Manual
00809-0100-4925, Rev AC
September 2024

Rosemount™ 925FGD Fixed Gas Detector

Integrated Gas Detection

ROSEMOUNT™

EMERSON™

Safety messages

⚠ WARNING

Explosions

Explosions could result in death or serious injury.

Installation of device in an explosive environment must be in accordance with appropriate local, national, and international standards, codes, and practices.

Before connecting a handheld communication device in an explosive atmosphere, ensure the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.

⚠ WARNING

Electrical shock

Electrical shock could cause death or serious injury. High voltage that may be present on leads can cause electrical shock.

Avoid contact with the leads and terminals.

⚠ WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

NOTICE

Read this document before working with the product. For personal and system safety, and for optimum product performance, make sure you thoroughly understand the contents before installing, using, or maintaining this product.

NOTICE

This guide provides configuration and basic installation information for the Rosemount 925FGD Wireless Gas Monitor. It does not provide diagnostic, maintenance, service, troubleshooting, Intrinsically Safe (IS) installation, or ordering information.

For more information, refer to the Rosemount 928 Wireless Gas Monitor Reference Manual.
The manual and this guide are also available electronically on Emerson.com/Global.

NOTICE

Nuclear applications

The products described in this document are not designed for nuclear qualified applications. Using non-nuclear qualified products in applications that require nuclear-qualified hardware or products may cause inaccurate readings.

For information on Rosemount nuclear-qualified products, contact an Emerson sales representative.

Contents

1 Introduction

1.1 Definition of models and terms

%/volume	Percentage concentration per volume
HART®	Highway addressable remote transducer: a digital communication protocol
IP filter	Ingress protection filter
IR	Infrared
LED	Light-emitting diode
LEL	Lower explosive limit
LOI	Local operator interface
PV	Primary variable
Rosemount 625	Sensor housing
Rosemount 625ND	Non-dispersive infrared sensor module
Rosemount 905	Junction box for remote mounting
Rosemount 925	Gas detection universal transmitter
Rosemount 925FGD	Fully-assembled gas detector, consisting of transmitter, sensor housing, and sensor module. May also contain junction box for remote mount sensor configurations.

1.2 Device overview

The Rosemount 925FGD is a fixed gas detector compatible with the Rosemount 625 Sensor Module.

The Rosemount 925FGD is a fully-assembled unit for either sensor-direct-mount or sensor-remote-mount installations. For remote-mount installatoins, the detector will consist of one standalone Rosemount 925 Transmitter and one Rosemount 905 Junction Box with a Rosemount 625 Sensor Housing wired and attached. For configuration, you can order the Rosemount 925FGD with or without the sensor module for instances where sensor modules will be installed after the initial transmitter installation.

The Rosemount 925FGD Transmitter consists of the transmitter electronics, an LOI display, and infrared touch buttons contained in an explosion-proof housing. The transmitter provides outputs, including 4-20 mA analog signal, fault relay, alarm relays (2), and HART® protocol. The transmitter is also equipped with status indication LEDs.

All Rosemount 625 Sensors are smart sensors, meaning all configuration, calibration, and gas sensing data is stored directly on or generated directly from the sensor. This data is then communicated to the Rosemount 925 Transmitter, which displays information on the local operator interface (LOI) and generates outputs for communication with site control systems.

For combustible hydrocarbon gas detection, the Rosemount 925FGD incorporates the Rosemount 625ND Sensor Module. The Rosemount 625ND Sensor Module uses non-

dispersive infrared technology to measure combustible hydrocarbon gas using absorption spectroscopy in the infrared sensor bands.

2 Configuration

2.1 Overview

Note
Unless otherwise specified, all sensor modules will leave the factory with default configuration options selected. The operator can change the options in the field using either the local operator interface (LOI) or HART® communication.

2.2 Configuration options

To order the Rosemount 625ND or replacement Rosemount 625ND Sensor Modules with custom configuration, select the **C1** optional model code and add it to the configured model number. Submit an additional Configuration Data Sheet specifying the custom options required. You can also configure settings with HART® communication or the local operator interface (LOI).

The following are the available configuration options for the Rosemount 925FGD when ordered as a fully assembled detector:

1. Basic setup
    a. Descriptor
    b. Message
    c. Date
    d. HART long tag
2. Display
    a. Backlight settings
    b. Heater settings
3. Diagnostic alarms and alerts
    a. Alarm 1 level
    b. Alarm 2 level
    c. Alarm latching settings
    d. Alarm relays normally open/normally closed
4. Advanced setup
    a. Passcode settings

⚠ CAUTION

The Ingress Protection (IP) filter must be installed.

If the IP filter is not installed, damage may occur to the sensor. Type 4X/IP ratings are not valid if IP filter is not installed on 625ND.

Do not operate the transmitter without the correct IP filter installed in the sensor module.

When installing the IP filter, verify that the IP filter gasket is in place, is properly aligned, and that it does not block the white filter media. When handling the IP filter, avoid contact with the filter media.

Verify that all three legs are fully latched by pushing upward on each leg of the IP filter.

Avoid getting water inside the IP filter.

Do not attempt to clean the IP filter.

Do not rinse or spray the IP filter with water.

Do not immerse the IP filter in water.

IP/Type4X ratings does not imply that the equipment will detect gas during and after exposure to those conditions.

3 Installation

3.1 Safety messages

Instructions in this section may require special precautions to ensure the safety of personnel performing the operations.

⚠ WARNING

Follow installation guidelines

Failure to follow these installation guidelines could result in death or serious injury.

Ensure that only qualified personnel perform the installation.

⚠ WARNING

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

⚠ WARNING

Explosions

Before connecting a handheld communication device in an explosive atmosphere, ensure that the instruments are installed in accordance with Intrinsically Safe or non-incendive field wiring practices.

Verify that the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

When connecting an external device to the Rosemount 925FGD's discrete output in a hazardous area, ensure that the external device is installed in accordance with Intrinsically Safe or non-incendive field wiring practices.

3.2 Rosemount 625ND non-dispersive infrared sensor effectiveness

- When installing the Rosemount 925 FGD Gas Detector with a Rosemount 625ND Non-dispersive Infrared Sensor, it is required the sensor be mounted in a vertical configuration with the IP filter pointed downward.
- When mapping a gas detection system, it should be understood that gas must physically pass through the IP filter and the integral sinter to reach the sensor. Therefore, the “field of view” or detection distance of a non-dispersive infrared sensor is limited to the immediate vicinity surrounding the sensor.
- The IP filter and sinter should always be kept free of debris and should be subject to regular scheduled maintenance to clear any obstructions.
- When mounting the sensor, installation height should be determined by considering a combination of the following: height most suitable to the safety of personnel on site as well as the correlation of target gas specific gravity compared to the surrounding

atmosphere (i.e. methane and natural gas are lighter than air and tend to rise, while propane and butane are heavier than air and tend to sink).

- In order to relay LEL percentage as accurately as possible it is important the correct gas calibration option be selected that best represents the target gases on site intended to be detected (i.e. if hoping to detect natural gas leaks, a methane calibration will provide considerably more accurate percent LEL readings than a propane calibration).
- For optimum accuracy and reliability the calibration schedule should be followed as mentioned in Sensor calibration. While the minimum recommended calibration interval is 12 months, if the installation site is subject to more frequent swings in environment conditions, the calibration interval should be decreased accordingly.

3.3 Mounting

The Rosemount 925FGD Gas Transmitter can be mounted either with the sensor directly attached or with the sensor mounted remotely withseparation up to 1,500 ft (457 m). You can also mount the transmitter either on the surface or on a pole. The Rosemount 925FGD Gas Transmitter can be mounted with the sensor directly attached or with the sensor mounted remotely with separation up to 1,500 ft (457 m). The transmitter can also be mounted on either on the surface or on a pole.

For the surface mounting with direct-mount sensors, refer to Figure 3-1.

Figure 3-1: Surface Mount with Direct-Mount Sensor

For pole mounting with direct-mount sensors, select the BP optional model code, which includes the necessary pole mount bolts in the box with the transmitter. Refer to Figure 3-2.

Figure 3-2: Pole Mount with Direct-Mount Sensor

For surface mount installations with the remote mount sensor options selected, see Figure 3-3 to install the transmitter. See Figure 3-4 to mount the junction box with the included hardware and fasteners.

Figure 3-3: Surface Mount with Remote Sensor Mount

For pole-mount installations with the remote sensor option selected, see Figure 3-3 to install the transmitter and Figure 3-4 to install the Junction box.

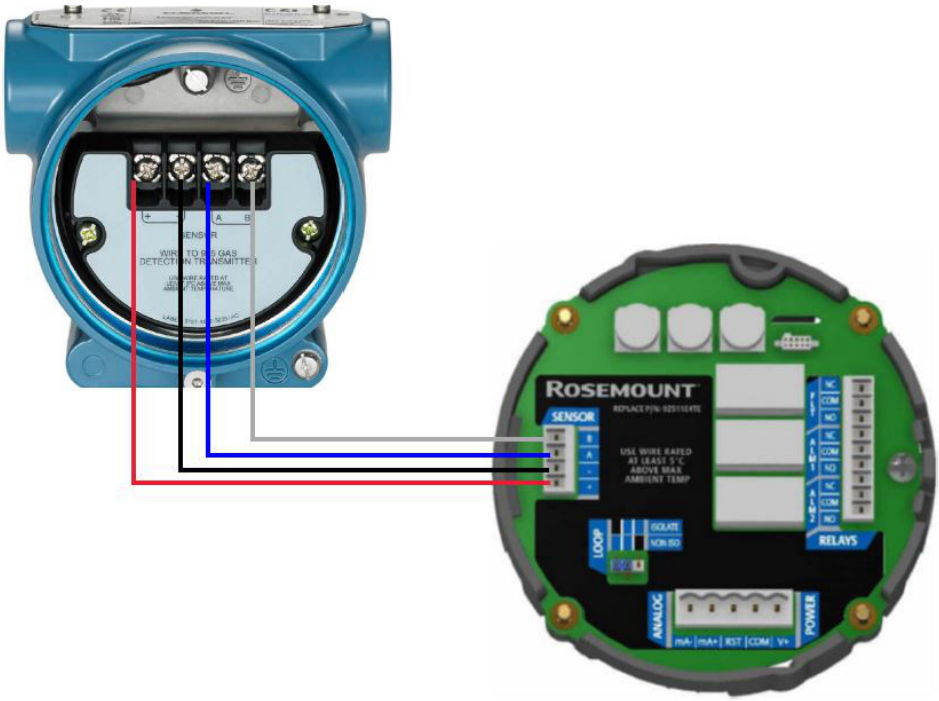
Figure 3-4: Sensor and 905 Junction box with mounting bracket

3.4 Remote mount monitoring

When the sensor is required to be mounted away from the transmitter, refer to Figure 3-5 for information on connecting the sensor to the transmitter terminal block.

To meet EMC requirements, it is required to use dual twisted-pair shielded wire with an outer shield between the 925 transmitter and the 905 junction box. If the 905 junction box is not connected to conduit, the provided conduit gland must be installed for compliance with EMC requirements. If the 905 junction box is connected to conduit, the provided conduit gland is not required.

Figure 3-5: Wiring Diagram for 625 Sensor and 925 Transmitter with 905 Junction Box



Note
Ground wire from the 625 sensor must be connected to the ground on the 905 terminal block as shown in Figure 3-5.

3.4.1 Analog output, isolated supply, non-isolated supply, and jumper configuration

The analog output may be powered from the main instrument power supply or a separate, isolated power supply, in which case an isolated wiring configuration is necessary.

An isolated loop uses 4-wires, 2 to power the device, and 2 for the analog output. A non-isolated loop uses 3-wires, as the analog output is tied into the power supply loop. Ensure the loop jumper is correctly set for the wiring configuration you are using. See Figure 3-6.

Figure 3-6: 925 Transmitter Terminal Block

3.4.2 Field wiring

The power to the transmitter is supplied over the signal wiring. Signal wiring must be shielded, twisted pair.

⚠ CAUTION

Do not run unshielded signal wiring in conduit or open trays with power wiring or near heavy electrical equipment because high voltage may be present on the leads and may cause an electrical shock.

To meet EMC requirements, for the transmitter power wiring (V+ and COM) and signal wiring (mA+ and mA-) it is required to use twisted shielded pair wires between the user power supply and the 925 transmitter. All flameproof entry devices, including plugs, must be rated to a pressure greater than 2450 kPa (356 psi).

Seal all threads with an approved thread sealant, such as silicone or PTFE tape (if required). When attaching the cover; tighten at least one-third turn after the O-ring contacts the transmitter housing.

⚠ CAUTION

The transmitter cover must be fully engaged to meet explosion-proof requirements.

NOTICE

Do not apply high voltage (e.g., AC line voltage) to the power or sensor terminals, since high voltage can damage the unit.

To wire the transmitter:

Table 3-1: Sensor terminals

Sensor terminals	
Sensor wires	**Transmitter sensor board terminal designation**
Red	+Vdc (from transmitter)

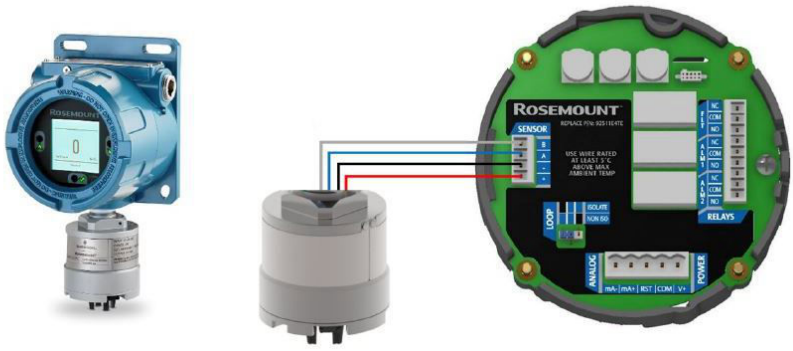
Table 3-1: Sensor terminals *(continued)*

Sensor terminals	
Sensor wires	**Transmitter sensor board terminal designation**
Blue	Signal A
White	Signal B
Black	Common
Green	Earth ground

Table 3-2: Transmitter power terminals

Transmitter power terminals	
Transmitter terminal designation	**Function**
V+ 18-30Vdc	Power (+)
COM	Power (-)
RST	Remote reset
mA+	Current loop output
mA-	Current loop output

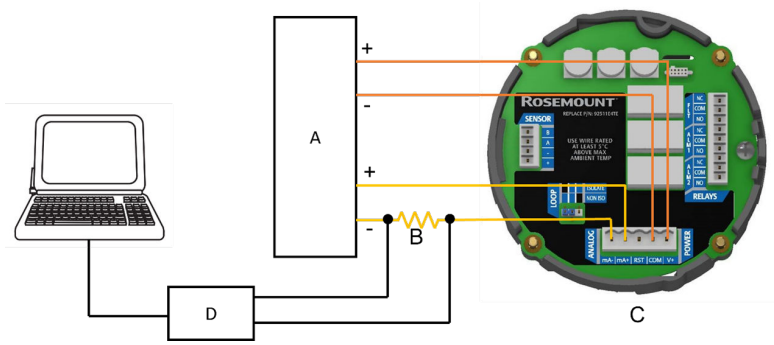
Figure 3-7: Direct mount wiring diagram



Isolated 4-wire loop wiring

For a 4-wire loop setup, ensure the loop jumper is set to the **ISOLATE** position and that shielded, twisted pairs are used.

Figure 3-8: Isolated 4-wire wiring diagram

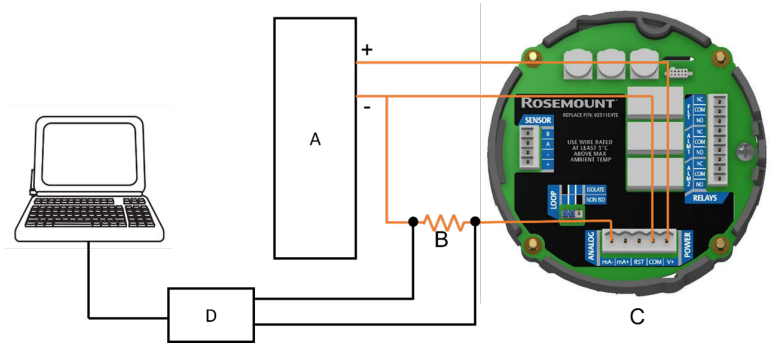


A. Power supply (18-30 Vdc)
B. 200 ≤ R_L ≤ 800
C. Power/4-20 mA analog loop terminals
D. HART® modem

Non-isolated 3-wire loop wiring

For a 3-wire loop setup, ensure the loop jumper is set to the NON ISO position and that shielded, twisted pairs are used.

Figure 3-9: Non-isolated 3-wire wiring diagram



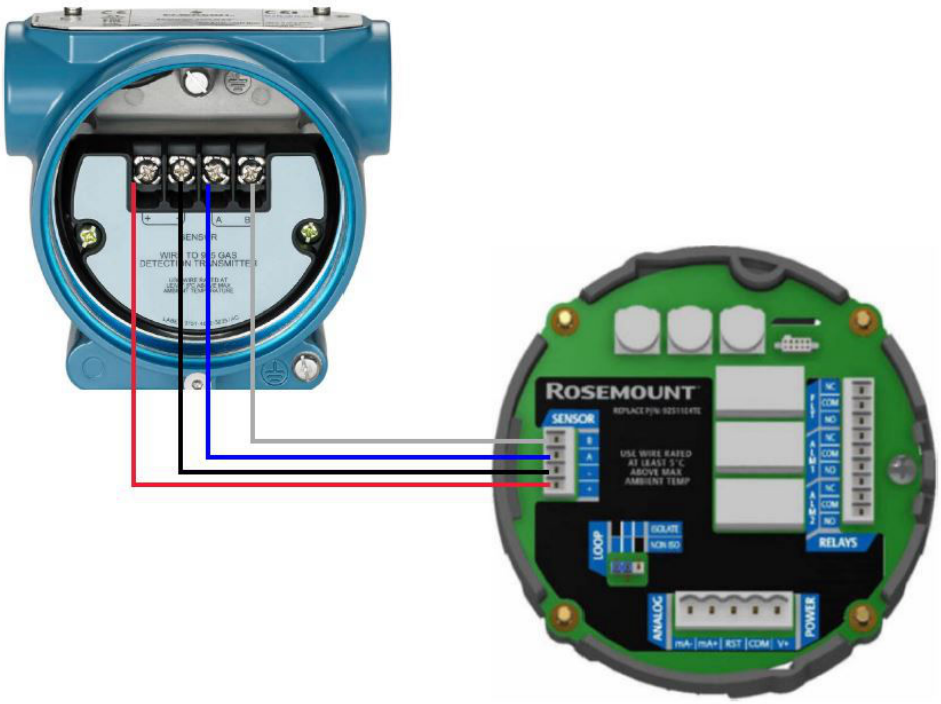
A. Power supply (18-30 Vdc)
B. 200 ≤ RL ≤ 800
C. Power/4-20 mA analog loop terminals
D. HART modem

3.4.3 Remote mount monitoring

When the sensor is required to be mounted away from the transmitter, refer to Figure 3-10 for information on connecting the sensor to the transmitter terminal block.

To meet EMC requirements, it is required to use dual twisted-pair shielded wire with an outer shield between the 925 transmitter and the 905 junction box. If the 905 junction box is not connected to conduit, the provided conduit gland must be installed for compliance with EMC requirements. If the 905 junction box is connected to conduit, the provided conduit gland is not required.

Figure 3-10: Wiring Diagram for 625 Sensor and 925 Transmitter with 905 Junction Box



Note
Ground wire from the 625 sensor must be connected to the ground on the 905 terminal block as shown in Figure 3-10.

3.4.4 Remote reset

If the alarm relays are configured for latching operation, Emerson recommends resetting latched alarms from a remote location. In this case, a normally open, momentary push-button switch can be connected across terminals **RST** and **COM**.

3.4.5 Relays

Electromechanical relays have Form-C SPDT contacts rated 5 amps at 30 Vdc. There are three physical relays; one fault and two alarm relays. These relays have normally open and normally closed contacts at the output terminals.

Alarm relay(s)

The transmitter comes with two programmable alarm relays. These relays will change state from their non-alarm state to an alarm state when gas concentrations, as read by the sensor, reach the programmed alarm points set in the transmitter.

The alarm relays change states at the configured alarm 1 and alarm 2 set points (where alarm 2 is greater than alarm 1). The relays can be programmed to be energized or de-energized under normal conditions. They are also configurable to be either latching or non-latching in alarm.

Fault relay

The fault relay is normally energized (normally open) when no fault conditions are present and is set up for non-latching. The operation of the fault relay is not configurable.

The transmitter indicates various fault conditions when the transmitter or connected sensor(s) are not operating as expected. These fault conditions will override any alarm conditions because the sensor may be unable to reliably detect a gas exposure. Examples of fault conditions can include no gas detection due to memory corruption, communication errors, or sensor failure. Other faults can provide unreliable detection due to sensor drift or sensor nearing the end of its life. When a transmitter is in fault mode, take immediate action to determine the source and correct the fault condition.

Emerson 925 transmitters and 625 sensors continually check for situations that may prevent the transmitter and sensor from providing an expected response to ambient conditions and records these as a fault condition in the event log and the output(s) of the transmitter. When the transmitter detects a system fault, the amber Status LED will flash fast (250 milliseconds on, 250 milliseconds off), the analog output will output a 2.5 mA signal, and the fault relay will change states from normally open to normally closed (de-energize to indicate a fault condition).

Note
The fault relay output is not commonly used to imitate an automatic shutdown. The fault output indicates a potential problem with the transmitter not an alarm condition.

3.5 Local operator interface (LOI)

The Rosemount 925 Transmitter uses through-the-glass infrared (IR) touch buttons to navigate the LOI display.

Figure 3-11 shows the location of the IR buttons on the left, right, and bottom of the LOI.

Figure 3-11: Front view of LOI

For best results when activating the IR touch buttons, ensure that your finger covers the complete surface of the glass above the button.

The IR buttons have automatically adjusting sensitivity, meaning that they will adjust to installation conditions, such as the cover being removed.

3.5.1 Unlock Local Operator Interface (LOI)

The Rosemount 925 Transmitter comes with a screen lock feature as a default to inhibit accidental operation and potential environmental stimulus that might activate the infrared (IR) touch buttons.

For added safety, you can enable a four-digit passcode instead of the following standard unlock sequence. You can do this through the LOI or via HART®.

For more information on this safety feature, refer to the Rosemount 925FGD Safety Manual.

Procedure

1. Press any **IR** button to initiate the unlock sequence.
2. Press the **checkmark**.
3. Press the **up** arrow.
4. Press the **checkmark**.
5. Press the **down** arrow.

Related information

LOI menu tree
HART communication

3.5.2 LOI menu tree

Figure 3-12, Figure 3-13, and Figure 3-14 show the navigation and menu options of the Rosemount 925FGD display.

Figure 3-12: LOI Menu Tree Sheet 1

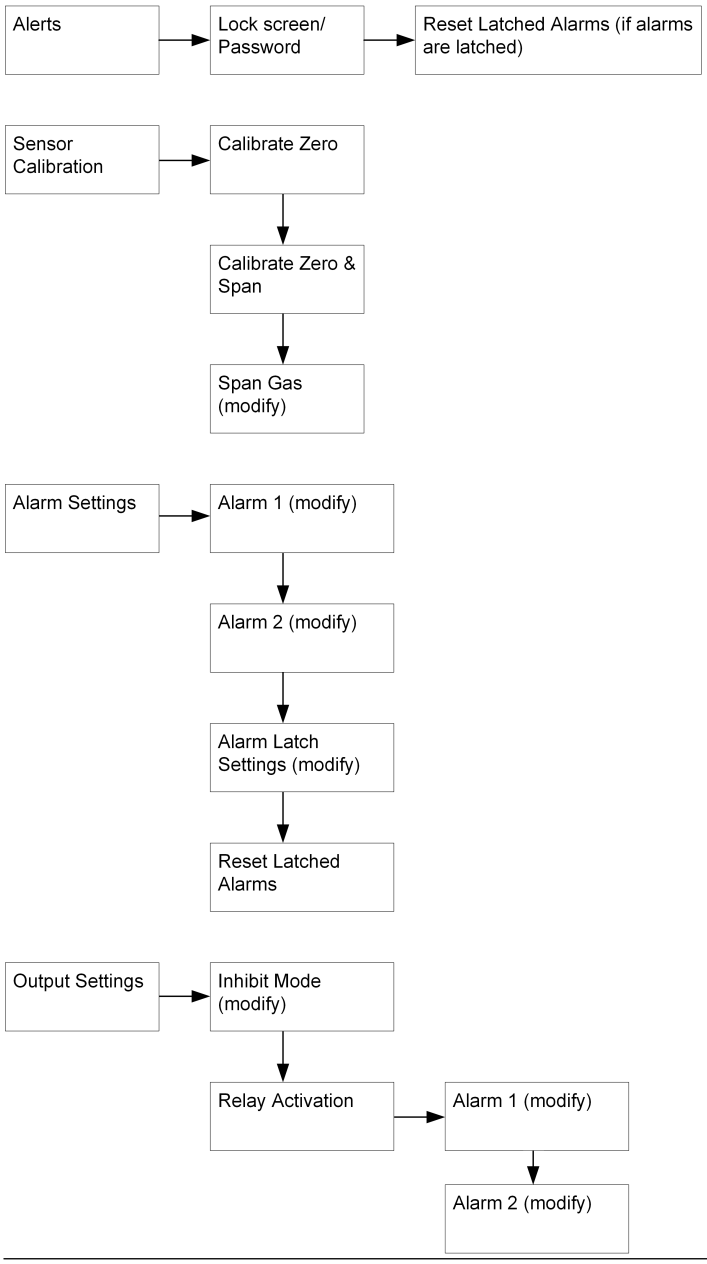


Figure 3-13: LOI Menu Tree Sheet 2

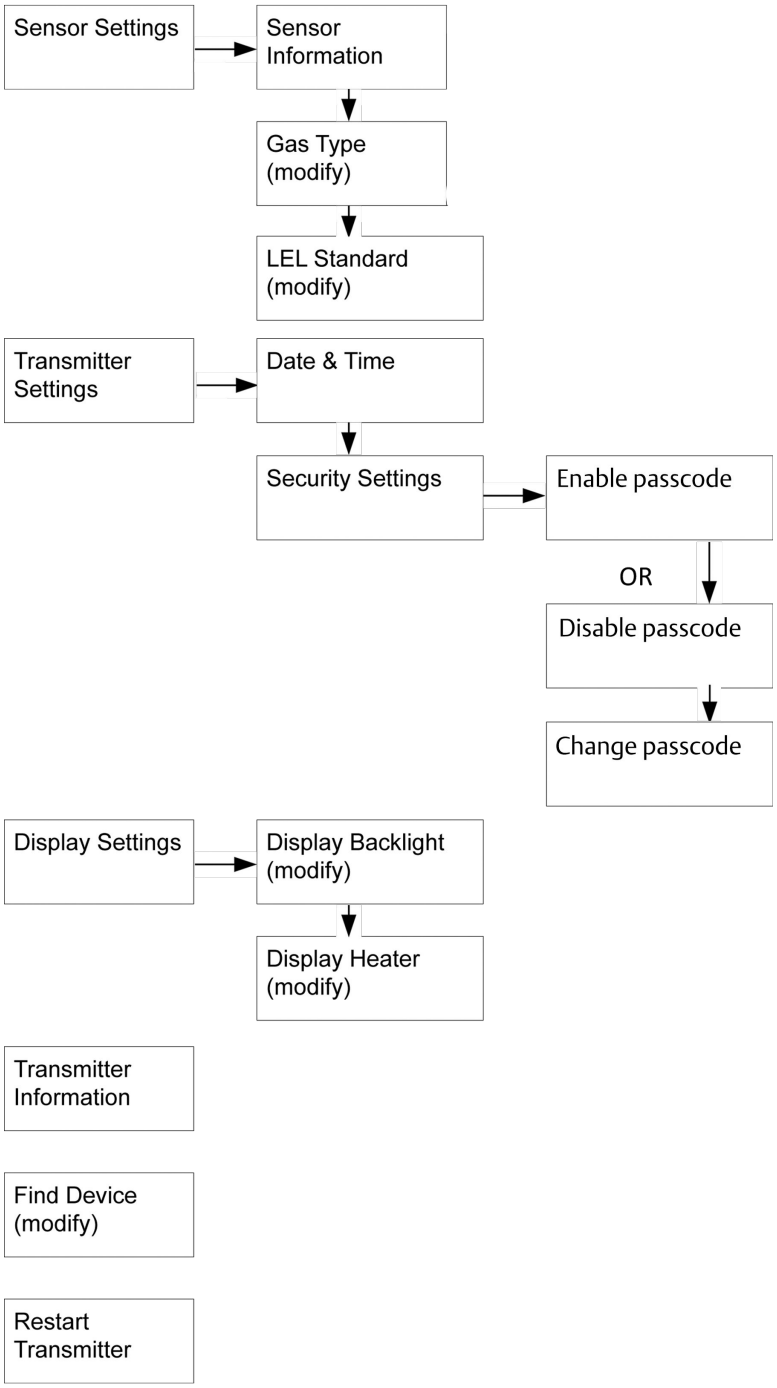
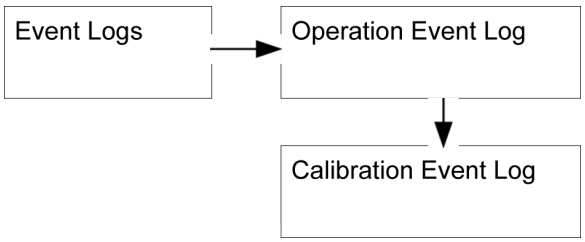


Figure 3-14: LOI Menu Tree, Sheet 3



3.6 HART® communication

Figure 3-15 through Figure 3-24 show the navigation paths for Field Communicator commands and options. A Rosemount 925FGD Device Description (DD) is required for HART transmitter communication. To obtain the latest Emerson DD, visit the *System Software and Device Description* web page for your handheld communicator. Refer to your handheld communicator's reference manual for a menu structure with descriptions of each option.

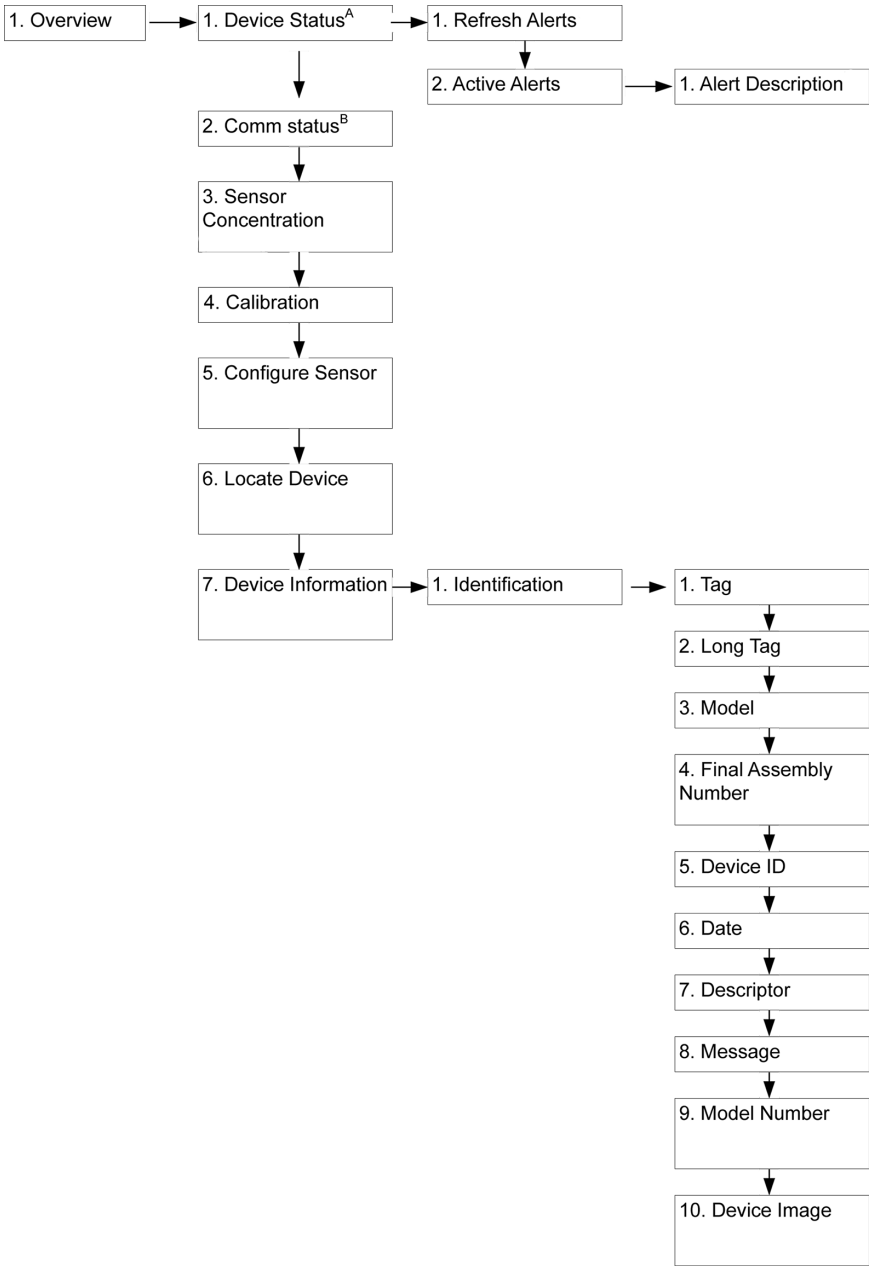
Prior to making any changes to the Rosemount 925FGD Fixed Gas Detector, such as changing the configuration or replacing the sensor, take appropriate action to avoid a false trip by electronically bypassing the safety Programmable Logic Controller (PLC).

Prior to placing the transmitter online and removing the bypass from the safety PLC, verify the transmitter configuration and all safety parameters.

⚠ WARNING

If the transmitter is in a classified area, do not open the wiring compartment unless the power to the transmitter has been removed or unless the area has been declassified. Contact Emerson.com/Global for further information.

Figure 3-15: HART Menu Tree, Sheet 1



A. *If there are no alerts active, then Device Status is **Good**. Otherwise, the Device Status is one of the following: **Failure**, **Function Check**, **Out of Specification**, or **Maintenance Required**.*

B. *Communication Status is **Polled** initially. If Burst Message is enabled, Communication Status will show **Burst**.*

Figure 3-16: HART Menu Tree, Sheet 2

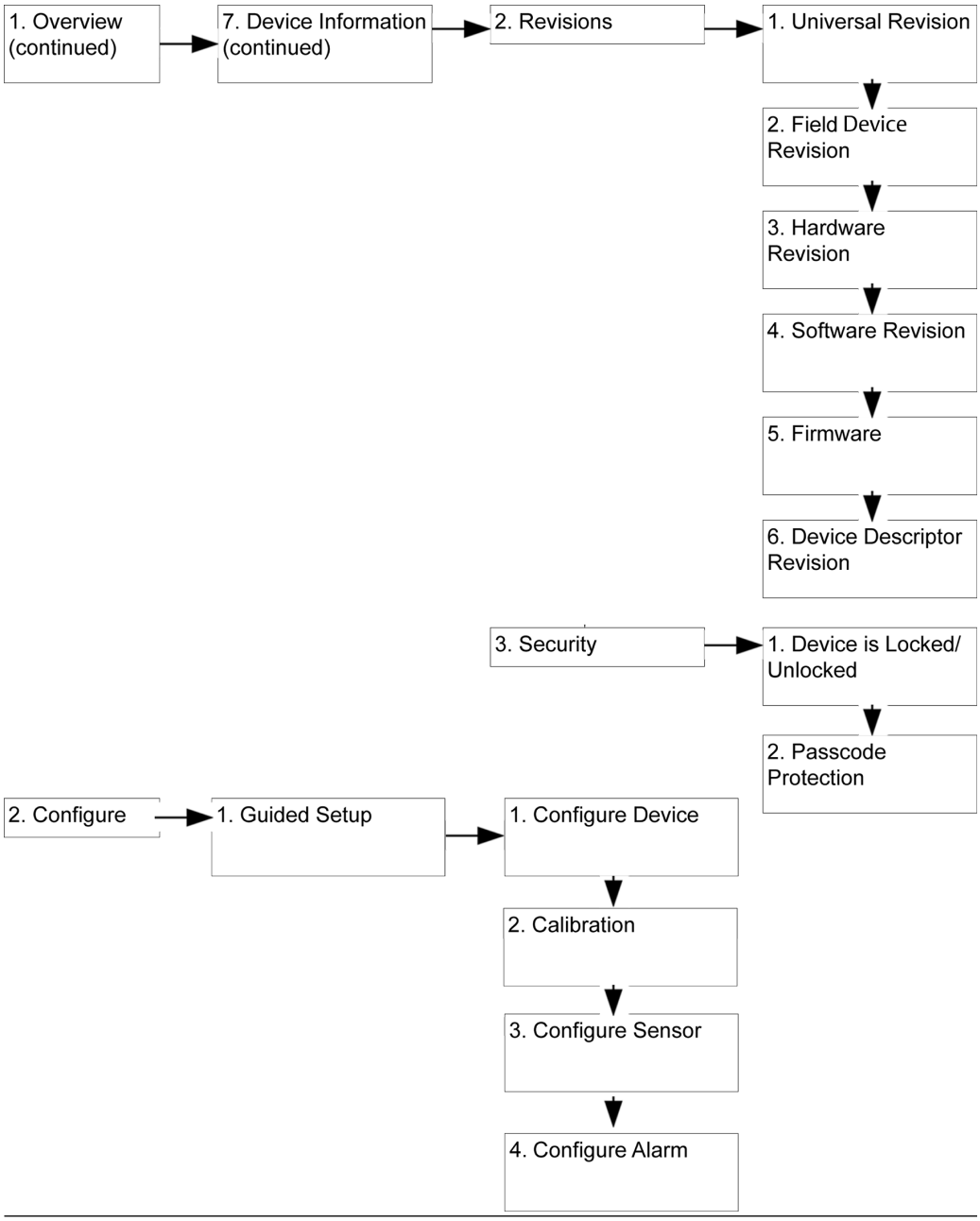
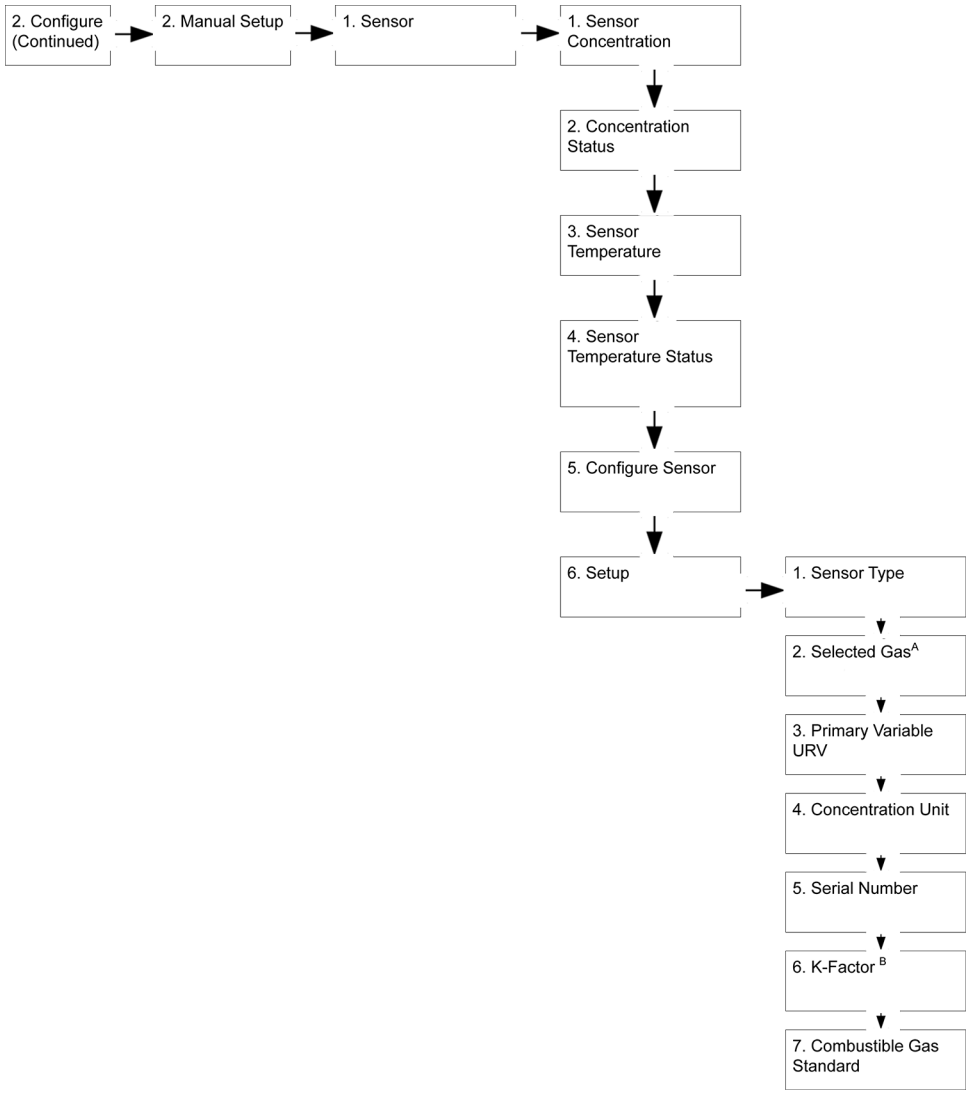


Figure 3-17: HART Menu Tree, Sheet 3



A. Selected Gas and Sensor Upper Range are only writable if an infrared (IR) or electrochemical sensor is selected.

Figure 3-18: HART Menu Tree, Sheet 4

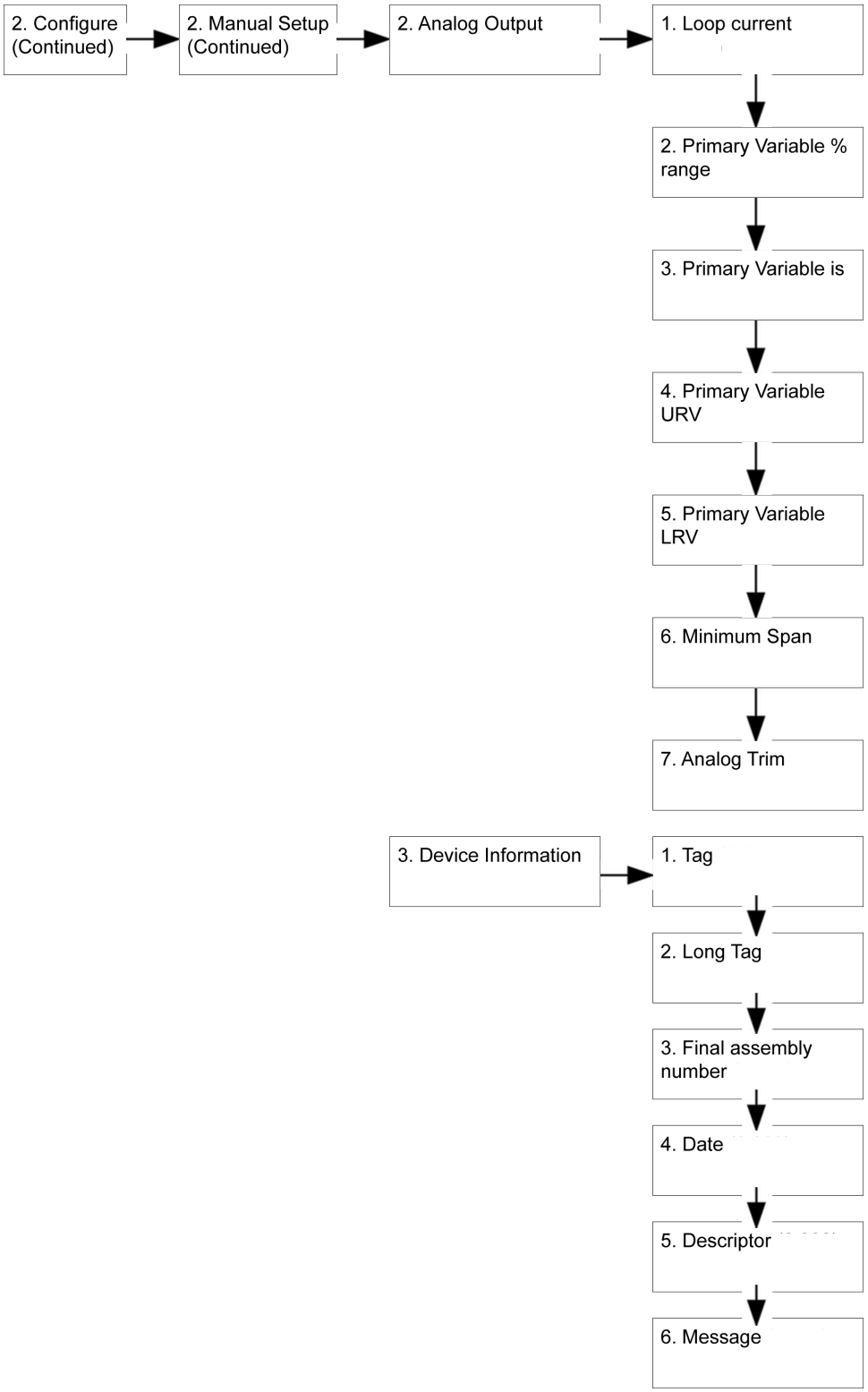
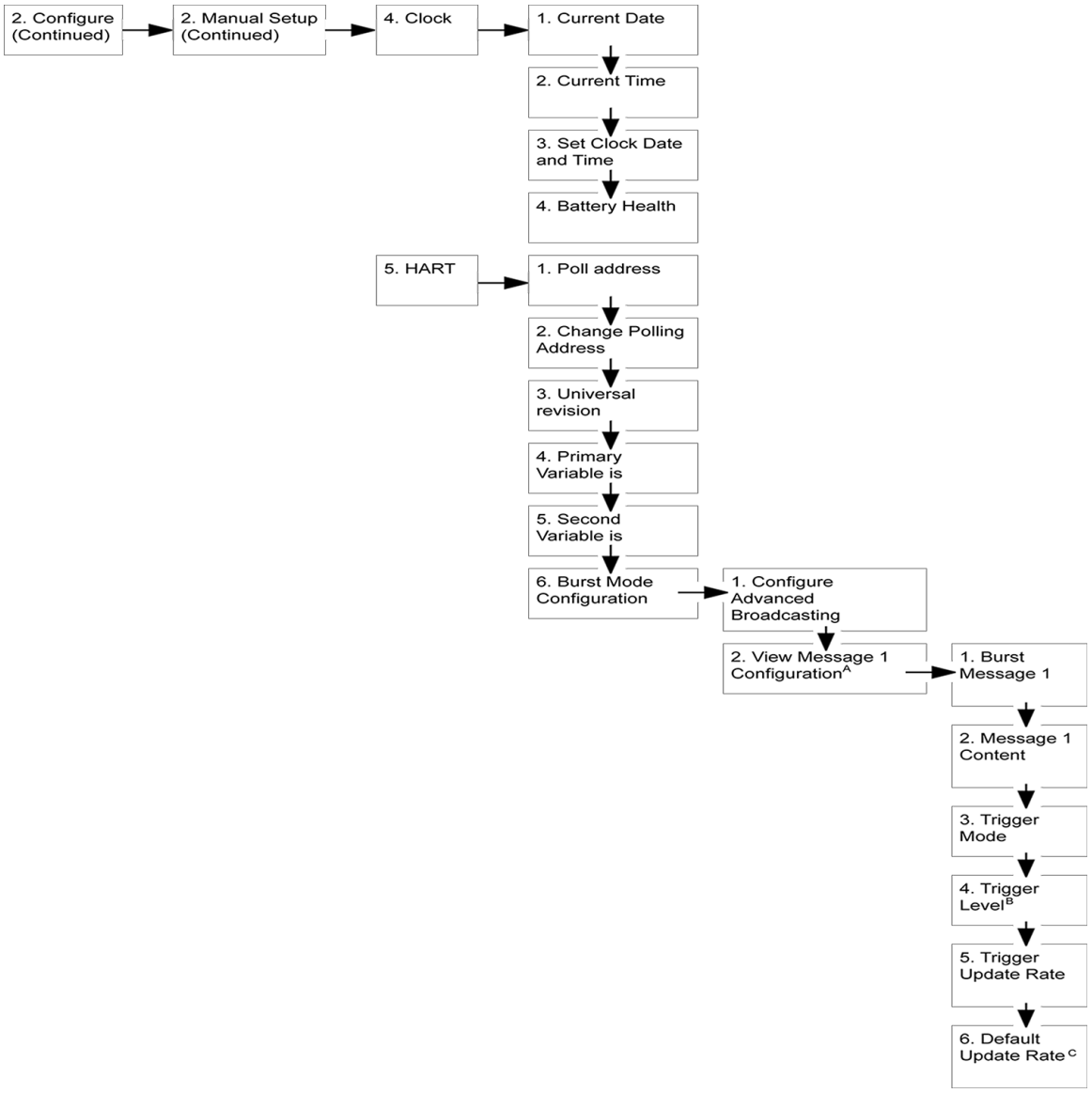
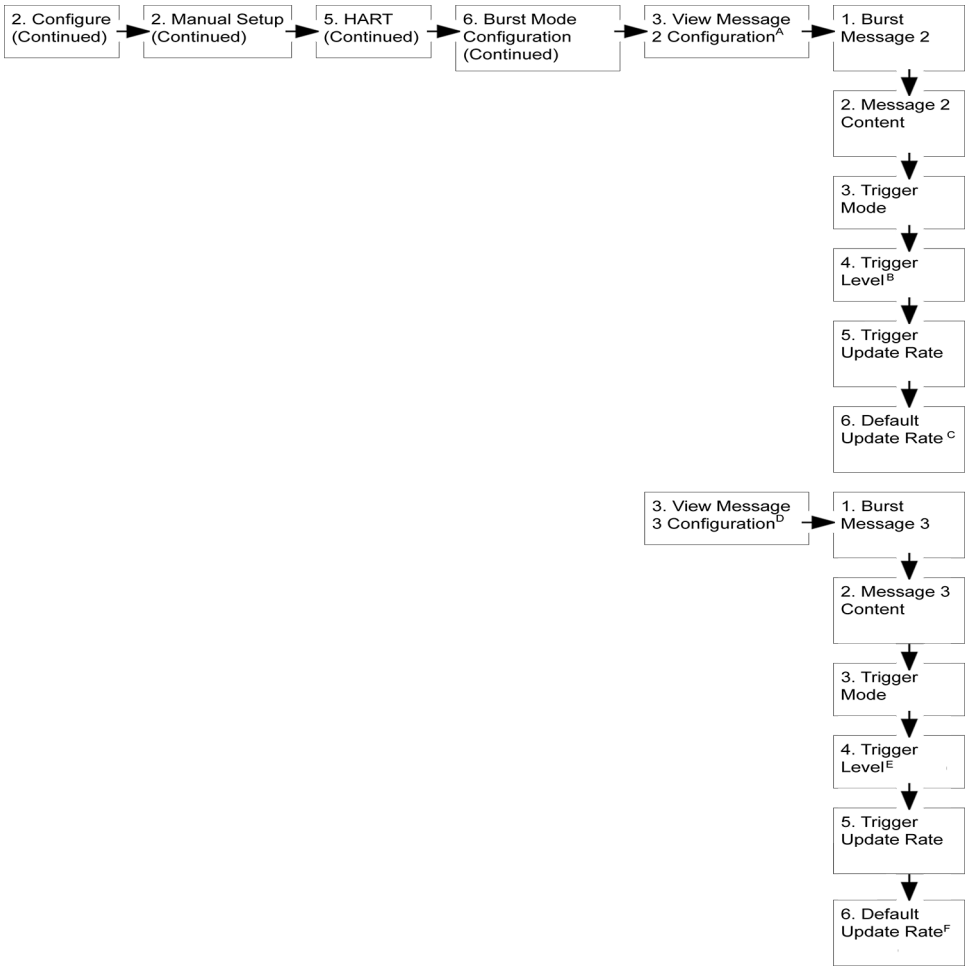


Figure 3-19: HART Menu Tree, Sheet 5



*A. **View Message 1 Configuration** menu will be visible only when Message 1 is Enabled.*
*B. Trigger Level will not be visible of the Trigger Mode is **Continuous** or **On-Change**.*
*C. Default Update Rate will not be visible if Trigger Mode is **Continuous**.*

Figure 3-20: HART Menu Tree, Sheet 6



A. ***View Message 2 Configuration*** *menu will be visible only when Message 2 is Enabled.*
B. *Trigger Level will not be visible of the Trigger Mode is* ***Continuous*** *or* ***On-Change****.*
C. *Default Update Rate will not be visible if Trigger Mode is* ***Continuous****.*
D. ***View Message 3 Configuration*** *menu will be visible only when Message 3 is Enabled.*
E. *Trigger Level will not be visible of the Trigger Mode is* ***Continuous*** *or* ***On-Change****.*
F. *Default Update Rate will not be visible if Trigger Mode is* ***Continuous****.*

Figure 3-21: HART Menu Tree, Sheet 7

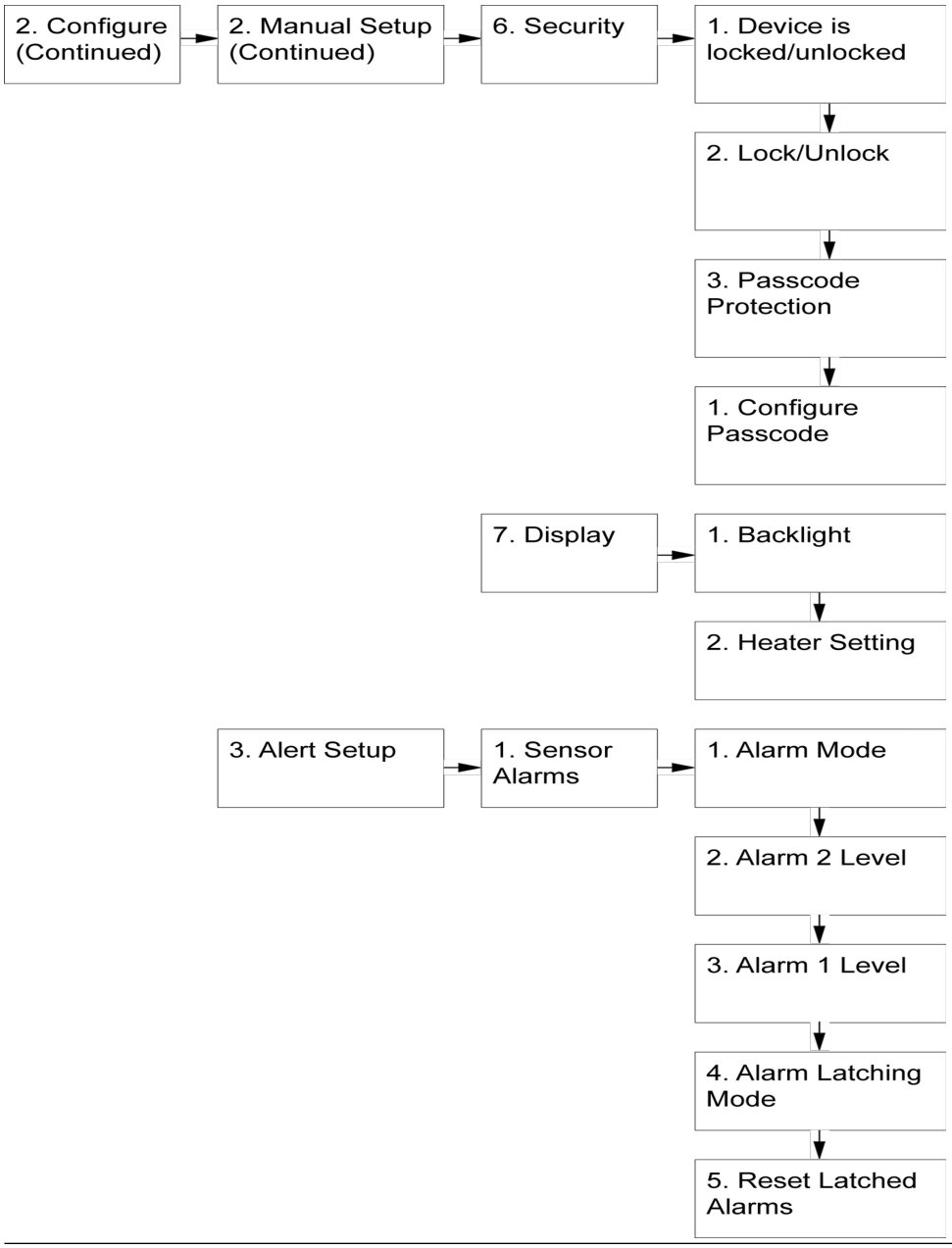
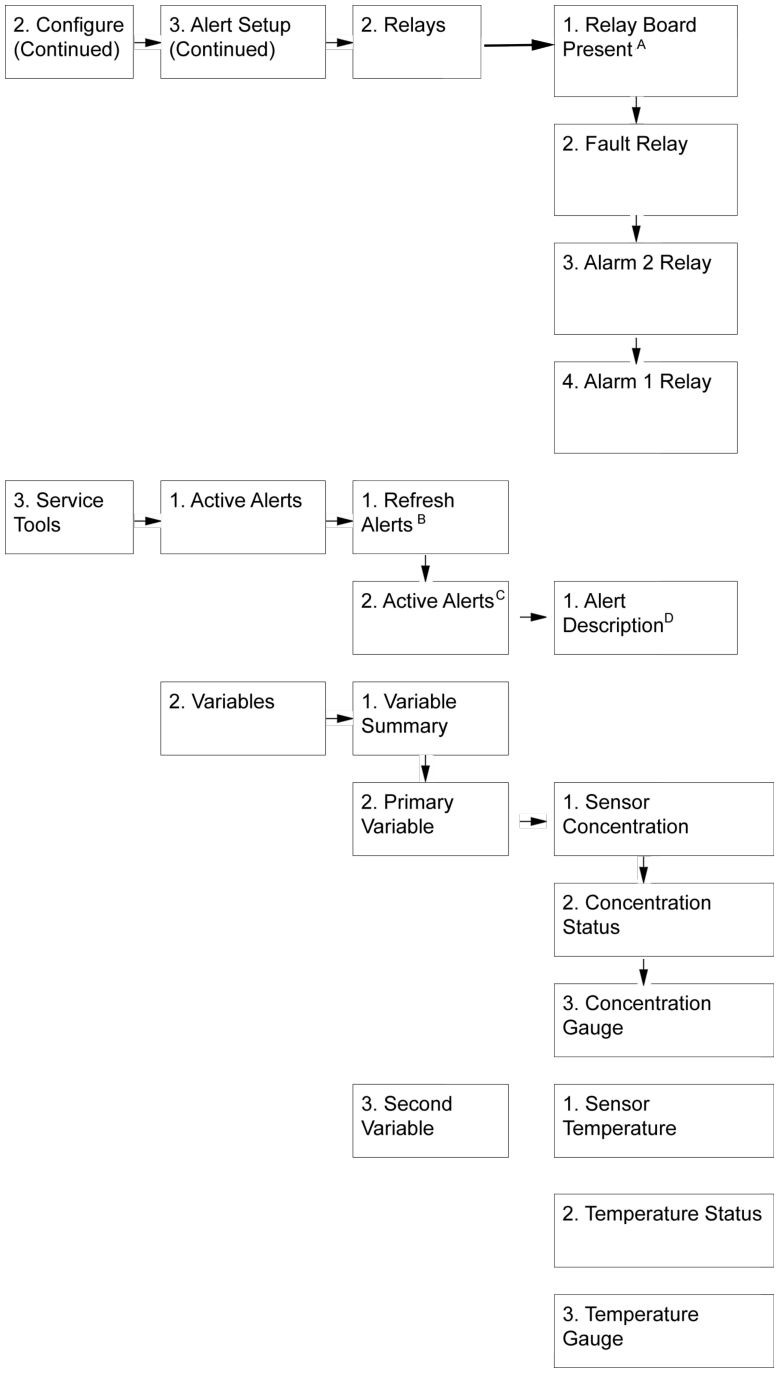


Figure 3-22: HART Menu Tree, Sheet 8



A. Relay Board is always present. Fault Relay is always disabled.

*B. This method sends command **48** to refresh alert status.*

*C. If there are no alerts active, **No Active Alerts** is shown. Otherwise, a combination of the **Failure**, **Function Check**, **Out of specification**, or **Maintenance Required** alerts are shown depending on the active alerts.*

D. Methods are used to display the text related to the alert if it is longer than 19 characters.

Figure 3-23: HART Menu Tree, Sheet 9

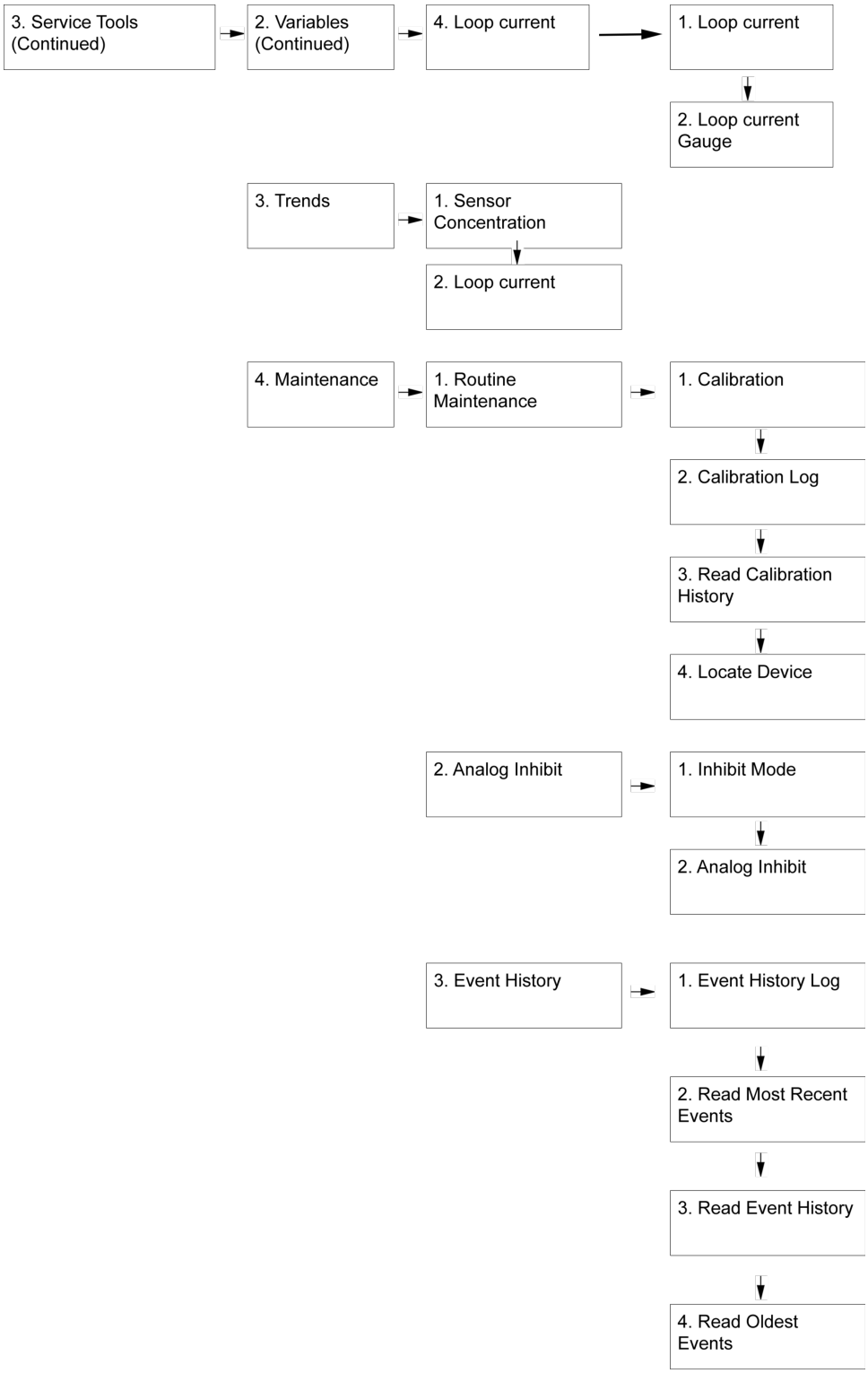
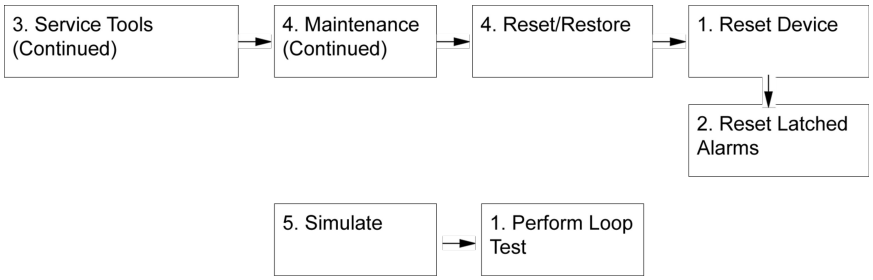


Figure 3-24: HART Menu Tree, Sheet 10



The following parameters can be modified via the LOI or HART communicator menu trees, within the range limits shown below:

LOI/HART parameter	Valid range
Alarm 1 level	1% to 100%
Alarm 2 level	1% to 100% (must be higher than Alarm 1 level)
Alarm latching mode	**Yes**/**No**
Inhibit mode	**Off**/**On**
Alarm 1 relay activation mode	**Normally closed**/**Normally open**
Alarm 2 relay activation mode	**Normally closed**/**Normally open**
Gas type	Methane, Propane, Butane, Ethane, Ethylene
Range	1(0-100)
LEL standard	ISO/IEC, NFPA
Passcode	0000 to 9999
Heater setting	**Disabled**, **Automatic**
Backlight setting	**Disabled**, **Enabled**, **Automatic**

3.7 Power on and start-up

Once you have made all necessary wiring connections and applied power, the transmitter will power on.

During this start-up process, the display will show a progress bar as well as the firmware versions for all components of the Rosemount 925FGD system. The status indicator LEDs will cycle through all colors: green, amber, and red.

Figure 3-25: Local operator interface (LOI) at start-up

When a new sensor module is detected, either upon initial installation or replacement of a sensor module, the configuration settings are shown on the LOI. At this point, you have the option of accepting configuration settings or selecting new settings.

Figure 3-26: New Sensor Detected Screen

Following the configuration prompt, an additional prompt appears stating that a field calibration is recommended. Refer to Calibration options.

Figure 3-27: Field Calibration Recommended screen

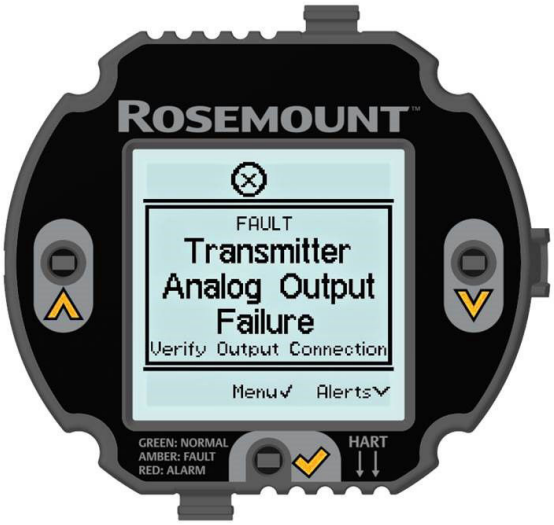
Unless one or more faults are present, the LOI will go to the ***Primary Variable*** screen, displaying the gas type and current concentration being measured by the sensor.

Figure 3-28: Primary Variable Screen Using Methane

Note
If the operator removes and reapplies power to the transmitter without replacing the sensor module, and no faults are present upon start-up, the display will go directly to the ***Primary Variable*** screen following the ***Start-up*** screen.

Note
If the 4-20 mA analog output has not been connected, a current loop failure fault will be present after the other prompts have been cleared. You can clear this fault either by terminating the 4-20 mA output to the appropriate control system input or by placing a 250 Ω resistor between the analog output terminals.

Figure 3-29: Current Loop Fault Screen



4 Sensor calibration

All sensor modules for the Rosemount 925FGD will arrive with factory calibration information stored in the sensor memory. While field calibration following initial installation is not required, it is best practice to calibrate sensors according to the specific environmental conditions present to achieve highest levels of accuracy. After initial installation, Emerson recommends performing complete zero and span calibration every 12 months.

For more information on Installation, Use And Maintenance Of Detectors For Flammable Gases, refer to IEC 60079-292-2.

4.1 Factory calibration gases

Table 4-1: Rosemount 625ND Non-Dispersive Infrared Combustible Gas Sensor Module

Gas type	Range	Default 50% lower explosive limit (LEL) calibration gas per National Fire Protection Association (NFPA) standards	Optional 50%LEL calibration gas per International Organization for Standardization (ISO)/IEC standards
Methane (default)	0-100% LEL	2.50%/volume	2.20%/volume
Propane	0-100% LEL	1.05%/volume	0.85%/volume
Butane	0-100% LEL	0.95%/volume	0.70%/volume
Ethane	0-100% LEL	1.50%/volume	1.20%/volume
Ethylene	0-100% LEL	1.35%/volume	1.15%/volume

Note
To order a Rosemount 925FGD with the optional ISO/IEC gas concentrations used for factory calibration, you must add the optional **IEC** model code to the configured model number. You can also change this in the field by selecting sensor settings in the local operator interface (LOI) menu or via HART® communication.

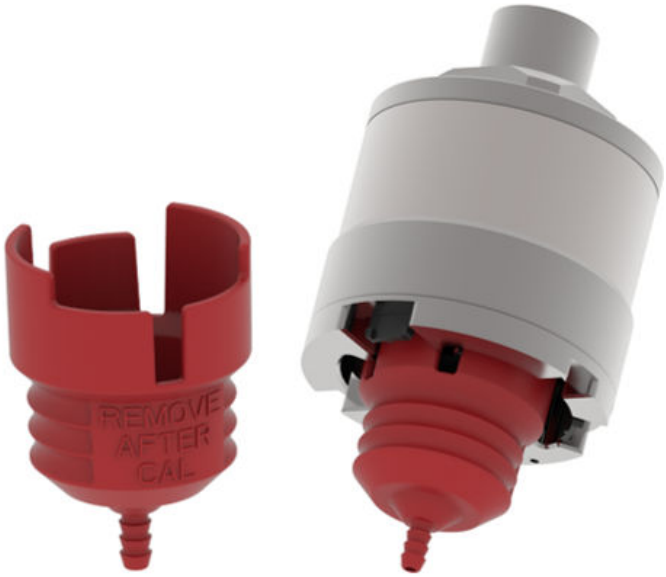
Note
To ensure proper calibration, verify that the correct concentration of calibration gas is used in correlation with the concentration settings selected in the transmitter.

4.2 Calibration options

The calibration cup (part number 00925-9100-0001) is the preferred method for sensor calibration.

The calibration cup attaches to the sensor by fitting over the pre-installed IP filter on the Rosemount 625ND Infrared Sensor. Refer to Figure 4-1 to see how to attach ¼-in inner diameter (ID) (⅜-in outer diameter [OD]) plastic gas tubing.

Figure 4-1: Attaching Calibration Cup to Sensor



The calibration cup creates a mostly sealed environment for the sensor, mitigating environmental effects such as wind and humidity. Leaving the calibration cup attached would render the sensor inoperable for detecting hazardous gases.

Note
Remove the calibration cup after calibration.

If a calibration cup isn't used, the IP filter is designed with an attachment point for ¼-in ID (⅜-in OP) plastic gas tubing. This design feature allows for permanent attachment of plastic gas tubing.

NOTICE

As the IP filter does not provide for physical containment of the gas supply leaving the tubing, it is subject to dispersion from environmental effects. This may affect the accuracy of calibration. Calibration using the IP filter may require higher volumes, pressures, and/or flow rates of calibration gas.

Note
A new calibration is required following changes to any of the below settings:

- Gas type
- LEL standard
- Span gas concentration

4.3 Calibration instructions

4.3.1 Zero calibrate only

Procedure

1. Go to **Menu** → ***Unlock sequence*** → **Sensor Calibration** → **Calibrate Zero**.
2. Attach the calibration cup to the Rosemount 625ND Sensor, leaving the IP filter in place.
3. Connect the appropriate zero gas concentration cylinder to the sensor, attaching the tubing to the IP filter.
4. Confirm **Yes** on the Local Operator Interface (LOI) to begin the zero calibration process.
5. Open the regulator and allow zero-gas to flow until prompted with the message *Zero calibration is a success*.
6. Select **OK** to return to the ***Primary Variable*** screen.

4.3.2 Zero and span calibrate

Procedure

1. Go to **Menu** → ***Unlock sequence*** → **Sensor Calibration** → **Calibrate Zero**.
2. Attach the calibration cup to the Rosemount 625ND Sensor, leaving the IP filter in place.
3. Connect the appropriate zero gas concentration cylinder to the sensor, attaching the tubing to the IP filter.
4. Confirm **Yes** on the Local Operator Interface (LOI) to begin zero calibration.
5. Open the regulator and allow zero-gas to flow until prompted to stop.
6. Select **Next** on the LOI while applying zero gas to the sensor.
7. Once zero calibration is complete, disconnect the zero gas and attach the appropriate concentration of span gas.
8. Select **Next** on the LOI to begin span calibration.
9. Open the regulator and allow span-gas to flow until prompted to stop.
10. Remove span gas when prompted on the LOI.
    After calibration is completed, the LOI shows *Zero & Span Calibration Success*.
11. Select **OK** and return to the ***Primary Variable*** screen.

4.4 Calibration diagnostics

Stability requirements

If inconsistent calibration gas concentrations are measured during calibration, or if the calibration gas flow is sporadically stopped, the calibration attempt will fail and be rejected.

Note
Calibration attempts using the IP filter attachment in high wind environments may not create the required stability and may be rejected.

Note
If any calibration attempt is rejected or aborted, the sensor will defer to to the most recent calibration information stored in memory.

5 Operation and maintenance

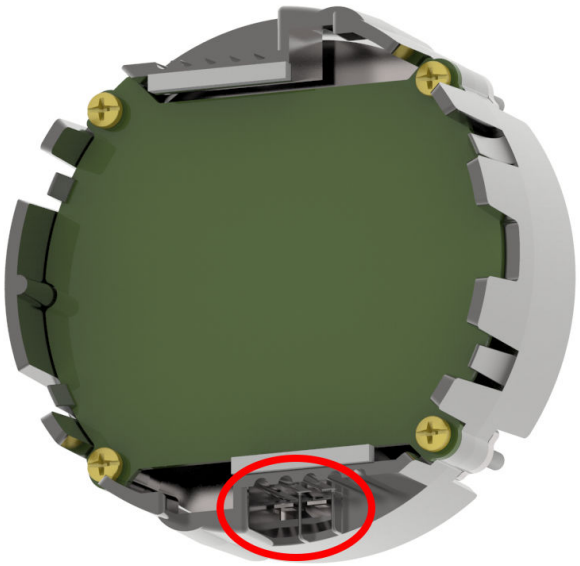
5.1 Outputs

The outputs from the Rosemount 925 Transmitter include the current loop, HART® signal, and relay outputs. The current loop and relay outputs are updated every 200 milliseconds.

For remote mount configurations, in addition to power and outputs from the Rosemount 925 Transmitter, you must wire communication between the transmitter and the Rosemount 905 Junction Box. The 4-20 mA analog output is capable of both sink or source configuration.

The HART protocol is accessible over the 4-20 mA analog wiring or through the HART specific connection points found on the front of the transmitter electronics, as shown in Figure 5-1.

Figure 5-1: HART Connection Points



Status indication LEDs are installed on the local operator interface (LOI), located behind the checkmark, up arrow, and down arrow characters.

Table 5-1: Status Indication LEDs

Color	Style	Detector operation mode
Green	Alternating 3 seconds **On**, 1 second **Off**	**Normal** mode
Amber	Solid **On**	**Warning** or **Fault** mode

Table 5-1: Status Indication LEDs *(continued)*

Color	Style	Detector operation mode
Red	Solid **On**	Gas concentrations have reached Alarm 1 and/or Alarm 2 values.

Table 5-2: Device outputs status conditions

Status	Current loop level	Fault relay output	Alarm 1 relay output	Alarm 2 relay output	Display	Button LED color	Event logged
Startup	Less than 0.5 mA	De-energized	De-energized	De-energized	925	Red, Amber, Green, Startup sequence	Yes
Sensor initialization	2.5 mA	Fault	Not changed	Not changed	Icons: Sensor fault icon Fault message text: "Sensor Initializing"	Amber	Yes
Signal range	4.0 to 20.0 mA, reflecting the gas value	Not changed	Not changed	Not changed	PV screen	Green	No
Hardware failure	0 mA	Fault	Not changed	Not changed	Icons: Sensor fault icon Fault message text: "Transmitter electronic failure" Required user action text: "Replace module"	Amber	Yes
Diagnostic faults	2.0 mA	Fault	Not changed	Not changed	Icons: Sensor fault icon Fault message text: "varies base on fault" Required user action text: "varies base on fault"	Amber	Yes
Diagnostic faults with active alarm	If no alarm is active then 2.5 mA, 4-20 mA if alarm is active	Fault	Alarm condition	Alarm condition	Icons: Fault icon Fault message text: "varies base on fault" Required user action text: "varies base on fault"	Red	No
Sensor calibration	3.0 mA	Not changed	Not changed	Not changed	Message text: "varies based on calibration status"	Amber	No

Table 5-2: Device outputs status conditions *(continued)*

Status	Current loop level	Fault relay output	Alarm 1 relay output	Alarm 2 relay output	Display	Button LED color	Event logged
Under range	2.0 mA	Fault	Not changed	Not changed	Icons: Sensor fault icon Fault message text: "Sensor negative drift" Required user action text: "Calibrate sensor"	Amber	Yes
Over range	20.5 mA	Not changed	Not changed	Not changed	Icons: Sensor warning: Active alert text: "Sensor over range"	Amber	Yes
Inhibit current mode	4 mA	No fault condition	No fault condition	No fault condition	Icon: Fixed current	Amber	No
Fixed current mode	4.20 mA,as set by user	Not changed	Not changed	Not changed	Icon: Fixed current	Amber	No
Transmitter warning	Not changed	Not changed	Not changed	Not changed	Icon: Transmitter warning Active alert message text: varies based on the specific warning"	Amber	Yes
Sensor warning	Not changed	Not changed	Not changed	Not changed	Icon: Sensor warning Active alert message text: varies based on the specific warning"	Amber	Yes

5.2 Proof tests

Conduct proof tests, otherwise known as bump tests, of sensor modules using one of the gas delivery options described in Calibration options.

To conduct proof testing without changing any detector outputs, enable the Inhibit output feature. This feature can be found in the *Transmitter Settings* section of the LOI menu or via HART® communication.

Provide calibration gas to the sensor for approximately two seconds or until the primary variable displays a gas concentration equal to concentration of the calibration gas, within the acceptable accuracy tolerances.

5.3 Replace sensor

To replace the Rosemount 625ND Non-dispersive Infrared Combustible Module, refer to the Rosemount 925FGD Fixed Gas Detector PDS for configured model number and ordering information.

5.3.1 Replace Rosemount 625ND Non-dispersive Infrared Combustible Gas Sensor Module

Prerequisites

Remove power from the Rosemount 925FGD and open the Rosemount 625ND sensor housing. Ensure all appropriate permits are gathered and all actions are taken to declassify the installation area.

Procedure

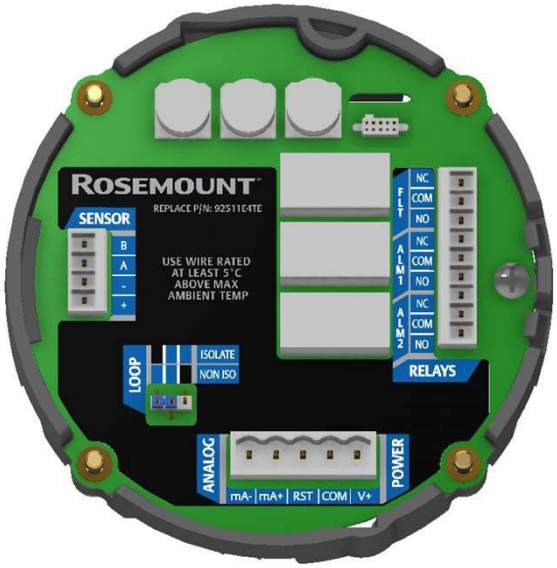
1. Loosen the set screw locking the sensor retaining ring; then screw off the retaining ring by rotating it counterclockwise.
2. Remove the O-ring.
3. Pull the sensor module straight down to remove it.
4. Insert the new sensor module using the alignment guides, ensuring the sensor is properly seated and the electronic connection has been made.
5. Replace the sensor retaining ring, rotating clockwise.
6. Tighten the set screw to complete the sensor replacement.

As stated in Power on and start-up, the transmitter display will show prompts for sensor configuration information and calibration after detecting a new sensor.

5.4 Replace complete transmitter electronics assembly

The transmitter electronics assembly part number is **92511E4TE**.

Figure 5-2: Rosemount 92511E4TE



5.5 Replace transmitter LOI screen and display board

The part number of the Rosemount 925 transmitter display board, which includes the LOI screen and IR buttons, is **00925-9100-0006**.

Figure 5-3: 00925-9100-0006

5.6 Event logs

The transmitter maintains an event log which is accessible through both the LOI display and HART® communication. There are two types of events which are logged, calibration events and operational events.

Calibration events Record of all field calibrations, both zero only and zero and span calibrations. Zero and span events are recorded as separate events.

Operational events These are any changes in status or mode except for calibration events.

5.7 Reset transmitter

This function restarts the transmitter. This function does not reset the transmitter or sensor to factory configurations if they have been changed.

5.8 Service support

For technical support, contact your Emerson representative or email safety.csc@emerson.com.

The Response Center will ask for product model and serial numbers and will provide a Return Material Authorization (RMA) number.

The Response Center will also ask for the process materials to which the product was last exposed.

⚠ WARNING

Hazardous substances

Individuals who handle products exposed to a hazardous substance can avoid injury if they are informed of and understand the hazard. If the product being returned was exposed to a hazardous substance as defined by the Occupational Safety and Health Administration (OSHA), a copy of the required Safety Data Sheet (SDS) for each hazardous substance identified must be included with the returned goods.

5.9 Product recycling/disposal

Recycling of equipment and packaging should be taken into consideration and disposed of in accordance with local and national legislation/regulations.

6 Notifications, faults, and diagnostics

6.1 Transmitter electronics failure

Icon	Transmitter fault
Fault message text	Transmitter electronics failure
Required user action text	Replace module.

Potential cause

A failure has been detected in the transmitter electronics circuit board.

Recommended actions

1. Power cycle.
2. If issue persists, then replace transmitter module.

6.2 Transmitter power supply low

Icon	Transmitter fault
Fault message text	Transmitter power supply low
Required user action text	Verify operation range.

Potential cause

Supply voltage is lower than 15.5 V.

Recommended actions

1. Raise power supply voltage.
2. If issue persists, then replace transmitter module.

6.3 Transmitter analog output failure

Icon	Transmitter fault
Fault message text	Transmitter analog output failure
Required user action text	Verify output connection.

Potential cause

The current loop readback error is larger than two percent of span.

Recommended actions

1. Power cycle.
2. Verify analog output connection and 3-wire or 4-wire jumper position.

3. If issue persists, then replace transmitter module.

6.4 Sensor incompatible

Icon	Transmitter fault
Fault message text	Sensor incompatible
Required user action text	Refer to manual.

Potential cause

Transmitter is not compatible with sensor.

Recommended action

Update transmitter firmware or install compatible sensor.

6.5 Transmitter software fault

Icon	Transmitter fault
Fault message text	Transmitter software fault
Required user action text	Reset device.

Potential cause

Software has detected an unexpected software condition or parameter that may be impairing device operation.

Recommended actions

1. Power cycle.
2. If issue persists, then replace transmitter module.

6.6 Transmitter temperature high

Icon	Transmitter warning
Active alert message text	Transmitter temperature high

Potential cause

Temperature is above the device maximum operating temperature.

Recommended actions

1. Lower ambient temperature.
2. If the condition persists, then replace the transmitter module.

6.7 Transmitter temperature low

Icon	Transmitter warning
Active alert message text	Transmitter temperature low

Potential cause

Temperature is below the device minimum operating temperature.

Recommended actions

1. Raise ambient temperature.
2. If the condition persists, then replace the transmitter module.

6.8 Transmitter power supply high

Icon	Transmitter warning
Active alert message text	Transmitter power supply high

Potential cause

The supply voltage is higher than 29.75 V.

Recommended actions

1. Lower power supply voltage.
2. If the condition persists, then replace the transmitter module.

6.9 Transmitter display board failure

Icon	Transmitter warning
Active alert message text	Transmitter display board failure

Potential cause

Software unable to communicate with LOI display buttons.

Recommended actions

1. Cycle power to the transmitter.
2. If the condition persists, then replace the transmitter module.

6.10 Sensor initializing

Icon	Sensor fault
Fault message text	Sensor initializing

Potential cause

The sensor is initializing.

Recommended action

Allow sensor to finish performing its initialization sequence.

6.11 Sensor not calibrated

Icon	Sensor fault
Fault message text	Sensor not calibrated
Required user action text	Calibrate sensor.

Potential cause

The sensor has not been calibrated.

Recommended action

Perform a zero and span calibration of the sensor.

6.12 Sensor negative drift

Icon	Sensor fault
Fault message text	Sensor negative drift
Required user action text	Calibrate sensor.

Potential cause

Sensor is detecting a negative reading.

Recommended action

Perform a zero calibration on the sensor.

6.13 Sensor electronics failure

Icon	Sensor fault
Fault message text	Sensor electronics failure
Required user action text	Replace module.

Potential cause

A failure has been detected in the sensor electronics.

Recommended action

Replace sensor hardware.

6.14 Sensor temperature high

Icon	Sensor fault
Fault message text	Sensor temperature high
Required user action text	Verify operation range.

Potential cause

Temperature is above the sensor's maximum operating temperature.

Recommended actions

1. Lower ambient temperature for sensor.
2. If the condition persists, then replace the sensor electronics.

6.15 Sensor temperature low

Icon	Sensor fault
Fault message text	Sensor temperature low
Required user action text	Verify operation range.

Potential cause

Temperature is below the sensor's minimum operating temperture.

Recommended actions

1. Raise ambient temperature for sensor.
2. If the condition persists, then replace the sensor electronics.

6.16 Sensor power supply high

Icon	Sensor fault
Fault message text	Sensor power supply high
Required user action text	Verify operation range.

Potential cause

Supply voltage to the sensor is higher than the sensor's maximum operating voltage.

Recommended actions

1. Verify supply voltage to sensor.
2. If the condition persists, then replace the sensor electronics.

6.17 Sensor power supply low

Icon	Sensor fault
Fault message text	Sensor power supply low
Required user action text	Verify operation range.

Potential cause

Supply voltage to the sensor is lower than the sensor's minimum operating voltage.

Recommended actions

1. Verify supply voltage to sensor.
2. If the condition persists, then replace the sensor electronics.

6.18 Sensor environmental fault

Icon	Sensor fault
Fault message text	Sensor environmental fault
Required user action text	Verify operation range.

Potential cause

Environmental conditions exceed the operating limits of the sensor.

Recommended actions

1. Verify all environmental conditions (pressure, humidity, etc.).
2. If issue persists, then replace sensor module.

6.19 Sensor fault not defined

Icon	Sensor fault
Fault message text	Sensor fault not defined
Required user action text	Refer to manual.

Potential cause

Undefined sensor status detected.

Recommended actions

1. Power cycle.
2. If issue persists, then replace sensor module.

6.20 Sensor fault

Icon	Sensor Fault
Text	--- (instead of showing gas concentration)
Fault message	Sensor Communication Fault
Required user action text	Verify sensor connection.

Potential cause

Software unable to communicate with sensor.

Recommended actions

1. Verify sensor is properly connected to transmitter.
2. If the condition persists, then replace the transmitter module.

6.21 Sensor weak signal

Icon	Sensor warning
Active alert text	Sensor weak signal

Potential cause

Sensor signal is weak.

Recommended actions

1. Verify calibration gas and re-calibrate sensor.
2. If issue persists, then replace sensor module.

6.22 Replace sensor soon

Icon	Sensor warning
Active alert text	Replace sensor soon.

Potential cause

Sensor is nearing end of life.

Recommended action

Replace the sensor in the near future.

6.23 Undefined sensor warning

Icon	Sensor warning
Active alert text	Undefined sensor warning

Potential cause

Undefined sensor status detected.

Recommended actions

1. Power cycle.
2. If issue persists, then replace sensor module.

A Specifications

For the most recent specifications, refer to the Rosemount 925FGD Product Data Sheet.

B Product certifications

B.1 Safety

For more information on SIL2 certification or required SIS installation procedures, refer to the Rosemount 925FGD Manual.

B.2 Global hazardous area and performance

For the most recent information, please refer to the Rosemount 925FGD Quick Start Guide.

C Spare parts

Part number	Description
00925-9100-0001	625ND and 628 Calibration Cup (Individual)
00925-9100-0006	Replacement 925 Transmitter Display Assembly
00925-9100-0008	U-Bolt for 925 Transmitter Pole Mount (Set of 2)
00925-9100-0015	Gas Calibration Kit, 0.5 LPM SST Regulator, with Cal Cup
00628-9000-0001	Spare, ingress protection filter assembly for 625ND and 628
SSK-51	Sunshade assembly, 1-in. pipe
SSK-52	Sunshade assembly, 2-in. pipe
SSK-53	Sunshade assembly, 3-in. pipe
00925-9100-0007	Replacement 905 Junction Box Terminal Assembly
00925-9100-0010	B4 Bracket and Hardware for 905 Junction Box Direct or Pole Mount

00809-0100-4925
Rev. AC
2024

For more information: **Emerson.com/global**

ROSEMOUNT™

EMERSON™