Product Data Sheet
00813-0100-4754, Rev EA
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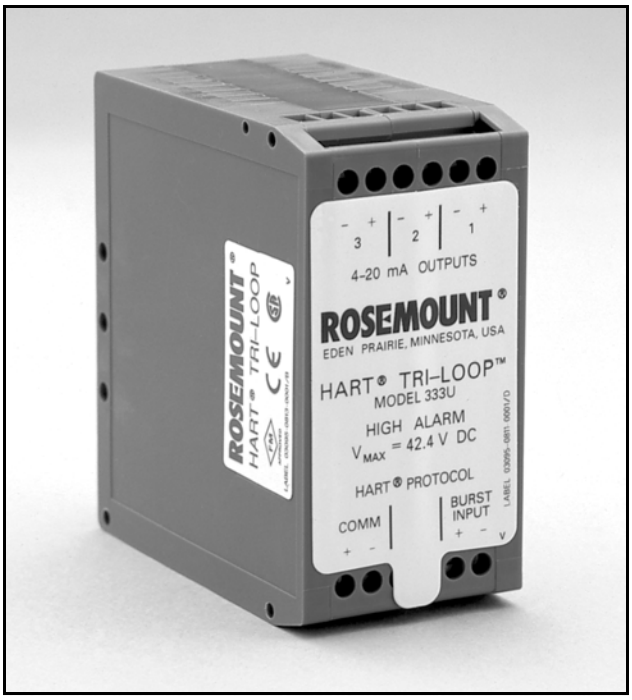
Rosemount 333 HART® Tri-Loop™

HART-TO-ANALOG SIGNAL CONVERTER

- *Convert a digital HART signal into three additional analog signals*
- *Easy to configure and install*
- *Accessory product for multivariable instruments*
- *Available as either High-alarm or Low-alarm device*



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Contents

HART Tri-Loop HART-to-Analog Signal Converter

Convert a digital HART signal into three analog signals

Convert a multivariable digital HART signal into independent 4-20 mA analog process variables using the Rosemount 333 HART Tri-Loop. Apply in control or monitoring applications to obtain up to three additional analog outputs without additional process penetrations.

Accessory product for multivariable instruments

For use with the Rosemount 3095 MultiVariable™, 3051S Advanced HART Diagnostics, and 3144P products. When used with the 3095, the 333 HART Tri-Loop allows possible outputs of Differential, Absolute or Gage pressure, Process Temperature and Mass Flow. When used with the 3051S Advanced HART Diagnostics, possible outputs include pressure, sensor module temperature, scaled variable, standard deviation, and mean. When used with the Rosemount 3144P, possible outputs include sensor 1, sensor 2, differential and transmitter terminal temperature.

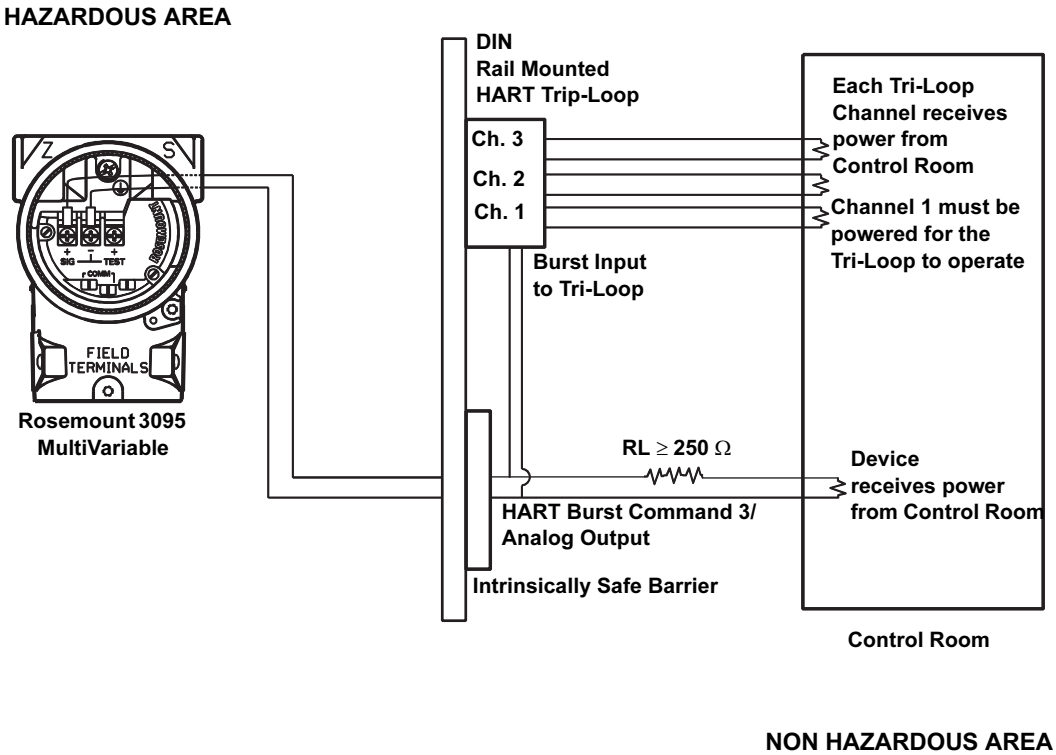
Easy to configure and install

The 333 HART Tri-Loop is easy to configure and maintain using the 375 Communicator. AMS and Engineering Assistant (version 5.0 to 5.5.1) provide easy PC-based user configuration. Installation is quick and easy with three DIN rail mount options and electrically isolated analog output channels for flexible grounding.

Available as either High-alarm or Low-alarm device

Tri-Loop alarm channels are factory configured. All channels alarm if the attached device indicates a sensor failure or transmitter malfunction.

FIGURE 1. Example Tri-Loop Installation with Rosemount 3095



Specifications

FUNCTIONAL SPECIFICATIONS

Service

Accessory product for use with the 3095 MultiVariable Mass Flow Transmitter, 3051S Advanced HART Diagnostics Transmitter, 3144P Temperature Transmitter, or any other HART device with a burst mode output.

Output

One, two, or three 4–20 mA user-selectable output signals.

Device	Output Options
3095MA	DP, AP, GP, PT, or Mass Flow.
3051S	Pressure, Sensor Module Temperature, Scaled Variable, Standard Deviation, and Mean.
3144P	Sensor 1, Sensor 2, Differential Temperature, or Transmitter Terminal Temperature.

Power Supply

External power supply required for each channel. Each channel operates on terminal voltage of 11–42.4 V dc.

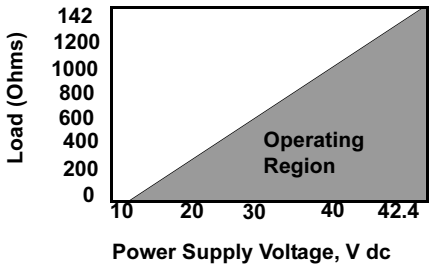
NOTE

Channel 1 must be powered for Tri-Loop operation.

Load Limitations

Loop resistance is determined by the voltage level of the external power supply, as described below:

$$\text{Max. Loop Resistance} = \frac{\text{Power Supply voltage} - 11}{0.022}$$



Turn-on Time

Analog signals will be within specifications five seconds after power is applied to Tri-Loop.

Installation Locations

- Approved for FM ordinary locations, approved for CSA ordinary locations

Temperature Limits

Ambient

50 to 104 °F (10 to 40 °C)

Storage

–40 to 158 °F (–40 to 70 °C)

Humidity Limits

0–95% non-condensing relative humidity

Failure Mode Alarm

If Tri-Loop diagnostics detect a Tri-Loop failure or the transmitter indicates a transmitter malfunction, the analog signal for all channels will be driven either below 3.75 mA or above 21.75 mA to alert the user. The high or low alarm signal is determined by the Tri-Loop Model Number, see “Ordering Information” on page Accessories-4.

PERFORMANCE SPECIFICATIONS

(Performance specifications are for the HART Tri-Loop only.)

Reference Accuracy

±0.045% of span

Ambient Temperature Effect per 50 °F (28 °C)

±0.15% of span

Stability

±0.1% of span for 12 months

Analog Output Update

- Tri-Loop responds to every HART burst update (Typical transmitter burst update rate: 0.3 to 0.5 s.)

Tri-Loop Response Time (after each burst update)

Channel 1–120 ms; Channel 2–220 ms; Channel 3–320 ms

Total Response Time

Typical response time from sensor change to transmitter to Tri-Loop analog update: 0.7 to 1.0 s.

PHYSICAL SPECIFICATIONS

Electrical Connections

Screw clamps. Accepts 24–12 AWG solid or stranded wire

Dimensions

1.57 × 3.11 × 3.36 in. (40 × 79 × 85,5 mm)

DIN Rail Mounting Options

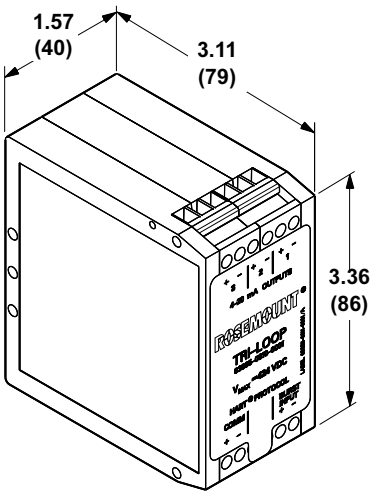
Asymmetrical 32mm G rail, symmetrical 35 × 7.5 mm top hat rail, or symmetrical 35 × 15 mm top hat rail (see “Tri-Loop Dimensions” on page Accessories-4)

Weight

0.27 lb (0,1 2 kg)

Dimensional Drawings

Tri-Loop Dimensions



NOTE
Dimensions are in inches (millimeters)

Ordering Information

Model	Product Description
333	HART Tri-Loop
Code	**Alarm Option**
U	High Alarm
D	Low Alarm
Code	**Configuration Option**
C2	Custom Configuration (Requires a completed Configuration Data Sheet, document number 00806-0100-4754)
Typical Model Number: 333 U	

Alarm Configuration

Tri-Loops are configured with all channels to alarm in the same direction. Alarm direction is configured at the factory, and cannot be changed in the field. In addition, all channels alarm if the attached device indicates a sensor failure or transmitter malfunction. Tri-Loops are ordered according to the desired alarm direction.

Standard Configuration

Unless otherwise specified with a C2 option, Tri-Loop is shipped as described in Table 1.

Tri-Loop Label

Each Tri-Loop is labeled with serial number, part number, and factory configuration.

TABLE 1. Standard Configuration

Tri-Loop Channel	Assigned Variable	Variable Range	Variable Units	Channel Status
Channel 1	Secondary	0–250	inH_2O at 68 °F	Disabled
Channel 2	Third	0–800	psi	Disabled
Channel 3	Fourth	–40 to 400	Degree F	Disabled

Custom Configuration

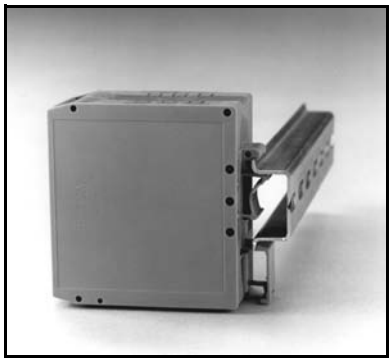
If a custom configuration Tri-Loop is ordered with a C2 option, the customer specifies the assigned variable, variable range, variable units, and channel status for all three channels.

HART Tri-Loop Configuration

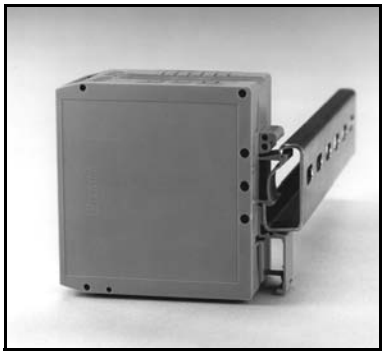
The HART Tri-Loop Configurator can be fully configured using the 375 Communicator. AMS and Engineering Assistant (version 5.0 to 5.5.1) software (used to configure the 3095MA Transmitter) provide a PC-based user configuration. Configuration hardware and software may be ordered separately.

FIGURE 2. DIN Rail Mounting Options

SYMMETRICAL 35X 7.5 MM TOP HAT RAIL



SYMMETRICAL 35X15 MM TOP HAT RAIL



ASYMMETRICAL 32MM G RAIL

Configuration Data Sheet

Customer Information			
Customer			
P.O. No			
Customer Line Item			
Model No. (select one)	☐ High Alarm (03095-0810-003)	☐ Low Alarm (03095-0810-0004)	
Device Information (optional)			
Tag	|__|__|__|__|__|__|__|__| (8 characters)		
Descriptor	|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|(16 characters maximum)		
Message	|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__| |__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__| (32 characters)		
Date	|__|__| (dd)	|__|__|__| (MMM)	|__|__| (yy)
Channel 1			
Channel Status (select one)	☐ Enabled★	☐ Disabled	
Assigned Variable (select one)(1)	☐ Primary Variable	☐ Secondary Variable★	
	☐ Teritary Variable	☐ Fourth Variable	
Variable Range	Zero (4 mA) Value _____(2)		
	Full Scale (20 mA) Value _____(2)		
Variable Units	_____(2)(3)		
Channel 2			
Channel Status (select one)	☐ Enabled	☐ Disabled★	
Assigned Variable (select one)(1)	☐ Primary Variable	☐ Secondary Variable	
	☐ Tertiary Variable★	☐ Fourth Variable	
Variable Range	Zero (4 mA) Value _____(2)		
	Full Scale (20 mA) Value _____(2)		
Variable Units	_____(2(3)		
Channel 3			
Channel Status (select one)	☐ Enabled	☐ Disabled★	
Assigned Variable (select one)(1)	☐ Primary Variable	☐ Secondary Variable	
	☐ Tertiary Variable	☐ Fourth Variable★	
Variable Range	Zero (4 mA) Value _____(2)		
	Full Scale (20 mA) Value _____(2)		
Variable Units	_____(2)(3)		

(1) Verify process variable assignment for your instrument.

(2) For each enabled channel, this information must be completed before the CDS can be accepted.

(3) Selected units must match device units or the Tri-Loop will alarm. Verify unit assignment for your instrument.

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