The *Permian II*
Model OI-792

Operation Manual

OTIS
INSTRUMENTS INC.

Product Overview

The OI-792 *Permian II* is a self-contained relay/alarm board, specifically designed for conjunctive use with Otis Instruments, Inc. sensor assemblies.

The OI-792 *Permian II* features automatic channel hold when either the low or high alarm is triggered. The device can monitor up to two sensors, and the ability to mount the device near the entrance of a site allows the technician to immediately determine if it is safe to enter the site—making this device incredibly useful in any environment hosting hazardous gas.

The OI-792 *Permian II* requires 12-24 Volts DC (with DC alarms).

These key features—and more—make the OI-792 *Permian II* a reliable and convenient tool that is incredibly useful in any environment hosting hazardous gas.

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Introduction

This document is an Operation Manual containing diagrams and step-by-step instruction for proper operation of the Otis Instruments, Inc. OI-792 *Permian II*. This document should be read before initial operation of the product.

Should a question arise during the use of the product, this document will serve as a first reference for consultation. If further questions arise, or if the device is not working properly, please contact the sales representative of this product.

Warnings

- To ensure technician safety, always wire the relays before supplying power to the device.

- Do not open the enclosure door while the device is energized.

- Do not open the enclosure door if in an atmosphere where explosive gas may be present.

Recommendations

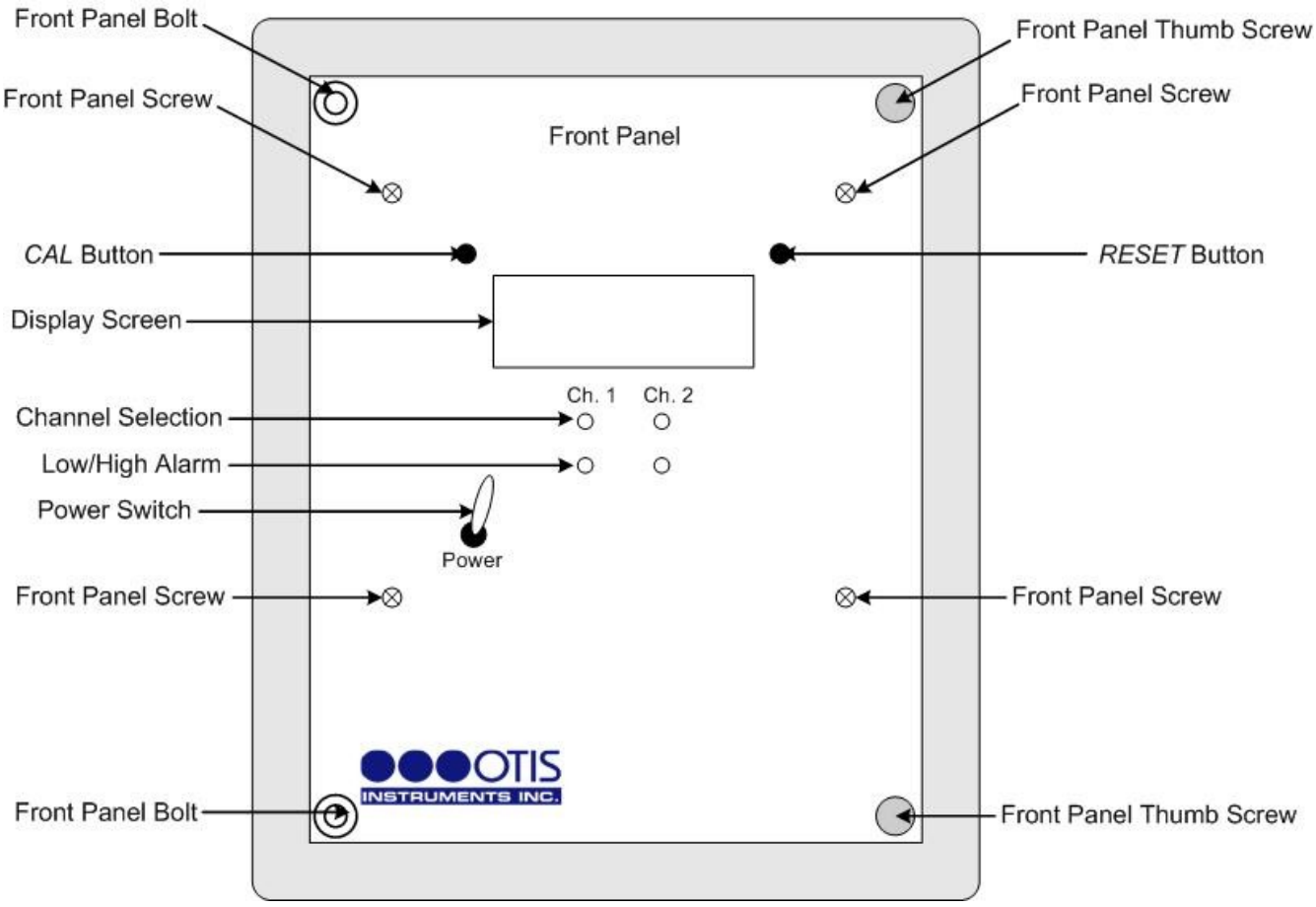
For optimal performance, the manufacturer recommends using a minimum of 22 gauge wire for all Wiring Configurations.

Different loads require different gauge wire. Use appropriate wire size, depending on the voltage and current requirements.

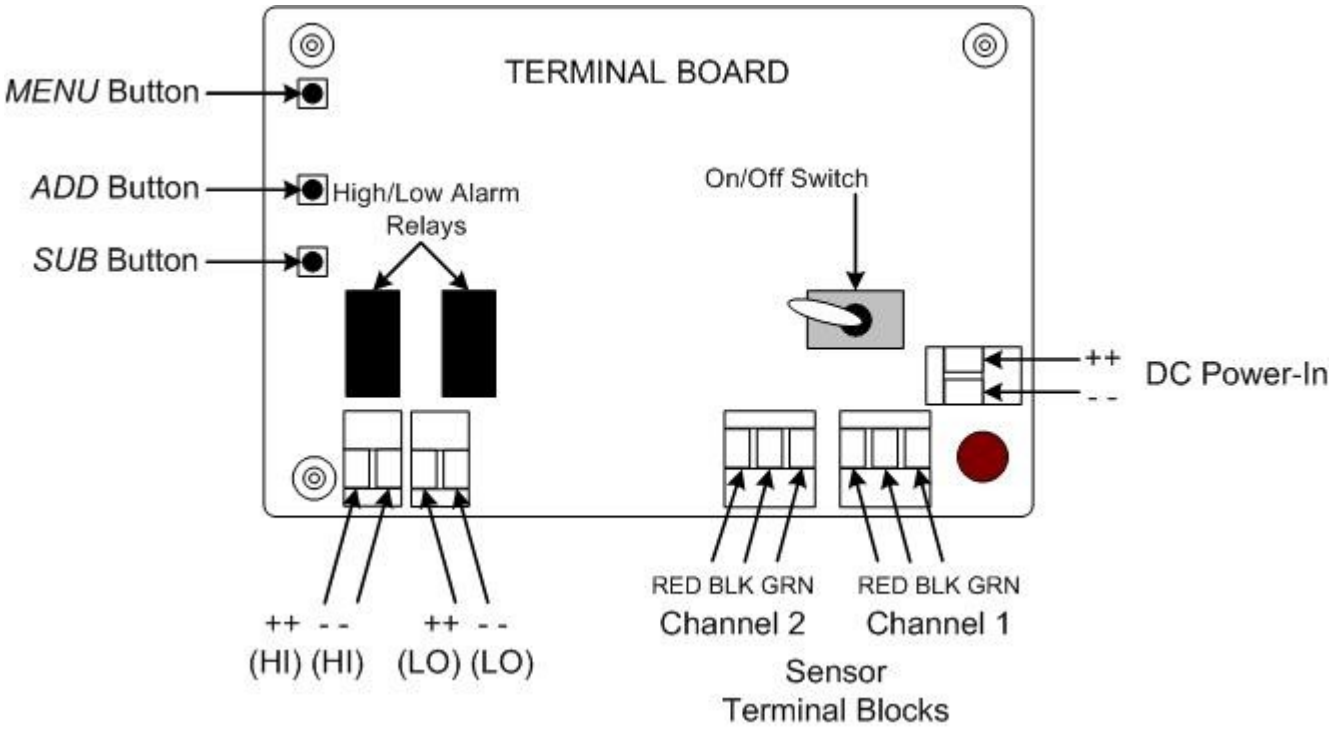
Complete System Diagrams

The following diagrams should be consulted for identification of the system and all parts that may be referred to in this Operation Manual.

Front Panel



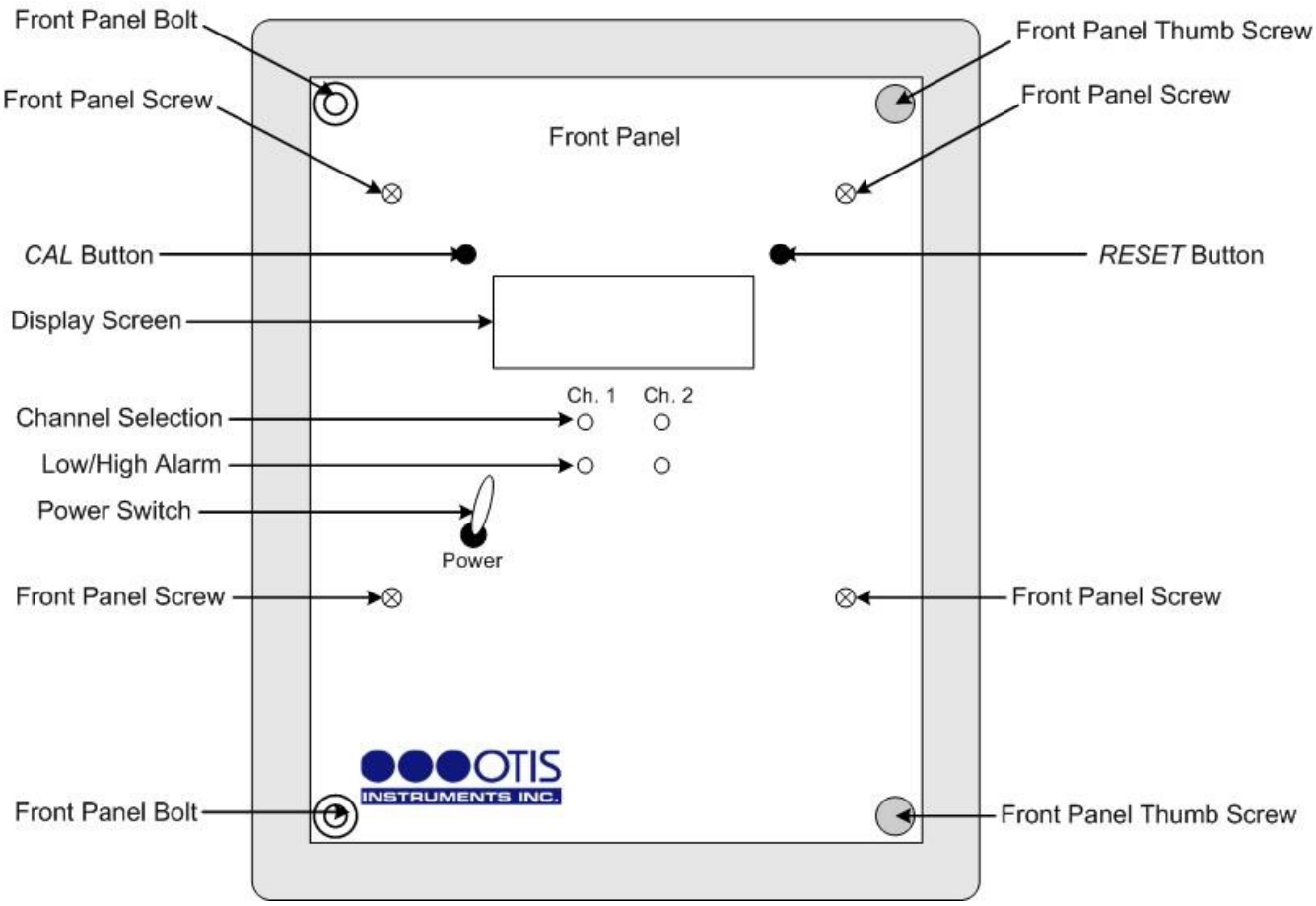
Terminal Board



Power On

Powering on the device activates its functions. When powered on, the device is fully functional and access to system and settings menus is allowed.

1. Open the latch on the right side of the enclosure.
2. Open the enclosure door.
3. Locate the Power Switch.



4. Flip the Power Switch upward.

Power On cont...

5. The display screen will show:

    - Revision number (r x.x)
    - Input voltage

1. The device will count up from 0 to 20.

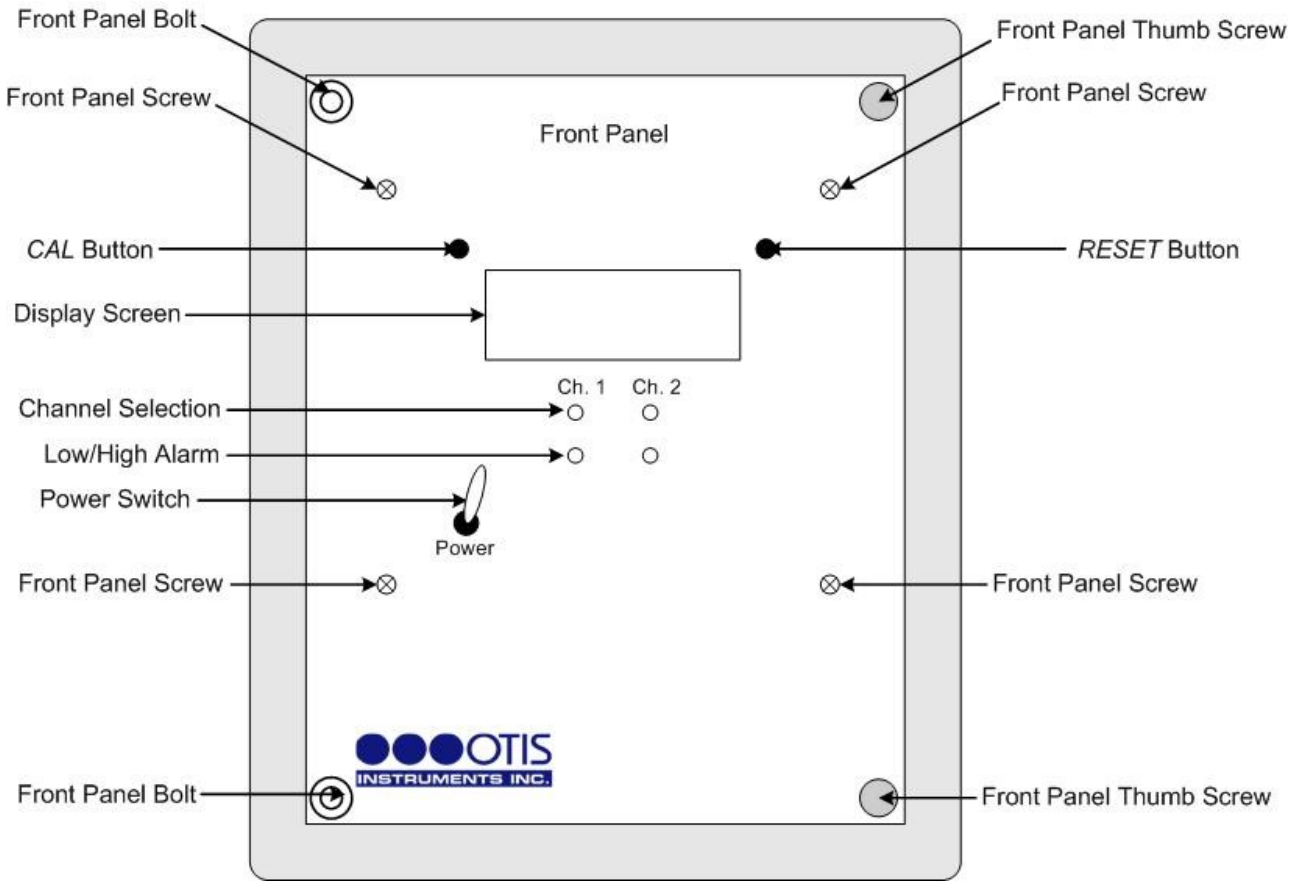
    NOTE: To prevent unwanted alarm activation, the alarms are disabled during start-up.

2. When “0” is displayed, the device is signifying that there is no gas present.
6. Close the enclosure door.
7. Re-latch the latch.
8. The device is now in Normal Operating Mode and fully operational.

Power Off

Powering off the device shuts down the system. When powered off, the device will no longer receive radio signals from the sensors.

1. Open the latch on the right side of the enclosure.
2. Open the enclosure door.
3. Locate the Power Switch.



4. Flip the Power Switch down.
5. Close the enclosure door.
6. Re-latch the latch.

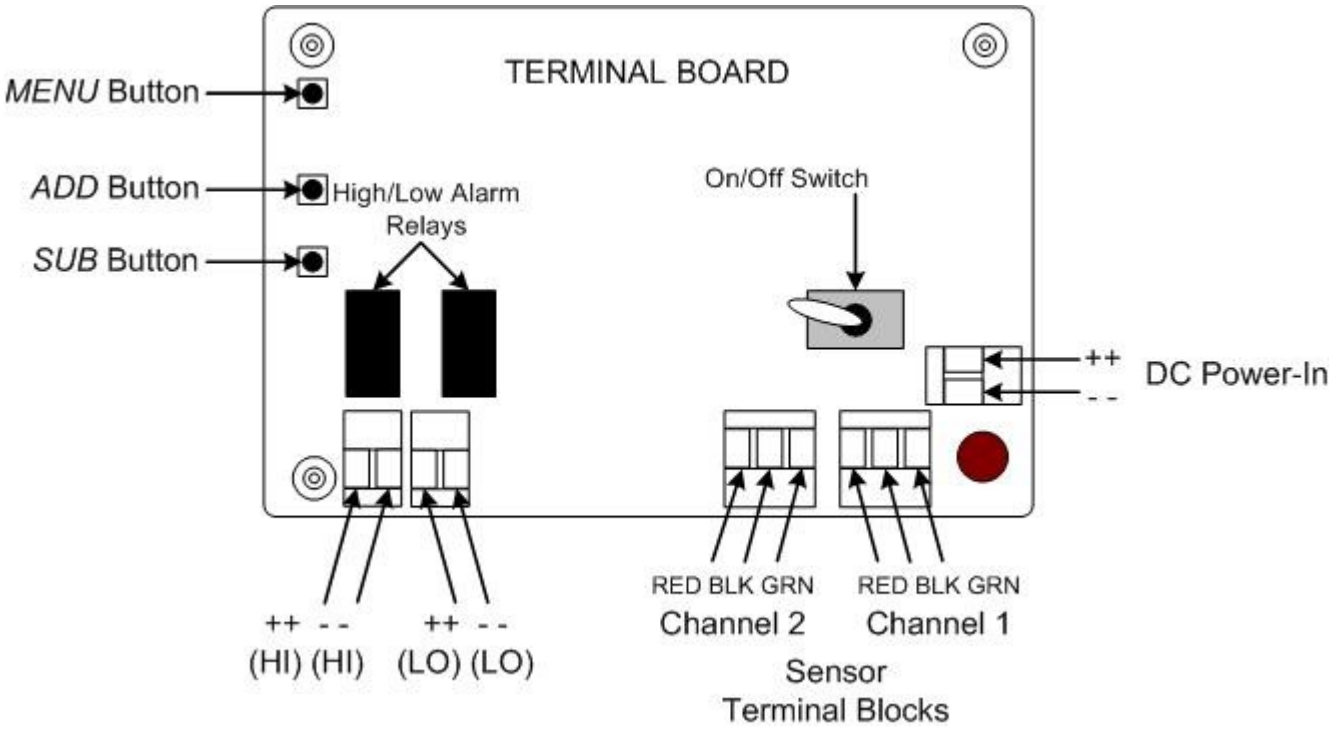
Channel Setup

This feature is used to setup Channel On/Off, Alarm Settings, Relay Settings, and Scale Setting for each of the channels that the device is monitoring (up to four).

Each channel must be setup individually for each sensor, therefore, this section of the Operation Manual (Channel Setup) must be completed the same number of times that there are sensors being monitored.

Channel Selection

1. Open the latch on the right side of the enclosure.
2. Open the enclosure door.
3. Open the Front Panel so that the Terminal Board is exposed (reverse of Front Panel).
4. Locate *MENU*, *ADD* and *SUB* on the Terminal Board.



Channel Selection cont...

5. Press *MENU* once.
6. Press *ADD* (increase) or *SUB* (decrease) to select the channel to be setup.

NOTE: A green flashing Front Panel LED indicates the selected channel.

7. Once the desired channel is selected, proceed to the next step.

Channel On/Off

1. After the Channel Selection has been made (see above), the display screen will show "On" or "OFF".
2. Press *ADD* (or *SUB)* to manipulate the Channel On/Off setting.
3. Once the desired setting is selected, proceed to the next step.

Low Level Alarm Setting

NOTE: To turn off an alarm, adjust the setting to "0".

1. After the Channel On/Off has been completed (see above), press *MENU* once.
2. Press *ADD* (increase) or *SUB* (decrease) to manipulate the Low Level Alarm setting.
3. Once the Low Level Alarm is set, proceed to the next step.

High Level Alarm Setting

NOTE: To turn off an alarm, adjust the setting to "0".

1. After the Low Level Alarm has been set (see above), press *MENU* once.
2. Press *ADD* (increase) or *SUB* (decrease) to manipulate the High Level Alarm setting.
3. Once the High Level Alarm is set, proceed to the next step.

Low Relay Setting

1. After the High Alarm has been set (see above), press *MENU* once.
2. The display will alternately show "LO" and then "LA" (latching) or "Un" (non-latching).

EXAMPLE: "LO" and then "LA"

3. Press *ADD* (or *SUB)* to manipulate the Low Relay setting.
4. Once the Low Relay is set, proceed to the next step.

NOTE: A latching relay will stay "on" until it is manually reset. A non-latching relay will automatically turn "off" when the gas level falls below the alarm set-point.

High Relay Setting

1. After the Low Relay has been set (see above), press *MENU* once.
2. The display will alternately show “Hi” and then “LA” (or “Un”).
3. Press *ADD* (or *SUB)* to manipulate the High Relay setting.
4. Once the High Relay is set, proceed to the next step.

Scale Setting

1. After the RS-485 Address has been set (see above), press *MENU* once.
2. Press *ADD* (increase) or *SUB* (decrease) to manipulate the Scale. Pressing *ADD* will adjust the scale from 0-100; pressing *SUB* will adjust the scale from 0-10.

   NOTE: Ranges may be set at: 0-1, 0-10, 0-50, 0-100, 0-250, 0-500, 0-1,000, 0-10,000 or Oxygen.

3. Once the Display Scale is set, press *RESET* to return to Normal Operating Mode.
4. Once ALL channels have been setup, complete the following instructions:

   - Close the Front Panel
   - Reattach Front Panel the thumb screws
   - Close the enclosure box

CHANNEL SETUP MUST BE COMPLETED INDIVIDUALLY FOR *EACH* CHANNEL.
REPEAT THE CHANNEL SETUP INSTRUCTIONS FOR EACH CHANNEL BEFORE USE.

Calibration Mode

This feature should be used to set the calibration for all remote sensors containing a 4-20mA Amplifier Card.

Entering Calibration Mode

1. Open the enclosure box.
2. Press and hold *SCAN/HOLD* for four seconds to enter Calibration Model
3. The display screen will show “CAL”.
4. The device is now in Calibration Mode. The device will remain in Calibration Mode for 20 minutes in order to allow user adequate time to calibrate each of the two sensors.

Exiting Calibration Mode

1. After the sensors have been calibrated, press *RESET* to return to Normal Operating Mode. All sensors are now active.

> *NOTE: If RESET is not pressed after calibration is complete, the relays will automatically reset after 20 minutes of inactivity.*

8. Close the enclosure door.
9. Re-latch the latch.

APPENDIX A: DC Wiring Configurations

DC Wiring Configurations

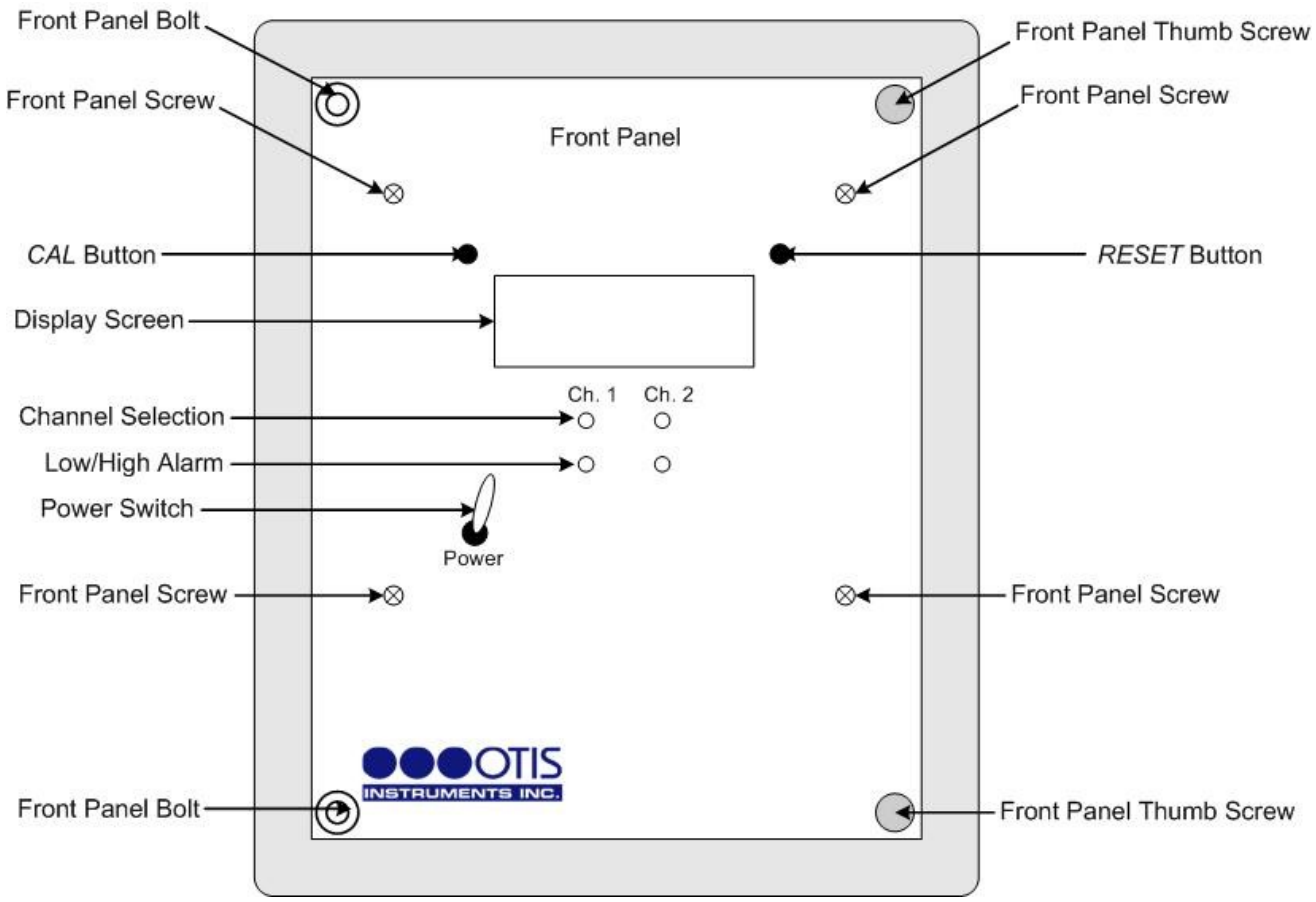
To ensure full-functionality, complete ALL of the following Wiring Configurations before installing the device in the field.

NOTE: To ensure technician safety, always wire the relays BEFORE wiring power to the device.

NOTE: For optimal performance, the manufacturer recommends using 22 gauge wire for all Wiring Configurations.

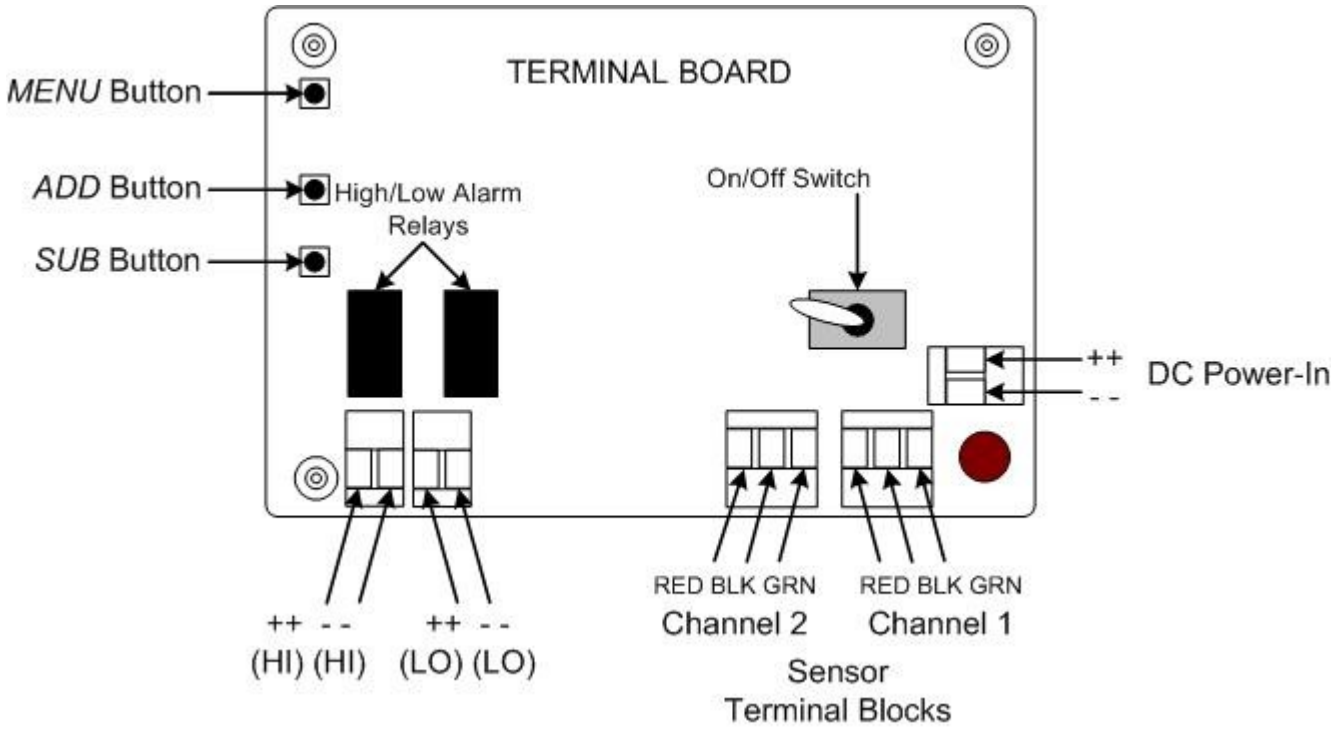
Low DC Relay Wiring Configurations

1. Open the latch on the right side of the enclosure.
2. Open the enclosure door.
3. Unscrew both thumb screws and open the hinged Front Panel to reveal the Terminal Board.



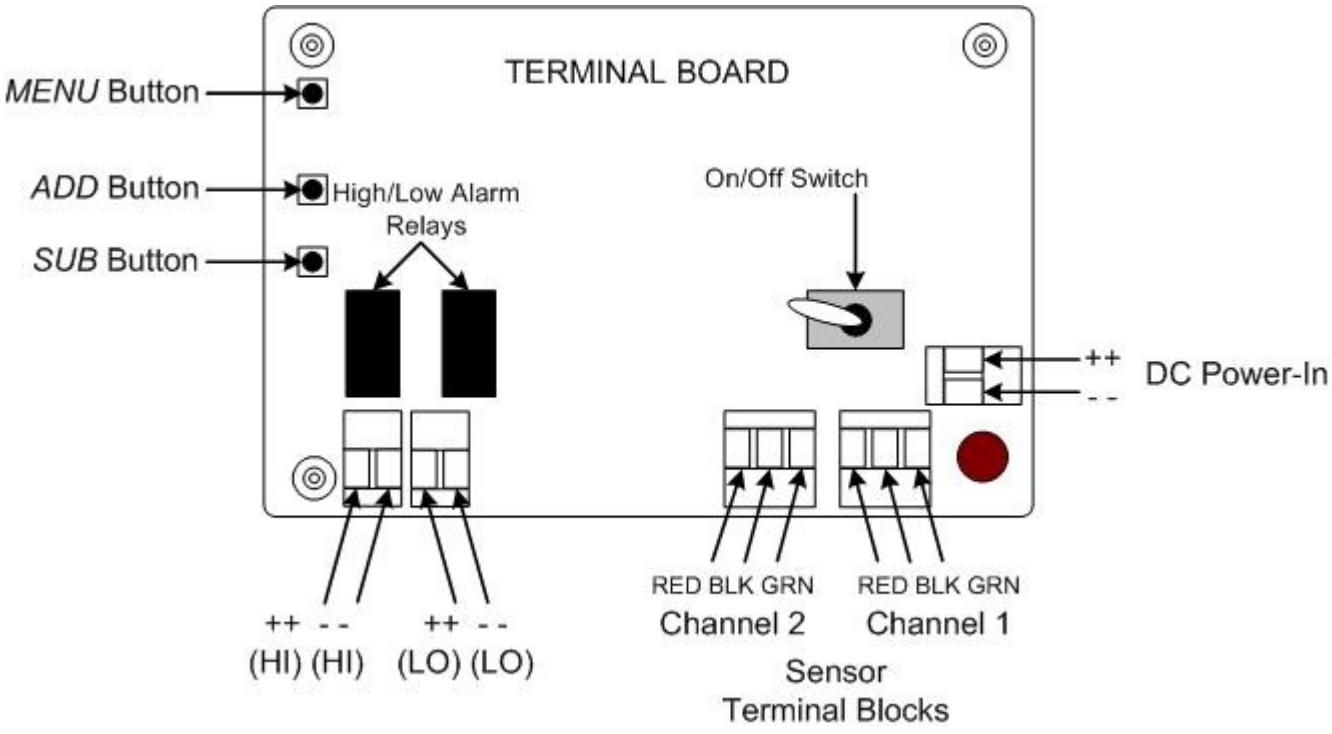
Low DC Relay Wiring Configurations cont...

4. Locate the Low Alarm Relay terminal block on the Terminal Board.
5. Connect the Low Alarm ground wire to the terminal labeled “LO --”.
6. Connect the Low Alarm positive wire to the terminal labeled “LO ++”.
7. Once the Low DC Relay Wiring Configurations are complete, proceed to the next section.



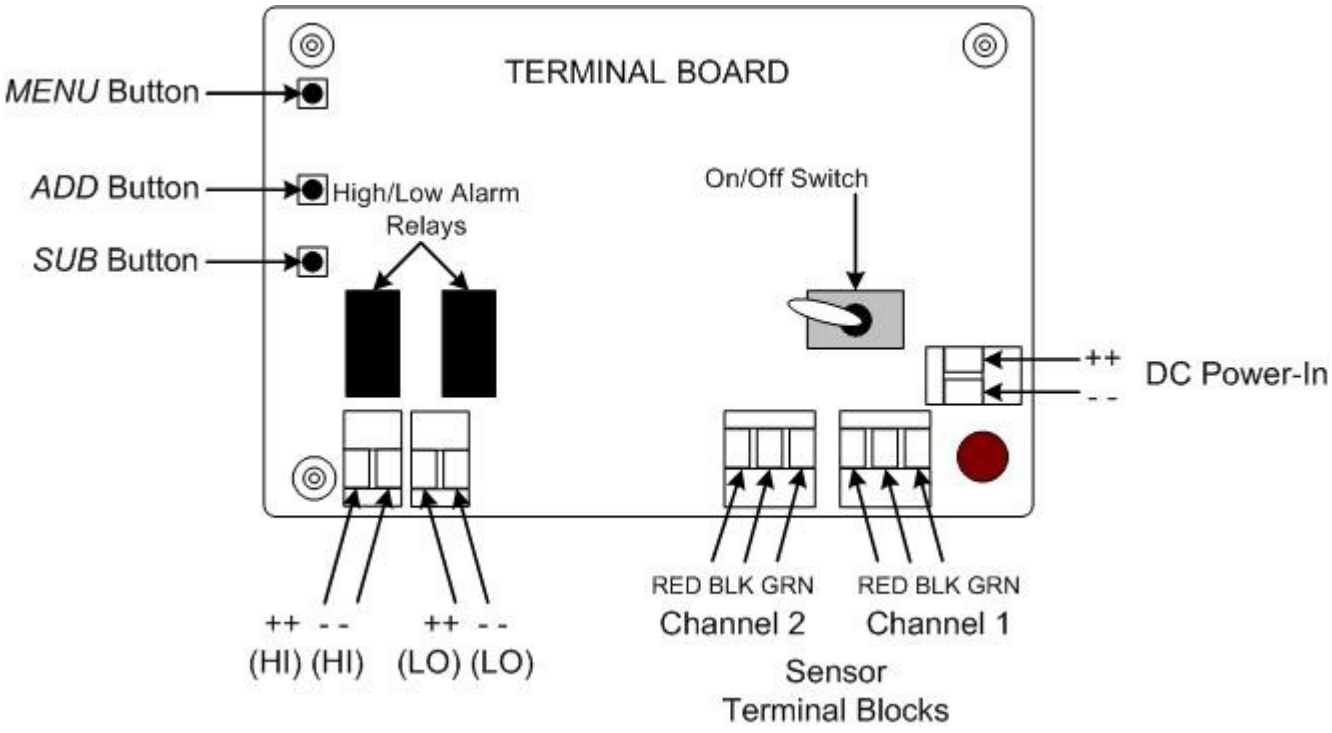
High DC Relay Wiring Configurations

1. After the Low DC Relay Wiring Configurations have been completed (see above), locate the High Alarm Relay terminal block on the Terminal Board.
2. Connect the High Alarm ground wire to the terminal labeled “HI --”.
3. Connect the High Alarm positive wire to the terminal labeled “HI ++”.
4. Once the High DC Relay Wiring Configurations are complete, proceed to the next section.



Sensor Assembly Connection to Monitor

1. Locate the Sensor Terminal Blocks on the Terminal Board.



2. Wire the first sensor assembly to the Channel 1 Sensor Terminal Block as follows:

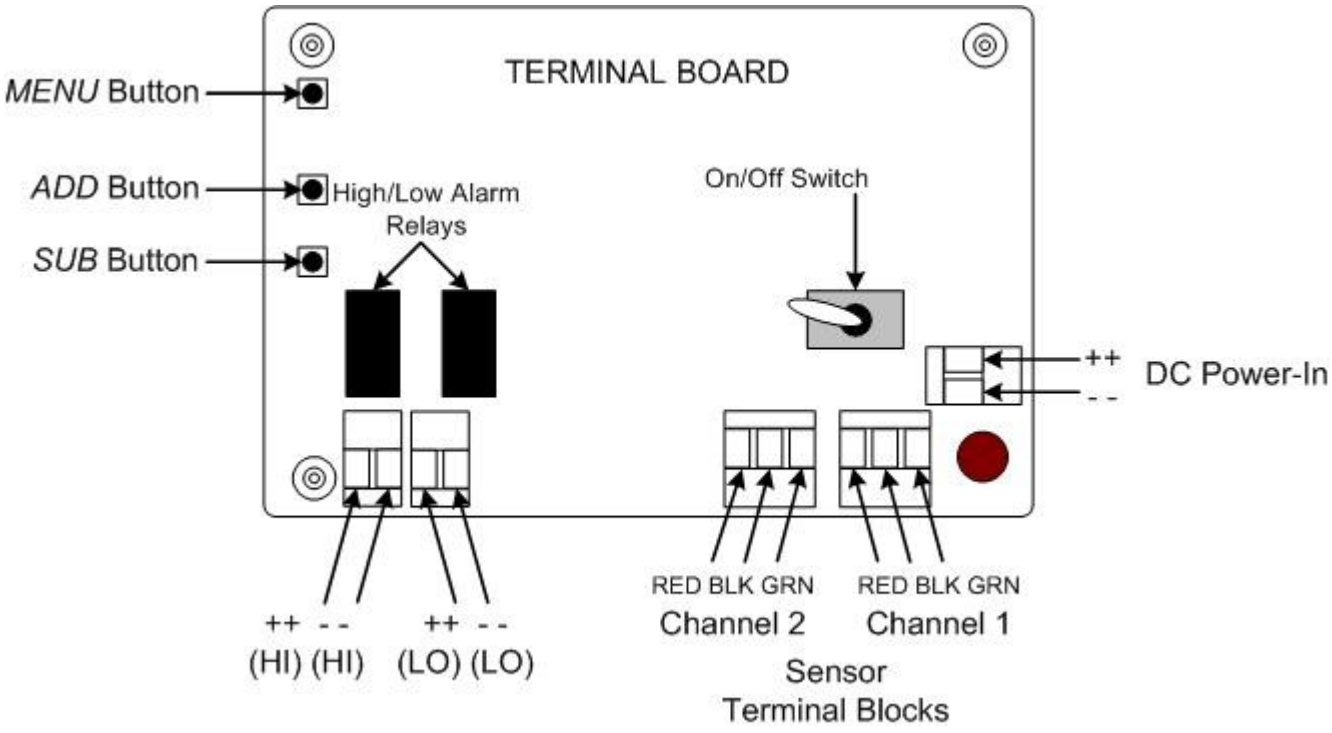
   - Connect the red (positive) wire to the terminal labeled “RED”
   - Connect the black (ground) wire to the terminal labeled “BLK”
   - Connect the green (signal) wire to the terminal labeled “GRN”.

3. Repeat the above process for Channel 2.

DC Power Wiring Configurations

NOTE: To ensure technician safety, always wire the relays BEFORE wiring power to the device.

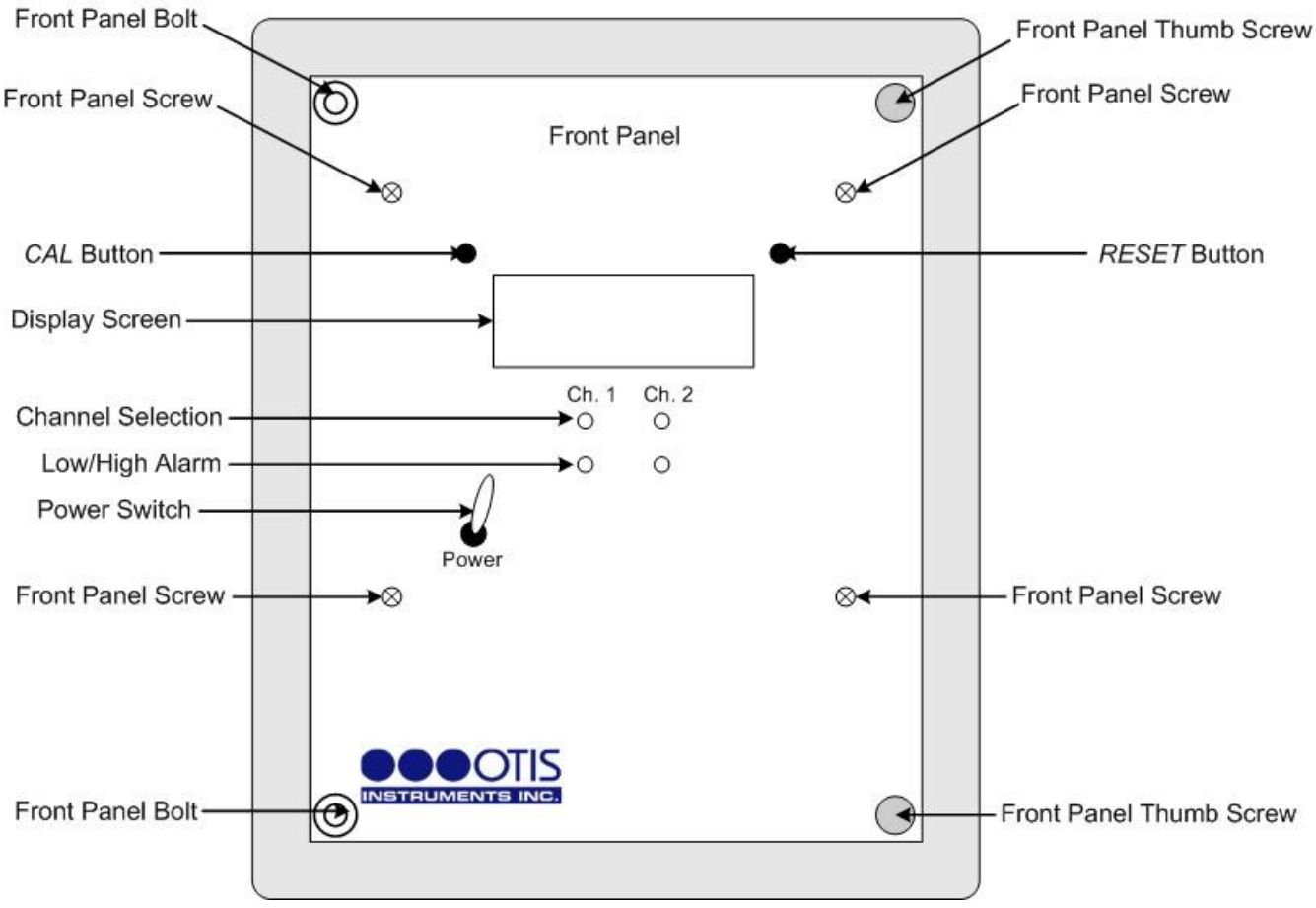
1. After the Low and High DC Relay Wiring Configurations have been completed (see above), locate the DC Power In terminal block on the Terminal Board.
2. Connect a positive wire from the 12-24 Volt power supply to the terminal block labeled "++".
3. Connect a ground wire from the 12-24 Volt power supply to the terminal block labeled "--".



4. Close the Front Panel and tighten both thumb screws.

   NOTE: When closing the Front Panel, be careful not to disturb or remove any of the wires that were just configured.

5. Close the enclosure door.
6. Re-latch the enclosure door latch.
7. All DC Wiring Configurations are complete. The device is now fully functional and ready to operate.



Specifications

Supply Voltage:	12-24 Volts DC
Operating Temperature:	0 to 167°C (-17.5 to 75°F)
Channels:	2 heads w/ individually configurable set-points
Relays:	Two Normally Open, 10 Amp, 12-24 Volt DC For Low and High alarms
Alarms:	Field adjustable, individually set to: Full-scale, latching or non-latching, or OFF High alarm disable w/ Auto Reset after 20 minutes.
High Alarm:	Model OI-488 Dual Tone Alarm 102 dB(A); 12-24 Volts DC
Low Alarm:	Model OI-481 PM, single flash 2.0 Joule; 12-24 Volts DC
Fuses:	Self-resetting for input power, relays, and sensor terminals.
Enclosure:	NEMA 4; 8” x 8” x 4”; Wall Mount
Warranty:	Hardware: One year (Limited)

Troubleshooting Guide

Problem:
- The display screen is showing "FAU 1" (Fault 1).

Solution:
- "FAU 1" indicates low (3.0mA or less) 4-20mA signal current from the Sensor Amplifier.

Solution:
- While in Fault 1, the green channel LED will flash. This indicates the particular channel that is in Fault. Once the proper current has been restored, the monitor will automatically return to Normal Operating Mode.

NOTE: Relays for the channel in Fault will be disabled while the monitor is in Fault 1.

Problem:
- The display screen is showing "FAU 2" (Fault 2).

Solution:
- "FAU 2" indicated no 4-20mA signal current is being received from the Sensor Amplifier.

Solution:
- While in Fault 2, the green channel LED will flash. This indicates the particular channel that is in Fault. Once the proper current has been restored, the monitor will automatically return to Normal Operating Mode.

NOTE: Relays for the channel in Fault will be disabled while the monitor is in Fault 2.

Problem:
- The display screen is showing Lo:bA and all four LEDs are flashing

Reason:
- The battery is low (below 11.5 Volts DC).

Solution:
- Perform the necessary procedures for restoring full power at the Power Supply. Once the power has been restored, the monitor will automatically return to Normal Operating Mode.

NOTE: If gas is detected while the battery is low, the gas concentration will still be displayed, and the relays will function normally.

Warranty Statement for **The OI-792 *Permian II***

Hardware

Otis Instruments, Inc. (Manufacturer) warrants its products to be free of defects in workmanship and materials—under normal use and service—from the date of purchase from the manufacturer or from the product's authorized reseller. The hardware for this device is under a one year limited warranty.

The manufacturer is not liable (under this warranty) if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's (or any third party's) misuse, neglect, or improper installation, testing or calibrations. Any unauthorized attempt to repair or modify the product, or any other cause of damage beyond the range of the intended use, including damage by fire, lightening, water damage or other hazard, voids liability of the manufacturer.

In the event that a product should fail to perform up manufacturer specifications during the applicable warranty period, contact the product's authorized reseller or return the product directly to the manufacturer with a Return Material Authorization (RMA). This number will be assigned upon contacting customer service at 979.776.7700 or Otis@otisinstruments.com. The manufacturer will--at its option and expense--repair or replace the product, or deliver an equivalent product or part to the purchaser at no additional charge.

Any replaced or repaired product or part has either a 90-day warranty or the remainder of the initial warranty period (whichever is longer).

Otis Instruments, Inc.

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