

# Rosemount™ Xi

Advanced Electronics for Zirconium Oxide Flue Gas O<sub>2</sub> Probes



## Essential Instructions

Read this page before proceeding!

Emerson designs, manufactures, and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, you must properly install, use, and maintain them to ensure they continue to operate within their normal specifications. The following instructions must be adhered to and integrated into your safety program when installing, using, and maintaining Emerson's Rosemount products. Failure to follow the proper instructions may cause any one of the following situations to occur: loss of life, personal injury, property damage, damage to this instrument, and warranty invalidation.

- Read all instructions prior to installing, operating, and servicing the product.
- If you do not understand any of the instructions, contact your Emerson representative for clarification.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- Install your equipment as specified in the installation instructions of the appropriate instruction manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, use qualified personnel to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Emerson. Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, and VOID YOUR WARRANTY. Look-alike substitutions may result in fire, electrical hazards, or improper operation.
- Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified people, to prevent electrical shock and personal injury.

The information contained in this document is subject to change without notice.

## NOTICE

**The 375 Field Communicator must be upgraded to System Software 2.0 with Graphic License for operation with Xi Electronics. The AMS software must be upgraded to AMS 8.0 or above. Contact Emerson's Global Service Center (GSC) at 1-800-833-8314 to upgrade the 375 Field Communicator software to System Software 2.0 with Graphic License.**

## Definitions

The following definitions apply to WARNINGS, CAUTIONS, and NOTICES found throughout this publication.

### **WARNING!**

Highlights an operation or maintenance procedure, condition, statement, etc. that if not strictly observed, could result in injury, death, or long-term health hazards of personnel.

### **CAUTION!**

Highlights an operation or maintenance procedure, practice, condition, statement, etc. that if not strictly observed, could result in damage to or destruction of equipment or loss of effectiveness.

## NOTICE

Highlights an essential operating procedure, condition, or statement.

## Symbols



Earth (ground) terminal



Protective conduit or terminal



Risk of electrical shock



Warning: Refer to Instruction Manual

## NOTICE

**The number in the lower right corner of each illustration in this publication is a manual illustration number. It is not a part number and is not related to the illustration in any technical manner.**

### Technical Support Hotline

For assistance with technical problems, please call the Customer Support Center (CSC). The CSC is staffed 24 hours a day, 7 days a week.

Phone: 1-800-433-6076, 1-440-914-1261

In addition to the CSC, you may also contact Field Watch. Field Watch coordinates Emerson's field service throughout the U.S. and abroad.

Phone: 1-800-654-RSMT (1-800-654-7768)

Emerson may also be reached via the Internet through email and the World Wide Web:

Email: [GAS.CSC@emerson.com](mailto:GAS.CSC@emerson.com)

World Wide Web: [www.Emerson.com/RosemountGasAnalysis](http://www.Emerson.com/RosemountGasAnalysis)

### Warranty

Rosemount™ warrants that the equipment manufactured and sold by it will, upon shipment, be free of defects in workmanship or material. Should any failure to conform to this warranty become apparent during a period of one year after the date of shipment, Rosemount shall, upon prompt written notice from the purchaser, correct such nonconformity by repair or replacement, F.O.B. factory of the defective part or parts. Correction in the manner provided above shall constitute a fulfillment of all liabilities of Rosemount with respect to the quality of the equipment.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY WHETHER WRITTEN, ORAL, OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE).

The remedy(ies) provided above shall be purchase's sole remedy(ies) for any failure of Rosemount to comply with the warranty provisions, whether claims by the purchaser are based in contract or in tort (including negligence).

Rosemount does not warrant equipment against normal deterioration due to environment. Factors such as corrosive gases and solid particulates can be detrimental and can create the need for repair or replacement as part of normal wear and tear during the warranty period.

Equipment supplied by Rosemount but not manufactured by it will be subject to the same warranty as is extended to Rosemount by the original manufacturer.

At the time of installation, it is important that the required services are supplied to the system and that the electronic controller is set up at least to the point where it is controlling the sensor heater. This will ensure that, should there be a delay between installation and full commissioning, the sensor being supplied with ac power and reference air will not be subjected to component deterioration.



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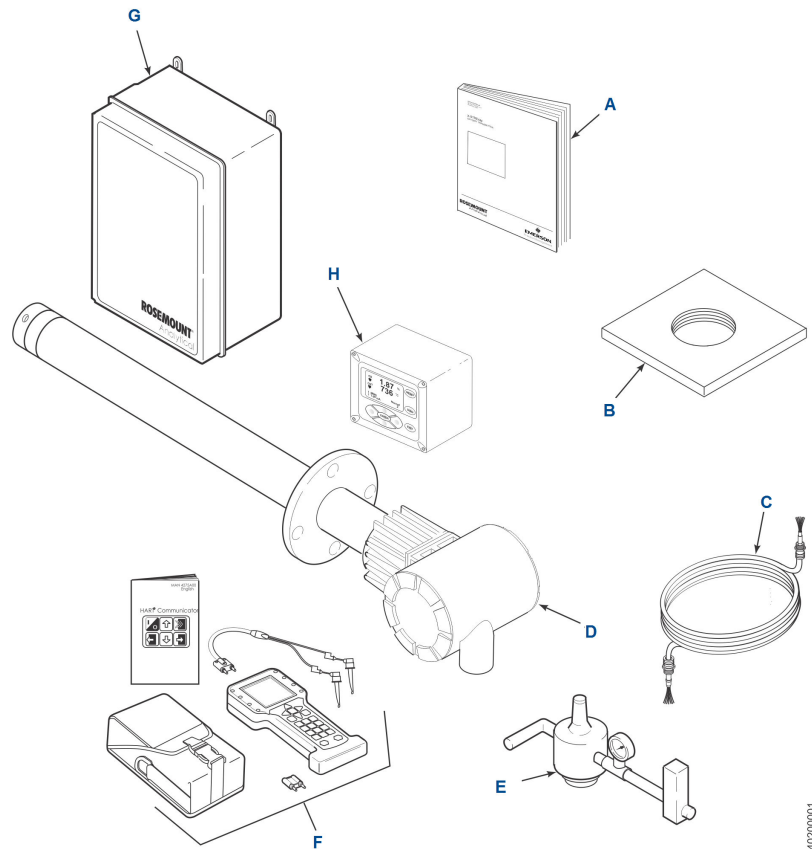


# 1 Plan

## 1.1 Unpacking

1. Inspect the shipping container. If it is damaged, contact the shipper immediately for instructions. Save the box.
2. If there is no apparent damage, remove the transmitter.
3. Ensure that all items shown on the packing list are present. If items are missing, notify Rosemount immediately.

See [Figure 1-1](#).

**Figure 1-1: Typical system package**

- A. Quick Start Guide
- B. Weld plate
- C. Traditional architecture cable
- D. O<sub>2</sub> probe
- E. Reference air set (not used if SPS 4001B or IMPS 4000 is used)
- F. HART<sup>®</sup> 375/475 Field Communicator package (optional)
- G. Optional SPS 4001B or IMPS 4000 Autocalibration Sequencer
- H. Xi Advanced Electronics

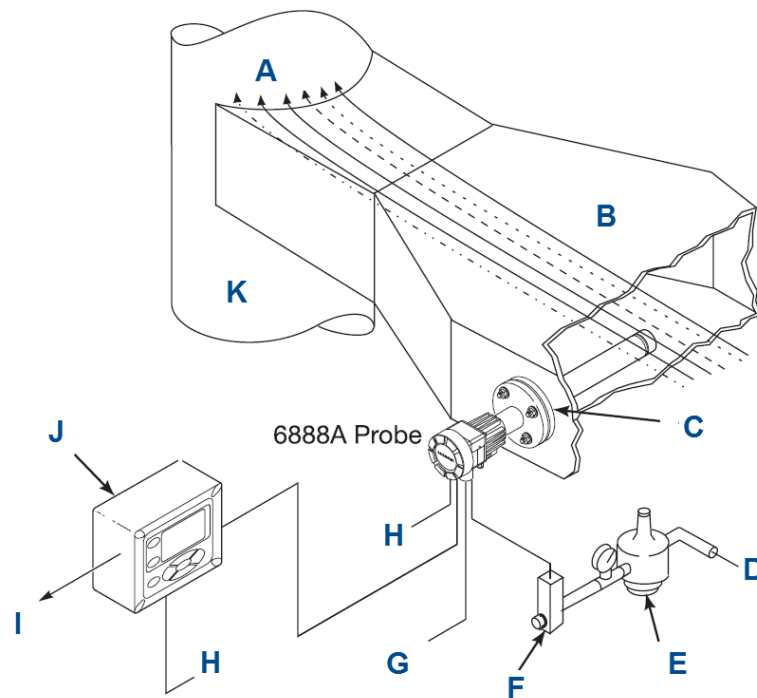
4. Save the shipping container and packaging.  
They can be reused to return the transmitter to the factory in case of damage.



## 1.2 System considerations

A typical system installation for an Xi or O2 probe is shown in [Figure 1-2](#).

**Figure 1-2: Typical system installation**



- A. Gases
- B. Duct
- C. Adapter plate and flange
- D. Instrument air supply (reference air)
- E. Pressure regulator
- F. Flowmeter
- G. Calibration gas
- H. Line voltage
- I. 4 to 20 mA signal
- J. Rosemount 6888Xi Advanced Electronics (optional)
- K. Stack

## 1.3 Mount

The Xi Advanced Electronics is available in a panel mounting, wall mounting, or pipe mounting configuration.

Refer to [Figure 1-3](#) or [Figure 1-4](#) for the panel, wall, or pipe mounting details.

### Procedure

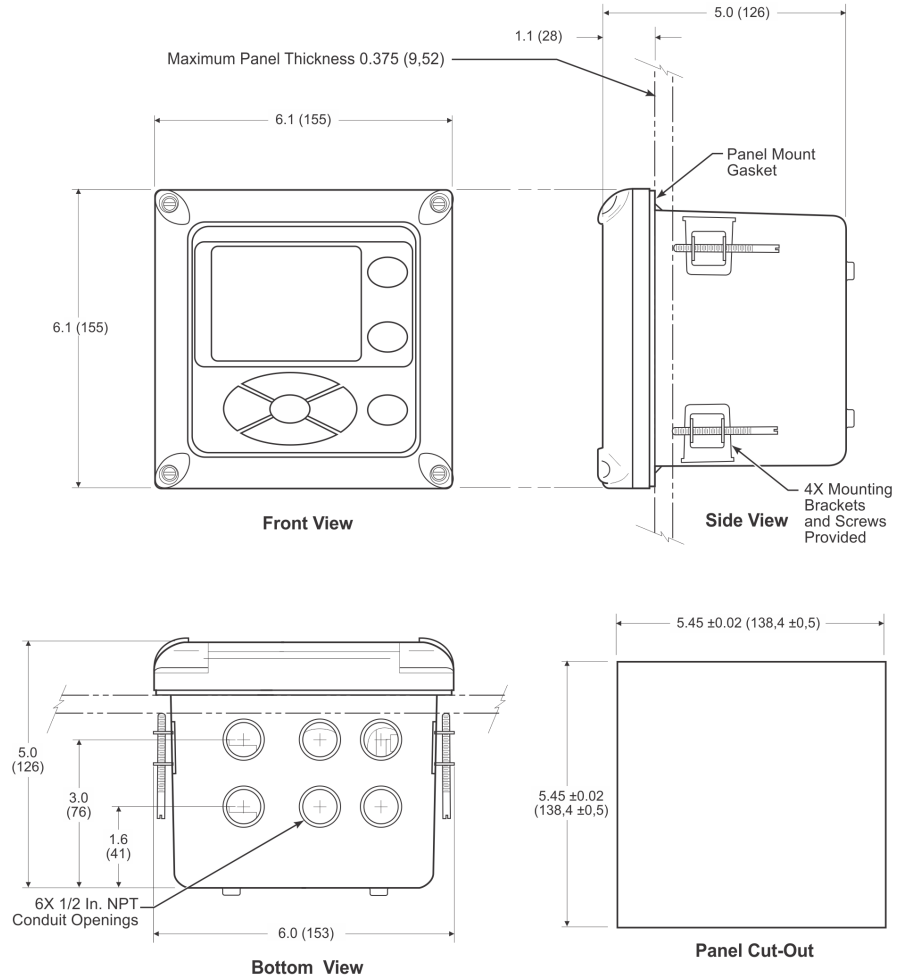
1. Ensure all components are available to install the Xi.
2. Select a mounting location near or removed from the O<sub>2</sub> probe.  
  
Consider the temperature limitations of the Xi (see [Section 1.4](#)) when selecting the mounting location.
3. Mount the Xi at a height convenient for viewing and operating the interface.  
  
Approximately 5 ft (1.5 m) is recommended.
4. The keypad window on the Xi may have interior and exterior protective membranes. Remove the protective membranes prior to use of the Xi enclosure.

### **NOTICE**

**Failure to remove the protective membranes may cause the display to appear distorted. The membrane may be difficult or impossible to remove after extended use at elevated temperatures.**

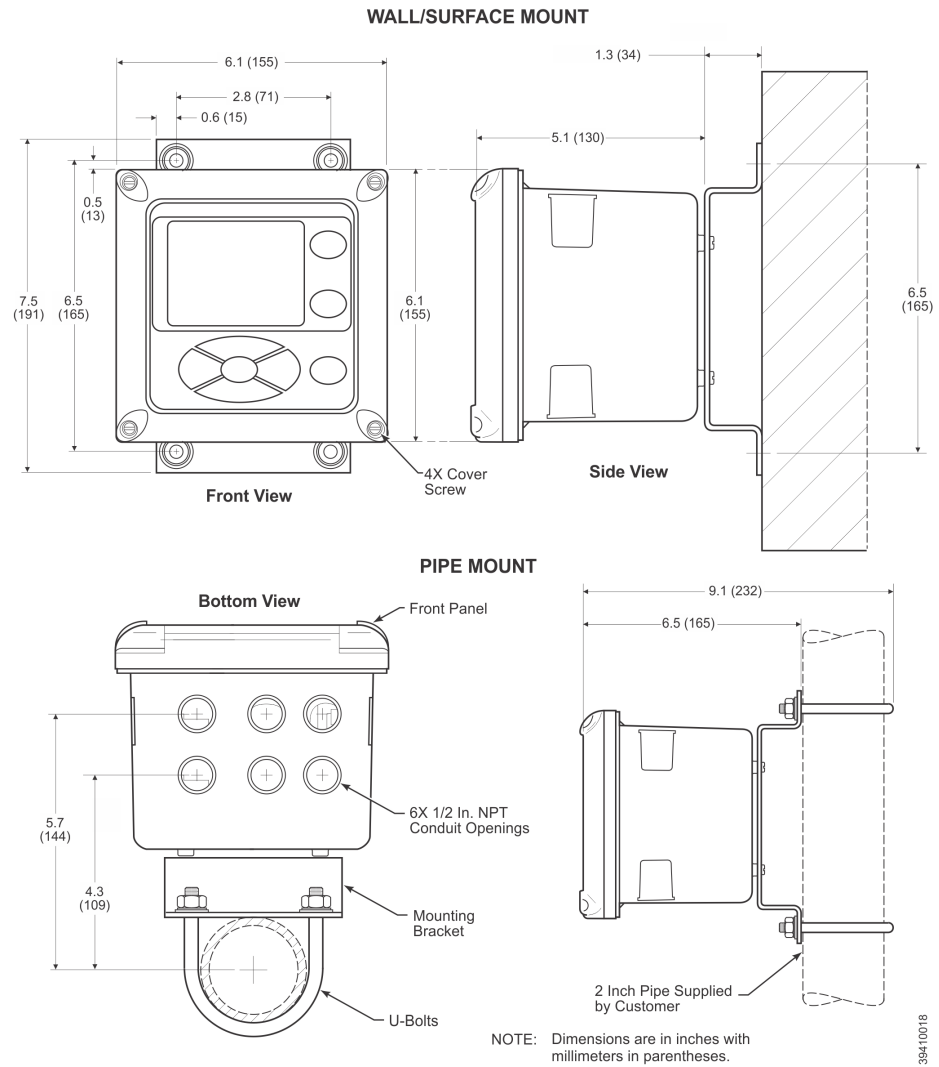
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**Figure 1-3: Xi Advanced Electronics - panel mounting details**



- NOTES: 1. Dimensions are in inches with millimeters in parentheses.  
 2. The front panel is hinged at the bottom. The panel swings down for easy access to the wiring locations.

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**Figure 1-4: Xi Advanced Electronics - wall/surface and pipe mounting details**


## 1.4 Specifications

**Table 1-1: Specifications**

Measurement specifications	
Net O <sub>2</sub> range	0 to 50% O <sub>2</sub> user scalable -2 to 50% O <sub>2</sub> user scalable with stoichiometer
Lowest detectable limit	0.01% O <sub>2</sub>

**Table 1-1: Specifications (continued)**

Signal stability	±0.03% O <sub>2</sub>
Accuracy in reducing conditions	±10% of reading or 0.1% O <sub>2</sub>
System responses in reducing conditions	Going from oxidizing to reducing -T <sub>90</sub> in 120 seconds Going from reducing to oxidizing -T <sub>90</sub> in 30 seconds
Ambient temperature effect on Xi 4-20 mA signal	Less than 0.0025% O <sub>2</sub> per degree Celsius
<b>Environmental specifications</b>	
Xi Advanced Electronics	Type 4X/IP66 polycarbonate material
Ambient temperature limits	-4 to 122 °F (-20 to 50 °C) -4 to 158 °F (-20 to 70 °C) as measured by electronics
Xi LCD display: ambient temperature limits	-4 to 131 °F (-20 to 55 °C)
General purpose certifications	  
<b>Installation specifications</b>	
Mounting	Panel, wall, or pipe
Reference air	0.5 scfh (0.25 l/min), clean, dry, instrument-quality air (20.95% O <sub>2</sub> ), regulated to 5 psi (34 kPa)
Calibration	Semi-automatic or automatic
Cal gases	0.4% O <sub>2</sub> and 8% O <sub>2</sub> , balance N <sub>2</sub>
Traditional architecture cable	200 ft (61 m) maximum length
Transmitter electrical power	12 - 24 Vdc (loop-powered from control room or Xi)
Electrical power for Xi	100 - 240 Vac ±10%, 50/60 Hz
Power consumption of Xi	12 VA maximum or 776 VA maximum with traditional architecture, 120 V probes 450 VA maximum with traditional architecture, 44 V probes
Alarm relay outputs	Two provided - 2 Amperes, 30 Vdc, Form-C
Optional loss of flame input	Internally powered input to remove heater power actuated via dry contact output from user's flame scanner
	Emerson has satisfied all obligations from the European legislation to harmonize the product requirements in Europe. All static performance characteristics are with operating variables constant. Specifications subject to change without notice.

**Table 1-2: Product matrix, Xi advanced electronics**

Xi	Xi Advanced Electronics
<b>Code</b>	<b>Remote type</b>
01	Single channel <sup>(1)</sup>

**Table 1-2: Product matrix, Xi advanced electronics (continued)**

02	Single channel, accepting a loss-of-flame input to remove heater power with flame status relay <sup>(1)</sup>
03	Dual channel <sup>(1)</sup>
04	Single channel traditional architecture for 120 V probes
05	Single channel traditional architecture for 44 V probes
<b>Code</b>	<b>Mounting</b>
00	No hardware
01	Panel mount kit with gasket
02	2 in. pipe/wall mount kit
<b>Code</b>	<b>Cable</b>
00	No cable
10	20 ft (6 m) cable
11	40 ft (12 m) cable
12	60 ft (18 m cable)
13	80 ft (24 m cable)
14	100 ft (30 m) cable
15	150 ft (45 m) cable
16	200 ft (60 m) cable
<b>Code</b>	<b>Stoichiometer function</b>
00	None
01	Single channel (stoichiometer cell also required in probe)
02	Dual channel (stoichiometer cell also required in probe)
<b>Code</b>	<b>Programmable reference function</b>
00	None
01	Single channel
02	Dual channel
<b>Code</b>	<b>800 deg C process function</b>
00	None
01	Single channel
02	Dual channel

1. Requires XPS transmitter, P/N 6A00358G03

**Note**

All static performance characteristics are with operating variables constant. Specifications subject to change without notice.

## 2 Wire

### 2.1 Electrical installation

All wiring must conform to local and national codes. Multiple wiring diagrams are shown in this section. Always refer to the diagrams that apply to your transmitter configuration and disregard all other wiring diagrams.

#### **⚠ WARNING!**

##### **ELECTRIC SHOCK**

**Disconnect and lock out power before connecting the power supply. Failure to lock out power could result in serious injury or death.**

#### **⚠ WARNING!**

##### **ELECTRIC SHOCK**

**Install all protective covers and safety ground leads after installation. Failure to install covers and ground leads could result in serious injury or death.**

#### **⚠ WARNING!**

##### **ELECTRIC SHOCK**

**To meet the safety requirements of IEC 1010 (EC requirement) and ensure safe operation of this equipment, connection to the main electrical power supply must be made through a circuit breaker (min 10 A) which will disconnect all current-carrying conductors during a fault situation. This circuit breaker should also include a mechanically operated isolating switch. If it does not, locate another external means of disconnecting the power supply close by. Circuit breakers or switches must comply with a recognized standard such as IEC 947.**

#### **Note**

Line, voltage, signal, and relay wiring must be rated for at least 105 °C (221 °F).

#### **NOTICE**

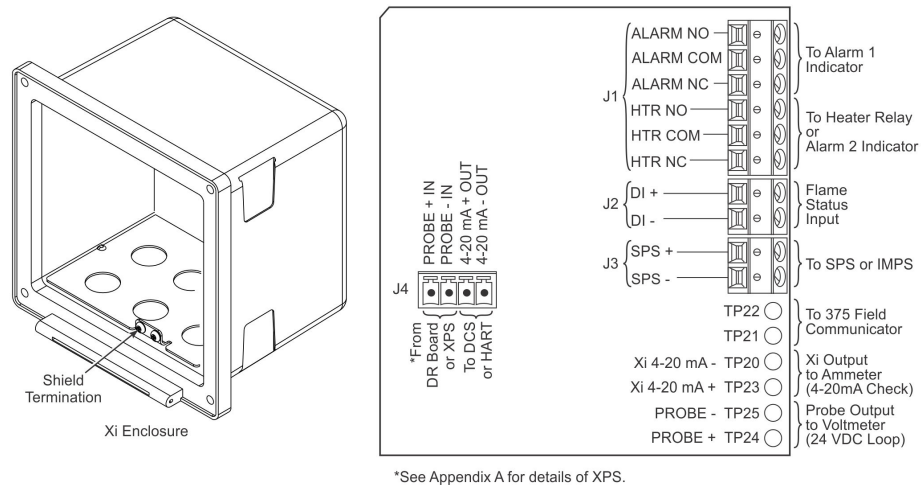
**If a metal conduit is used with the Xi, the conduit should be reliably bonded to protective earth. The grounding plate inside the Xi is not bounded to PE and does not provide adequate grounding.**

1. Remove cover screws from the front cover of the Xi. Swing down the front cover of the interface box.
2. Pull out the I/O board on the right-hand side of the card rack inside the Xi. If your system is configured to operate two transmitter probes, there are two I/O interface boards.
3. See [Figure 2-1](#). Connect the 4-20 mA signal wires at J4 of the I/O board. Attach the supplied ferrite clamp over the 4-20 mA OUT wires that extend past the shield.

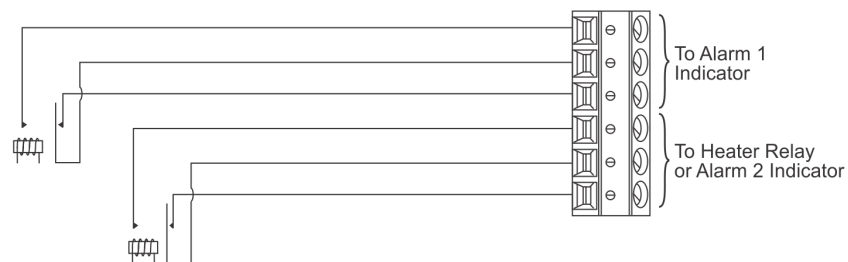
**NOTICE**

**Installation of the ferrite clamp over the 4-20 mA OUT wires is required for compliance with the European EMC directive.**

**Figure 2-1: Signal connections at I/O board**



**Figure 2-2: Alarm indicator relay terminals**

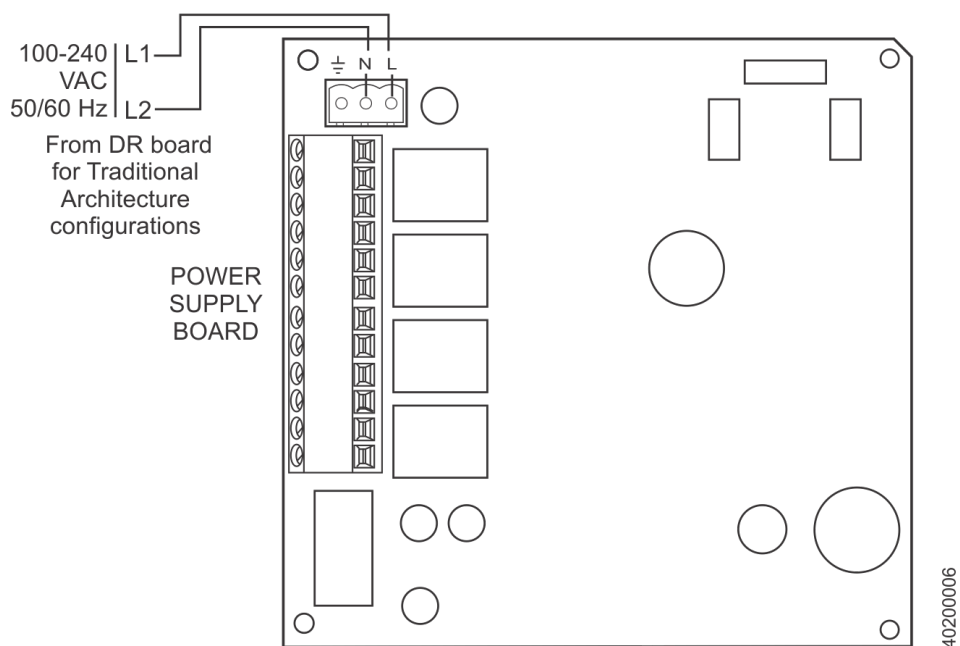


4. Terminate the shield of the 4-20 mA signal wires at the designated ground terminal of the Xi. Do not allow bare shield wires to contact the circuit boards. Insulate the shield wires prior to termination.
5. Connect the signal wires from the SPS or IMPS (if used) to the applicable terminals of J3. Refer to the SPS or IMPS instruction manual for wiring details.
6. Connect the signal wires for the flame status input (if used) to the applicable terminals of J2. The flame status sensing device is supplied by the customer. Refer to the applicable OEM documents for signal wiring details.



7. Connect the customer's alarm indicator devices to the alarm indicator relay terminals. See [Figure 2-2](#) for the alarm indicator relay terminals.
8. Reinstall the I/O board in the card rack of the Xi.

**Figure 2-3: Power connections - Xi Advanced Electronics**

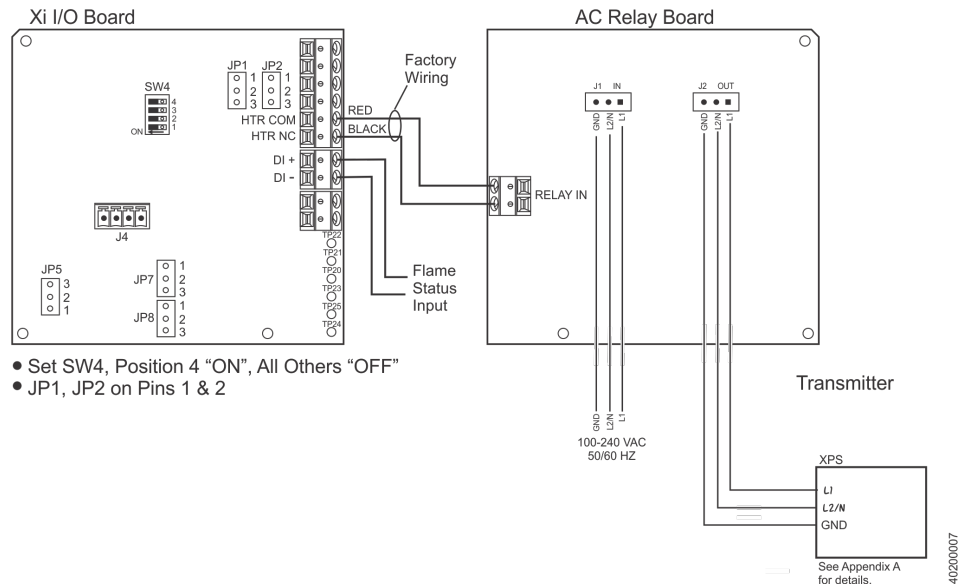


9. If your system is configured for two channel operation, repeat steps 2 through 7 to connect the other signal wires.
10. Remove the connector from the power supply board located on the left-hand side of the card rack inside the Xi.
11. See [Figure 2-3](#). Connect the line, or L1, wire to the L1 terminal and the neutral, or L2, wire to the N terminal.
12. Reinstall the power supply connector in the power supply board.
13. Close and fasten the Xi cover.

## 2.1.1 Optional flame safety interlock

A flame safety interlock by Emerson is available for the heater power disconnect whenever there is a loss of the process flame or a heater runaway condition (heater over-temperature) in the O<sub>2</sub> probe. A simplified wiring diagram for the flame safety interlock is shown in [Figure 2-4](#). The input is internally powered by the Xi and is actuated via a dry contact output from the user's flame scanner. A closed contact indicates a flame is present. An open contact indicates a loss of flame.

Figure 2-4: Flame safety interlock - wiring diagram



## 2.1.2

## Wire the traditional architecture cable connections

A traditional architecture configuration is used to provide for remote location of the transmitter electronics. All electronics are housed inside the Rosemount 6888Xi. A multi-conductor power/signal cable connects between the probe and the Rosemount 6888Xi. Use the following procedure to connect the traditional architecture probe to the Rosemount 6888Xi.

### NOTICE

**The traditional architecture cable is provided at the specified length and is ready for installation. The cable glands must be properly terminated to maintain EMC/EMI noise protection.**

### Procedure

1. Run the 7-conductor cable between the traditional architecture probe and the installation site for the Rosemount 6888Xi. Use new cable conduit or trough as needed.
2. Install the cable and lead wires to the probe per manufacturer's instructions.
3. Install the cable at the probe housing and at the Rosemount 6888Xi enclosure according to the following procedure:
  - a. Unscrew the locking nut from the gland assembly and slide the locking nut back along the cable.
  - b. Pull the gland body away from the plastic insert.

Use care not to damage the cable shield braid.

- c. Insert the cable wires into the proper entry port in either the probe housing or the Rosemount 6888Xi enclosure.
  - d. At the probe housing, apply Teflon<sup>®</sup> tape or similar sealing compound to the tapered pipe threads. Thread the gland body into the probe housing until properly seated.
  - e. At the Rosemount 6888Xi enclosure, insert the gland body into the left front cable port from the inside of the enclosure. Use the rubber O-ring provided to seal the cable port.
  - f. Ensure the cable shield braid is evenly formed over the gray insert.  
  
When properly formed, the braid should be evenly spaced around the circumference of the insert and not extend beyond the narrow diameter portion.
  - g. Carefully press the gray insert into the gland body. The grooves on the insert should align with similar grooves inside the gland body. Press the insert in until it bottoms out in the gland body.
  - h. Slide the locking nut up and thread it onto the gland body. Tighten the locking nut so the rubber grommet inside the plastic insert compresses against the cable wall to provide an environmental seal.
4. At the Rosemount 6888Xi, connect the cable leads to the connectors on the transmitter I/O board.

# 3 Configure

## 3.1 Verify installation

**⚠ WARNING!**

**ELECTRIC SHOCK**  
 Install all protective equipment covers and safety ground leads before equipment startup. Failure to install covers and ground leads could result in serious injury or death.

**⚠ WARNING!**

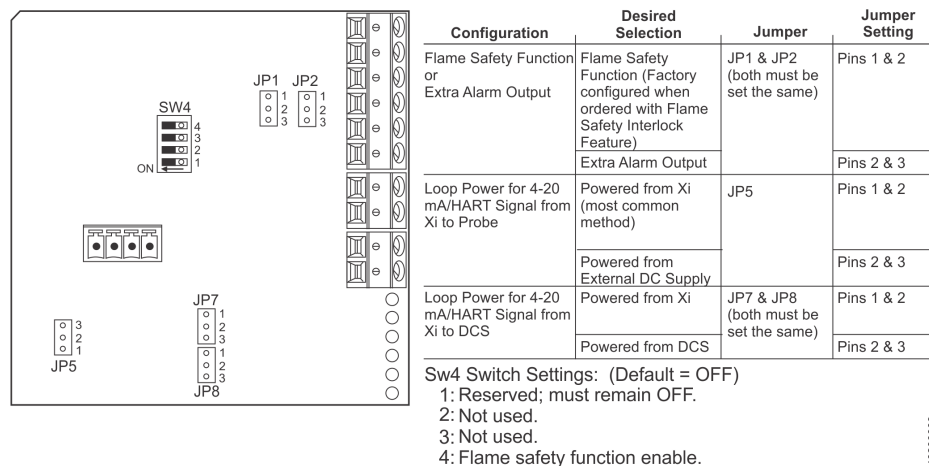
**ELECTRIC SHOCK**  
 If external loop power is used, the power supply must be a safety extra low voltage (SELV) type.

### 3.1.1 Xi configuration

Refer to [Figure 3-1](#) for the configuration of jumpers JP1 through JP8. The jumper configuration for your I/O board depends on the system design and system components used in your installation.

The setting of switch SW4 and the configuration of jumpers JP1 through JP8 must be verified on the I/O board in the Xi. All four dip switches on switch SW4 must be set to the *Off* position, as shown.

**Figure 3-1: I/O board jumper configuration**



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## 3.2 Set test gas values

Use a Field Communicator or the Xi to set test gas values for calibration. An Xi shipped from the factory has test gas values for low and high set to 0.4% and 8% respectively. This same process must be performed any time a replacement transmitter board, I/O board, or DR board is installed.

Setting test gas values using Xi display/keypad

### Procedure

1. Press the *MENU* button once.
2. From the main menu, select *PROBE 1*.
3. From *PROBE 1*, select *DETAILED SETUP*.
4. From the *DETAILED SETUP* menu, select *CAL SETUP*.
5. From *CAL SETUP*, select *Cal Gas 1*. Enter the percent O<sub>2</sub> used for the low O<sub>2</sub> test gas.
6. From *CAL SETUP*, select *Cal Gas 2*. Enter the percent O<sub>2</sub> used for the high O<sub>2</sub> test gas.
7. Press the *Left* arrow key several times to return to the main menu.
8. Repeat steps 2 through 6 for *PROBE 2* if configured for dual channel.

## 3.3 Setting test gas values using Field Communicator

1. Use the Field Communicator software to access the HART menu.
2. From the *DEVICE SETUP* menu, select *DETAILED SETUP*.
3. From the *DETAILED SETUP* menu, select *CAL SETUP*.
4. From *CAL SETUP*, select *Cal Gas 1*. Enter the percent O<sub>2</sub> used for the low O<sub>2</sub> test gas.
5. From *CAL SETUP*, select *Cal Gas 2*. Enter the percent O<sub>2</sub> used for the high O<sub>2</sub> test gas.

## 3.4 Alarm relay output configuration

The Xi has two dry contact Form-C alarm relay output signals that can be configured in eight different modes through the Xi keypad display or the 375/475 Field Communicator. A list of possible configurations is shown in [Table 3-1](#). Each alarm relay can be configured separately.

If the Xi is configured with the optional flame safety interlock, Alarm 2 is configured with *Heater Relay* and prewired to the AC relay board. In this condition, the relay configuration cannot be changed to any other setting. If the Xi is not configured with the optional flame safety interlock, *Heater Relay* is not valid and cannot be chosen for Alarm 2.

**Table 3-1: Alarm relay output configurations**

Mode	Configuration
No alarm <sup>(1)</sup>	The output is not configured for any alarm condition.
Unit alarm	The output is configured for a unit alarm.
Low O <sub>2</sub> alarm	The output is configured for a low O <sub>2</sub> alarm.
Low O <sub>2</sub> /unit alm	The output is configured for a unit alarm and a low O <sub>2</sub> alarm.
Cal recommended	The output is configured for a calibration recommended display.
Cal rec/unit alm <sup>(2)</sup>	The output is configured for a unit alarm and a calibration recommended display.
Low O <sub>2</sub> /cal rec	The output is configured for a low O <sub>2</sub> alarm and a calibration recommended display.
Low O <sub>2</sub> /unit/cal rec	The output is configured for a low O <sub>2</sub> alarm, a unit alarm, and a calibration recommended display.
Heater relay	The output is configured for flame safety interlock.

(1) The default configuration for Alarm 2

(2) The default configuration for Alarm 1

### 3.4.1 Configuring alarm relays with the Xi keypad/display

1. Press the *MENU* button once.
2. From the main menu, select *PROBE 1*.
3. From *PROBE 1*, select *DETAILED SETUP*.
4. From the *DETAILED SETUP* menu, select *ALARM RELAY*.
5. From *ALARM RELAY*, select as follows:
  - Alm Relay1 - Alarm 1 mode
  - Alm Relay2 - Alarm 2 mode
  - Low O<sub>2</sub> Alm SP - Low O<sub>2</sub> alarm setpoint
  - High Temp Alm SP - High temperature alarm setpoint
6. Press the *Left* arrow key several times to return to the main menu.
7. Repeat steps 2 through 6 for *PROBE 2* if configured for dual channel.

### 3.4.2 Configuring autocalibration with the Field Communicator

1. Use the 375/475 Field Communicator software to access the HART menu.
2. From the *DEVICE SETUP* menu, select *DETAILED SETUP*.
3. From the *DETAILED SETUP* menu, select *CAL SETUP*.
4. From *CAL SETUP*, select *Auto Cal*.
5. Press the *Right* arrow key to change the state from *NO* to *YES*.

## 3.5 Autocalibration setup

If autocalibration is desired, the Xi must be used with either an SPS 4001B or IMPS 4000. The Xi must be properly configured before autocalibration can take place. Refer to the applicable SPS 4001B or IMPS 4000 instruction manual for details on performing autocalibration. Refer to [Chapter 4](#) for details on manual calibration procedures.

An Xi is shipped from the factory without autocalibration configured. This same process must be performed any time a replacement I/O board is installed.

## 3.6 Configure analog output

The analog output signal from the Rosemount 6888A can be configured for the 4-20 mA range and fault condition. A separate configuration is set up when the Rosemount 6888A is used with the optional Rosemount 6888Xi Advanced Electronics. When the Rosemount 6888A is used without the Rosemount 6888Xi, this parameter must be set to NO. If it is set to YES and a Rosemount 6888Xi is not connected, the Rosemount 6888A triggers an alarm and forces the analog output to the fault level. If the Rosemount 6888A is used later with a Rosemount 6888Xi, the Rosemount 6888Xi automatically sets this parameter to YES.

An Rosemount 6888A shipped from the output has the analog outputs set to 4 to 20 mA range with a 3.5 mA alarm level. You must complete the same process any time transmitter board is replaced.

1. Use the 375/475 Field Communicator to access the main HART menu.
2. From the main menu, select CONFIGURE.
3. From the **CONFIGURE** menu, select MANUAL SETUP.
4. From the **MANUAL SETUP** menu, select ANALOG OUTPUT.
5. From the **ANALOG OUTPUT** menu, select from the following parameters; then press **ENTER**.
  - O<sub>2</sub> LRV: O<sub>2</sub> value at lower analog output value (0% at 4 mA, non-configurable)
  - O<sub>2</sub> URV: O<sub>2</sub> value at upper analog output value (50% max at 20 mA)
  - Output Range: Range of analog output (4-20 mA, non-configurable)
  - Alarm level: O<sub>2</sub> alarm level (3.5 mA or 21.1 mA)
  - Xi Mode: Selects whether or not the Rosemount 6888A is used with a Rosemount 6888Xi (should always be set to NO for a stand-alone Rosemount 6888A)
6. Use the stylus to enter the value; then press ENTER when finished.
7. Use the stylus to select SEND to update the Rosemount 6888A.

## 4 Startup and operation

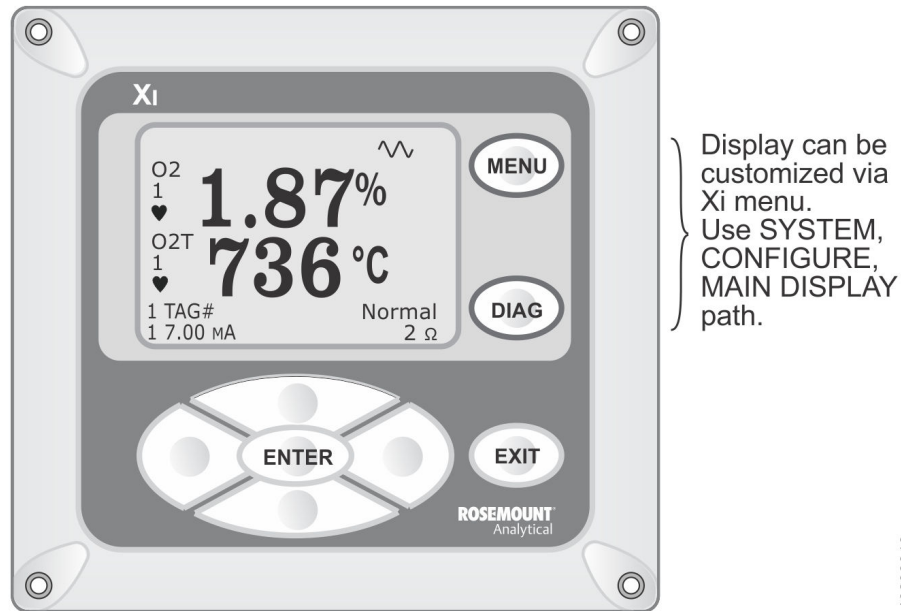
### 4.1 Startup

The O<sub>2</sub> probe takes approximately 45 minutes to warm up to the 736 °C (1357 °F) heater setpoint. The 4-20 mA signal remains at a default value of 3.5 mA through this warmup period. Once warm, the O<sub>2</sub> reads oxygen, and the 4-20 mA signal's reading is based on the default range of 0-10% O<sub>2</sub>.

#### NOTICE

The Xi offers optional advanced features, such as elevated process temperature capability to 1472 °F (800 °C), autocalibration via an SPS solenoid vox, a stoichiometer feature for indicating the level of oxygen deficiency in reducing conditions, and programmable reference to enhance accuracy at near ambient levels of O<sub>2</sub>.

Figure 4-1: Xi display (typical)



#### 4.1.1 Operation via Xi

The following procedures describe operations using the Xi to set up and calibrate the system. Additional operating instructions are included in the *SPS 4001B* or *IMPS 4000* instruction manual, if applicable to your system.

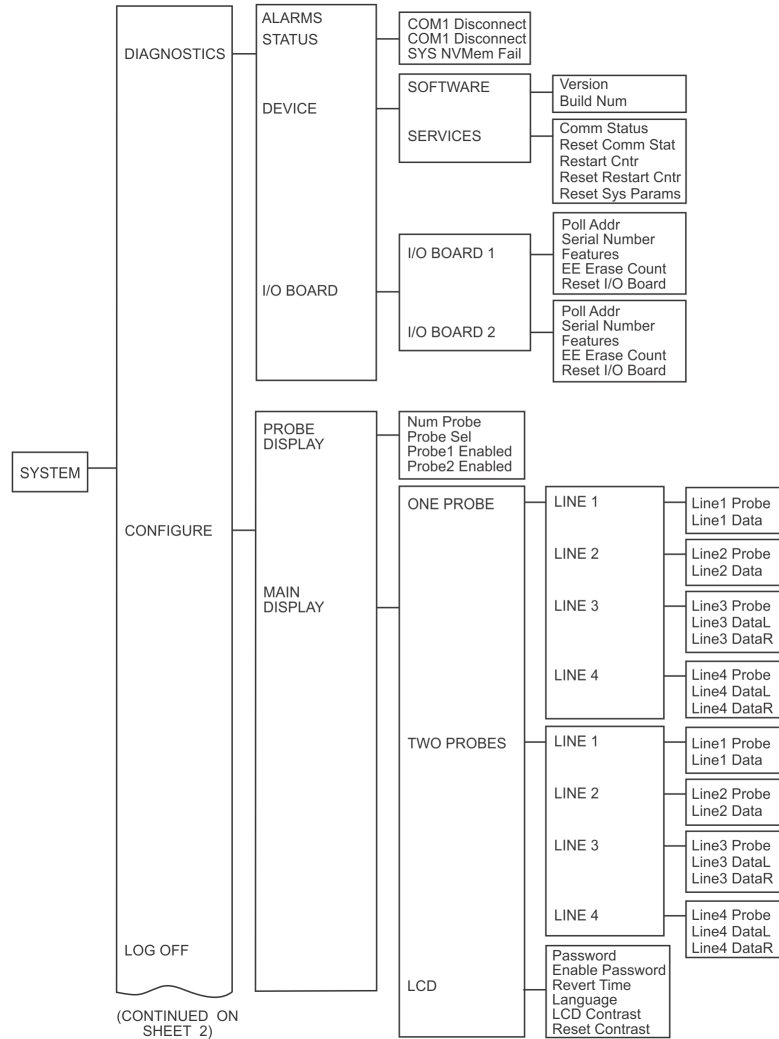


## 4.1.2 Xi Controls

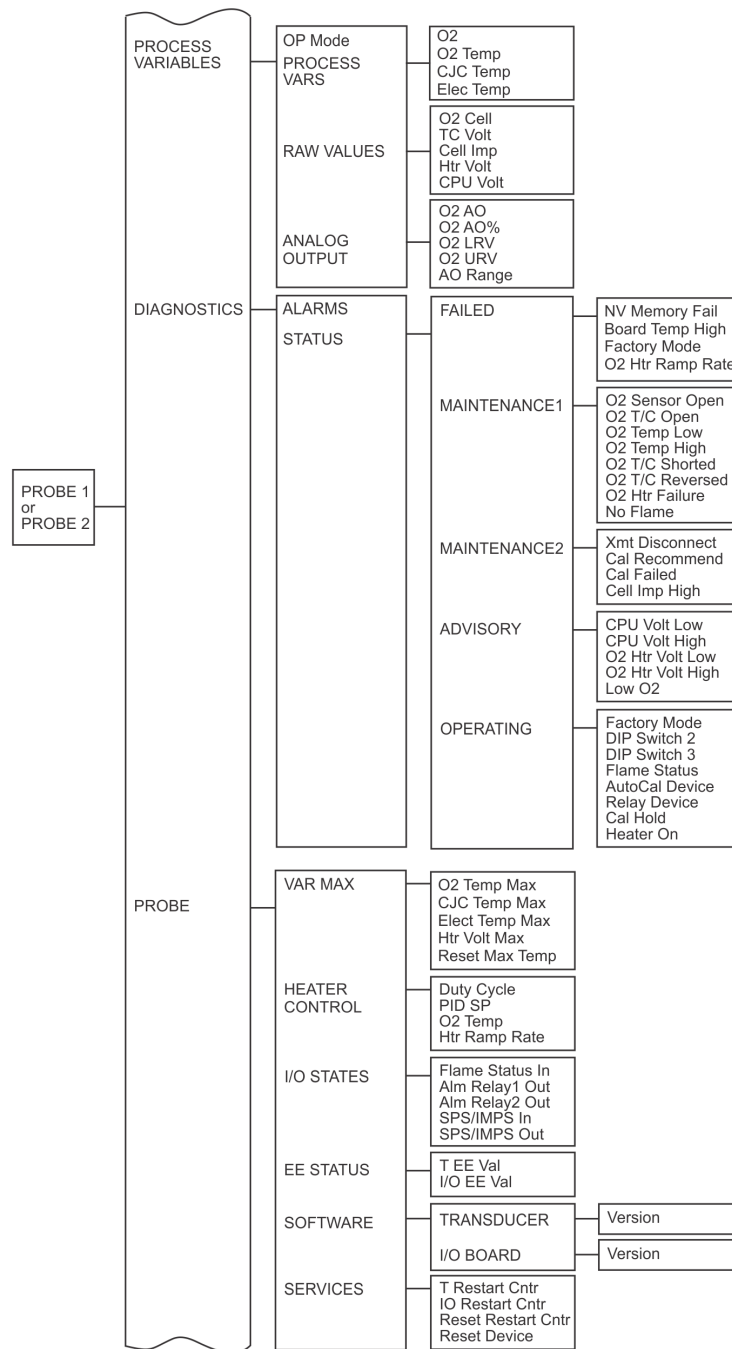
The Xi can be used to change the software and alarm settings, to adjust the high and low gas settings, and to initiate the calibration sequence. Refer to the following control descriptions. Use the control keys on the front panel of the Xi ([Figure 4-1](#)) to navigate and edit the Xi menu ([Figure 4-2](#)).

- *MENU* toggles between three main menu options: *System*, *Probe1*, and *Probe2* (if available). The top level of the selected main menu is displayed.
- *DIAG* toggles between the *Alarms* list of the three main menus. All faults and warnings related to the selected main menu device are displayed.
- *ENTER* saves newly entered data and returns you to the previous menu level.
- *EXIT* returns you to the previous menu level without saving newly entered data. When navigating the menu tree, pressing *EXIT* returns you to the main menu.
- *Up/Down* keys scroll up and down through menu items. During data entry, the *Up/Down* keys increment and decrement the data values.
- *Left* arrow key returns you to the previous menu level. During data entry, the *Left* arrow key moves the cursor one digit to the left.
- *Right* arrow key advances you to the next menu level and, when a menu item is highlighted, selects the item from a list of menu options. During data entry, the *Right* arrow key moves the cursor one digit to the right.

Figure 4-2: Xi menu

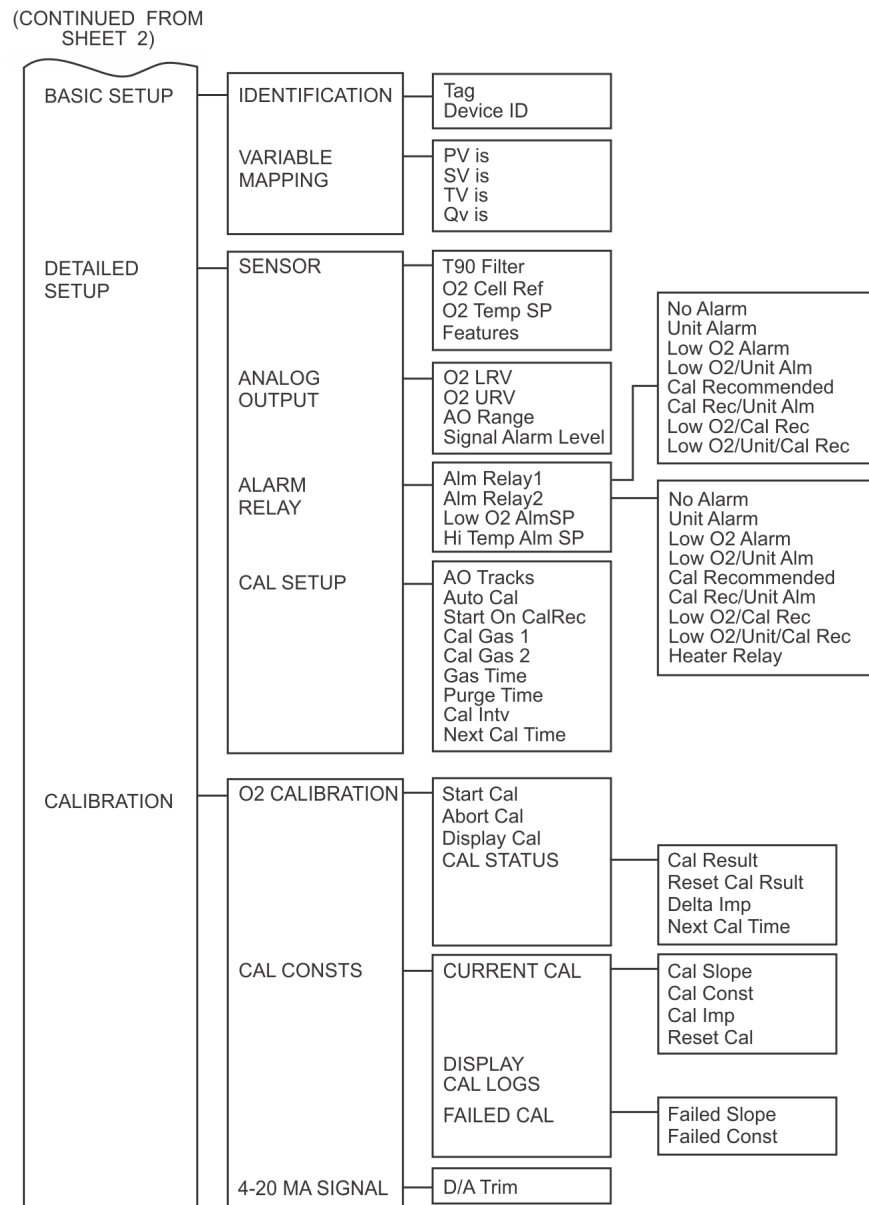


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(CONTINUED ON SHEET 3)

40050004



39640008

### 4.1.3 Password protection

Beginning with Xi system software version 1.05 or higher, the main display and diagnostic screens of the Xi can be viewed at any time, but further access and unauthorized configuration changes can be prevented by enabling a password protection feature. However, the Xi is shipped with password protection disabled.

Password protection can be enabled by selecting **System Main Menu > Configure > LCD > Enable Password** (see [Figure 4-2](#)).

The factory default upon enabling the password protection is *ROSE*, but the password can consist of any 4 alpha/numeric characters.

If you forget the password, call Rosemount technical support at 800-433-6076 to gain access to a master password.

A *Lock* icon is displayed at the top right corner of the main display when password protection is in effect.

The password protection relocks itself after a certain number of seconds with no button pushes (defined as *revert time* in the same *LCD setup* menu). You can also force the front panel to be locked by selecting **System Main Menu > Log Off**. The *Log Off* selection performs on function if the password feature is disabled.

The Xi has a *Reset* function that reestablishes all factory default conditions, including the password protection feature, i.e., the password protection falls back to a disabled condition after a reset.

## 4.2 Operation via HART/AMS

The 375/475 Field Communicator is a handheld communications interface device. It provides a common communications link to all microprocessor-based instruments that are HART compatible. The handheld communicator contains a liquid crystal display (LCD) and 21 keys. A pocket-sized manual, included with the 375/475 Field Communicator, details the specific functions of all the keys.

The 375/475 Field Communicator accomplishes its task using a frequency shift keying (FSK) technique. With the use of FSK, high-frequency digital communications signals are superimposed on the Xi's 4-20 mA current loop. The 375/475 Field Communicator does not disturb the 4-20 mA signal, as no net energy is added to the loop.

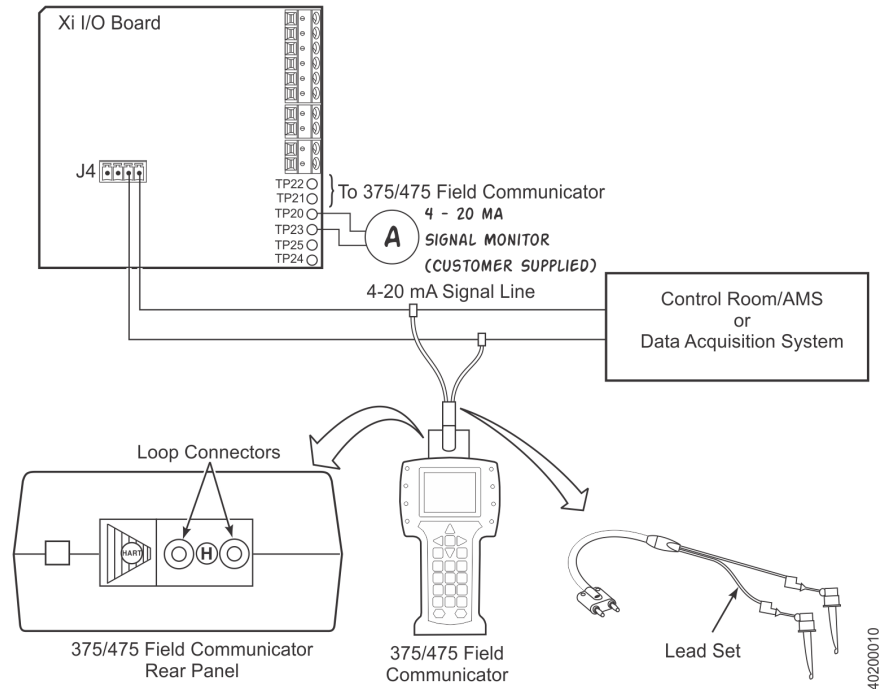
### NOTICE

**The 375 Field Communicator must be upgraded to System Software 2.0 with Graphic License for operation with the Xi. The AMS software must be upgraded to AMS 8.0 or above for operation with the Xi.**

**Contact Emerson's Global Service Center (GSC) at 1-800-833-8314 to upgrade the 375 Field Communicator software to System Software 2.0 with Graphic License.**

### 4.2.1 Field communicator signal line connections

When working at the Xi, the 375/475 Field Communicator can be connected directly to test points TP21 and TP22 on the Xi I/O board as shown in [Figure 4-3](#). The AM+ and AM- test points are provided to monitor the 4-20 mA signal without breaking into the loop.

**Figure 4-3: 375/475 Field Communicator connection at the Xi**

## 4.3 Offline and online operations

The 375/475 Field Communicator can be operated both offline and online.

Offline operations are those in which the communicator is not connected to the O<sub>2</sub> probe. Offline operations include interfacing the 375/475 Field Communicator with a PC (refer to applicable HART documentation regarding HART/PC applications).

In the online mode, the 375/475 Field Communicator is connected to the 4-20 mA analog output signal line. The communicator is connected in parallel to the O<sub>2</sub> probe or in parallel to the 250 ohm load resistor.

# Appendix A

## Safety instructions for the wiring and installation of this apparatus

The following safety instructions apply specifically to all EU member states. They should be strictly adhered to in order to assure compliance with the Low Voltage Directive. Non-EU states should also comply with the following unless superseded by local or national standards.

1. Adequate earth connections should be made to all earthing points, internal and external, where provided.
2. After installation or troubleshooting, all safety covers and safety grounds must be replaced. The integrity of all earth terminals must be maintained at all times.
3. Mains supply cords should comply with the requirements of IEC227 or IEC245.
4. All wiring shall be suitable for use in an ambient temperature of greater than 75 °C (167 °F).
5. All cable glands used should be of such internal dimensions as to provide adequate cable anchorage.
6. To ensure safe operation of this equipment, connection to the mains supply should only be made through a circuit breaker which will disconnect all circuits carrying conductors during a fault situation. The circuit breaker may also include a mechanically operated isolating switch. If it does not, then another means of disconnecting the equipment from the supply must be provided and clearly marked as such. Circuit breakers or switches must comply with a recognized standard, such as IEC947. All wiring must conform with any local standards.
7. Where equipment or covers are marked with the following symbol, hazardous voltages are likely to be present beneath. These covers should only be removed when power is removed from the equipment - and then only by trained service



personnel.

8. Where equipment or covers are marked with the following symbol, there is a danger from hot surfaces beneath. These covers should only be removed by trained service personnel when power is removed from the equipment. Certain surfaces may



remain hot to the touch.

9. Where equipment or covers are marked with the following symbol, refer to the



Reference Manual for instructions.

10. All graphical symbols used in this product are from one or more of the following standards: EN61010-1, IEC417, and ISO3864.

11. Where equipment or labels are marked "Do Not Open While Energized" or similar, there is a danger of ignition in areas where an explosive atmosphere is present. This equipment should only be opened when the power is removed and adequate time as specified in the label or in the instruction manual has been allowed for the equipment to cool down - and then only by trained service personnel.



# Appendix B

表格 1: 含有 China RoHS 管控物质超过最大浓度限值的部件型号列  
**Table 1: List of Model Parts with China RoHS Concentration above MCVs**

部件名称 Part Name	有害物质 / Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr +6)	多溴联苯 Polybrominated biphenyls (PBB)	多溴联苯醚 Polybrominated diphenyl ethers (PBDE)
电子组件 Electronics Assembly	X	○	○	○	○	○
传感器组件 Sensor Assembly	X	○	○	○	○	○

本表格系依据 SJ/T11364 的规定而制作。

This table is proposed in accordance with the provision of SJ/T11364

○: 意为该部件的所有均质材料中该有害物质的含量均低于 GB/T 26572 所规定的限量要求。

O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为在该部件所使用的所有均质材料里, 至少有一类均质材料中该有害物质的含量高于 GB/T 26572 所规定的限量要求。

X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.



# EU Declaration of Conformity



XI

This declaration is issued under the sole responsibility of the manufacturer:  
Rosemount Inc., 8200 Market Blvd., Chanhassen, MN 55317 USA

The product,

**X-STREAM Oxygen Remote Interface, Model Xi**

to which this declaration relates, is in conformity with relevant Union harmonization legislation:

- (2014/30/EU) EMC Directive
- (2014/35/EU) Low Voltage Directive

Assumption of conformity is based on the application of the harmonized standards:

- EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements
- EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

(Signature)

**Chris LaPoint**  
(Name printed)

Vice President Global Quality, Engineering, & Approvals  
(Function name)

July 1, 2017  
(Date of issue)



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