

# Convert 4-20 mA Output to FOUNDATION Fieldbus Output

## OVERVIEW

This technical note illustrates the wiring and configuration of the Rosemount 644 temperature transmitter to convert a 4-20 mA signal to a measurable millivolt signal that can then be converted in the AI block via FOUNDATION Fieldbus

## NOTICE

To be rated as Intrinsically Safe, a device must operate on only one power source. Conversion of a 4-20 mA source to a measurable millivolt signal constitutes a second power source in the terminal block of the 644 and **voids** the Intrinsically Safe approval. Adding this second power source does not affect the division 2/non-incendive approvals. With this configuration, the 644 is still suitable for installation and operation in division 2 areas. This technique should not be applied to a 4-20 mA source that is actively connected to a loop control. The 5 ohm resistor must be installed before powering up the transmitter. Do not apply the mA source directly to the transmitter's millivolt terminals; applying directly to the mV terminals without the resistor may damage the electronics. Do not allow the voltage to exceed 100 mV. Exceeding 100mV voltage in the loop could potentially damage the transmitter.

## SIGNAL CONVERSION

The 644 measures millivolt signals. To monitor a 4-20 mA signal, a conversion to millivolt will be required using a 5 Ohm resistor. A 5 ohm resistor will convert the 4-20 mA signal to a 20-100 mV signal. It is optimal to use a low-error 5 Ohm resistor with stable operation rating across the ambient temperature range in which the 644 is installed. See Figure 1 and Figure 2 for wiring diagrams.

## ROSEMOUNT 644 CONFIGURATION

Configuration of the 644 can be performed using a Handheld Field Communicator or AMS Device Manager. Configure the sensor type and device units to "mV." Configure the AI block of the 644 as follows:

1. Set the MODE\_BLK.TARGET to OOS
2. Set CHANNEL to the transducer block configured for the analog input
3. Set XD\_SCALE.EU\_0 to 20  
Set XD\_SCALE.EU100 to 100  
Set XD\_SCALE.ENGUNITS to mV
4. Set OUT\_SCALE to match the desired scale and units for the connected analog transmitter.
5. Flow Example: 0-200 gpm  
OUT\_SCALE.EU\_0 = 0  
OUT\_SCALE.EU\_100 = 200  
OUT\_SCALE.ENGUNITS = gpm
6. Set L\_TYPE to INDIRECT
7. Set the MODE\_BLK.TARGET to AUTO

Figure 1. Rosemount 644 Terminal Diagram with 4-20 mA Conversion to 20-100 mV

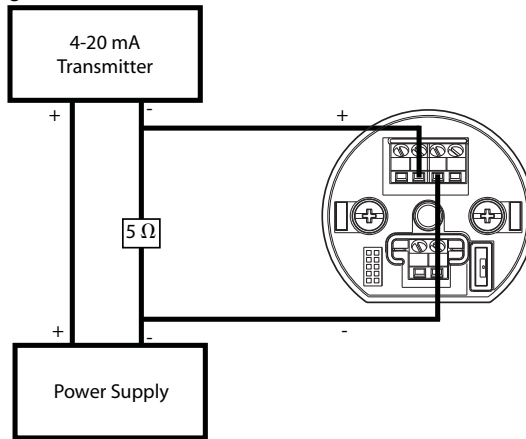
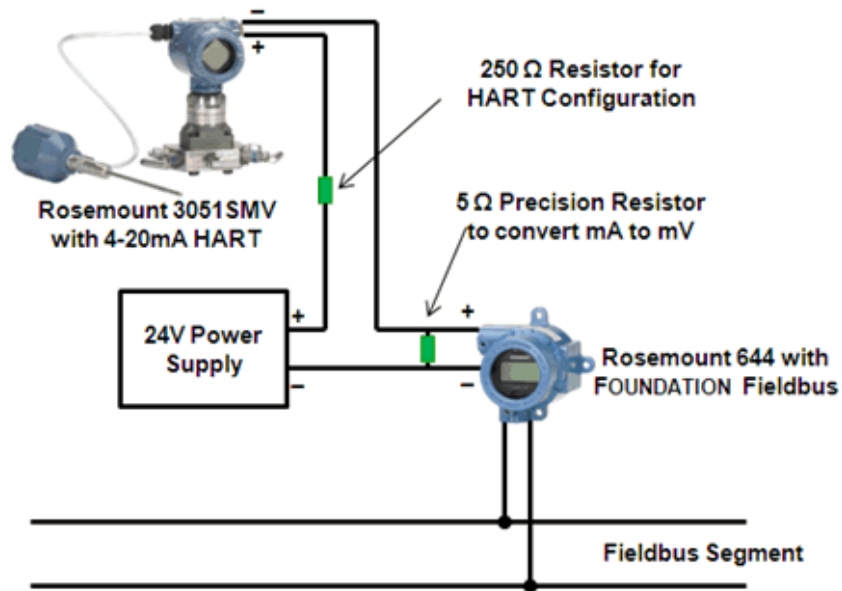


Figure 2. Wiring diagram for Rosemount 3051SMV converted into FOUNDATION Fieldbus signal



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