

HART[®] Communication

Rosemount[™] 935 Open Path Gas Detector

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1 Introduction

Using digital communication with the Rosemount™ 935 Open Path Detector, the operator can monitor the status of the detector, determine factory settings, and initiate field tests.

This document provides guidance for establishing HART® communication and describes the HART menu structure when using the detector with a HART hand-held communicator, Personal Computer (PC), or other process interface device that supports Device Description Language (DDL).

2 Connecting to the HART® Communicator

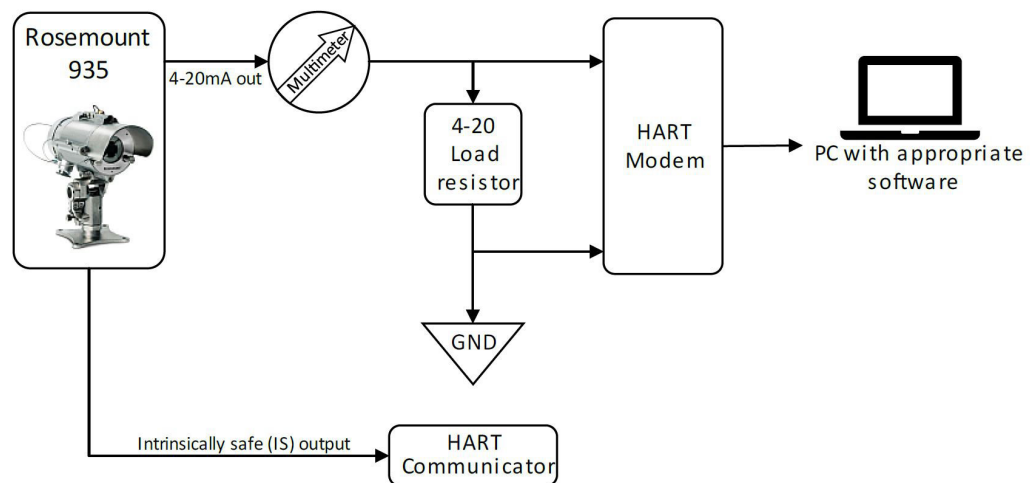
The host connects to the detector via the two-wire 4–20 mA current loop or the Intrinsically Safe (IS) port. Refer to the [Rosemount 935 Reference Manual](#) for connection details. These outputs from the detector represent the analog output channel. They correspond to the Primary Variable (PV) and support HART communication.

2.1 Connecting HART® Communicator to wiring terminals

The operator can connect the HART communicator to the detector at any wiring termination point in the analog output signal loop.

Connect the HART Communicator in parallel with the 500 Ω load resistor. The HART connections are non-polarized.

2.2 Connecting HART® Communicator to Intrinsically Safe (IS) port



Note

4-20 mA current load resistor, defined in HART standard as 250-600 Ω.

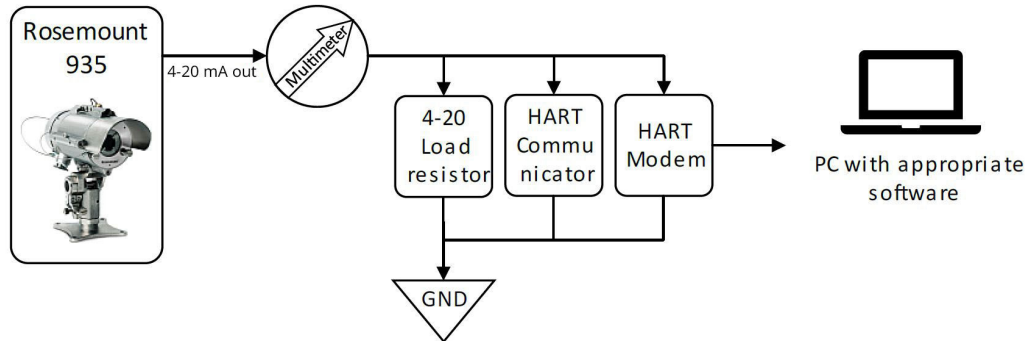
To use the IS port, connect the HART Communicator to the detector using the appropriate communication cable, as described in the [Rosemount 935 Reference Manual](#).

Switch on the HART Communicator.

If the HART Communicator finds the detector, it displays the main menu.

If the HART Communicator doesn't find the detector, check the connections, and verify the presence of a 500 Ω load resistance in series to the loop.

2.3 Connecting two HART® Communicators (primary and secondary master)



Note

4-20 mA current load resistor, defined in the HART standard as 250–600.

2.4 Multidrop mode

Optical gas detectors are safety devices requiring a 4–20 mA loop current to transmit important detector status data. Do not use optical gas detectors in conjunction with multidrop mode. If multidrop mode is required, no gas reading will be available via the 4–20 mA loop.

3 HART® Device Description Language (DDL)

The HART protocol incorporates a concept called the DDL that enables all suppliers of HART instruments to define and document their products in a single, consistent format.

This format can be read by hand-held communicators, personal computers (PCs), and other process interface devices, regardless of manufacturer, allowing full functionality from any HART device.

Note

Install a HART Communication Foundation Device Description (HCF DD) on your machine for full compliance with the gas detector and the HART host application. You can download a complete listing of the HCF DD library in the manufacturer and device type sequence on the [HCF website](#).

The Rosemount™ 935 device description allows you to present the HART menu in a graphical mode. However, this option is not supported by all host manufacturers. Refer to the HART host literature for more information about using the graphical mode.

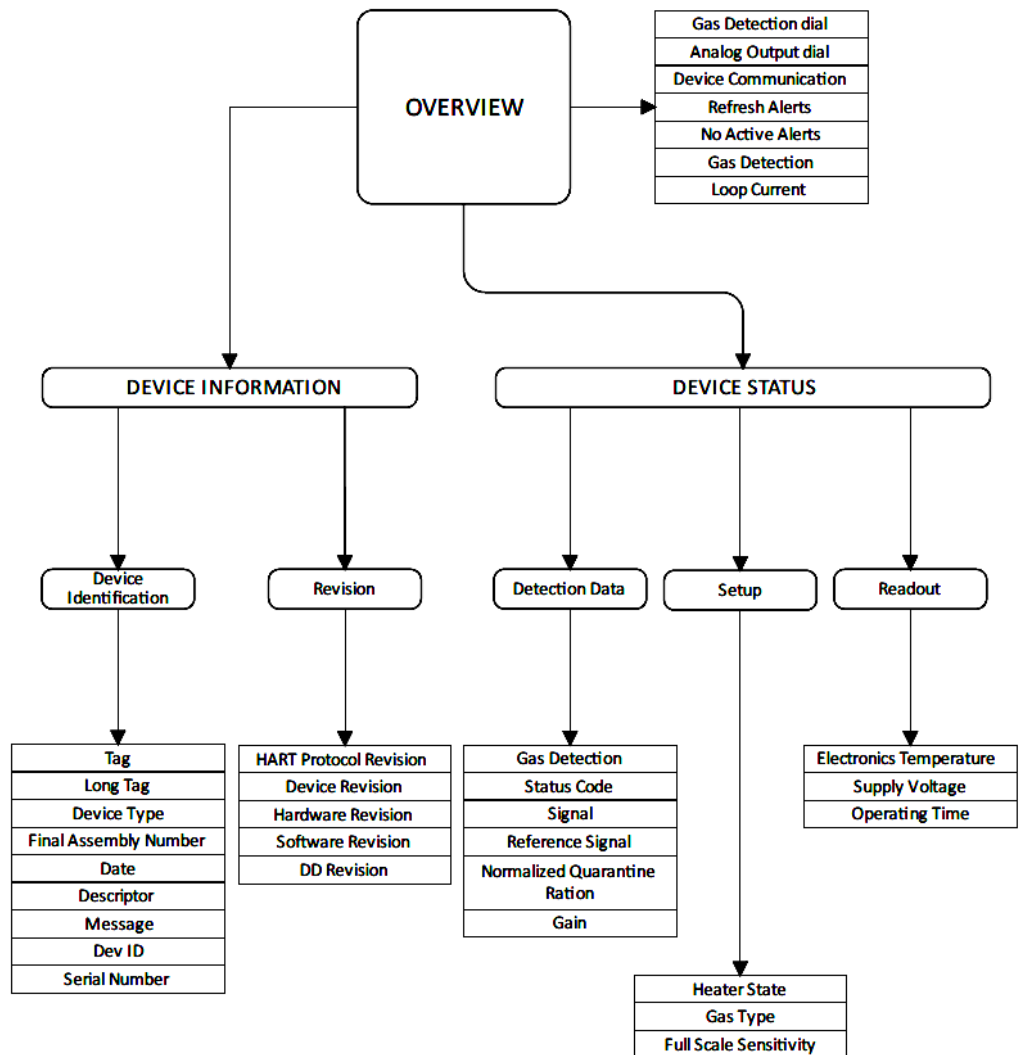
4 HART® menu structure

The following root menu appears upon successful connection establishment with the HART device:



The next chapters will provide a detailed sub-menu description.

5 Overview menu



Option	Description	Read/Write
Analog output	Shows a dial with the 4–20 mA analog output indication	R
Gas detection	Shows a dial with the current LEL readings	R
Device communications	Shows device communication status	R
Refresh alerts	Refreshes alerts	R/W
Active alerts	Show active alert status	R
Gas detection	Shows current LEL measurements	R
Loop current	Shows real-time 4–20 mA analog output indication	R

5.1 Device Information menu

Table 5-1: Device Identification screen

Option	Description	Read/Write
Tag	Text that is associated with the field device installation (16 chars). This text can be modified and used by the operator in any way.	R
Long tag	Text that is associated with the field device installation (32 chars). This text can be modified and used by the operator in any way.	R
Device type	Shows detector model type	R
Final assembly number	A number that is used for identification purposes and is associated with the overall field device.	R
Date	Any Date is chosen by the operator to be used for any purpose.	R
Descriptor	The text associated with the field device can be used by the operator in any way.	R
Message	Shows the message stored by the user	R
Dev ID	Shows device ID	R
Serial number	Shows a detector serial number	R

Table 5-2: Revisions screen

Option	Description	Read/Write
HART® protocol revision	Shows universal HART protocol revision	R
Device revision	HART device revision	R
Software revision	Shows field device SW revision	R
Hardware revision	Shows field device HW revision	R
DD revision	Shows HART Device Description revision	R

5.2 Device Status menu

Table 5-3: Detection Data screen

Option	Description	Read/Write
Gas detection	Shows current LEL measurements	R
Status code	Shows the current status (N, F, V, etc.) of the detector	R
Signal	Shows the power of the signal channels	R
Reference signal	Shows the power of the reference channels	R
Normalized quarantine ratio	Shows the current NQratio	R
Gain	Shows the current gain	R

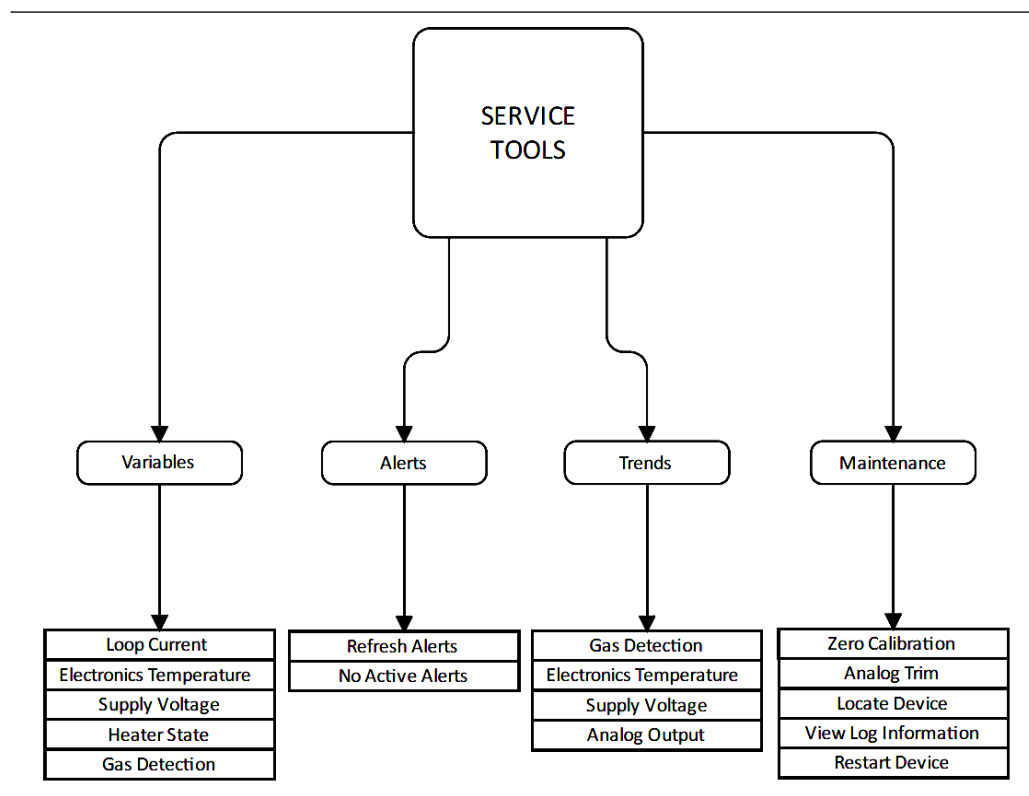
Table 5-4: Setup screen

Option	Description	Read/Write
Heater status	Heater mode selector (ON, OFF, AUTO)	R
Gas type	Gas type selection (Methane, Propane, Ethylene)	R
Full-scale sensitivity	Shows the Full-scale sensitivity setting	R

Table 5-5: Readout screen

Option	Description	Read/Write
Electronics temperature	Heater mode selector (ON, OFF, AUTO)	R
Supply voltage	Input voltage (Vin)	R
Operating time	Shows operating time	R

6 Service Tools menu



6.1 Alerts menu

Option	Description	Read/Write
Refresh alerts	Refreshes alerts	R/W
Active alerts	Show alert status	R

6.2 Variables menu

Option	Description	Read/Write
Gas detection	Shows current LEL readings	R
Electronics temperature	Shows internal temperature	R
Supply voltage	Input voltage (Vin)	R
Heater state	Heater state selector (ON , OFF , AUTO)	R
Loop current	Shows real-time 4-20 mA analog output indication	R

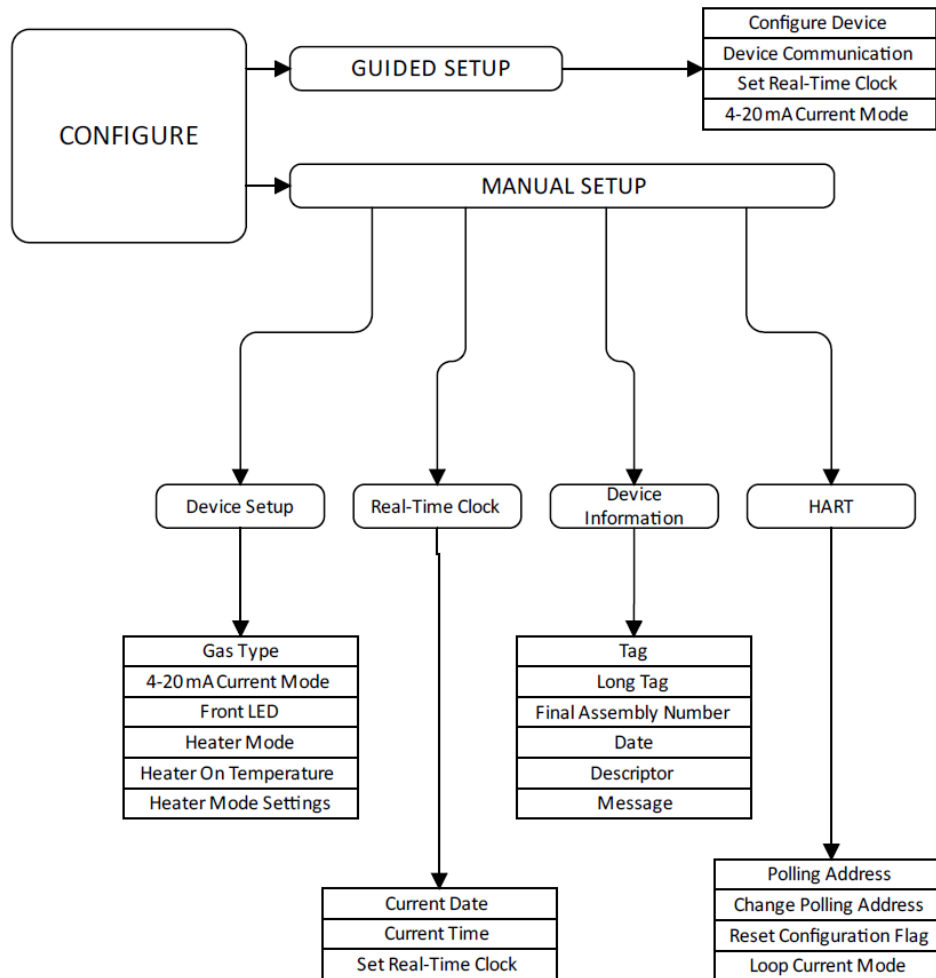
6.3 Trends menu

Option	Description	Read/Write
Electronics temperature trend	Verifies trend functionality	R
Gas detection trend	Verifies trend functionality	R
Supply voltage trend	Verifies trend functionality	R
Analog output trend	Verifies trend functionality	R

6.4 Maintenance menu

Option	Description	Read/Write
Zero calibration	Performs a zero calibration	R/W
Analog trim	Performs a 4–20 mA calibration	R/W
Locate device	Locating device process	R/W
View log information	Internal log	R/W
Restart device	Restarting the detector	R/W

7 Configure menu



7.1 Guided Setup menu

Option	Description	Read/Write
Configure device	Step-by-step configuration wizard	R/W
4–20 mA current mode	Switch between “Continuous/Discrete”	R/W
Front LED	Switch front LED ON/OFF	R/W
Set real-time clock	Option to set RTC (real-time clock)	R/W

7.2 Manual Setup menu

Device Setup screen

Option	Description	Read/Write
Gas type	Gas type selection (Methane, Propane, Ethylene)	R/W
4–20 mA current mode	Shows a dial with the current LEL readings.	R/W
Front LED	Switch front LED ON/OFF	R/W
Heater mode	Heater mode indication-only	R
Heater on temperature	Heater AUTO mode temperature selector	R
Heater mode setting	Heater mode selector	R/W

Real-Time Clock screen

Option	Description	Read/Write
Current date	Shows the current date	R
Current time	Shows the current time	R
Set real-time clock	Option to set RTC (real-time clock)	R/W

Device Information screen

Option	Description	Read/Write
Tag	Allows to input device tag	R/W
Long tag	Allows to input device long tag	R/W
Final assembly number	Allows to input a final assembly number	R/W
Date	Allows to input a date	R/W
Descriptor	Allows to store a description text	R/W
Message	Allows to store a message	R/W

HART® screen

Option	Description	Read/Write
Polling address	The address used by the host to identify a field device.	R
Change polling address	Allows to set a polling address	R/W
Reset configuration changed flag	Configuration reset	R/W
Loop current mode	Enables to choose between fixed or not fixed current mode.	R

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