Send 4-20 mA Outputs Wirelessly with Rosemount® 648 and 248 Wireless Transmitters

1.1 Application

This technique is used to capture data from a 4-20 mA source that does not have a loop connection to traditional loop control and monitoring systems.

Applications include current sensor, MOVs, and anything with an active 4-20 mA output that does not require power from the 648 or 248 Wireless Transmitter.

1.2 Overview

This technical note illustrates the wiring and configuration of the 648 or 248 Wireless Transmitter to monitor a 4-20 mA signal through a conversion to a measurable millivolt signal.

Figure 1. Rosemount 648 Wireless Temperature Transmitter
Note
The conversion of a 4-20 mA source to a measurable millivolt signal constitutes a second power source in the terminal block of the 648 or 248 Wireless Transmitter and voids Intrinsically Safe approval. Adding this second power source doesn’t affect the Division 2/Non-Incendive approvals. Also, this technique should not be applied to a 4-20 mA source currently connected to a loop control or monitoring system.

1.3 Signal conversion

The 648 or 248 Wireless Transmitter can measure a millivolt signal. To monitor a 4-20 mA signal, a conversion to millivolt will be required using a 5-Ohm resistor to create a 20-100 mV signal. It is optimal to use a low-error 5-Ohm resistor with stable operation over the ambient temperature range where the 648 or 248 Wireless Transmitter is located.
1.4 Transmitter configuration

Using a 475 HART® Field Communicator, 1420 Smart Wireless Gateway, or AMS® Device Manager, reconfigure the sensor type and device units to millivolts. Set the lower and upper range values to 20 and 100 to scale between 0-100%.

**Figure 4. Rosemount 648 Terminal Diagram with 4-20 mA Conversion to 20-100 mV**

A. 4-20 mA transmitter  
B. 5Ω  
C. Power supply

**Note**  
The 5-Ohm resistor must be installed before powering up the transmitter. Applying the mA source directly to the millivolts terminal may damage the transmitter.

**Figure 5. Rosemount 248 Wireless Terminal Diagram (Polymer housing) with 4-20 mA Conversion to 20-100 mV**

A. 4-20 mA transmitter  
B. 5Ω  
C. Power supply

**Note**  
The 5-Ohm resistor must be installed before powering up the transmitter. Applying the mA source directly to the millivolts terminal may damage the transmitter.
Figure 6. Rosemount 248 Wireless Terminal Diagram (Aluminum housing) with 4-20 mA Conversion to 20-100 mV

A. 4-20 mA transmitter  
B. 5Ω  
C. Power supply

**Note**  
The 5-Ohm resistor must be installed before powering up the transmitter. Applying the mA source directly to the millivolts terminal may damage the transmitter.