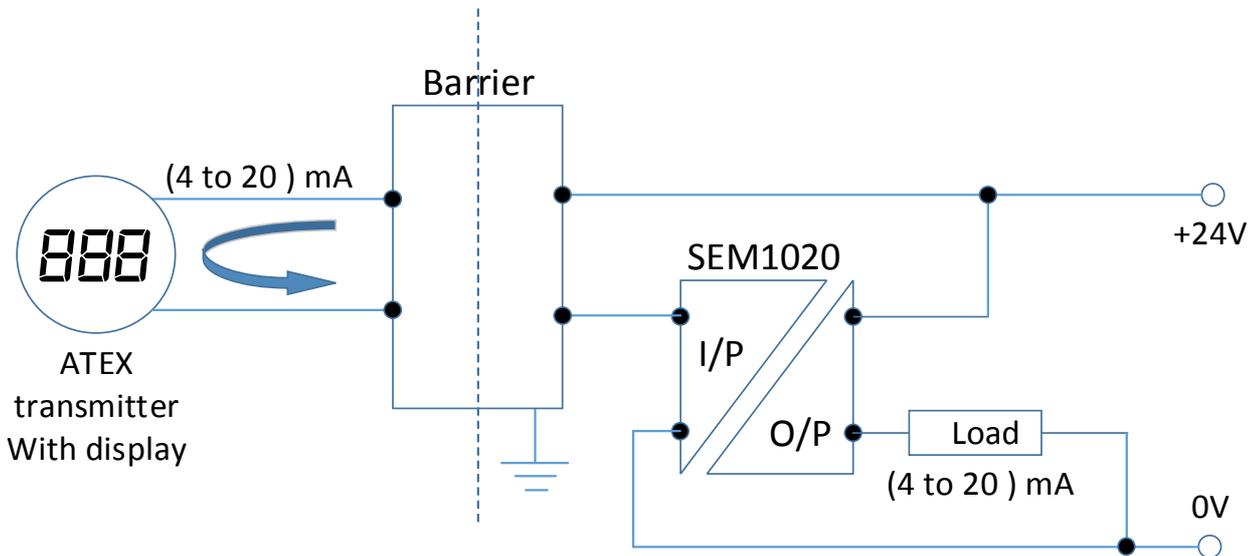
With a SEM1020



In this example the SEM1020 unit is connected between a sensor on a PSU powered loop and a control system with active input pins.

SEM1020 Application notes

IS circuit using a SEM1020 to boost load capacity in the safe area.



Some intrinsically safe circuits only have approximately 17 volts available for the transmitter and the load from a 24 Vdc supply; this is due to the barrier resistance. The SEM1020 in this circuit allows for higher loads in the safe area

Alternatives

Status Instruments has a range of isolators and signal conditioners to meet a large variety of conditions. Please see our website for the full list or call and ask for assistance with choosing the correct instrument for your application.

See also the
SEM1000 range
SEM1600 range
SEM1700 range
SEM1200

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