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Process Control Instruments

XDP Explosion-Proof Display Package

User's Manual *910-204B*

GE Panametrics

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Warranty

Each instrument manufactured by GE Panametrics is warranted to be free from defects in material and workmanship. Liability under this warranty is limited to restoring the instrument to normal operation or replacing the instrument, at the sole discretion of GE Panametrics. Fuses and batteries are specifically excluded from any liability. This warranty is effective from the date of delivery to the original purchaser. If GE Panametrics determines that the equipment was defective, the warranty period is:

- one year for general electronic failures of the instrument
- one year for mechanical failures of the sensor

If GE Panametrics determines that the equipment was damaged by misuse, improper installation, the use of unauthorized replacement parts, or operating conditions outside the guidelines specified by GE Panametrics, the repairs are not covered under this warranty.

The warranties set forth herein are exclusive and are in lieu of all other warranties whether statutory, express or implied (including warranties or merchantability and fitness for a particular purpose, and warranties arising from course of dealing or usage or trade).

Return Policy

If a GE Panametrics instrument malfunctions within the warranty period, the following procedure must be completed:

1. Notify GE Panametrics, giving full details of the problem, and provide the model number and serial number of the instrument. If the nature of the problem indicates the need for factory service, GE Panametrics will issue a RETURN AUTHORIZATION NUMBER (RAN), and shipping instructions for the return of the instrument to a service center will be provided.
2. If GE Panametrics instructs you to send your instrument to a service center, it must be shipped prepaid to the authorized repair station indicated in the shipping instructions.
3. Upon receipt, GE Panametrics will evaluate the instrument to determine the cause of the malfunction.

Then, one of the following courses of action will then be taken:

- If the damage is covered under the terms of the warranty, the instrument will be repaired at no cost to the owner and returned.
- If GE Panametrics determines that the damage is not covered under the terms of the warranty, or if the warranty has expired, an estimate for the cost of the repairs at standard rates will be provided. Upon receipt of the owner's approval to proceed, the instrument will be repaired and returned.

Chapter 1

General Information

Introduction

The *XDP* Explosion-proof Display Package has been designed as one component of a system that monitors the composition of a binary gas. The second component is a remotely-mounted sensor/transmitter, such as the GE Panametrics *Model TMO2-TC* or similar device.

Note: *Refer to the documentation supplied with the specific transmitter used for complete information on the transmitter.*

The XDP performs the following basic functions:

- supplies the 24 VDC required to power the transmitter
- accepts and processes the 4-20 mA output from the transmitter
- shows a selected process parameter on a digital display
- provides a user interface for programming the system
- provides user-configurable alarm relays and analog outputs

The XDP is wall-mounted via its integral mounting plate and it is connected to the transmitter with an electrical conduit. Both components can be rated for use in Class I, Division 1, Groups B, C & D hazardous environments.

Basic Features

The XDP incorporates the following basic features:

- wall-mountable, explosion-proof enclosure
- 40 W universal VAC power input
- 24 VDC power output
- 4-20 mA analog input
- high-resolution, backlit LCD digital display
- infrared (“through-the-glass”) programming keypad
- a Windows-like graphical user interface
- three built-in gas measurement ranges
- two isolated 4-20 mA analog outputs
- four general-purpose alarm relays
- built-in error reporting diagnostics

See Figure 1-1 on page 1-2 for a picture of the XDP.

Basic Features (cont.)

Figure 1-1: The XDP

System Overview

In a binary gas mixture, the transmitter measures the concentration of a target gas in a known background gas (see the documentation for the transmitter for a discussion of the specific technology employed by the sensor mechanism). To be suitable for use in an XDP system, the transmitter must meet the following requirements:

- powered by the +24 VDC output from the XDP
- output a 4-20 mA signal to the XDP analog input
- meet all performance specifications for the system
- suitable for use in the specified environment

The XDP accepts the 4-20 mA analog input from the transmitter and processes the information. Then, the results are displayed on the built-in digital display window. In addition, the data may be output as a linear analog signal to drive a data recorder and/or controller device.

A Typical Application

Heavy-duty electricity generators are typically cooled with hydrogen gas to maximize generator efficiency. The hydrogen gas level is continuously monitored, at both ends of the generator. An XDP system with a remote transmitter is ideally suited for this service.

During normal operation, the hydrogen gas must be monitored for the presence of air, which would create an explosion hazard. Then, in preparation for a maintenance shutdown, the hydrogen gas is purged with carbon dioxide gas before the chamber is opened up and exposed to air. At the conclusion of the maintenance work, the chamber is resealed and the air is purged with carbon dioxide. Finally, the carbon dioxide is purged with hydrogen prior to resuming operation. Thus, at various times, the following gas mixtures must be monitored:

- 70-100% hydrogen in air
- 0-100% hydrogen in carbon dioxide
- 0-100% air in carbon dioxide

GE Panametrics offers several transmitters that are well suited for operation in all of these environments, and the XDP has been designed to permit quick and easy switching between the analysis and display of these three gas mixture inputs.

Alarm Settings

When factory-configured for this typical application, the XDP's built-in alarms are set up as follows:

- **XDP Normal Alarm:** failsafe, tripped if:
  - **a.** active curve is not H2/AIR
  - **b.** field calibration is in progress
  - **c.** any built-in error condition occurs
  - **d.** power to the XDP is interrupted
- **XDP Fault Alarm:** failsafe, tripped if:

  while in *measurement* mode:
  - **a.** any error condition, except Low H2 or Low-Low H2, occurs
  - **b.** power to the XDP is interrupted

  or

  while in *calibration* mode:
  - **a.** ADC is out of range, mA input under/over range error occurs
  - **b.** power to the XDP is interrupted

Alarm Settings (cont.)

- **Low Alarm:** field-programmable, failsafe or non-failsafe, tripped in *H2/AIR measurement mode* by:
  - **a.** H2 level below 85% setpoint (programmable)
- **Low-Low Alarm:** field-programmable, failsafe or non-failsafe, tripped in *H2/AIR measurement mode* by:
  - **a.** H2 level below 80% setpoint (programmable)

Chapter 2

Installation

Introduction

This chapter provides a general description of the XDP Explosion-proof Display Package and gives directions on how to install and wire the unit for proper operation.

IMPORTANT: *The XDP requires an external power disconnect device such as a switch or circuit breaker. The disconnect device must be marked as such, clearly visible, directly accessible, and located within 1.8 m (6 ft) of the unit.*

Be sure to observe all installation limits and precautions described in this chapter. Pay particular attention to the ambient temperature range of –10 to +65°C (14 to +149°F) specified for the instrument.

!WARNING!
To ensure safe operation of the XDP, the unit must be installed and operated as described in this manual. Also, be sure to follow all applicable local safety codes and regulations for installing electrical equipment. In addition, all procedures should be performed by trained service personnel.

Proceed to the next page to begin the installation.

Choosing an Installation Site

All environmental and installation factors should have been discussed with a GE Panametrics applications engineer or field sales person at the time the XDP was ordered. Thus, the equipment should be suited to the application and the planned installation site. However, before installing the unit, read these guidelines to verify that the best installation site has been chosen for optimum instrument accuracy and reliability.

- Make sure that the XDP and transmitter enclosures are suitable for the environmental conditions at the installation site.
- Install the system in a location with little or no vibration.
- Mount the transmitter in accordance with the instructions provided in its accompanying documentation.
- Make sure the ambient temperature at the XDP installation site is –10 to 65°C (14 to 149°F).
- Use a suitable electrical conduit to interconnect the remote transmitter and the XDP enclosure.
- Use a suitable sample system between the gas source and the sample inlet of the transmitter.
- Observe all normal safety precautions. Specifically, do not exceed the maximum pressure and temperature ratings of the transmitter or the sample system.
- Install the XDP system in a location that provides ready access for programming, testing, and servicing the unit.
- Protect all cables from excessive physical strain (bending, pulling, twisting, etc.). Do not subject the cables to temperatures above 65°C (149°F) or below –50°C (–58°F).
- Be sure that the line voltage used at the planned installation site corresponds to the factory preset line voltage rating for the XDP.

Mounting the XDP System

This section explains how to mount the XDP system components and the transmitter/sample system at the installation site.

IMPORTANT: *The XDP requires an external power disconnect device such as a switch or circuit breaker. The disconnect device must be marked as such, clearly visible, directly accessible, and located within 1.8 m (6 ft) of the unit.*

IMPORTANT: *This symbol indicates Caution - risk of electric shock:*

Mounting the XDP Enclosure

Refer to Figure 2-1 on page 2-9, and complete the following steps to mount the XDP enclosure:

1. Select a flat surface on a vertical wall or instrument panel with sufficient space to hold the XDP enclosure.

2. Using the mounting dimensions shown in Figure 2-1 on page 2-9, locate and prepare four (4) mounting holes or two (2) horizontal mounting rails on the vertical surface.

3. Secure the XDP enclosure to the mounting surface with four (4) sets of mounting hardware. Be sure that the enclosure is in a vertical position, with the display window at the top.

Mounting the Remote Transmitter/Sample System

Mount the remote transmitter in accordance with the instructions in its accompanying documentation.

Note: *Most GE Panametrics transmitters may be located up to 2,800 ft (850 m) from the XDP enclosure.*

To provide reliable and accurate results, the transmitter is often installed in a suitable sample system. The sample system is designed to deliver a clean, representative gas sample to the inlet of the transmitter at the proper temperature, pressure and flow rate.

Note: *A suitable sample system may be ordered directly from GE Panametrics. The sample system would be supplied fully assembled on a flat plate with four (4) mounting holes. See the sample system and/or transmitter manuals for more details.*

Wiring the XDP

To completely wire the XDP, connect the following items:

- analog output from transmitter (J6)
- +24 VDC input to transmitter (J6)
- XDP alarm relays (J3)
- XDP analog output (J8)
- serial port (J4) - optional
- line power (J1)

Note: *See Appendix B,* Additional Wiring Connections*, for a discussion of connections to terminal blocks J2, J5, and J7.*

Refer to the wiring diagram shown in Figure 2-2 on page 2-10, while completing the instructions presented in this section.

!Attention European Customers!
To meet CE Mark requirements, install all cables as described in Appendix A, *CE Mark Compliance*.

IMPORTANT: *The XDP requires an external power disconnect device such as a switch or circuit breaker. The disconnect device must be marked as such, clearly visible, directly accessible, and located within 1.8 m (6 ft) of the unit.*

!WARNING!
To ensure safe operation of the XDP, the unit must be installed and operated as described in this manual. Also, be sure to follow all applicable local safety codes and regulations for installing electrical equipment. In addition, all procedures should be performed by trained service personnel.

Remove the two side covers on the XDP enclosure. This is accomplished by loosening the set screw in the cover and using a long screwdriver or rod in the slots provided to unscrew the cover. Proceed to the appropriate sub-section to wire each of the terminal blocks.

Note: *A long, pin-like, plastic wiring tool is stored inside the XDP enclosure. Insert the tool into the connector pin being wired to open the hole, and then insert the wire. When the tool is removed, the wire is clamped into the connector.*

Wiring The Remote Transmitter - J6

Terminal block J6 contains the analog signal and loop power connections for the remote transmitter. To wire the transmitter, complete the following steps:

1. Connect the XDP to the transmitter as follows:

Note: *Refer to the transmitter manual for details on wiring the transmitter's terminal block(s).*

a. Connect pin #1 to the positive terminal of the analog output from the transmitter.

b. Connect pin #2 to the +24 VDC loop power input on the transmitter.

c. Connect pin #3 to the return connection of the analog output from the transmitter.

Proceed to the next section to continue wiring the XDP.

Wiring The XDP Alarm Relays - J3

Terminal block J3 contains connections for the XDP alarm relays. To wire these alarms, complete the following steps:

Note: *A* failsafe *alarm is wired to the normally-closed (NC) contacts, while a* non-failsafe *alarm is wired to the normally-open (NO) contacts.*

1. Connect the *Normal* alarm as follows (this alarm is factory-configured for *failsafe* operation):

a. Connect pin #1 (NC) to the alarm device input.

b. Connect pin #2 (C) to the alarm device return.

c. Pin #3 (NO) is not used for fail-safe operation

2. Connect the *XDP Fault* alarm as follows (this alarm is factory-configured for *failsafe* operation):

a. Connect pin #4 (NC) to the alarm device input.

b. Connect pin #5 (C) to the alarm device return.

c. Pin #6 (NO) is not used for fail-safe operation

Wiring The XDP Alarm Relays - J3 (cont.)

3. Connect the *XDP Low* alarm as follows (this alarm is factory-configured in *failsafe* mode, but may be reconfigured):

   a. Connect pin #7 (NC) to the alarm device input.

   b. Connect pin #8 (C) to the alarm device return.

   c. Pin #9 (NO) is not used for fail-safe operation.

4. Connect the *XDP Low-Low* alarm as follows (this alarm is factory-configured in *failsafe* mode, but may be reconfigured):

   a. Connect pin #10 (NC) to the alarm device input.

   b. Connect pin #11 (C) to the alarm device return.

   c. Pin #12 (NO) is not used for fail-safe operation.

Proceed to the next section to continue wiring the XDP.

Wiring the XDP Analog Output - J8

Terminal block J8 contains connections for the XDP's analog output. To wire this analog output, complete the following steps:

1. Connect pin #1 to positive input on the analog output device.

2. Connect pin #2 to the negative input on the analog output device.

3. Pin #3 has no connection.

Proceed to the next section to continue wiring the XDP.

Wiring the Optional Serial Port - J4

Terminal block J4 contains connections for the XDP's serial port. The connections on terminal block J4 are optional, in that they are not required for proper operation of the analyzer. To wire the serial port, complete the following steps:

Note: *This connection may be made with a GE Panametrics #704-668 cable. If this cable is used, pin #1 is the red wire, pin #2 is the white wire, and pin #3 is the green wire.*

1. Connect pin #1 to the transmit pin on the computer.

2. Connect pin #2 to the receive pin on the computer.

3. Connect pin #3 to the return pin on the computer.

Proceed to the next section to continue wiring the XDP.

Wiring The Line Power

The terminal block on the power supply board contains connections for the line power to the XDP. Make these connections only with wire that meets the following specifications:

- individual conductor gauge of 18 AWG minimum (maximum current capacity of 12 Amps)
- voltage rating of 600 Volts minimum
- insulation temperature rating of 105°C minimum

!WARNING!
The rating of the wire insulation must be at least 15°C above the expected ambient temperature.

Refer to Figure 2-2 on page 2-10 and complete the following steps:

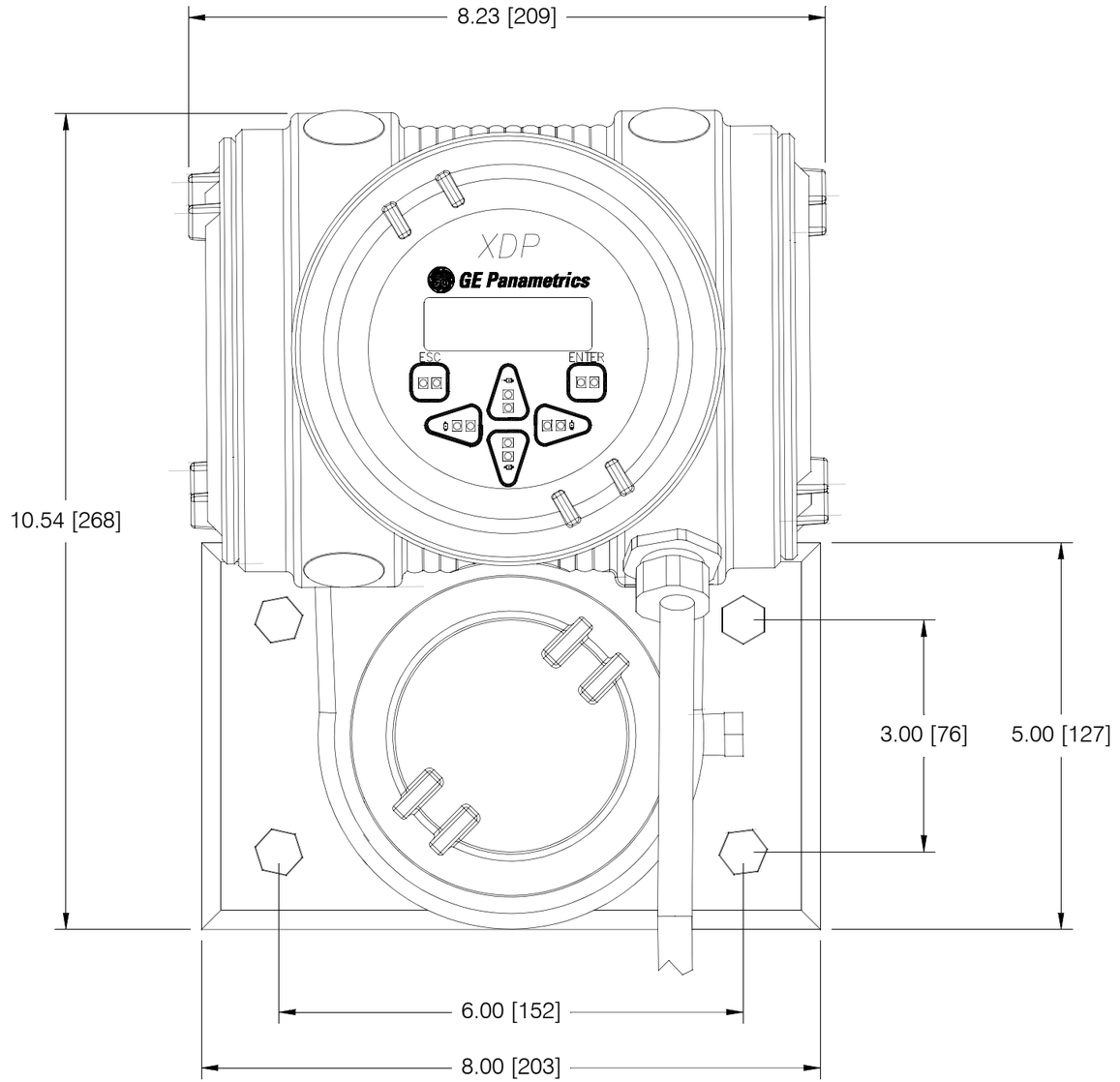
!WARNING!
Before proceeding with the section, verify that the line power has been turned off at the external disconnect device.

1. Attach a cable or conduit with the three line power conductors to a cable entry port on the electronics enclosure.

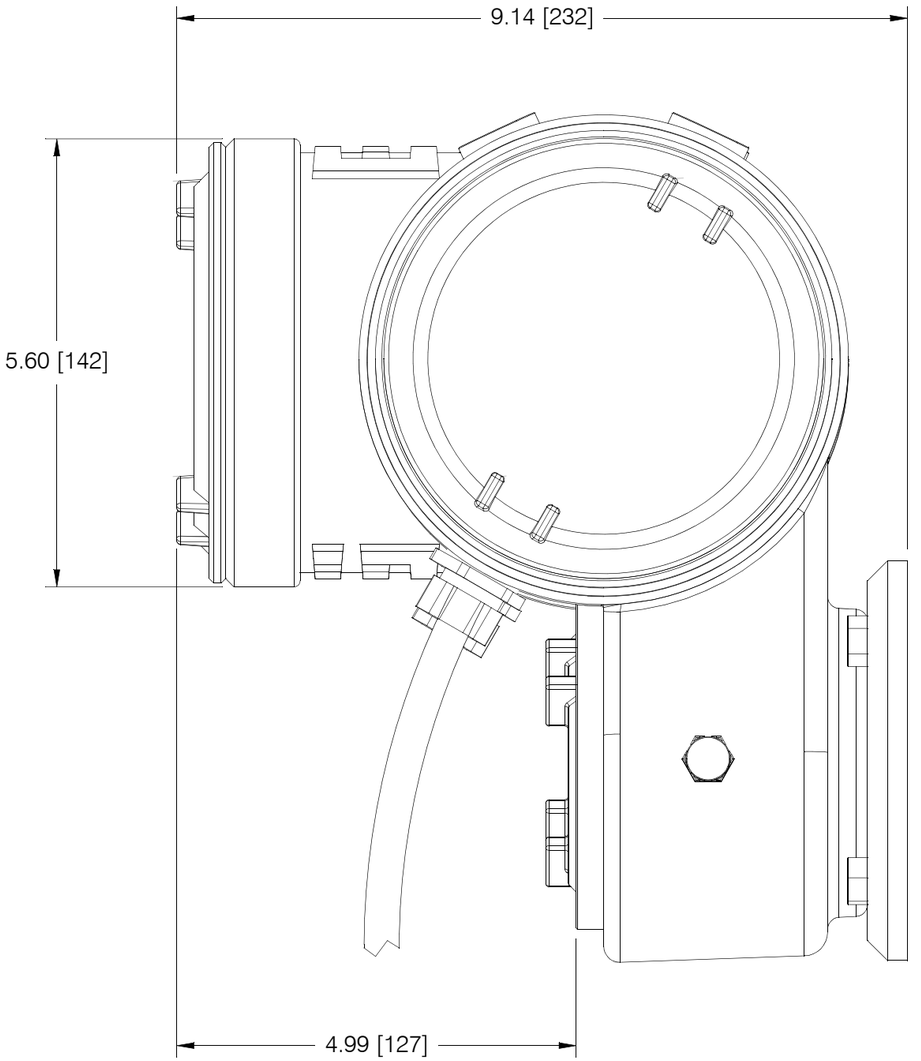
Caution!
Be sure that the input voltage to the XDP complies with the value specified at the time of purchase.

2. Connect the line power leads to terminal block J1 as follows:
   a. Connect the *line* power lead (black) to pin L on the power connector.
   b. Connect the *neutral* power lead (white) to pin N on the power connector.
   c. Connect the *ground* power lead (green) to the chassis ground screw shown in Figure 2-2 on page 2-10.
3. Make sure that the factory-installed jumper wire at pin G on the power connector is secure.

This completes the wiring of the XDP. Proceed to Chapter 3, *Operation*, for instructions on using the meter.

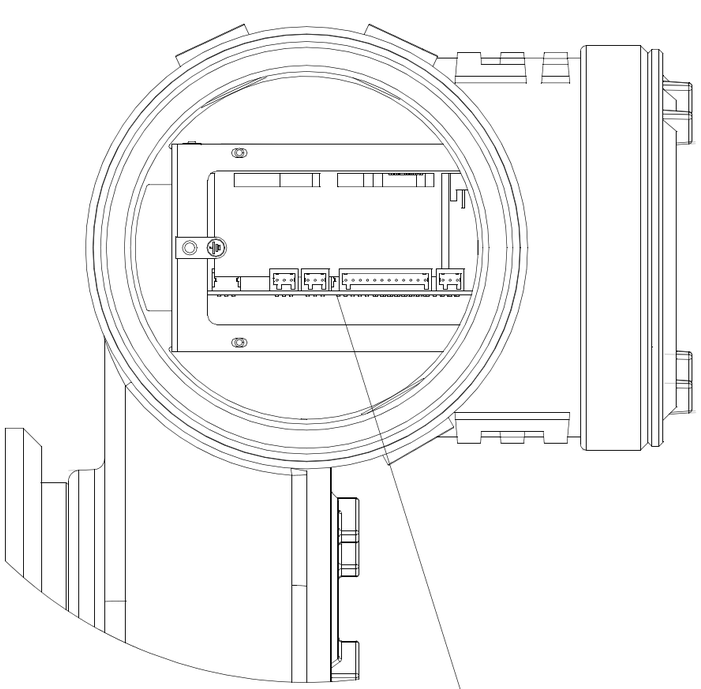


FRONT VIEW

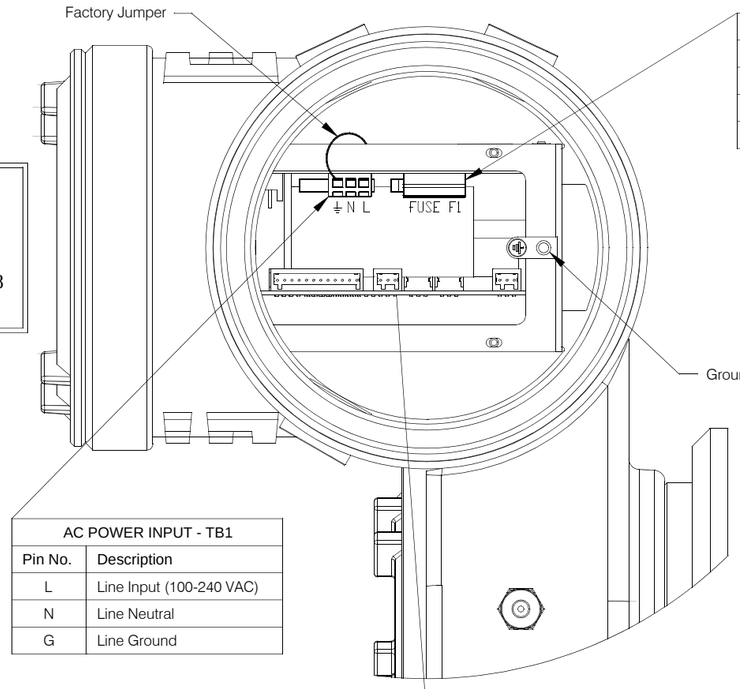


SIDE VIEW

Figure 2-1: XDP Mounting Dimensions

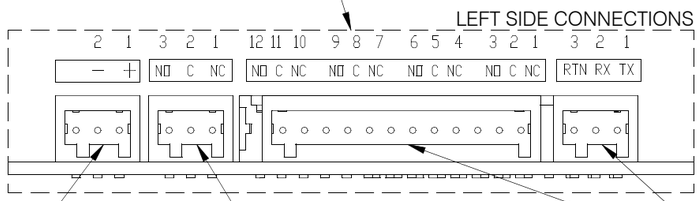


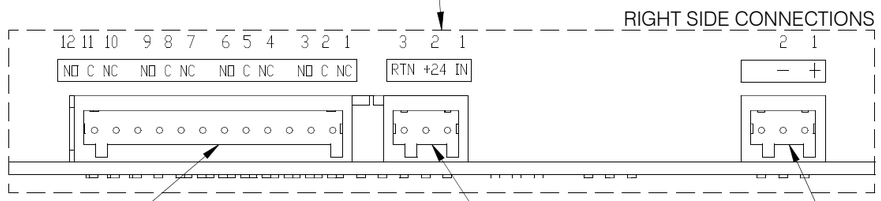
NOTE: This unit requires an external power disconnect device such as a switch or circuit breaker. The disconnect device must be marked as such, clearly visible, directly accessible and located within 1.8 m (6 ft) of the XDP.



FUSE	
Rating	1.25 Amp
Voltage	250 V
Size	5 x 20 mm
Type	T

AC POWER INPUT - TB1	
Pin No.	Description
L	Line Input (100-240 VAC)
N	Line Neutral
G	Line Ground





XDP ALARMS - J3	
Pin No.	Description
1	Normal (NC)
2	Normal (C)
3	Normal (NO)
4	Fault (NC)
5	Fault (C)
6	Fault (NO)
7	Low (NC)
8	Low (C)
9	Low (NO)
10	Low-Low (NC)
11	Low-Low (C)
12	Low-Low (NO)

OTHER CONNECTIONS - J7	
Pin No.	Description
1	No connections required here. (See Appendix B)
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

SYSTEM ANALOG OUTPUT - J5	
Pin No.	Description
1	No connections
2	required here.
3	(See Appendix B)

SYSTEM FAULT ALARM - J2	
Pin No.	Description
1	No connections
2	required here.
3	(See Appendix B)

[* wire colors for Panametrics #704-668 serial cable]

RS232/485 COMM - J4		
Pin No.	Description	Color*
1	Transmit (TX)	Red
2	Receive (RX)	White
3	Return (RTN)	Green

TRANSMITTER CONNECTIONS - J6	
Pin No.	Description
1	Analog Input (IN)
2	Power Output (+24)
3	Return (RTN)

XDP ANALOG OUTPUT - J8	
Pin No.	Description
1	Analog Output (AOUT)
2	Return (RTN)
3	No Connection

Figure 2-2: XDP Wiring Connections (Drawing #702-363)

Chapter 3

Operation

Introduction

The XDP is an easily operated monitoring device. Make sure that the system has been installed in accordance with the instructions given in Chapter 2, *Installation*, before applying power. This chapter includes discussions of the following topics:

- preventing common problems
- powering up the system
- programming the meter
- taking measurements

!WARNING!
To ensure safe operation of the XDP, it must be installed and operated as described in this manual. In addition, be sure to follow all applicable local safety codes and regulations for installing electrical equipment.

Preventing Common Problems

The complexity of accurately measuring the target gas mixtures dictates that some basic precautions be observed in using the XDP. Failure to observe these simple procedures is often the cause of some common problems. Compliance with the following points will help to eliminate such problems:

- Calibration of the analyzer should be checked approximately every 2–6 months, depending upon the specific application (see "Calibrating the System" on page 4-20).
- Never use thread sealant on any connection in the sample gas flow path. Thread sealant emits combustible vapors that can cause reading errors.
- The infrared keypad may not function properly if direct sunlight strikes the face of the XDP or if the XDP is installed in an environment that has a high infrared content. To minimize such factors, provide suitable shading during installation.

Cleaning the Enclosure

If the glass window or the case of the XDP becomes soiled, use a soft cloth dampened with water for cleaning. Never use solvents or detergents to clean the XDP.

Powering Up the System

Check the wiring connections and close both the XDP and transmitter enclosures before applying power. Energize the external disconnect device to power up the XDP. Allow the transmitter to warm up for at least thirty minutes, before taking measurements.

IMPORTANT: *The XDP requires an external power disconnect device such as a switch or circuit breaker. The disconnect device must be marked as such, clearly visible, directly accessible, and located within 1.8 m (6 ft) of the unit.*

The Digital Display Window

The digital display window at the top of the XDP enclosure includes the components shown in Figure 3-1 below.

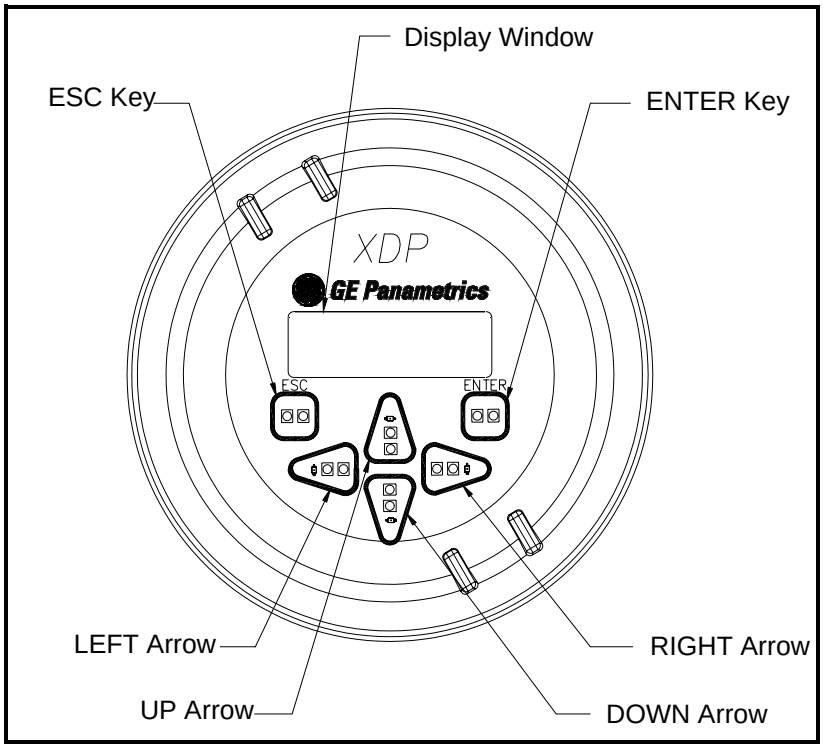


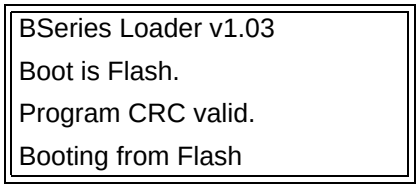
Figure 3-1: The Digital Display Window

The XDP is factory-configured to display *H2/AIR* as the active display range. However, changing the active gas curve automatically updates the display to show the new curve. See Chapter 5, *Advanced Programming*, to reconfigure the display, if necessary.

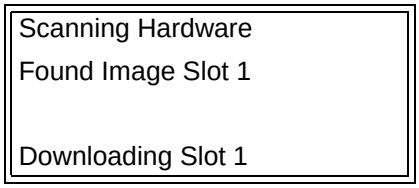
Note: *The XDP's infrared keypad permits programming of the instrument through the glass faceplate without removing the cover. Thus, all programming procedures may be performed while the unit is installed in a hazardous environment.*

Initial Screen Displays

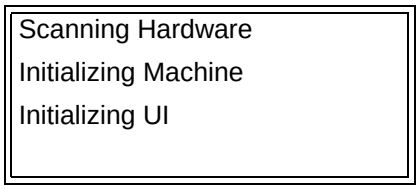
Immediately upon power up, the digital display shows the following sequence of informational screens, as the meter performs its internal systems checks.



This is a typical example of the first initialization screen.

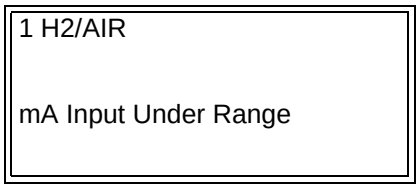


This is a typical example of the second initialization screen.

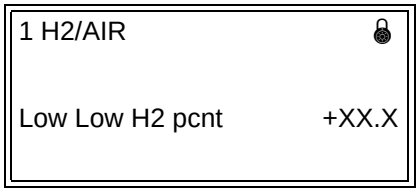


This is a typical example of the final initialization screen.

If the meter passes all of its internal system checks, the following data screens appear:



This message appears for a few seconds, until the sensor begins outputting a valid gas content signal.

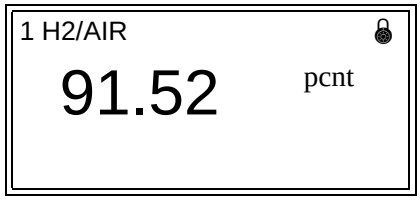


The temporary absence of valid signal triggers the Low Low alarm, and this screen appears.

Note: *The padlock icon at the upper right hand corner of the above displays indicates that the* User Program *is locked with password protection.*

Starting the Sample Gas

Initiate the flow of sample gas to the transmitter and allow a few minutes for the system to reach equilibrium. If the sample gas has a hydrogen concentration higher than the Low Low alarm setting, the Low Low alarm resets, and the following data screen appears.



This is a typical display. The actual concentration of your sample gas is shown here.

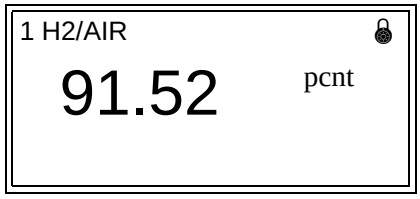
Note: *Allow approximately 30 minutes for the sensor to reach temperature equilibrium, to ensure accurate readings*

Notice that the display shows the *slot number* and the *input range* on the top line, and the current *live value* along with the *unit type* are displayed in the center of the screen.

Note: *The* "Slot Number" *refers to the location of the applicable circuitry in the digital controller module. Slot 0 is the main circuit board, slot 1 holds the XDP circuit board, and slots 2-4 may be used for optional circuit boards.*

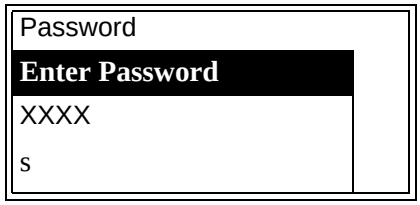
Accessing the User Program

The XDP software permits the operator to configure the meter for his specific requirements. To accomplish this, it is necessary to leave the measurement mode and enter the *User Program* as follows (see the menu maps in Figures C-1 and C-2 on pages C-1 and C-2):



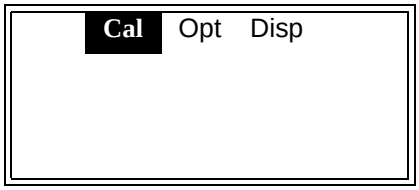
While in measurement mode, press the [ESC], [ENTER], and [ESC] keys in sequence.

Enter the operator level password (**2719**) at the next screen. This password grants access only to those menus needed by the operator of the meter. A different password is required to access the more advanced menus (see Chapter 5, *Advanced Programming*, for details).



Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

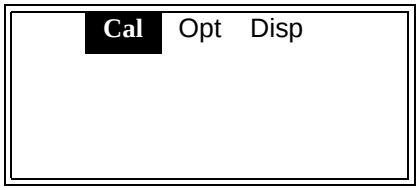
Accessing the User Program (cont.)



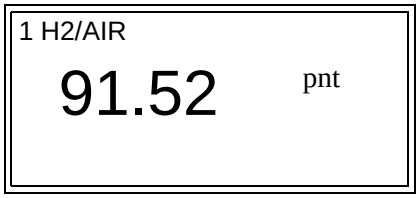
This screen shows the highest level of the *User Program*, which is referred to as the *main menu*.

Exiting the User Program

To leave the *User Program*, proceed as follows from the main menu:



Press the [ESC] key.



You are now back in normal run mode.

Notice that the padlock is no longer visible at the upper right corner of the display window. Once the *User Program* has been accessed with a valid password, the menus at that programming level remain unlocked when you return to run mode. With the menus unlocked, you may reenter the *User Program* by simply pressing the [ESC] key only. To re-lock the menus, see the instructions in Chapter 4, *Setup and Calibration*.

Note: *If the unit is powered down, the* User Program *will be locked when the unit is powered up again.*

To program a specific feature of the XDP, proceed to the appropriate section of Chapter 4, *Setup and Calibration*.

Error Messages

As an aid in diagnosing operational problems with the XDP, the built-in software has been designed to report several error conditions directly on the display screen. These error messages, along with the causes and suggested remedies are listed in Table 3-1 on page 3-6.

IMPORTANT: *Table 3-1 on page 3-6 lists the error messages in order of priority. If multiple errors occur simultaneously, only the highest priority error is displayed (errors with the same priority level cannot occur simultaneously).*

Table 3-1: Screen Error Messages

Priority Level	Error Message	Cause	Suggested Remedy	XDP Analog Output Response
1	ADC In Out of Range:	The analog-to-digital converter has returned an invalid value.	A low-level hardware failure is likely. Contact the factory.	Holds last value
2	mA Input Under Range:	The analog signal from the transmitter is less than 2.4 mA.	**1.** Could be caused by a loose or incorrect electrical connection. Check all electrical connections. **2.** The sensor calibration may have drifted too far. Contact the factory for sensor recalibration or replacement. **3.** May be caused by a failure in the ADC circuitry. Contact the factory for assistance. **4.** No transmitter signal. Check the transmitter wiring.	Holds last value
2	mA Input Over Range:	The analog signal from the transmitter is more than 21.6 mA.	The sensor calibration has drifted. Contact the factory for assistance with field recalibration.	Holds last value
3	Gas Pcnt Under Range:	The target gas percentage is below the preset range.	The sensor calibration has drifted. Perform a field calibration (see “Calibrating the System” on page 4-20).	Outputs zero value
3	Gas Pcnt Over Range:	The target gas percentage is above the preset range.	The sensor calibration has drifted. Perform a field calibration (see “Calibrating the System” on page 4-20).	Outputs span value
4	Low H2 pct:	Occurs in H2/AIR measurement mode, when the H2 reading is below the Low Alarm setpoint (usually 85%).	This indicates air contamination, and the Low Alarm will trip. Remove the source of the air contamination.	no response
4	Low Low H2 pct:	Occurs in H2/AIR measurement mode, when the H2 reading is below the Low-Low Alarm setpoint (usually 80%).	This indicates air contamination, and the Low-Low Alarm will trip. Remove the source of the air contamination.	no response

Chapter 4

Setup and Calibration

Introduction

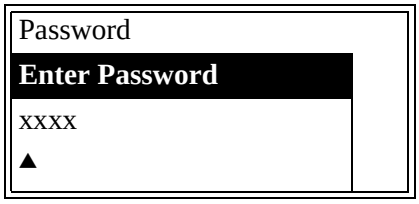
Although the XDP is set up at the factory with default values that are suitable for the intended application, the *User Progra*m provides a means for customizing many of the meter parameters. Proper setup of the system is very important to ensure accurate data readings. The following procedures are described in this chapter:

!WARNING!
To ensure safe operation of the XDP, it must be installed and operated as described in this manual. In addition, be sure to follow all applicable local safety codes and regulations for installing electrical equipment. In addition, all procedures should be performed by trained service personnel.

- selecting the *active curve*
- switching *display windows*
- adjusting the *display contrast*
- setting the *display backlight*
- setting the *fault alarm*
- setting up the *analog output*
- setting up the *serial port*
- *calibrating* the system

Note: *While in the* User Program, *press* [ESC] *at any time to abort the current operation and move back up one menu level.*

Access the *User Program* as described on page 3-4, and refer to the menu maps in Figures C-1 and C-2 on pages C-1 and C-2. At the following screen, enter the operator-level password. [The default password is **2719**].

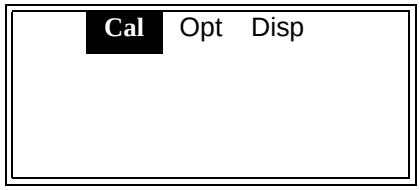


Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

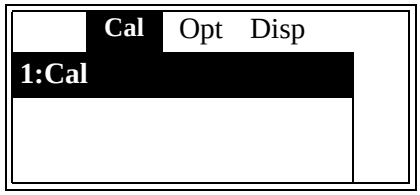
You will now be at the main menu screen. Proceed directly to the appropriate section to perform the desired programming task.

Selecting the Active Curve

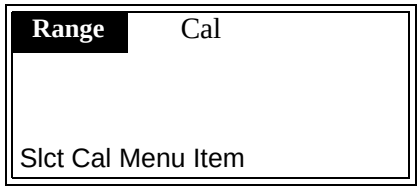
At times it will be desirable to view a curve other than H2/Air. For example, during the first stage of a shutdown, it will be necessary to view the H2/CO2 curve. To select the XDP active curve, access the *User Program* as described on page 3-4, and proceed as follows:



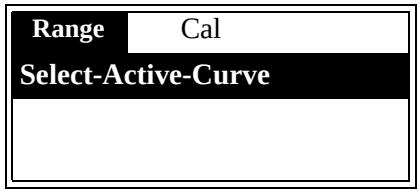
Use the [Ì] and [Í] keys to select [Cal] and press [ENTER].



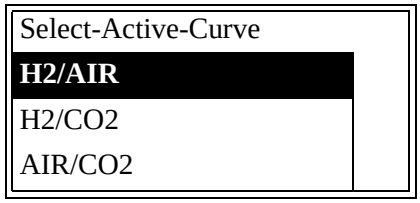
Press [ENTER].



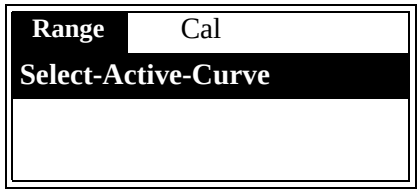
If necessary, use the [Ì] and [Í] keys to select [Range] and press [ENTER].



Press [ENTER].



Use the [Î] and [«] keys to select the desired gas mixture to be monitored and press [ENTER]. [H2/AIR is used as an example in this manual.]



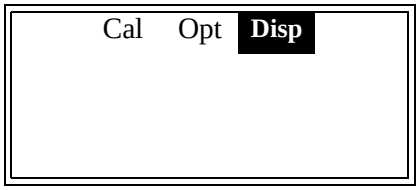
Press [ESC] three times to return to the main menu.

Press [ESC] as many times as necessary to return to normal RUN mode, or proceed to the appropriate section of this chapter to continue programming the XDP.

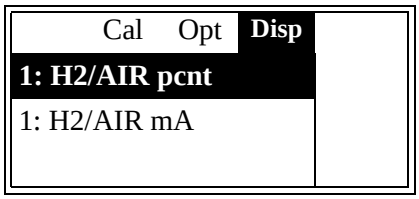
Switching Display Windows

If multiple XDP display windows have been configured (see Chapter 5, *Advanced Programming*, for instructions), the display may easily be switched between these windows from the within the *User Program*. To accomplish this, access the *User Program* as described on page 3-4 and proceed as follows:

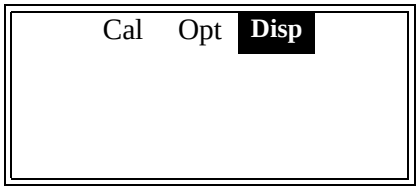
Note: *As a shortcut, the display windows may be switched from normal run mode by using the [Î] and [«] keys.*



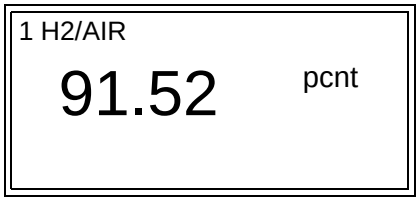
Use the [Ì] and [Í] keys to select [Disp] and press [ENTER].



All available display windows are listed. Use the [Î] and [«] keys to select the desired window and press [ENTER].



Press [ESC] to exit the *User Program* and return to measurement mode.

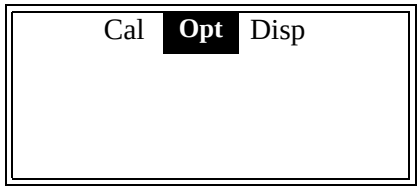


After pressing [ESC] at the previous prompt, the chosen display appears.

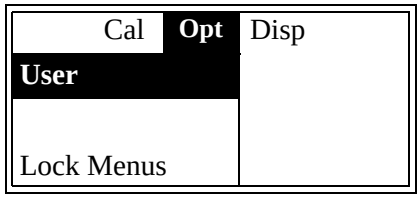
Note: *Although the digital display can be switched at any time between alternate inputs, an alarm or a recorder cannot be switched on the fly to respond to alternate inputs. They must be specifically configured to accept one input at a time.*

Adjusting the Display Contrast

After entering the *User Program*, as described on page 3-4, the main menu appears. To adjust the contrast of the LCD display, proceed as follows:

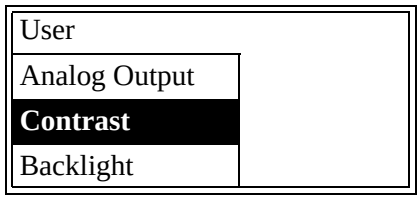


Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



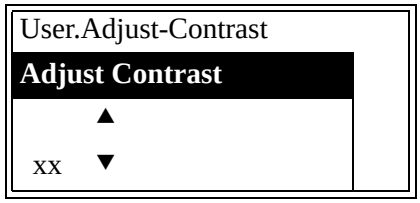
Use the [Î] and [«] keys to select [User] and press [ENTER].

Note: "Lock All" *and* "Versions" *menu options also appear on the above list.*

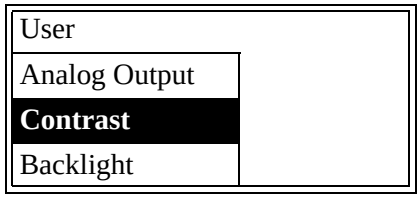


Use the [Î] and [«] keys to select [Contrast] and press [ENTER].

Note: *The* "Fault Alarm" *and* "Comm" *options are also available in the above list box.*



Use the [Î] and [«] keys to increment the value to a number between 0 (min. contrast) and 99 (max. contrast). When done, press [ENTER].

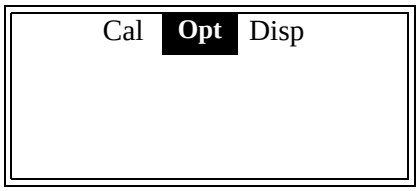


You are now back at the *User Menu*.

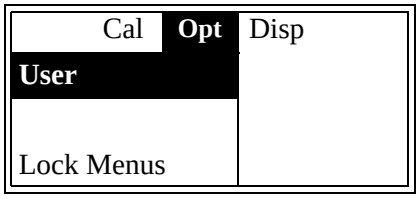
Press [ESC] as many times as necessary to return to normal RUN mode, or proceed to the appropriate section of this chapter to continue programming the XDP.

Setting the Display Backlight

After entering the *User Program*, as described on page 3-4, the main menu appears. To set the display backlight, proceed as follows:

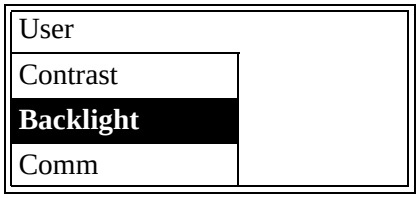


Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



Use the [Î] and [«] keys to select [User] and press [ENTER].

Note: "Lock All" *and* "Versions" *menu options also appear on the above list.*

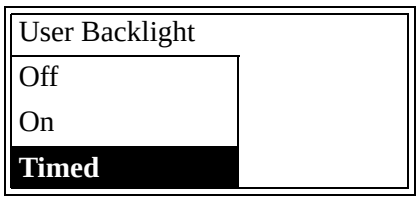


Use the [Î] and [«] keys to select [Backlight] and press [ENTER].

Note: *The* "Fault Alarm" *and* "Analog Output" *options are also available in the above list box.*

The display backlight has three possible settings:

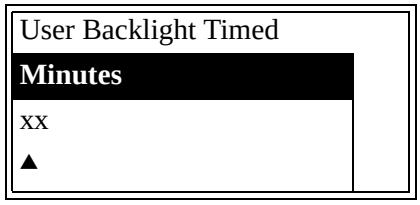
- *Off* - the backlight is permanently turned off
- *On* - the backlight is continuously on
- *Timed* - the backlight comes on whenever a key is pressed and remains on until a specified time interval has elapsed without any keypad activity



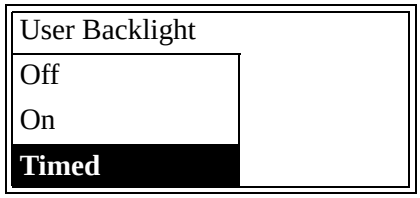
Use the [Î] and [«] keys to select the desired option and press [ENTER].

Note: *If* "Off" *or* "On" *was chosen above, the following two prompts do not appear and you are returned to the* User Menu.

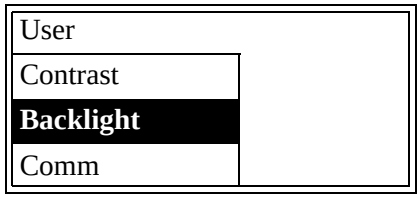
Setting the Display Backlight (cont.)



Use [Ì] and [Í] to position the cursor under the desired character. Use [Î] and [«] to enter a time between 0 and 99 min. When done, press [ENTER].



Press [ESC].



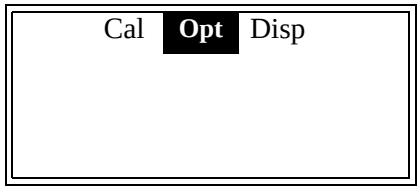
You are now back at the *User Menu*.

Press [ESC] as many times as necessary to return to normal RUN mode, or proceed to the appropriate section of this chapter to continue programming the XDP.

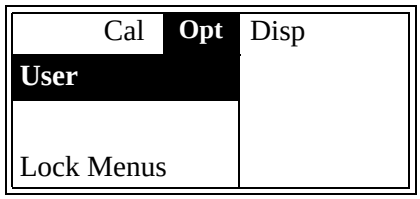
Setting the System Fault Alarm

The system fault alarm is <u>not</u> normally used for XDP applications. However, if you do intend to use this alarm relay, the fault alarm type may be specified by entering the *User Program*, as described on page 3-4, and proceeding as follows:

Note: *See Appendix B,* Additional Wiring Connections, *for instructions on wiring the system fault alarm.*



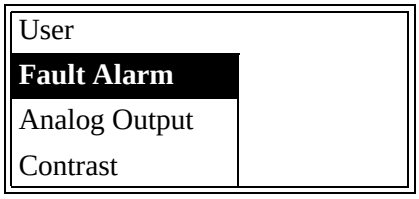
Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



Use the [Î] and [«] keys to select [User] and press [ENTER].

Note: "Lock All" *and* "Versions" *menu options also appear on the above list.*

Setting the System Fault Alarm (cont.)

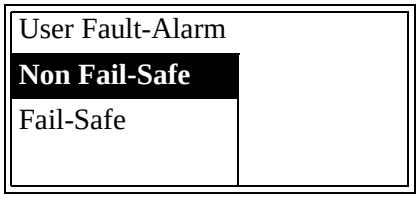


If necessary, use the [Î] and [«] keys to select [Fault Alarm] and press [ENTER].

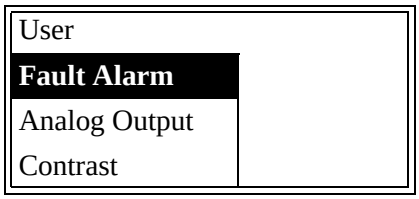
Note: *The* "Backlight" *and* "Comm" *options are also available in the above list box.*

The XDP fault alarm has two possible operating modes:

- *Non-Fail-Safe:* The alarm is wired to the normally-open (NO) and common (C) contacts, and the alarm is "Off" until a fault condition energizes the alarm relay to close these contacts and trigger the alarm.
- *Fail-Safe:* The alarm is wired to the normally-closed (NC) and common (C) contacts, and the alarm relay is energized to keep the alarm "Off" during normal operation. A fault condition de-energizes the alarm relay and triggers the alarm by allowing these contacts to close.



Use the [Î] and [«] keys to select the desired alarm mode and press [ENTER].



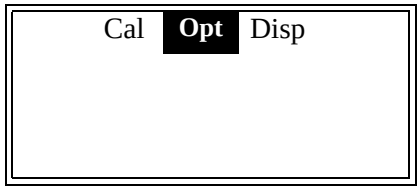
You are now back at the *User Menu*.

Press [ESC] as many times as necessary to return to normal RUN mode, or proceed to the appropriate section of this chapter to continue programming the XDP.

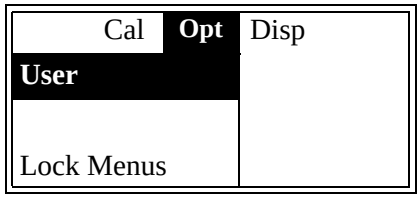
Setting Up the System Analog Output

The system analog output is not normally used for XDP applications. However, if you do intend to use this output, it may be configured by entering the *User Program*, as described on page 3-4, and proceeding as follows:

Note: *See Appendix B,* Additional Wiring Connections*, for instructions on wiring the system analog output.*

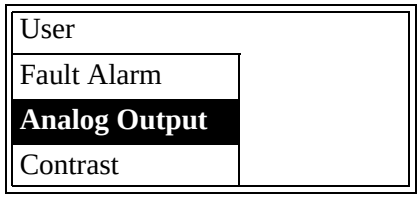


Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



Use the [Î] and [«] keys to select [User] and press [ENTER].

Note: "Lock All" *and* "Versions" *menu options also appear on the above list.*



Use the [Î] and [«] keys to select [Analog Output] and press [ENTER].

Note: *The* "Backlight" *and* "Comm" *options are also available in the above list box.*

The following analog output features may be set in this menu:

- **Analog Output Type:** configure the system analog output for a 0-20 mA, 4-20 mA or 0-2 V output device
- **Zero Setpoint:** enter the live measurement value that corresponds to the low end of the system analog output range.
- **Span Setpoint:** enter the live measurement value that corresponds to the high end of the system analog output range minus the zero setpoint.
- **Test:** manually generate a system analog output with a known value.
- **Zero Trim:** adjust the system analog output to equal the low end of the recorder range.

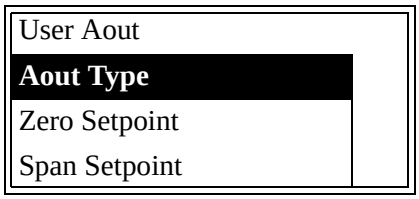
Setting Up the System Analog Output (cont.)

- **Span Trim:** adjust the system analog output to equal the high end of the recorder range minus the zero setpoint.

Proceed to the appropriate sub-section to program the desired system analog output feature.

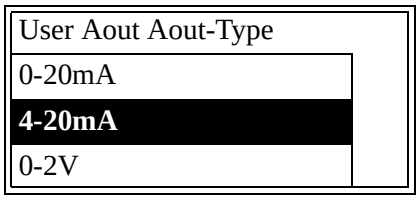
Choosing the System Analog Output Type

Enter the system analog output menu, as described on page 4-8, and proceed as follows:



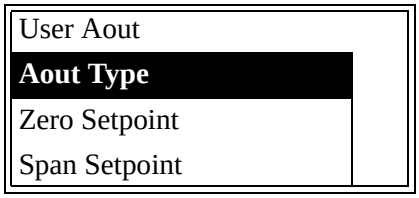
Use the [Î] and [«] keys to select [Aout Type], and press [ENTER].

Note: *The* Test, Zero Trim, *and* Span Trim *options are also available in the above list box.*



Use the [Î] and [«] keys to select the desired system analog output type, and press [ENTER].

Note: *The* "Namur" *option is also available in the above list box. The* Namur NE43 *specification requires a 4-20 mA output to be clamped in specific bands to indicate out-of-range errors.*

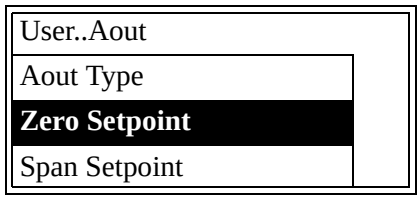


You are now back at the system analog output setup menu.

Either press [ESC] until you return the *User Menu* or proceed to the appropriate section to continue setting up the system analog output.

Setting the Zero Setpoint

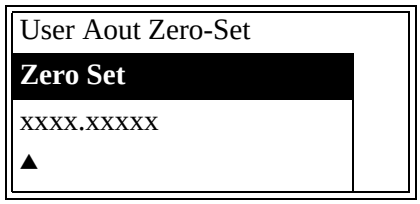
Enter the system analog output menu, as described on page 4-8, and proceed as follows:



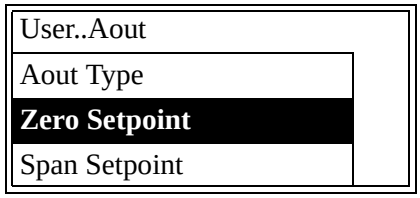
Use the [Î] and [«] keys to select [Zero Setpoint], and press [ENTER].

Note: *The* Test, Zero Trim, *and* Span Trim *options are also available in the above list box.*

At the next prompt, enter the desired zero setpoint (the percentage of target gas that corresponds to the lower end of the specified system analog output range).



Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

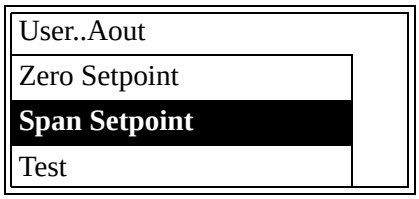


You are now back at the system analog output setup menu.

Either press [ESC] until you return the *User Menu* or proceed to the appropriate section to continue setting up the system analog output.

Setting the Span Setpoint

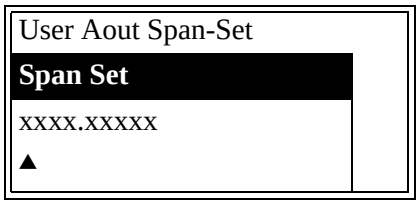
Enter the system analog output menu, as described on page 4-8, and proceed as follows:



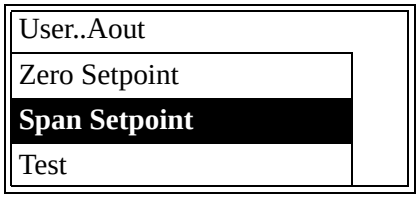
Use the [Î] and [«] keys to select [Span Setpoint], and press [ENTER].

Note: *The* Aout Type, Zero Trim, *and* Span Trim *options are also available in the above list box.*

At the next prompt, enter the desired span setpoint (the percentage of target gas that corresponds to the upper end of the specified system analog output range minus the zero setpoint).



Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

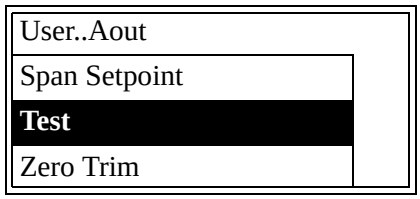


You are now back at the system analog output setup menu.

Either press [ESC] until you return the *User Menu* or proceed to the appropriate section to continue setting up the system analog output.

Testing the System Analog Output

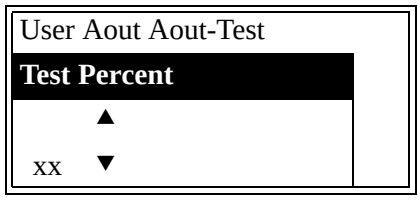
Enter the system analog output menu, as described on page 4-8, and proceed as follows:



Use the [Î] and [«] keys to select [Test], and press [ENTER].

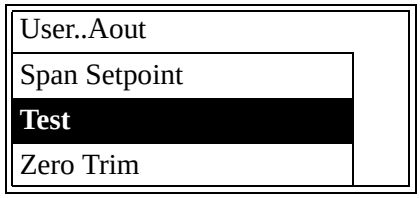
Note: *The* Aout Type, Zero Setpoint, *and* Span Trim *options are also available in the above list box.*

At the next prompt, enter the desired *"Test Percent"* value, which is the system analog output value (expressed as a percentage of the system analog output span) used by the meter as a TEST signal.



Use [Î] and [«] to increment the test percent to the desired value.

Enter as many values as desired at the above prompt to verify that the analog output device is accurately recording the specified test values. When done, press [ENTER].



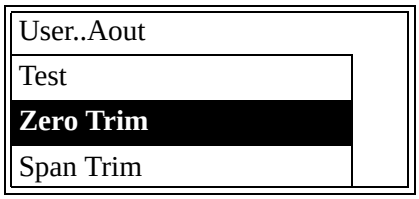
You are now back at the system analog output setup menu.

Either press [ESC] until you return the *User Menu* or proceed to the appropriate section to continue setting up the system analog output.

Setting the Zero Trim

Enter the system analog output menu, as described on page 4-8, and proceed as follows:

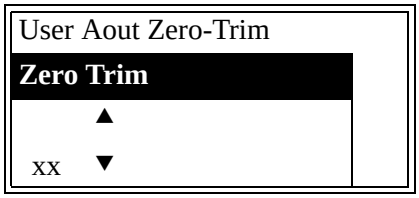
IMPORTANT: *Before proceeding with this section, make sure that the output percentage being trimmed has been entered in the* Test *menu on page 4-12.*



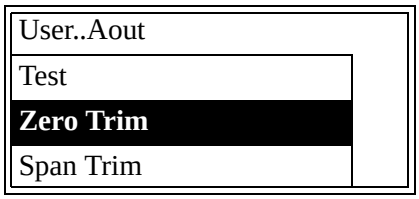
Use the [Î] and [«] keys to select [Zero Trim], and press [ENTER].

Note: *The* Aout Type, Zero Setpoint, *and* Span Setpoint *options are also available in the above list box.*

At the following prompt, the system analog output of the meter is driven at exactly the low end of the output range.



Press the [Î] or [«] key until your output device reads the correct value. When done, press [ENTER].



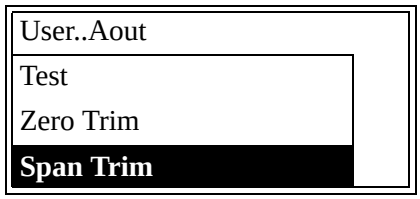
You are now back at the system analog output setup menu.

Either press [ESC] until you return the *User Menu* or proceed to the appropriate section to continue setting up the system analog output.

Setting the Span Trim

Enter the system analog output menu, as described on page 4-8, and proceed as follows:

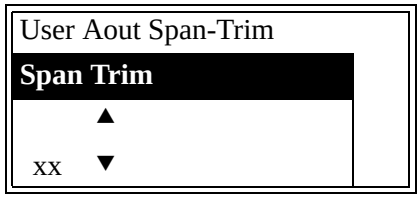
IMPORTANT: *Before proceeding with this section, make sure that the output percentage being trimmed has been entered in the* Test *menu on page 4-12.*



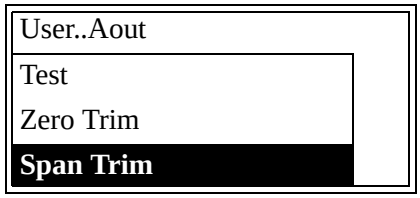
Use the [Î] and [«] keys to select [Span Trim], and press [ENTER].

Note: *The* Aout Type, Zero Setpoint, *and* Span Setpoint *options are also available in the above list box.*

At the following prompt, the system analog output of the meter is driven at exactly the high end of the output range.



Press the [Î] or [«] key until your output device reads the correct value. When done, press [ENTER].



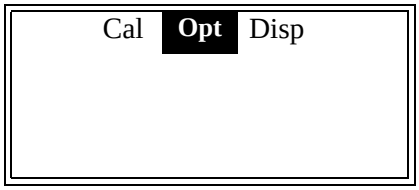
You are now back at the system analog output setup menu.

Either press [ESC] until you return the *User Menu* or proceed to the appropriate section to continue setting up the system analog output.

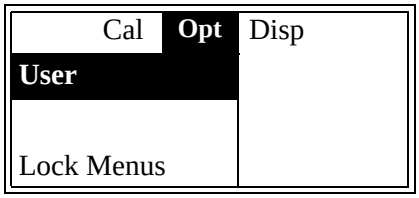
Setting Up the Serial Port

After entering the *User Program*, as described on page 3-4, the main menu appears. To set up the serial port, proceed as follows:

Note: *For the XDP, the serial port is normally used only for downloading software upgrades to the meter.*

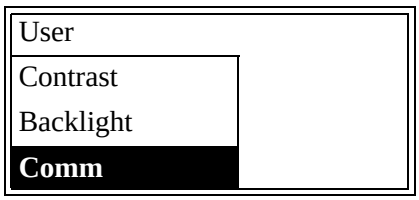


Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



Use the [Î] and [«] keys to select [User] and press [ENTER].

Note: "Lock All" *and* "Versions" *menu options also appear on the above list.*

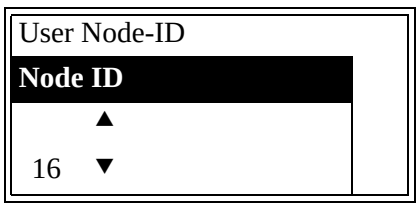


Use the [Î] and [«] keys to select [Comm] and press [ENTER].

Note: *The* "Fault Alarm" *and* "Analog Output" *options are also available in the above list box.*

IMPORTANT: *Each of the following prompts shows the usual default value for that parameter.*

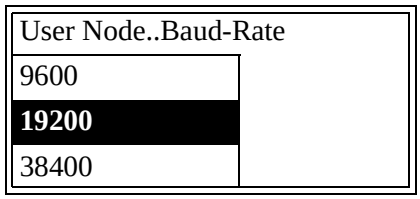
At the following prompt, choose one of the following numbers as the Node ID for the meter: 16, 32, 48, 64, 80, 96, 112, 128, 144, 160, 176, 192, 208, 224, or 240.



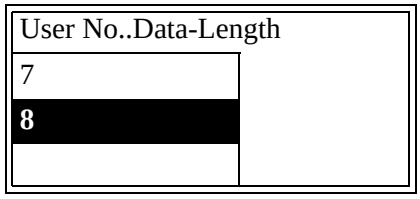
Use the [Î] and [«] keys to scroll the list of available node ID numbers. When the desired number is highlighted, press [ENTER].

Setting Up the Serial Port (cont.)

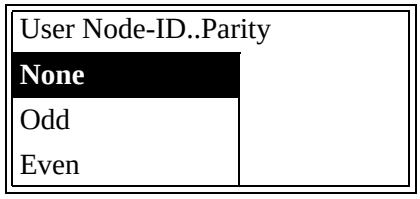
At the following prompt, choose one of the following baud rates: 300, 1200, 2400, 9600, 19200, 38400, 57600, or 115200.



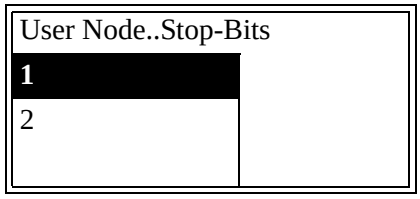
Use the [Î] and [«] keys to select the desired baud rate and press [ENTER].



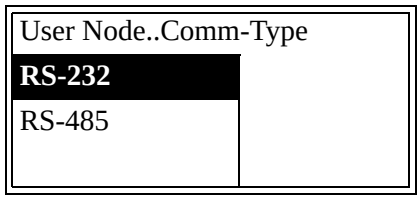
Use the [Î] and [«] keys to select the desired data length and press [ENTER].



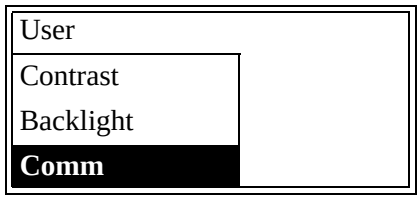
Use the [Î] and [«] keys to select the desired parity setting and press [ENTER].



Use the [Î] and [«] keys to select desired number of stop bits and press [ENTER].



Use the [Î] and [«] keys to select the type of serial port desired. Then, press [ESC] six times.



You are now back at the *User Menu*.

Press [ESC] as many times as necessary to return to normal RUN mode, or proceed to the appropriate section of this chapter to continue programming the XDP.

Other Opt Menu Options

In addition to the *User Menu* described in the previous section, the *Opt Menu* includes the following options:

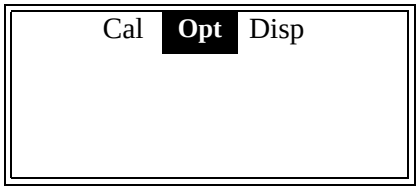
- Lock Menus
- Lock All
- Versions

Proceed to the appropriate section for a discussion of these options.

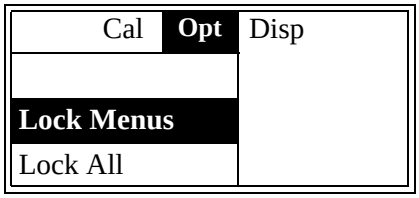
Lock Menus

To protect the *User Program* from unauthorized modifications, password protection may be reinstated. To accomplish this, access the main menu as described on page 3-4, and proceed as follows:

Note: *If the meter is powered down, the password protection is in effect by default when the meter is powered up.*

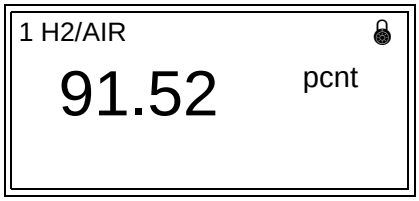


Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



Use the [Î] and [«] keys to select [Lock Menus] and press [ENTER].

Note: "User" *and* "Versions" *menu options are also available above.*

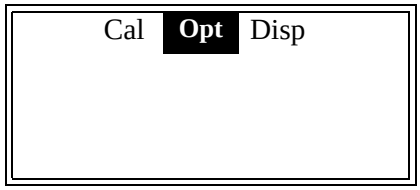


The meter returns directly to run mode, with the padlock icon indicating that the *User Program* is now locked.

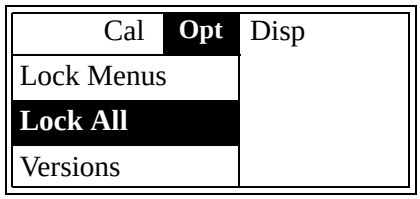
To program another meter function, proceed to the appropriate section of this chapter.

Lock All

To lock all meter functions (such as display window selection) in addition to the *User Program*, access the main menu as described on page 3-4, and proceed as follows:

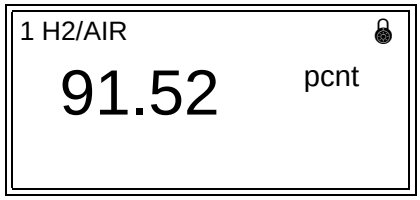


Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



Use the [Î] and [«] keys to select [Lock All] and press [ENTER].

Note: The "User" *menu option is also available above.*

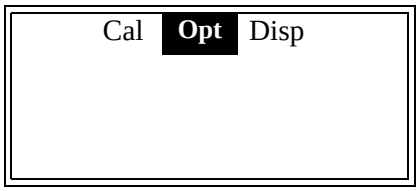


The meter returns directly to run mode, with the padlock icon indicating that the *User Program* is now locked.

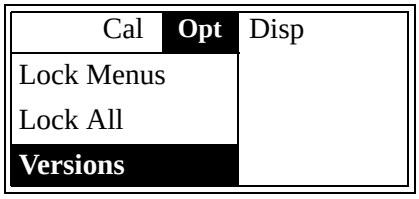
To program another meter function, proceed to the appropriate section of this chapter.

Versions

To view the current software versions installed in your meter, access the main menu as described on page 3-4, and proceed as follows:

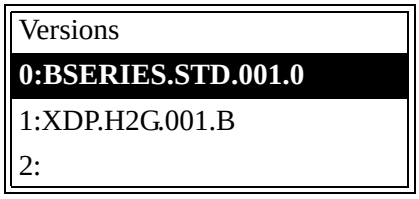


Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



Use the [Î] and [«] keys to select [Versions] and press [ENTER].

Note: The "User" *menu option is also available above.*

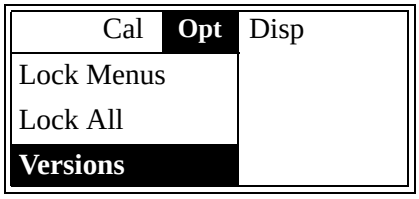


After noting the software version data, press [ENTER].

The following software information is listed in the above display:

- **Slot 0:** controller main circuit board software
- **Slot 1:** XDP circuit board software
- **Slots 2-4:** not normally used for the XDP

Note: *The versions of the software installed in Slots 1 and 2 at the above prompt are used only as an example. The actual versions of your software will appear instead.*



Press [ESC] to return to the main menu.

Press [ESC] until you exit the *User Program*, or proceed to the appropriate section of this chapter to continue programming the meter.

Calibrating the System

Prior to shipment, the XDP/transmitter system is factory-calibrated for the range(s) and gas mixture(s) specified at the time of purchase. However, to ensure the accuracy of the readings, the system should be recalibrated every 2–6 months. The optimum calibration interval depends on the specific details of the application and is best determined by periodic calibration checks after the initial installation.

Caution!
The calibration procedures described below should only be performed by trained service personnel.

In order to complete the calibration procedure, the following items are required:

- zero gas (usually either 100% air or 100% carbon dioxide)
- span gas (usually 100% hydrogen)
- a suitable sample system (see Figure 2-1 on page 2-4)

IMPORTANT: *Each gas cylinder must be certified as to the exact composition of the gas. The accuracy of the calibration is only as good as the accuracy of the calibration gases used.*

Proceed with the instructions in this section to calibrate the system.

Initial Preparation

A temporary connection between the transmitter and the gas cylinder may be made for calibration purposes. However, if a permanent connection is preferred, it should be as short as possible, with an isolation valve right at the gas inlet port on the transmitter (see the transmitter and/or sample manual for details).

!WARNING!
When working in a hazardous area, carefully follow all appropriate safety guidelines during the calibration process.

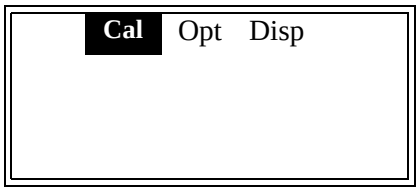
To set up for calibration complete the following steps:

1. Turn the system power ON and allow at least 30 minutes for the sensor to reach temperature equilibrium.

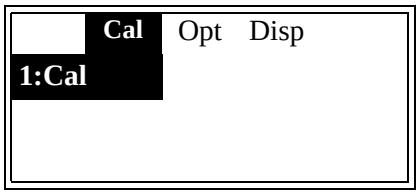
2. Begin the flow of the zero gas to the inlet port of the transmitter, at about 250 cc/min (0.5 SCFH) and atmospheric pressure.

Performing a Zero Calibration

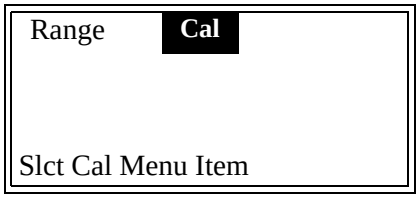
To perform a field calibration of the meter, access the main menu of the *User Program* (see page 3-4) and proceed as follows:



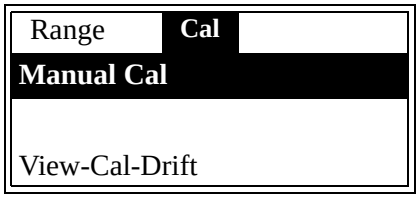
If necessary, use the [Ì] and [Í] keys to select [Cal] and press [ENTER].



Press [ENTER].

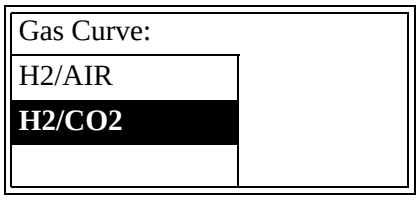


Use the [Ì] and [Í] keys to select [Cal] and press [ENTER].



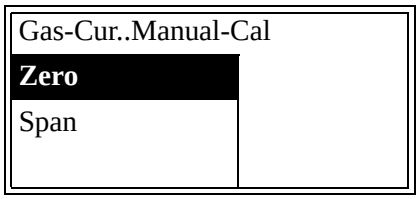
If necessary, use the [Î] and [«] keys to select [Manual Cal] and press [ENTER].

Note: *A* "Clear-Cal-Drift" *option also appears on the above list.*



Use the [Î] and [«] keys to select the calibration gas curve and press [ENTER].

Note: *The H2/CO2 calibration gas is used as an example here.*



Use the [Î] and [«] keys to select [Zero] and press the [ENTER] key.

Performing a Zero Calibration (cont.)

At the following prompt, enter the percentage of target gas (H2 in this example) in the zero gas mixture (usually 0.00%).

Gas-Curve: ..H2/CO2
Enter Zero Gas Pcnt
xx.xx
▲

Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

A [YES] response at the next prompt sends the last live value to the analog output, while a [NO] response sends the calibration gas value to the analog output.

Gas-Curve: Man..Cal		
Hold 4-20 mA Output		
During Calibration?		
	YES	NO

Use [Ì] and [Í] highlight the desired answer (YES or NO) to the question shown. Then, press the [ENTER] key.

Gas-Curve: Man..Cal		
Introduce Cal Gas		
x.x H2/CO2		
<Back	**Next>**	Cancel

Make sure the zero gas is flowing, and use [Ì] and [Í] to highlight [Next]. Then, press the [ENTER] key.

Note: *The value (x.x) shown at the above prompt is the current measured value for the active gas curve.*

The meter now recalibrates its zero point.

Gas-Curve: Man..Cal		
Hit Next When Stable		
x.x H2/CO2		
<Back	**Next>**	Cancel

When the displayed reading has stabilized, use [Ì] and [Í] to highlight [Next]. Then, press the [ENTER] key.

At the next prompt, the new zero drift value and an indication that the meter passed or failed the calibration attempt are displayed.

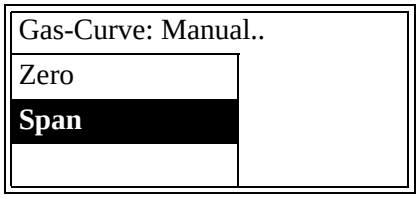
Gas-Curve: Man..Cal	
Zero Drift	
x.xx mA Passed	
<Back	**Finish**

If the calibration *"Passed"*, use [Ì] and [Í] to highlight [Finish]. Then, press the [ENTER] key.

Note: *If the calibration* "Failed", *repeat the calibration procedure. If another failure occurs, contact the factory for assistance.*

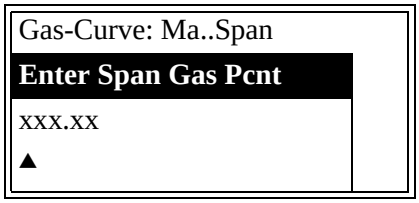
Performing a Span Calibration

Stop the flow of the zero calibration gas, and begin the flow of the span gas to the inlet port of the transmitter, at about 250 cc/min (0.5 SCFH) and atmospheric pressure.



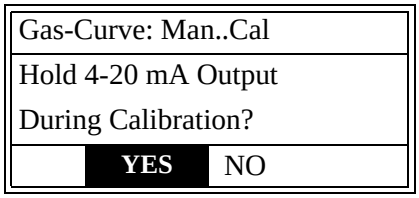
Use the [Î] and [«] keys to select [Span] and press the [ENTER] key.

At the following prompt, enter the percentage of target gas (H2 in this example) in the span gas mixture (usually 100.00%).

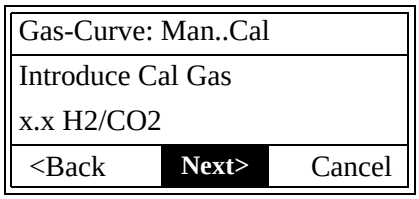


Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

A [YES] response at the next prompt sends the last live value to the analog output, while a [NO] response sends the calibration gas value to the analog output.



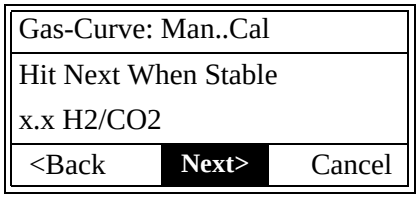
Use [Ì] and [Í] highlight the desired answer (YES or NO) to the question shown. Then, press the [ENTER] key.



Make sure the span gas is flowing, and use [Ì] and [Í] to highlight [Next]. Then, press the [ENTER] key.

Note: *The value (x.x) shown at the above prompt is the current measured value for the active gas curve.*

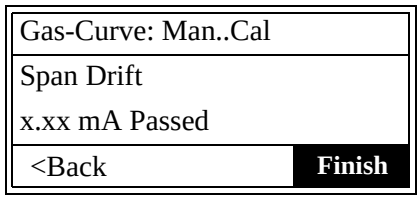
The meter now recalibrates its span point.



When the displayed reading has stabilized, use [Ì] and [Í] to highlight [Next]. Then, press the [ENTER] key.

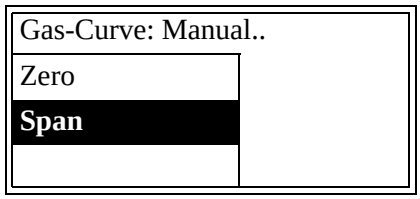
Performing a Span Calibration (cont.)

At the next prompt, the new span drift value and an indication that the meter passed or failed the calibration attempt are displayed.



If the calibration *"Passed"*, use [Ì] and [Í] to highlight [Finish]. Then, press the [ENTER] key.

Note: *If the calibration* "Failed"*, repeat the calibration procedure. If another failure occurs, contact the factory for assistance.*

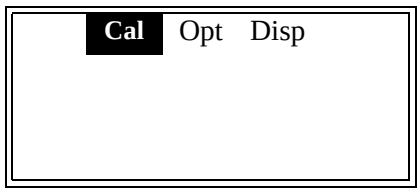


Press [ESC] three times to return to the *Cal Menu*.

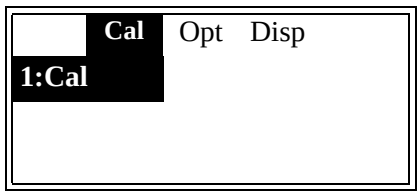
Press [ESC] twice to return to the main menu. Then, press [ESC] again to exit the *User Program*, or proceed to the appropriate section of this chapter to continue programming the meter.

Viewing and Clearing the Cal Drift

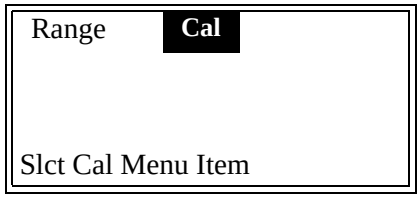
The XDP internally monitors the amount of drift from the factory calibration, and the operator may view the drift values and clear them, if desired. To accomplish this, access the main menu of the *User Program* (see page 3-4) and proceed as follows:



If necessary, use the [Ì] and [Í] keys to select [Cal] and press [ENTER].

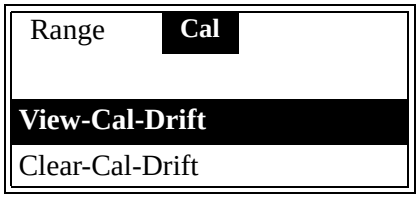


Press [ENTER].



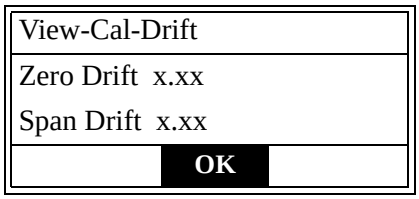
Use the [Ì] and [Í] keys to select [Cal] and press [ENTER].

Viewing and Clearing the Cal Drift (cont.)

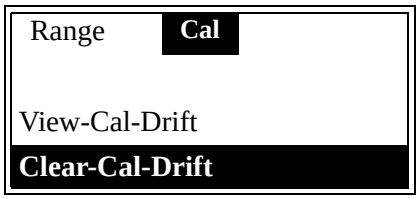


Use the [Î] and [«] keys to select [View Cal Drift] and press [ENTER].

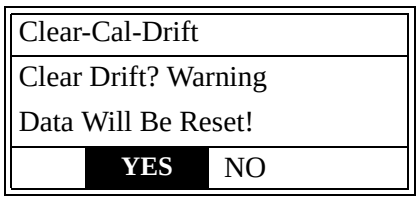
Note: *The* "Manual Cal" *menu option also appears on the above list.*



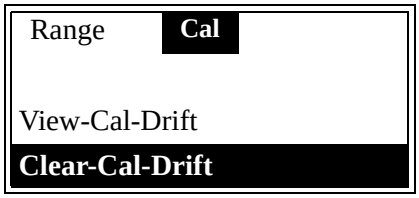
Both the zero and span drift values, in mA, are shown. Press the [ENTER] key when you are ready to continue.



Use the [Î] and [«] keys to select [Clear Cal Drift] and press [ENTER].



Use [Ì] and [Í] highlight the desired answer (YES or NO) to the question shown. Then, press the [ENTER] key.



Press [ESC] to return to the *Cal Menu*.

Press [ESC] as many times as necessary to return to normal RUN mode, or proceed to the appropriate section of this chapter to continue programming the XDP.

Chapter 5

Advanced Programming

Introduction

The XDP is factory-configured to provide optimum performance in the specified application. Because many of the advanced settings programmed into the meter during this procedure are essential for reliable and accurate operation, the operator does not see these menu items during routine programming of the XDP. However, in order to address operational problems or to fine-tune the performance of the system for a specific application, these additional programming features are made available to authorized service personnel.

Caution!

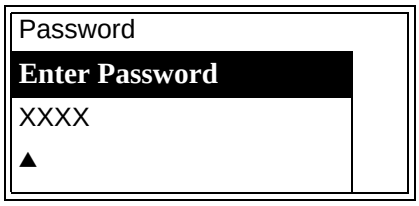
Always consult GE Panametrics before performing any of these advanced programming functions. Improper setup may impair the performance of the XDP system and/or prevent it from meeting its design specifications.

Programming Levels

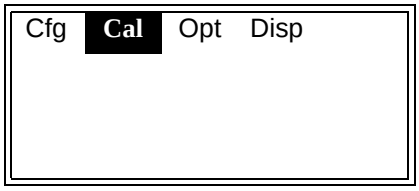
Advanced programming of the XDP is divided into two categories, which require passwords that are different from each other and from the operator-level password discussed on page 3-4. All three programming levels and the required passwords are listed below:

- *Operator (Basic) Level:* password = **2719**
- *Setup (General) Level:* password = **Consult Factory**
- *Factory (Advanced) Level:* password = **Consult Factory**

Access the *User Program* as described on page 3-4 (the menu structure that becomes available depends on which of the above three passwords is entered at the following prompt:



Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.



This screen shows the initial level of the *User Program* (the main menu).

To program any features of the XDP not covered in Chapters 3 or 4, proceed to the appropriate section of this chapter.

Setup-Level Programming

To program any of the features described in this section, access the *User Program* as described on page 3-4 and enter the correct value **(Consult Factory)** at the password prompt. Then, refer to Figure C-3 on page C-3 and go to one of the following sections:

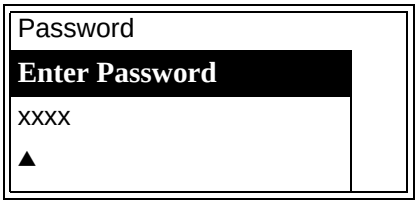
- configuring the display
- configuring the 4-20 mA output
- configuring the Low and Low Low alarms
- testing all XDP alarms

Configuring the Display

After powering up, the XDP performs a series of internal tests. If the display has not yet been configured, the following screen appears:

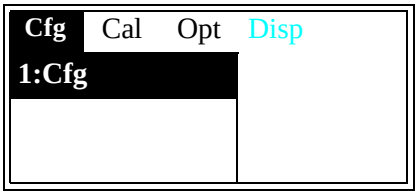
The padlock at the upper right means that the menus are currently password protected.

Before any data can be displayed, the XDP must be configured for the desired display parameter. To set the *active curve* that is output to the digital display, complete the following steps:



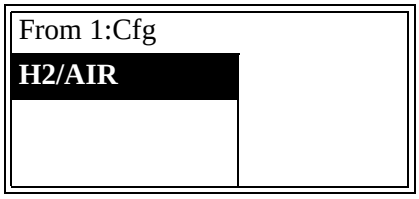
Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

If necessary, use the [Ì] and [Í] keys to select [Cfg] and press [ENTER]. (Notice *Disp* is unavailable at this time.)

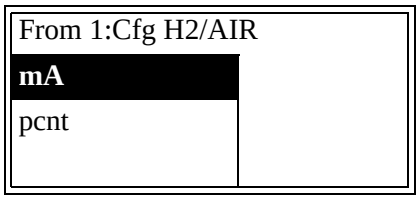


Press [ENTER].

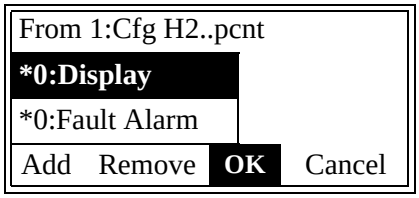
Configuring the Display (cont.)



The currently active range is listed. Press [ENTER] to select this range. (H2/AIR is used here as an example.)



A list of available units is shown. Use the [Î] and [«] keys to select the desired units and press [ENTER].

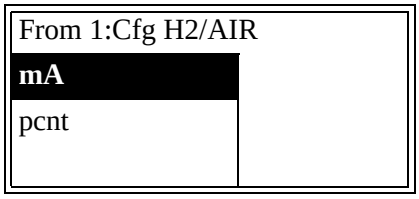


A list of the available output devices is shown. Follow the instructions below to select the desired outputs.

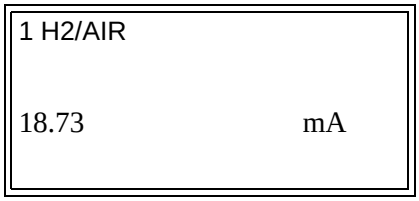
Note: "0:Analog Output" *is also available in the above list box.*

To select the desired output(s), complete the following steps:

1. Use the [Î] and [«] keys to highlight a specific system output. For this example, make sure that [0:Display] is selected as one of the outputs to be displayed.
2. Use the [Ì] and [Í] keys to select *"Add"* or *"Remove"* and press the [ENTER] key to change the status of the selected output. An output is selected if an asterisk (*) appears to its left.
3. When all of the desired outputs have been selected, use the [Ì] and [Í] keys to select *"OK"* and press the [ENTER] key.



Press [ESC] three times to return to the main menu. Then, press [ESC] again to return to run mode.



The selected display is shown. [Notice that the padlock no longer appears, as the menus are now unlocked.]

Configuring the Display (cont.)

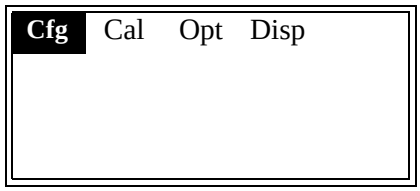
The newly configured display shows the *slot number* and the *active curve* on the top line, and the current *live value* along with the *unit type* are displayed in the center of the screen.

Note: *With the menus unlocked, you may reenter the* User Program *by simply pressing the* [ESC] *key only. To re-lock the menus, see the instructions in Chapter 4,* Setup and Calibration.

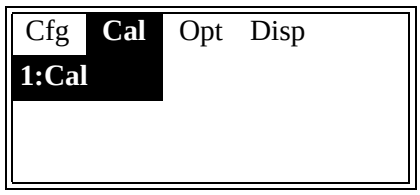
Upon reentering the *User Program,* the *"Disp"* main menu option will now be available, and the available display windows may be switched as described in Chapter 4, *Setup and Calibration*. Also, the display may be reconfigured at any time by repeating the above procedure.

Accessing the Setup Menu

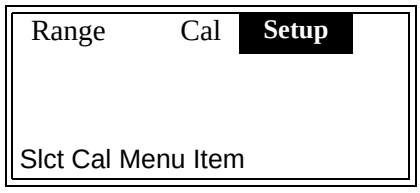
To access the setup menu from the main menu of the *User Program,* proceed as follows:



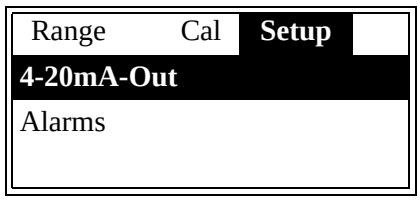
Use the [Ì] and [Í] keys to select [Cal].



Press [ENTER].



Use the [Ì] and [Í] keys to select [Setup] and press [ENTER].

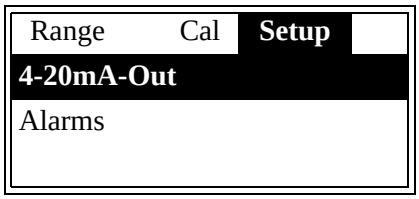


At this programming level, only the two options shown are available.

Proceed to the appropriate section to configure the desired option.

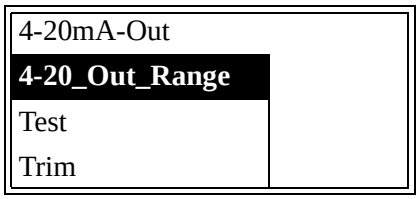
Configuring the 4-20 mA XDP Analog Output

To configure the XDP 4-20 mA analog output, access the setup menu as described on page 5-4 and complete the following steps:

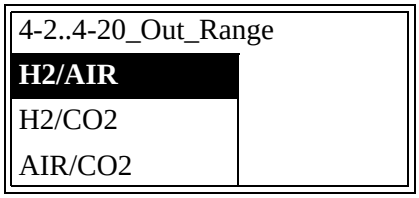


Use the [Î] and [«] keys to select [4-20mA-Out] and press [ENTER].

The Range Submenu



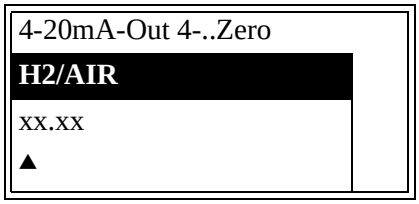
Use the [Î] and [«] keys to select [4-20_Out_Range] and press [ENTER].



Use the [Î] and [«] keys to select the desired output range and press [ENTER].

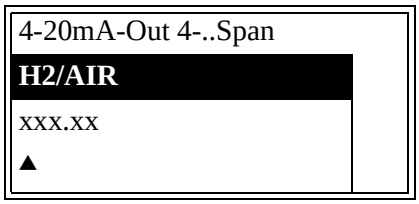
Note: *The H2/AIR range is used in this manual as an example. To program the other ranges, use similar procedures.*

At the next prompt, enter the percentage of hydrogen in air that should generate a mA output of 4.00 (typically 70.00%).



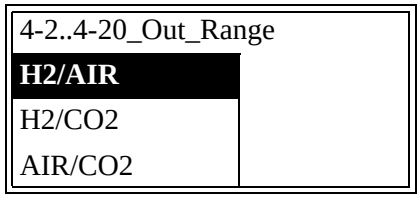
Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

At the next prompt, enter the percentage of hydrogen in air that should generate a mA output of 20.00 (typically 100.00%).



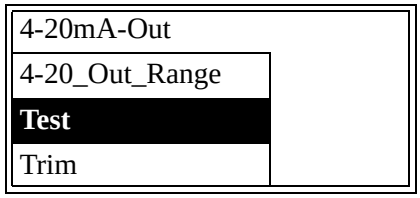
Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

The Range Submenu (cont.)



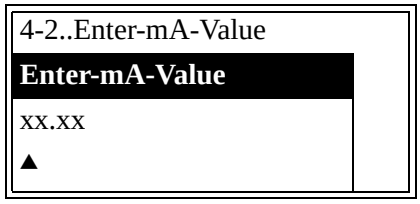
Press [ESC] to leave the [4-20 Out_Range] submenu.

The Test Submenu

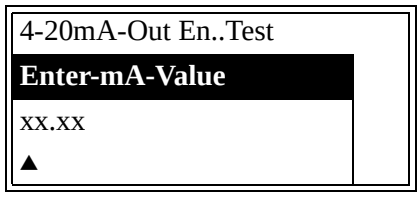


Use the [Î] and [«] keys to select [Test] and press [ENTER].

At the next prompt, enter the mA value to be output as a test signal.



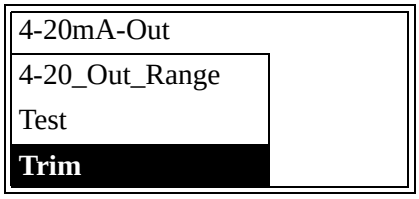
Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value and press [ENTER] when done.



Measure the XDP analog output test signal and compare it to the displayed value. When done, press [ENTER].

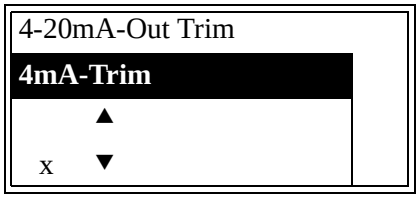
The above two prompts repeat so that more than one test value may be tried. When the testing is complete, press [ESC] from the first prompt to leave the *Test* submenu.

The Trim Submenu



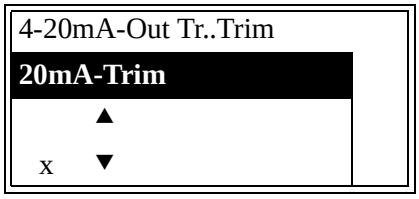
Use the [Î] and [«] keys to select [Trim] and press [ENTER].

At the following prompt, the XDP analog output of the meter is driven at exactly 4 mA.

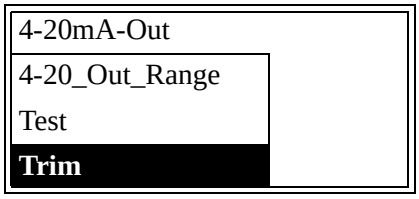


Press the [Î] or [«] key until your output device reads exactly 4 mA. When done, press [ENTER].

At the following prompt, the XDP analog output of the meter is driven at exactly 20 mA.



Press the [Î] or [«] key until your output device reads exactly 20 mA. When done, press [ENTER].

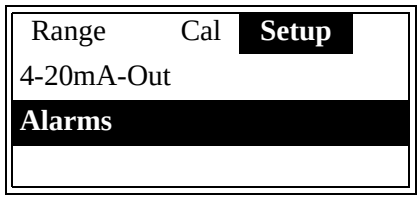


Press [ESC] to return to the setup menu.

To continue programming the setup menu, proceed to the appropriate section for instructions. Otherwise, press [ESC] four times to return to live measurement mode.

Configuring the Low and Low Low Alarms

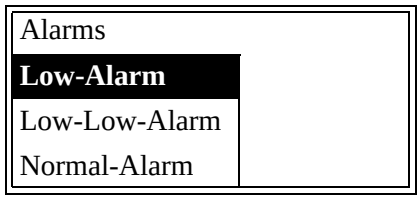
To configure the XDP Low and Low Low alarms, access the setup menu as described on page 5-4 and complete the following steps:



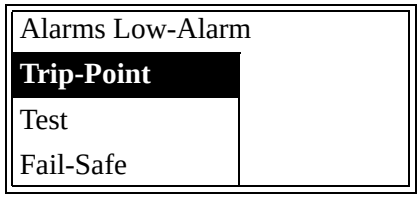
Use the [Î] and [«] keys to select [Alarms] and press [ENTER].

Note: *The other six alarm relays listed in the alarm setup menu are discussed in the next section.*

The Low Alarm

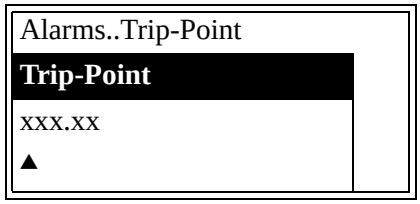


Use the [Î] and [«] keys to select [Low-Alarm] and press [ENTER].

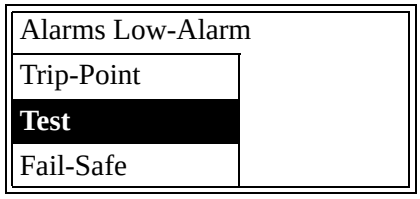


Use the [Î] and [«] keys to select [Trip-Point] and press [ENTER].

At the next prompt, enter the percentage of hydrogen in air that should trip the low alarm (typically 85.00%).

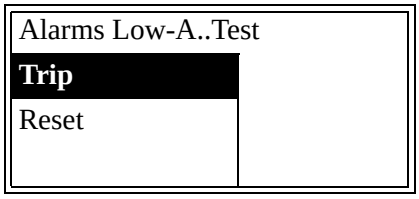


Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.



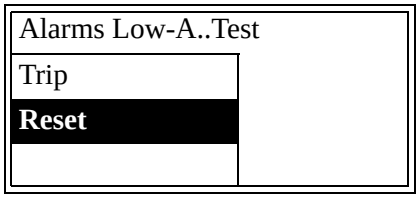
Use the [Î] and [«] keys to select [Test] and press [ENTER].

The Low Alarm (cont.)



Use the [Î] and [«] keys to select [Trip] and press [ENTER].

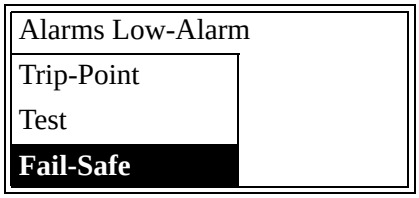
After verifying that the alarm has actually tripped, continue to the next prompt.



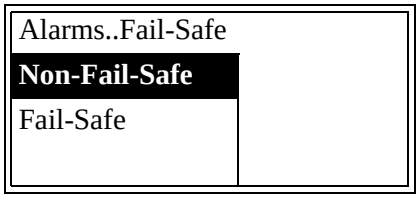
If necessary, use the [Î] and [«] keys to select [Reset] and press [ENTER].

The program alternates between the two previous prompts, each time [ENTER] is pressed. To leave the test loop, press [ESC].

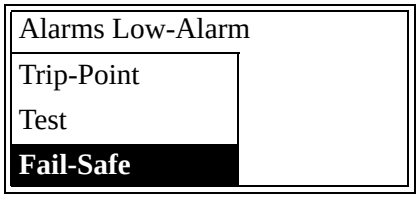
Note: *Upon leaving the test loop, the alarm is automatically reset to its normal state.*



Use the [Î] and [«] keys to select [Fail-Safe] and press [ENTER].

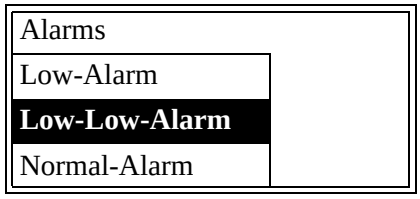


Use the [Î] and [«] keys to select desired alarm type and press [ENTER].

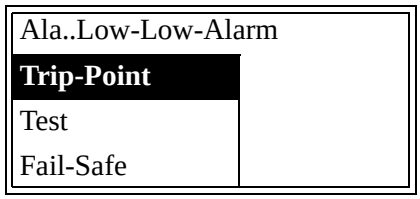


Press the [ESC] key to leave the *"Low Alarm"* submenu.

The Low Low Alarm

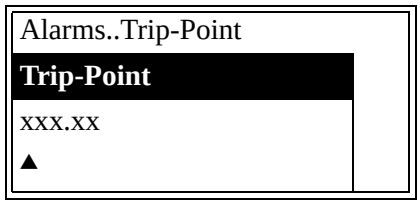


Use the [Î] and [«] keys to select [Low-Low-Alarm] and press [ENTER].

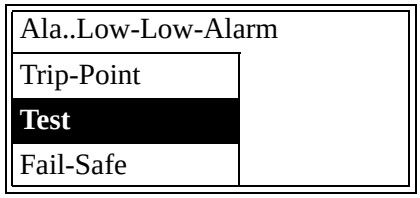


Use the [Î] and [«] keys to select [Trip-Point] and press [ENTER].

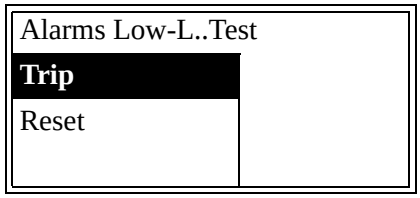
At the next prompt, enter the percentage of hydrogen in air that should trip the low low alarm (typically 80.00%).



Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

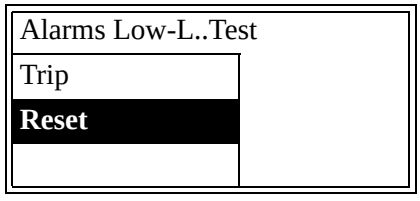


Use the [Î] and [«] keys to select [Test] and press [ENTER].



Use the [Î] and [«] keys to select [Trip] and press [ENTER].

After verifying that the alarm has actually tripped, continue to the next prompt.

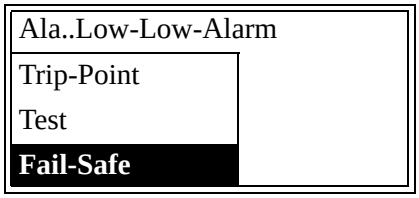


If necessary, use the [Î] and [«] keys to select [Reset] and press [ENTER].

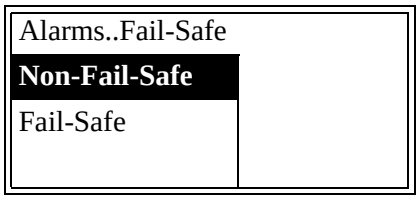
The Low Low Alarm (cont.)

The program alternates between the two previous prompts, each time [ENTER] is pressed. To leave the test loop, press [ESC].

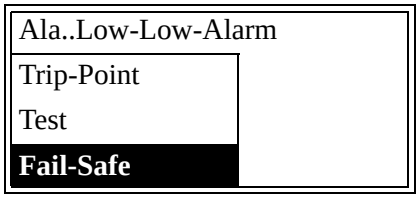
Note: *Upon leaving the test loop, the alarm is automatically reset to its normal state.*



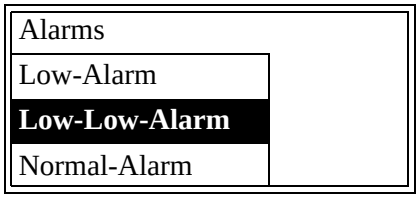
Use the [Î] and [«] keys to select [Fail-Safe] and press [ENTER].



Use the [Î] and [«] keys to select desired alarm type and press [ENTER].



Press the [ESC] key to leave the *"Low Low Alarm"* sub-menu.

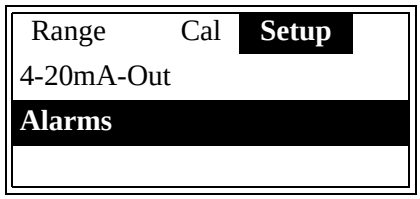


Press [ESC] to return to the setup menu.

To continue programming the setup menu, proceed to the appropriate section for instructions. Otherwise, press [ESC] four times to return to live measurement mode.

Testing the XDP Alarm Relays

To test the remaining six XDP alarm relays, access the setup menu as described on page 5-4 and complete the following steps:



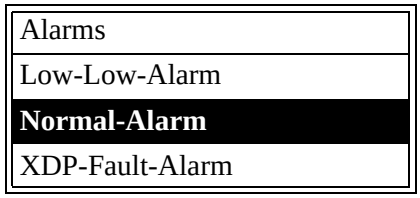
Use the [Î] and [«] keys to select [Alarms] and press [ENTER].

Note: *To configure the low and low low alarms, see the previous section.*

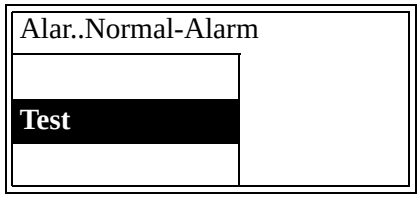
The following XDP alarm relays may be tested in this submenu:

- Normal Alarm
- XDP Fault Alarm
- Gas Curve Relay 1 (see Appendix B for wiring instructions)
- Gas Curve Relay 2 (see Appendix B for wiring instructions)
- Process/Cal Relay (see Appendix B for wiring instructions)
- Zero/Span Relay (see Appendix B for wiring instructions)

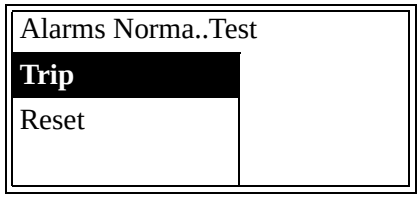
Testing of the *"Normal Alarm"* relay is used here as an example. Use the same procedures to test any of the other alarm relays.



Use the [Î] and [«] keys to select the [Normal-Alarm] for testing, and press [ENTER].



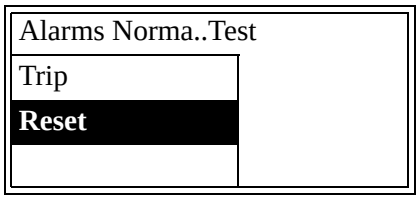
If necessary, use the [Î] and [«] keys to select [Test] and press [ENTER].



Use the [Î] and [«] keys to select [Trip] and press [ENTER].

Testing the XDP Alarm Relays (cont.)

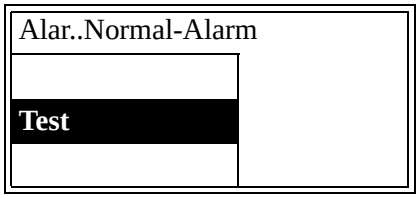
After verifying that the alarm has actually tripped, continue to the next prompt.



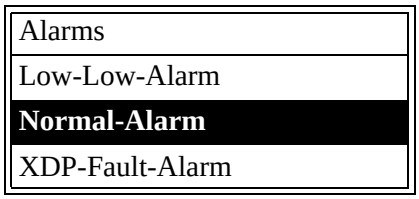
If necessary, use the [Î] and [«] keys to select [Reset] and press [ENTER].

The program alternates between the two previous prompts, each time [ENTER] is pressed. To leave the test loop, press [ESC].

Note: *Upon leaving the test loop, the alarm is automatically reset to its normal state.*



Press [ESC].



If desired, select another alarm relay for testing, and repeat the above instructions.

When the testing has been completed, press [ESC] to return to the setup menu. To continue programming the setup menu, proceed to the appropriate section for instructions. Otherwise, press [ESC] four times to return to live measurement mode.

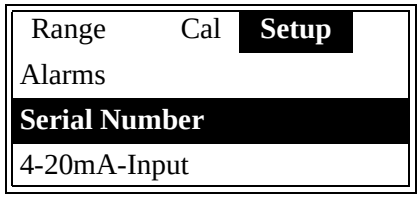
Factory-Level Programming

To program any of the features described in this section, access the *User Program* as described on page 3-4 and enter the correct value **(Consult Factory)** at the password prompt. Then, refer to Figure C-4 on page C-4 and go to one of the following sections:

- entering the sensor serial number
- configuring the 4-20 mA input
- entering factory calibration data
- loading software

Entering the Sensor Serial Number

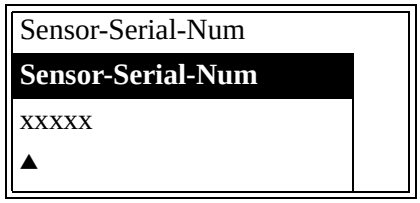
To enter the XDP system transmitter serial number, access the setup menu as described on page 5-4 and complete the following steps:



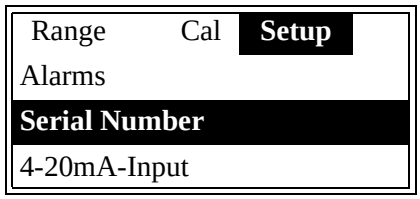
Use the [Î] and [«] keys to select [Serial Number] and press [ENTER].

Note: "4-20mA-Out" *and* "Factory Calibration" *menu options also appear on the above list.*

At the next prompt, enter serial number of the transmitter, as provided by GE Panametrics.



Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

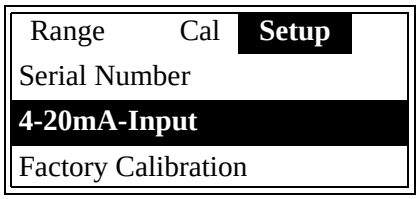


You are now back at the setup menu.

To continue programming the setup menu, proceed to the appropriate section for instructions. Otherwise, press [ESC] four times to return to live measurement mode.

Configuring the 4-20 mA Analog Input

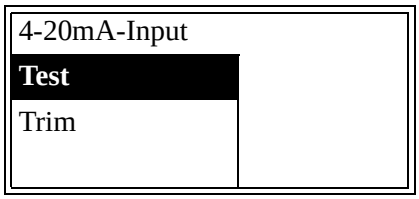
To configure the 4-20 mA analog input, access the setup menu as described on page 5-4 and complete the following steps:



Use the [Î] and [«] keys to select [4-20mA-Input] and press [ENTER].

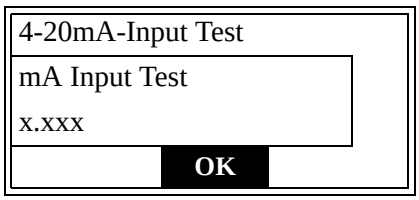
The Test Submenu

To test the analog input, program a test value into the XDP analog output (see page 5-6) and connect the analog output signal to the analog input terminals. Then, proceed as follows:



Use the [Î] and [«] keys to select [Test] and press [ENTER].

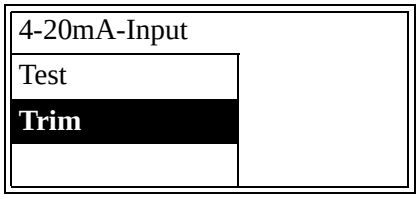
At the next prompt, the mA value of the test signal is shown.



After noting the mA value of the analog input signal, press [ENTER] to continue.

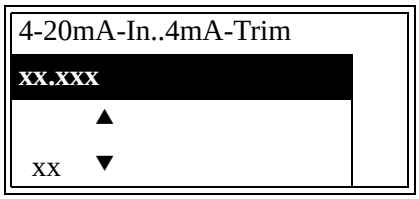
The Trim Submenu

To trim the analog input, make sure the XDP analog output has been calibrated (see page 5-5) and connect the XDP analog output signal to the analog input terminals.



Use the [Î] and [«] keys to select [Trim] and press [ENTER].

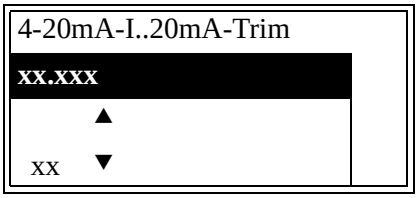
The XDP analog output is now driven to exactly 4 mA.



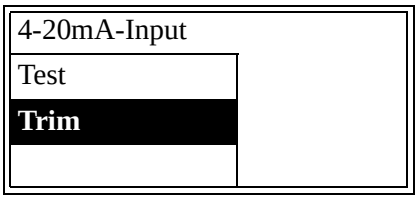
Press the [Î] or [«] key until the meter reads exactly 4 mA. When done, press [ENTER].

Configuring the 4-20 mA Analog Input (cont.)

Now, the XDP analog output is driven to exactly 20 mA.



Press the [Î] or [«] key until the meter reads exactly 20 mA. When done, press [ENTER].

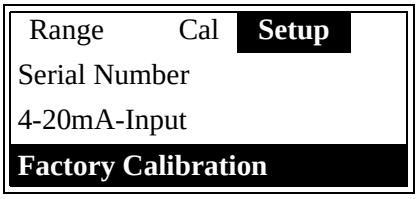


Press [ESC] to return to the setup submenu.

To continue programming the setup menu, proceed to the appropriate section for instructions. Otherwise, press [ESC] four times to return to live measurement mode.

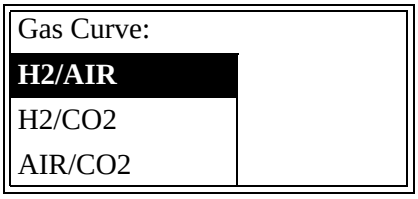
Entering Factory Calibration Data

To enter the factory calibration data, access the setup menu as described on page 5-4 and complete the following steps:



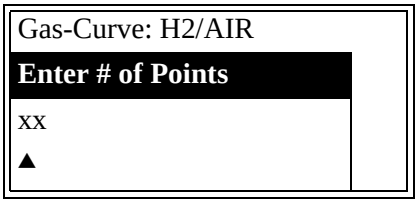
Use the [Î] and [«] keys to select [Factory Calibration] and press [ENTER].

At the next prompt, select the range to be calibrated (H2/AIR is used as an example in this manual).



Use the [Î] and [«] keys to select [H2/AIR] and press [ENTER].

At the next prompt, enter the number of data points available for calibrating the chosen gas curve.



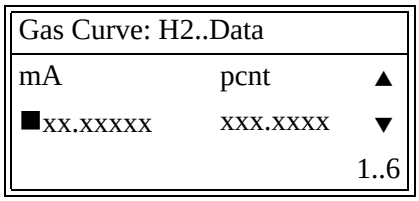
Use [Ì] and [Í] to position the cursor under the desired character. Then, use [Î] and [«] to increment the value. Press [ENTER] when done.

Entering Factory Calibration Data (cont.)

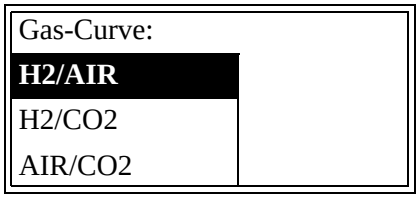
Caution!
Incorrect entry of the calibration data points will cause the instrument to give unreliable results.

At the following prompt, enter the (mA, pcnt) values for each of the known data points for the selected gas curve. To enter the data, complete the following steps:

1. Use [Ì] and [Í] to position the cursor at the desired position in the *mA value*, and use [Î] and [«] to increment the number.
2. Use [Ì] and [Í] to position the cursor at the desired position in the *pcnt value*, and use [Î] and [«] to increment the number.
3. Use [Ì] and [Í] to position the cursor at the double arrows at the far right, and use [Î] and [«] to increment the number and switch to a different calibration point.
4. Repeat steps 1-3 until all of the data points have been entered.



Press [ENTER] when all of the data points have been entered.



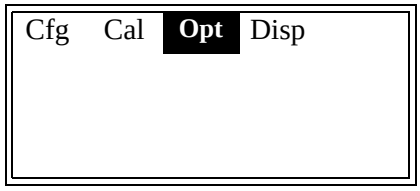
Press [ESC] to return to the setup submenu.

To continue programming the setup menu, proceed to the appropriate section for instructions. Otherwise, press [ESC] four times to return to live measurement mode.

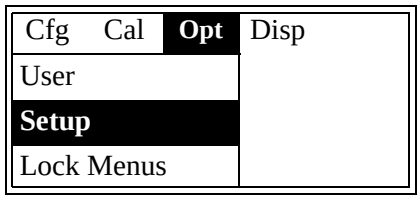
Loading Software

To download a new software program into the XDP, access the *User Program* as described on page 3-4 and proceed as follows:

IMPORTANT: *The download takes place via the XDP's serial port. Before proceeding, make sure that the serial port is properly connected and configured. Also, the new software file must be available on the connected PC.*



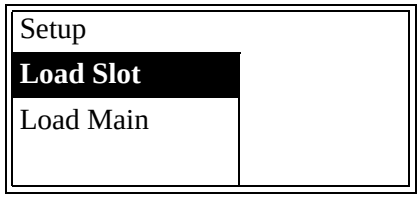
Use the [Ì] and [Í] keys to select [Opt] and press [ENTER].



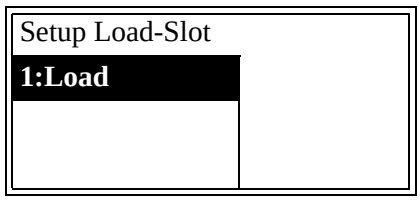
Use the [Î] and [«] keys to select [Setup]. Then, press [ENTER]. and proceed to the appropriate section.

Note: "Lock All" *and* "Versions" *menu options also appear on the above list.*

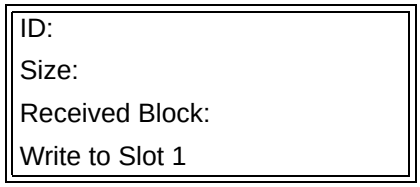
XDP Software



Use the [Î] and [«] keys to select [Load Slot] and press [ENTER].

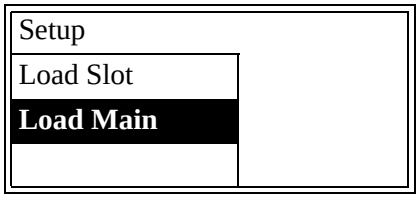


Press [ENTER].

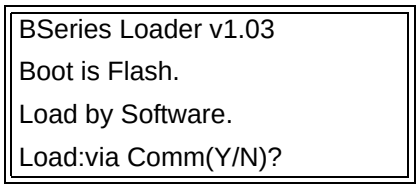


When the download is complete, the meter automatically reboots into run mode.

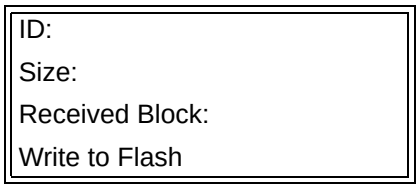
System Software



Use the [Î] and [«] keys to select [Load Main] and press [ENTER].



To respond to the question, press [ESC] for "Y" or press [ENTER] for "N".



When the download is complete, the meter automatically reboots into run mode.

Exiting the User Program

When you have finished programming all of the required functions, press [ESC] as many times as necessary to return to normal run mode. The number of key presses required depends on which feature was programmed last. The XDP may then be placed into service.

Chapter 6

Specifications

Performance Specifications

Accuracy:

±0.5% of full scale

Ambient Temperature Range:

-10 to 65°C (14 to 149°F)

Ambient Relative Humidity (maximum):

35% @65°C, 50% @40°C, 65% @20°C, 75% @0°C

Linearity:

±0.5% of full scale

Reliability:

50,000 hours MTBF minimum

Resolution:

±0.1% of full scale

Response Time:

90% of reading in 50 seconds

Stability:

zero drift less than 0.5% of full scale in 24 hours

Temperature Drift:

less than 0.5% of full scale per 100°F

Physical Specifications

Enclosure:

Panel-Mount, Explosion-Proof
(Class I, Division 1, Groups B, C and D)

Fuse:

1.25 A, 250 V, 5x20 mm, IEC Type T

Power Input:

100-240 VAC; 50/60 Hz; 40 W max.

Power Output to Transmitter:

24.0 ± 2.0 VDC; 1 A max.

Note: *The power supply meets CISPR 55022 and CISPR 55014, Level B EMI requirements and IEC1010-1 safety standards.*

Functional Specifications

Alarms (terminal blocks J2, J3):

Dual general-purpose contacts,
Contact rating: 2 A, 28 V, SPDT

XDP Fault (J3):	fail-safe type
XDP Normal (J3):	fail-safe type
XDP Low (J3):	fail-safe or non-fail-safe mode, trips if H2 <85% (setpoint is programmable)
XDP Low-Low (J3):	fail-safe or non-fail-safe mode, trips if H2 <80% (setpoint is programmable)

Analog Input (terminal block J6):

4–20 mA, 28 V

Analog Output (terminal block J8):

4–20 mA, 28 V

Communications (terminal block J4):

Standard RS232/RS485 Serial Port

Display:

4-line, backlit liquid crystal display (LCD)

Keypad:

6-key, infrared

Measurement Ranges (for sample application):

- 70–100% hydrogen in air
- 0–100% hydrogen in carbon dioxide
- 0–100% air in carbon dioxide

Environmental Specifications

The design, manufacture, and certification of the XDP have been conducted in a manner that allows its operation in Zone 1, Gas Group IIC, flameproof protection method in an ambient operating temperature of -10 to 65°C (14 to 149°F).

This unit complies with EMC Directive 89/336/EEC and the 73/23/EEC Low Voltage Directive (Installation Category II, Polution Degree 2). It is in compliance with ATEX directive 94/9/EC Annex II, per the document at the back of this manual.

Transmitter Specifications

For complete transmitter specifications, refer to the documentation provided with the transmitter.

Appendix A

CE Mark Compliance

Introduction

For CE Mark compliance, the XDP must meet both the *EMC* and *LVD* directives.

IMPORTANT: *CE Mark compliance is required only for units used in EEC countries.*

EMC Compliance

For *EMC* compliance, the electrical connections must be shielded and grounded as shown in Table A-1 below. After all the necessary electrical connections have been made, seal any unused cable entry holes with standard conduit plugs or equivalent.

Note: *If the instructions in this appendix are followed, the unit will comply with the EMC Directive 89/336/EEC.*

Table A-1: Wiring Modifications for EMC Compliance

Connection	Wiring Modification
Power	1. When connecting the power, select the cable entry closest to the chassis ground. 2. Use shielded cable* to connect the power to the XDP enclosure. Connect the shield to the nearest chassis ground terminal. 3. Connect the power line ground wire to the nearest chassis ground terminal.
Input/Output	1. Use shielded cable* to interconnect the Model XDP enclosure with any external I/O devices. 2. Connect the shields to the nearest chassis ground terminal.
*Wires enclosed in a properly-grounded metal conduit do not require additional shielding.	

LVD Compliance

For compliance with the European Union's Low Voltage Directive (73/23/EEC), the analyzer requires an external power disconnect device such as a switch or circuit breaker. The disconnect device must be marked as such, clearly visible, directly accessible, and located within 1.8 m (6 ft) of the XDP.

Note: *If the instructions in this appendix are followed, the unit will comply with the Low Voltage Directive (73/23/EEC).*

Appendix B

Additional Wiring Connections

Introduction

In addition to the features included specifically for typical XDP applications, the general purpose controller used in the XDP has its own built-in features. These include the following:

- system analog output
- system fault alarm

Also, there are four supplemental XDP alarm relays on terminal block J7 that can be wired and utilized.

Connecting the System Outputs

Although the XDP software is not intended to interface with the general controller system functions, those functions are active and may be accessed. To connect either or both of these outputs, refer to Figure 2-3 on page 2-10 and proceed to one of the following sections.

Wiring the System Analog Output - J5

Terminal block J5 contains connections for the system analog output. The connections on terminal block J5 are optional, in that they are not required for proper operation of the analyzer. To wire the system analog output, complete the following steps:

IMPORTANT: *The system analog output range does not automatically switch to the currently active curve.*

1. Connect pin #1 to positive input on the output device.

2. Connect pin #2 to the negative input on the output device.

3. Pin #3 has no connection.

Wiring The System Alarm Relay - J2

Terminal block J2 contains connections for the system fault alarm relay. To wire this alarm, complete the following steps:

Note: *The system fault alarm on terminal block J2 is usually factory-configured as a "fail-safe" alarm. That is, it is energized during normal operation and de-energized when tripped.*

1. Connect the *System Fault* alarm as follows:

a. Connect pin #1 to the alarm device input.

b. Connect pin #2 to the alarm device return.

c. Pin #3 is not used for fail-safe operation

XDP Alarm Relays

In addition to the alarm relays discussed in Chapter 2, Installation, there are four supplemental alarm relays at terminal block J7.

- Gas Curve Relay 1
- Gas Curve Relay 2
- Process/Cal Relay
- Zero/Span Relay

Note: *Contact GE Panametrics for information on the use and functions of these alarms.*

Table B-1: Terminal Block J7 Connections

Pin #	Alarm	Terminal
1	Gas Curve Relay 1	NC
2		C
3		NO
4	Gas Curve Relay 2	NC
5		C
6		NO
7	Process/Cal Relay	NC
8		C
9		NO
10	Zero/Span Relay	NC
11		C
12		NO

To wire the supplemental alarms, refer to Figure 2-3 on page 2-10 and Table B-1 above. Then, complete the following steps:

Note: *A* fail-safe *alarm is wired to the normally-closed (NC) contacts, while a* non-fail-safe *alarm is wired to the normally-open (NO) contacts.*

1. For *non-fail-safe* operation, connect pin #1 to the alarm input.

2. Connect pin #2 to the alarm device return.

3. For *fail-safe* operation, connect pin #3 to the alarm input

Appendix C

Menu Maps

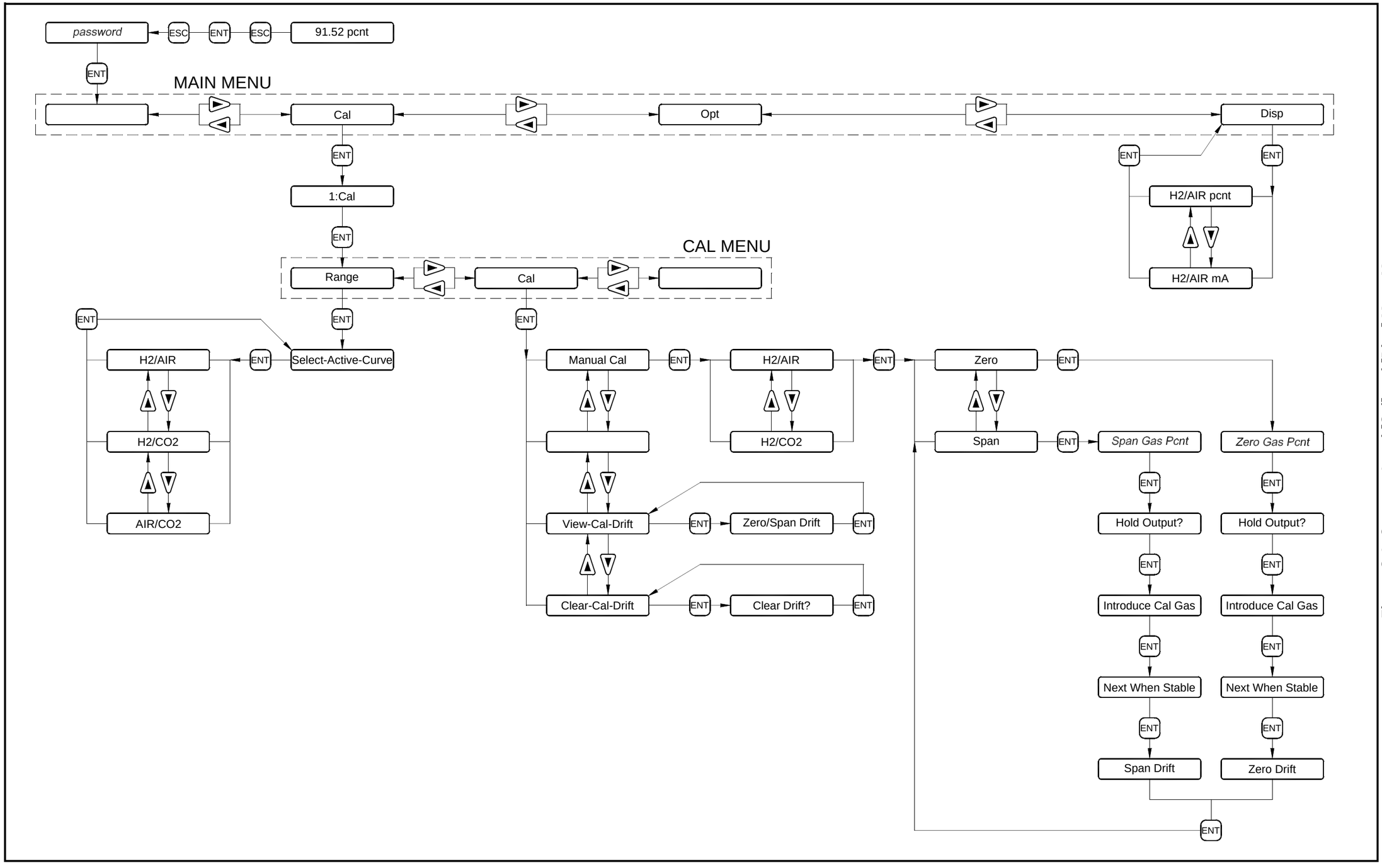


Figure C-1: Operator-Level [Cal] and [Disp] Menu Map

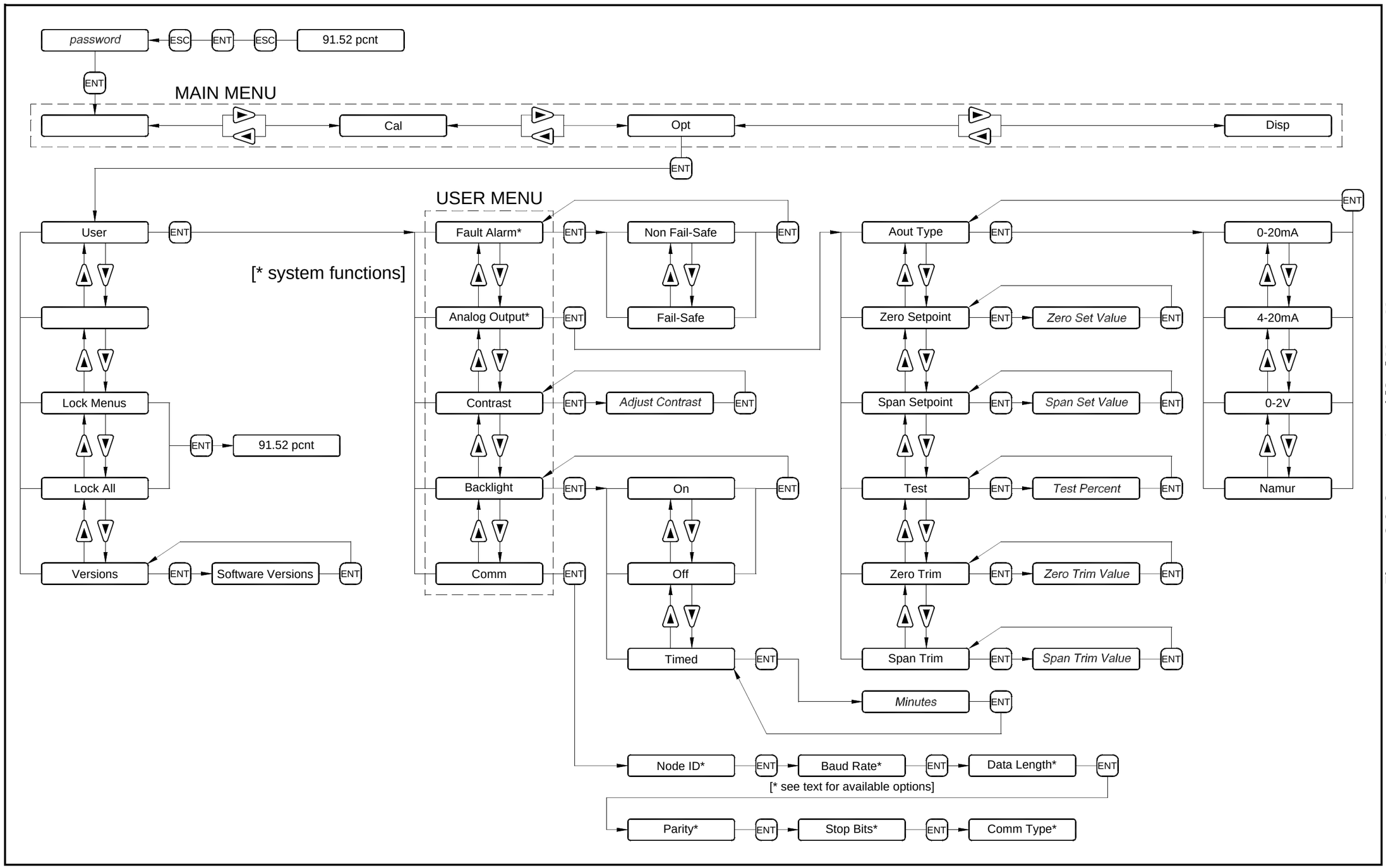


Figure C-2: Operator-Level [Opt] Menu Map

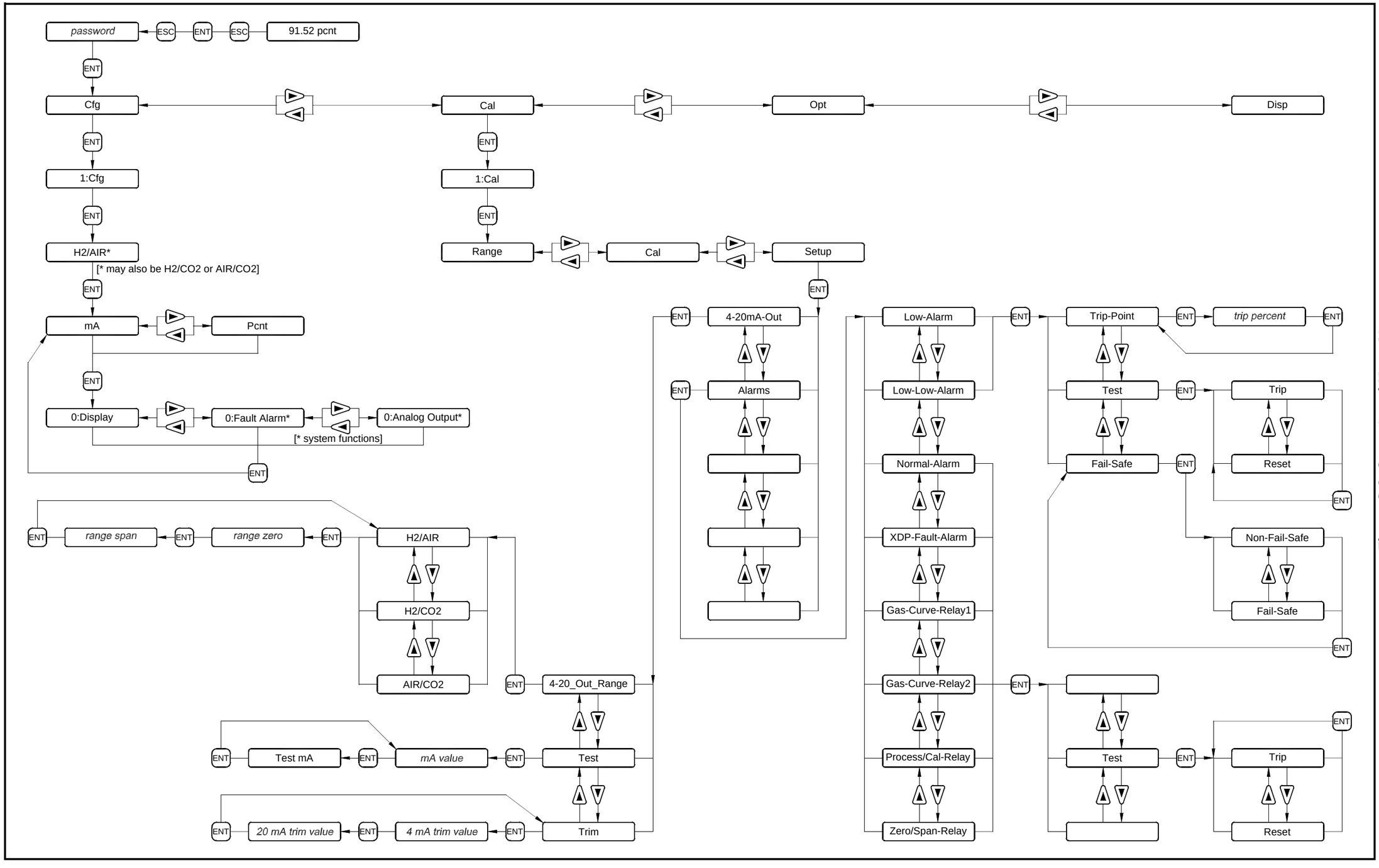


Figure C-3: Setup-Level Menu Map

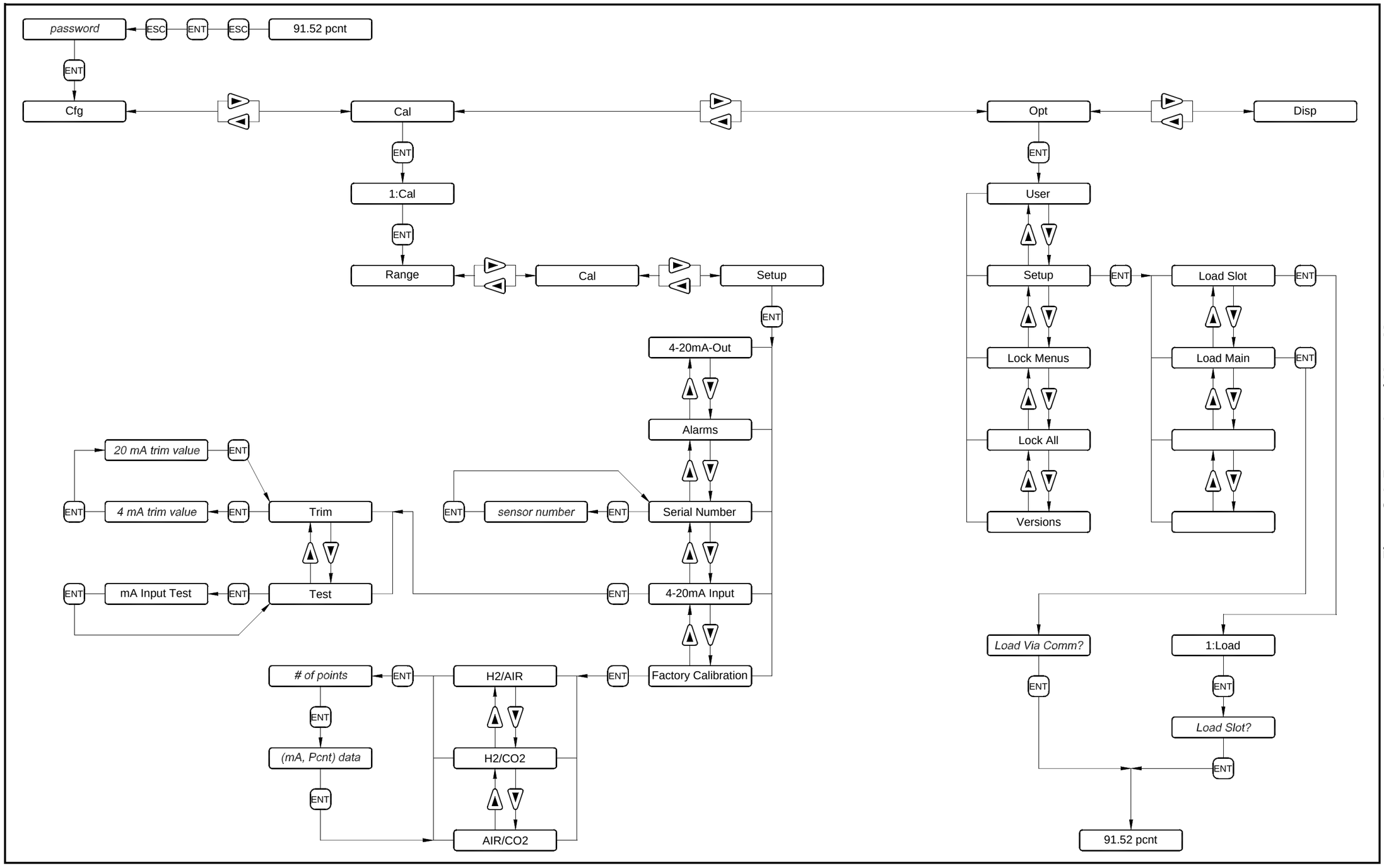


Figure C-4: Factory-Level Menu Map

Index

A

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N

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S

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U

W

Index (cont.)

X

Z

GE Panametrics

DECLARATION OF CONFORMITY

We,

GE Panametrics
Shannon Industrial Estate
Shannon, Co. Clare
Ireland

declare under our sole responsibility that the

APX Advanced Paramagnetic Oxygen Transmitter
XDP Explosion-Proof Display Package

to which this declaration relates, are in conformity with the following standards:

- EN 61326:1998, Class A, Annex A, Continuous Unmonitored Operation
- EN 61010-1:1993 + A2:1995, Overvoltage Category II, Pollution Degree 2

following the provisions of the 89/336/EEC EMC Directive and the 73/23/EEC Low Voltage Directive.

The *units listed above and any ancillary sample handling systems supplied with them* do not bear CE marking for the Pressure Equipment Directive, as they are supplied in accordance with Article 3, Section 3 (sound engineering practices and codes of good workmanship) of the Pressure Equipment Directive 97/23/EC for DN<25.

Shannon - June 1, 2002

Mr. James Gibson
GENERAL MANAGER

CE

NSAI
I.S. EN ISO 9002
Shannon

TÜV
TÜV ESSEN
ISO 9001
U.S.

GE Panametrics

DECLARATION DE CONFORMITE

Nous,

GE Panametrics
Shannon Industrial Estate
Shannon, Co. Clare
Ireland

déclarons sous notre propre responsabilité que les

APX Advanced Paramagnetic Oxygen Transmitter
XDP Explosion-Proof Display Package

rélatif á cette déclaration, sont en conformité avec les documents suivants:

- EN 61326:1998, Class A, Annex A, Continuous Unmonitored Operation
- EN 61010-1:1993 + A2:1995, Overvoltage Category II, Pollution Degree 2

suivant les régles de la Directive de Compatibilité Electromagnétique 89/336/EEC et de la Directive Basse Tension 73/23/EEC.

Les *matériels listés ci-dessus ainsi que les systèmes d'échantillonnages pouvant être livrés avec*, ne portent pas le marquage CE de la directive des équipements sous pression, car ils sont fournis en accord avec la directive 97/23/EC des équipements sous pression pour les DN<25, Article 3, section 3 qui concerne les pratiques et les codes de bonne fabrication pour l'ingénierie du son.

Shannon - June 1, 2002

Mr. James Gibson
DIRECTEUR GÉNÉRAL

CE

I.S. EN ISO 9002
Shannon

TÜV
TÜV ESSEN
ISO 9001
U.S.

GE Panametrics

KONFORMITÄTS-ERKLÄRUNG

Wir,

GE Panametrics
Shannon Industrial Estate
Shannon, Co. Clare
Ireland

erklären, in alleiniger Verantwortung, daß die Produkte

APX Advanced Paramagnetic Oxygen Transmitter
XDP Explosion-Proof Display Package

folgende Normen erfüllen:

- EN 61326:1998, Class A, Annex A, Continuous Unmonitored Operation
- EN 61010-1:1993 + A2:1995, Overvoltage Category II, Pollution Degree 2

gemäß den Europäischen Richtlinien, Niederspannungsrichtlinie Nr.: 73/23/EWG und EMV-Richtlinie Nr.: 89/336/EWG.

Die *oben aufgeführten Geräte und zugehörige, mitgelieferte Handhabungssysteme* tragen keine CE-Kennzeichnung gemäß der Druckgeräte-Richtlinie, da sie in Übereinstimmung mit Artikel 3, Absatz 3 (gute Ingenieurpraxis) der Druckgeräte-Richtlinie 97/23/EG für DN<25 geliefert werden.

Shannon - June 1, 2002

Mr. James Gibson
GENERALDIREKTOR

CE

I.S. EN ISO 9002
Shannon

TÜV
TÜV ESSEN
ISO 9001
U.S.

GE Panametrics

ATEX COMPLIANCE

We,

GE Panametrics
221 Crescent Street, Suite 1
Waltham, MA 02453
U.S.A.

as the manufacturer, declare under our sole responsibility that the product

XDP Explosion-Proof Display Package

to which this document relates, in accordance with the provisions of ATEX Directive 94/9/EC Annex II, meets the following specifications:

CE 1180 Ex **II 2 GD EEx d IIC T6**
KEMA01ATEX2128 T85°C, -20°C to +65°C

Furthermore, the following additional requirements and specifications apply to the product:

- Having been designed in accordance with EN 50014, EN 50018, and EN 50281, the product meets the fault tolerance requirements of electrical apparatus for category “d”.
- The product is an electrical apparatus and must be installed in the hazardous area in accordance with the requirements of the EC Type Examination Certificate. The installation must be carried out in accordance with all appropriate international, national and local standard codes and practices and site regulations for flameproof apparatus and in accordance with the instructions contained in the manual. Access to the circuitry must not be made during operation.
- Only trained, competent personnel may install, operate and maintain the equipment.
- The product has been designed so that the protection afforded will not be reduced due to the effects of corrosion of materials, electrical conductivity, impact strength, aging resistance or the effects of temperature variations.
- The product cannot be repaired by the user; it must be replaced by an equivalent certified product. Repairs should only be carried out by the manufacturer or by an approved repairer.
- The product must not be subjected to mechanical or thermal stresses in excess of those permitted in the certification documentation and the instruction manual.
- The product contains no exposed parts which produce surface temperature infrared, electromagnetic ionizing, or non-electrical dangers.

CE

Ex

GE Panametrics

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