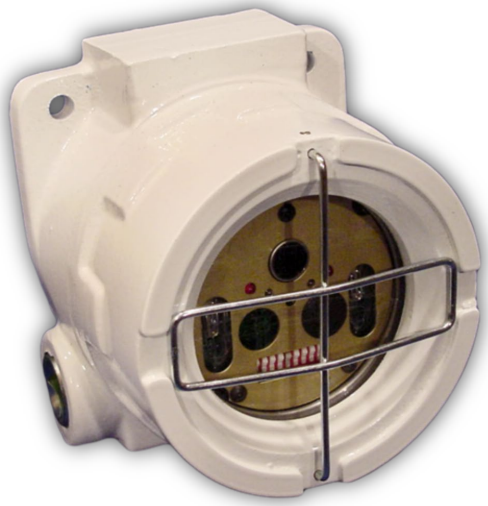
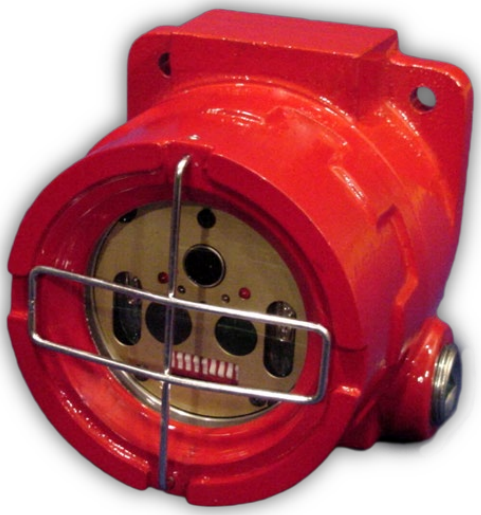
SIERRA SAFETY TECHNOLOGY, INC.

Technical Support & Installation Manual





RED1 Models

HST, HE1, HE2, HE3, HE4, and HNT
FLAME DETECTORS

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APPLICABILITY & EFFECTIVITY

This manual provides instructions for the follow products:

Model Highlights

RED1-HST: Fire & Fault Relay Outputs (N.O. and N.C.) with Optical Self-Test
RED1-HNT: Same as RED1-HST without Optical Self-Test
RED1-HE1: Same as RED1-HST with N.O. Verify & N.C. Aux Relays Outputs
RED1-HE2: Same as RED1-HST with N.C. Verify & N.O. Aux Relays Outputs
RED1-HE3: Same as RED1-HST with N.O. Verify & N.O. Aux Relays Outputs
RED1-HE4: Same as RED1-HST with N.C. Verify & N.C. Aux Relays Outputs

N.O. = Normally Open Contacts N.C. = Normally Closed Contacts

This manual is effective for the above models as of January 01, 2020

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Table of Contents

1. Overview

The RED1 High Speed Detector senses the radiant energy of either a sudden combustion event or the slower flaming combustion of an average fire. The detectors covered by this manual use UV, IR, Temperature and Visible sensors to sense combustion.

Flame detectors usually trigger a relay or output an alarm signal when they sense a fire. Flame detectors are typically employed if one of the following applies:

- The threat area requires a fast response.
- There is a severe risk.
- Where other types of detection simply will not or cannot work.

The detector also performs system tests looking for a fault condition that would impair its ability. Some of the things being checked for include: input power, sensor circuits, relay circuits, software integrity etc. Some versions also perform a lens/sensor test to verify sensor operation and general window cleanliness.

The RED1 detectors have a Fire Relay and a Fault Relay and may have a Verify Relay and an Aux. Relay. The Fire Verify adds a “field adjustable” level of certainty to the declaration of a verified fire. The Aux. Relay activates when the detector determines that the Lens or UV system is not working properly.

The RED1 detector is mounted in an approved NEMA 4X weather tight housing. The housing is explosion proof rated for Class I Divisions 1 & 2 Groups B, C, D, Class II Divisions 1 & 2 Groups E, F, G, and Class III locations. All of the electronics are mounted inside of an aluminum cup to protect the electronics during installation. All switch settings and indicators are located on the front of the detector module allowing field adjustments to be made without removing the detector module from the housing.

With the detector set to maximum sensitivity, it will respond to a 1 square foot gasoline (heptane) fire on axis at 80 feet in about 5 seconds.

If the "High Speed Disable" switch is turned off, then the detector will respond to a one-inch-high butane flame at 12 inches in about 50 milliseconds.

The RED1 has user settable sensitivity settings and verify levels.

2. Basic Operation

2.1 General

When the RED1 Detector is powered up, the microprocessor checks the configuration switch settings, initializes the detector and then executes a series of self-tests. After the self-test process is completed and all tests have been passed, the detector is starts looking for a fire.

All modes of operation are indicated by two LEDs located on the front of the detector. Normal Mode is indicated by a brief flash of the LEDs

every 8 seconds. In Normal Mode the detector is constantly monitoring the environment for a fire.

When a fire is detected the RED1 goes into Alarm Mode. If the device is configured for “Latching” the device will remain in Alarm Mode until power is removed. If configured for “Non-Latching” the Fire Relay will reset to normal when the detector cannot determine there is a fire.

The self-test system is continuously monitoring the internal systems. If the RED1 is not reporting a fire, then when a fault is detected the detector goes into Fault Mode. In Fault Mode the LEDs will flash a code indicating the type of fault. A fault indication may mean the device is unable to detect a fire or that a device has become unreliable. (i.e. a “Voltage Low” fault) For most faults the detector will return to Normal Mode when the fault condition is corrected.

2.2 Field-of-View

Optical Flame Detectors must be able to “see” the fire to declare an alarm. Any obstruction between the detector and the threat area will impair the detector’s ability to cover the threat area. An obstruction is anything that is not transparent to the energy being detected by the sensor elements of the detector. Even objects such as scaffolds and ladders within the field of view will impact the detector's response. Ultraviolet and Infrared sensors cannot see through most types of glass or plastic even if the glass or plastic is visually transparent. For coverage of a large area the detectors should be located with overlapping fields of view (see Figure 6). Flame detectors should never be located so that they are looking down from a ceiling of large enclosed spaces as products of combustion may stratify in the enclosed volume. Such stratification may reduce the detector's speed of response.

2.3 Range

The size of fire and type of materials that constitute the threat will affect the detector’s range. Different materials and environmental conditions produce different amounts of the radiant energy from the fire that is used by the detector to “see” the fire. Also, the range of the detector is a function of the fire size. The RED1 Detector is optimized to detect a 1 sq. ft. gasoline fire on axis within 80 feet when the sensitivity settings set to maximum.

The RED1 can be set for lower sensitivity using the dipswitches located on the face of the module.

2.4 Environment

All optical flame detectors sense radiant energy at some frequency or frequencies within their Field-of-View. Any source that radiates energy at the same frequency or frequencies used by the detector to sense a fire may impact the detector’s ability to “see” the fire (see Table **Error! Reference source not found.**). Care should be taken to minimize radiant energy sources within the detector’s Field-of-View. Because environments and conditions can impact the performance of the detector, a trained technician or qualified P.E. should be consulted before deciding on the location of the devices.

The RED1 may be interfaced to a computer using an interface box. If there is a question with possible radiant energy sources in an application, a technician can use a detector interfaced to a computer to determine the real time radiant energy in the application. This will allow the technician to determine any problem sources of energy so the detector can be set properly.

2.5 Configuration

RED1 detectors have field adjustable configuration switches located on the front face of the detector. The factory settings are shown in *italic* text.

2.5.1 Sensitivity

All models of the RED1 detector have several sensitivity settings available. The sensitivity settings are 20, 40, 60, and 80 feet. Each setting is optimized to alarm to a 1 sq. ft. gasoline fire within 5 seconds. Switches 1 and 2 are used to control the sensitivity. The factory default is 80 feet. (SW1 and SW2 are off.)

Note: Different fuels emit energy at differing rates. For example; a fire involving fuel oil does not emit energy at the same rate as gasoline.

2.5.2 Verify Control

Models RED1-HE1 to -HE4 have a Verify Relay. The Verify function is armed when the detector detects a fire and will trigger when the Verify function has confirmed the fire.

The switches located on the face of the detector allow the user to select the verify level (Levels 1 to 6), disable the verify function (Level 7), or have the Verify Relay operate in parallel with the Fire Relay (Level 0) *The factory default is level 0 (SW3, SW4 and SW5 are off) where the Verify Relay operates in parallel to the Fire Relay.*

The verify level sets the degree of certainty required to declare a verified fire. Level 1 is the lowest level with the quickest response (nominally about 5 seconds) and least certainty. Level Six is the highest level with the slowest response (can exceed 30 seconds) and the greatest certainty. The verify function enables an algorithm which evaluates the fire signature over time to determine the degree of certainty.

2.5.3 Latching Control

The latching controls allow the detector, Fire Relay and Verify Relay to be set to “Latching” or “Non-Latching”. “Latching” means the detector/relay will remain on until power is removed from the detector. “Non-Latching” means that the detector or relay output will reset when a flame is no longer being sensed by the detector.

SW6 configures the Fire Relay, SW7 configures the Verify Relay, and SW8 configures the Detector. *The factory defaults are “Latching” (SW6, SW7, and SW8 are all off).*

If the Fire Relay is latching, then the Verify Relay and the Detector will be latching.

If the Verify Relay is latching, then the Detector will be latching.

2.5.4 High Speed Disable

Switch 9 must be in the OFF position to enable the High Speed response (50 milliseconds).

2.6 LED operation

The status of the RED1 detector can be determined from the LEDs on the front of the detector. The LEDs indicate the detectors status (Power Up, Fault Mode, Normal Mode Fire Mode or Verified Fire Mode).

2.6.1 Power Up

On power up the LEDs will display the Switch Configuration. They will flash 9 times with the first flash being switch 1 and the last flash being switch 9. If one LED flashes then the switch is in the off position. If two LEDs flash, then the switch is in the on position. Note that switch 7 overrides switch 8 and switch 6 overrides switch 7 (see Latching)

2.6.2 Normal Mode

In Normal Mode the LEDs will flash briefly every 8 seconds. Whenever the device is in any other mode the “flash every 8 seconds” is suspended until the detector returns to Normal Mode.

2.6.3 Fire Mode

When the RED1 declares a fire both LEDs will come “on”. If the detector is set to “Latching” the LEDs will remain “on” and stay “on” until the detector is powered down. If the Fire Relay is set to “Non-Latching” then the Relay will reset when the fire has not been detected for a period of time (factory default is 3 seconds).

2.6.4 Verify Mode

When a verified fire is declared the LEDs will blink “off” briefly every second. If the Verify Relay is set to “Non-Latching” then the Relay will reset when a verified fire has not been detected for a period (factory default is 3 seconds).

2.6.5 Fault Mode

If the detector has power and is showing a fault then LED1 (the LED on the left, when facing the detector, with the configuration switches below the LEDs) will turn “on for 5 seconds and the LED2 (the right LED) will be “off”. Then LED1 will turn “off” and LED2 begin flashing, 1/2 second “on” and 1/2 second “off”, a number of times. The number of times LED2 flashes indicates the type of fault. This cycle is repeated until the fault is corrected. Only the highest numbered fault is indicated. Once a fault is corrected the next highest fault will be indicated until all faults are cured. With the exception of fault levels 2 and 3, a fire indication will override a fault indication. The detector is disabled if a fault 2 or 3 is indicated.

2.7 Relay Operation

RED1 detectors have a Fire Relay and a Fault Relay. Both the Fire and Fault relays have normally open and normally closed contacts (see section on Connectors).

The RED1-HE1, -HE2, -HE3 and -HE4 models have a Verify Relay and an Aux. Relay.

The Verify Mode adds a “field adjustable” level of certainty to the declaration of a verified fire.

The Aux. Relay activates when the detector determines that the Lens is not clean enough or the UV system is not working.

2.7.1 Fire Relay

The Fire Relay will energize when the detector declares a fire. Using switches, the relay may be configured for "Latching" or "Non-Latching" operation. The Fire Relay connector (J2) provides 2 connections for each of the common, normally open and normally closed contacts of the Fire Relay.

If the Fire Relay is configured for “Latching” then it will remain energized until power is removed.

If the Fire Relay is configured for “Non-Latching” (see Latching Control) then it will reset to normal when the detector no longer sees a fire for a period of time (factory default is 3 seconds).

2.7.2 Fault Relay

The Fault Relay is normally energized. It will de-energize when a Fault occurs. This means the Fault Relay will show as a “Fault” when the detector has no power. The Detector will remain in the “Fault” state until the detector is powered up and operating normally. The “J4” connector provides both a normally open contact and a normally closed contact of the Fault Relay.

2.7.3 Verify Relay

The operation of the Verify Relay will depend on the Model Type and the switch settings. See sections on Connectors, Latching Control and Verify Control.

Model	Verify Relay	Aux. Relay
RED1-HST	N/A	N/A
RED1-HNT	N/A	N/A
RED1-HE1	Open Contacts	Closed Contacts
RED1-HE2	Closed Contacts	Open Contacts
RED1-HE3	Open Contacts	Open Contacts
RED1-HE4	Closed Contact	Closed Contacts

If the Verify Relay is configured for “Latching” then it will remain energized until power is removed.

If the Verify Relay is configured for “Non-Latching” then it will reset to normal when the detector no longer sees a verified fire for a period (factory default is 3 seconds).

Pins on the "J3" connector labeled “Verify In” and “Verify Out” provide connections for Normally Open contacts on the -HE1 and -HE3 models or Normally Closed contacts on the -HE2 and -HE4 models.

2.7.4 Aux. Relay

The Aux. Relay is energized whenever the detector fails the UV self test. This fault indicates degradation in the detectors ability to “see” a fire. Normally, cleaning the lens will clear this fault. This condition normally occurs when there is an oily lens or a malfunctioning UV sensor. The Pins on the "J3" connector (see section on Connectors) labeled “Aux In” and “Aux Out” provide connections for a Normally Open contact on the -HE2 and -HE3 models or a Normally Closed contact on the -HE1 and -HE4 models.

3. Installation

3.1 Housing and Conduit

3.1.1 Mounting the Housing

The housing is mounted by using the two .3” diameter holes located in ears on the back of the housing. The two conduit holes located on the side of the housing are not to be used for mounting. The detector should be mounted securely to a flat surface. The mounting location must be strong enough to support the detectors weight. Although the detector is not vibration sensitive the detector should not be exposed to excessive vibration. The detector has been tested to .022” displacement, 10 Hz to 30 Hz sweep cycled at 2 cpm for 4 hours.

3.1.2 Installing the Conduit and Wiring

Mount a “Seal Off” at the housing into the 3/4” NPT conduit opening(s) located on either side of the housing. Connect the conduit to the “Seal Off”. If one of the conduit openings is not used insert a sealing plug into the unused opening. Run the wires through the conduit, “Seal Off”, and into the housing. The ends of the wire should extend several inches (at least 2” to 4”) beyond the front of the housing base.

3.2 Connection

All connections are made on the back of the RED1 Detector Module. Remove the housing cover from the housing base. Loosen the two slotted head captive screws located on the top of the PC board. Lift the Detector Module out of the housing base. Strip and connect the wires to the connectors located on the back of the Detector Module.

3.2.1 Power

Power for the RED1 detectors is connected to the J5 connector (see section on Connectors). Connect the negative wire to one of the connections labeled “V-”. Connect the positive (24 VDC) wire to one of the connections labeled “V+”. The two connection points

labeled “V-” and the two “V+” connection points are connected internally. The “D+” and “D-” connections should be left open and care should be exercised in not shorting or connecting power to these pins.

3.2.2 Fire Relay

The Fire Relay connector ("J2") has two connections points for each connection these connection points are internally connected, either or both may be used. The Fire Relay connector labeled “FIRE” has connection points for Normally Open, Normally Closed, and Common. The Normally Open connections are labeled “Open”, the Common contacts are labeled “Center”, and the Normally Closed contacts are labeled “Closed”.

3.2.3 Verify Relay

The Verify Relay connector ("J3") has two connections points for each connection these connection points are internally connected, either or both may be used. The Verify Relay connector is located between the Power and Fire relay connectors. The connection points are labeled “Verify In” and “Verify Out”. The Verify relay is configured for Normally Open (-HE1, -HE3), or Normally Closed (-HE2, -HE4) operation at the factory.

3.2.4 Fault Relay

The Fault Relay connector is labeled “Fault”. The Normally Open connection is labeled “O”, the Common connection is labeled “Cen”, and the Normally Closed connection is labeled “C”. The Fault Relay is normally energized. When the detector has no power (no power is a fault condition) the Normally Open contact is closed and the Normally Closed contact is open because this is a fault condition.

3.2.5 Aux. Relay

The "J3" connector for the Aux. Relay is located between the Power and Fire Relay connectors. The connection points are labeled “Aux In” and “Aux Out”. The Aux. Relay is configured for Normally Open (-HE2, -HE3), or Normally Closed (-HE1, -HE4) operation at the factory.

3.3 Testing

The RED1 detector uses ongoing self-test functions which will indicate a fault if any of the functions fail to pass.

If an end-to-end test is required, the detector may be put into alarm using butane lighter (Bic) with a flame approximately 1 inch high. Hold the lighter about 1 foot directly in front of detector's face. The detector should alarm almost immediately.

A 1 sq. ft. pan with 1 inch of water and 1/8 inch of gasoline (heptane) set at the maximum distance set by the sensitivity settings may also be used. The detector should alarm within 5 seconds of the fire becoming fully involved.

A factory approved test device may be used to put the detector into alarm.

NOTE: Because of the danger involved with fire testing all safety precautions must be observed. In addition, should an extinguishing system be connected, the outputs to the extinguishing system should be disconnected during testing.

4. Maintenance

All fire protection systems should be inspected in accordance with NFPA 72, or the appropriate local codes.

The self-test functions incorporated in the detectors reduce the need for most regular maintenance procedures. If a detector indicates a fault, use the troubleshooting section of this document.

4.1 Lens Cleaning

The most common fault is a UV Test Fault. Regular cleaning of the Lens will diminish this type of fault. The frequency of cleaning will depend on the cleanliness of the area where the detector is installed and how the detector is mounted. A detector that is pointed down should require less cleaning than one that is pointed up. An area which has lots of oil particulates or dust will require more frequent cleaning than one that is oil and dust free. The frequency of this fault will indicate how often cleaning is necessary. If the device is failing the “UV Test” too often, it may be necessary to install a dust shroud, realign the detector, or change the detector's location.

To clean the lens, wipe the lens surface and grill with a clean lint free cloth. If more extensive cleaning is required use denatured or Isopropyl alcohol and a clean lint free cloth. Do not use any silica-based solvents. (Most common glass cleaners are silica based and should not be used to clean the lens).

5. General Specifications

Color:	Red or White (order White by appending a -WB to the Model)
Input voltage:	15 to 32 Volts DC, typically 24 Volts DC
Current draw:	@ 24 Volts DC: 62 ma nominal
Temperature Range:	-40° to 85° Celsius operating -55° to 110° Celsius storage
Relay contacts:	0.5 Amp @ 120 VAC 1.0 Amp @ 30 VDC resistive
Connections:	Screw terminals, 14 - 22 AGW wire size
Weight:	Approximately 3.5 pounds
Housing:	
Dimensions:	5.4” x 4.8” x 3.7”
Material:	Copper free Aluminum with Red or White epoxy finish
Conduit:	Two 3/4-inch NPT
Rating:	NEMA 4X, Explosion proof Class I Divisions 1 & 2 Groups B, C, D Class II Divisions 1 & 2 Groups E, F, G Class III
Spectral Response:	UV - 185 to 260 nanometers IR - 0.715 to 3.5 microns Visible - 480 - 560 nanometers
Sensitivity:	There are 4 switch selectable settings for the detector’s response. These are 20, 40, 60 and 80 feet in response to a 1 sq. ft. gasoline fire within 5 seconds.
Field-of-View:	120° full cone
Approvals:	None

6. Figures

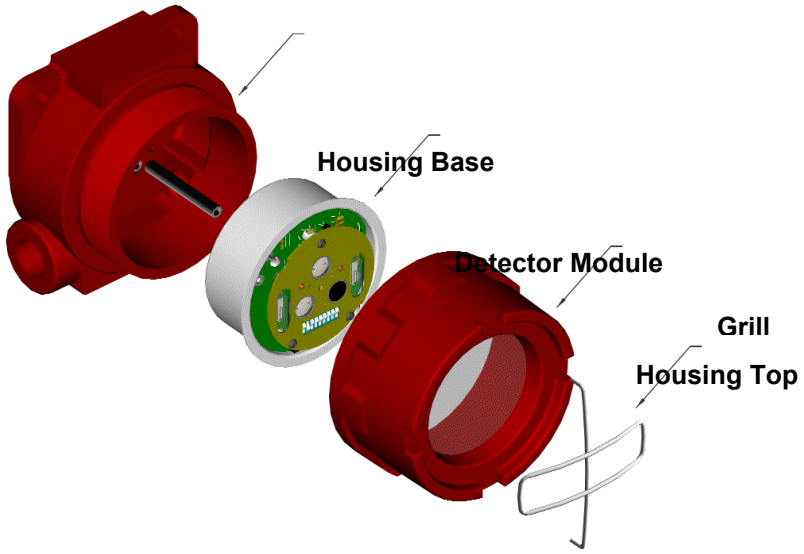


Figure 1
RED1 Exploded View

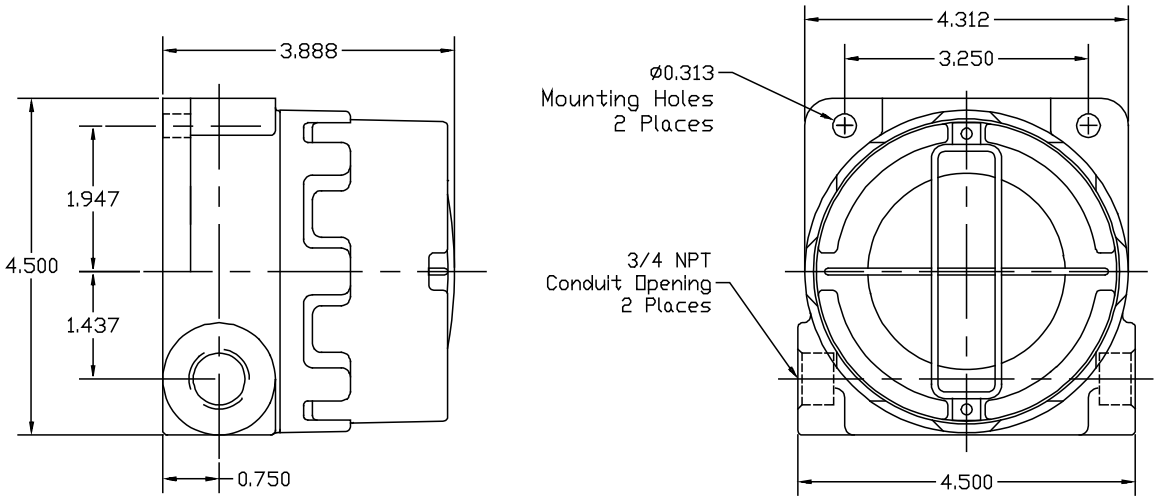


Figure 2
RED1 Housing Dimensions

Figure 3
RED1 Detector Module (Front)

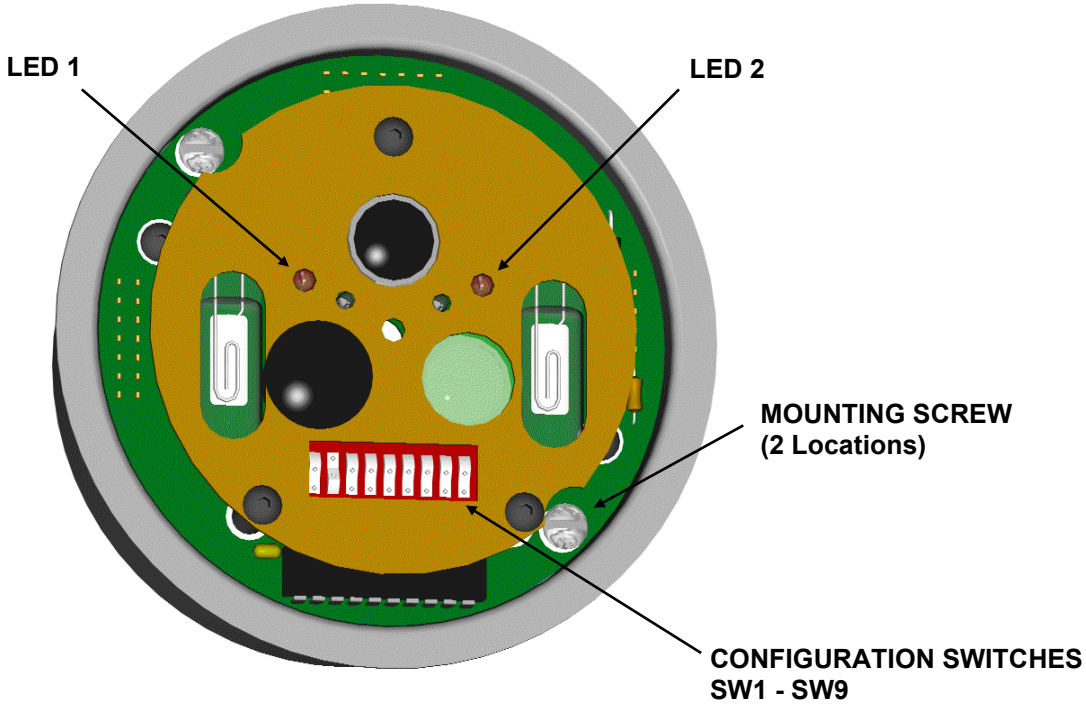


Figure 4
RED1-HE1 to -HE4 Detector Module (Back)

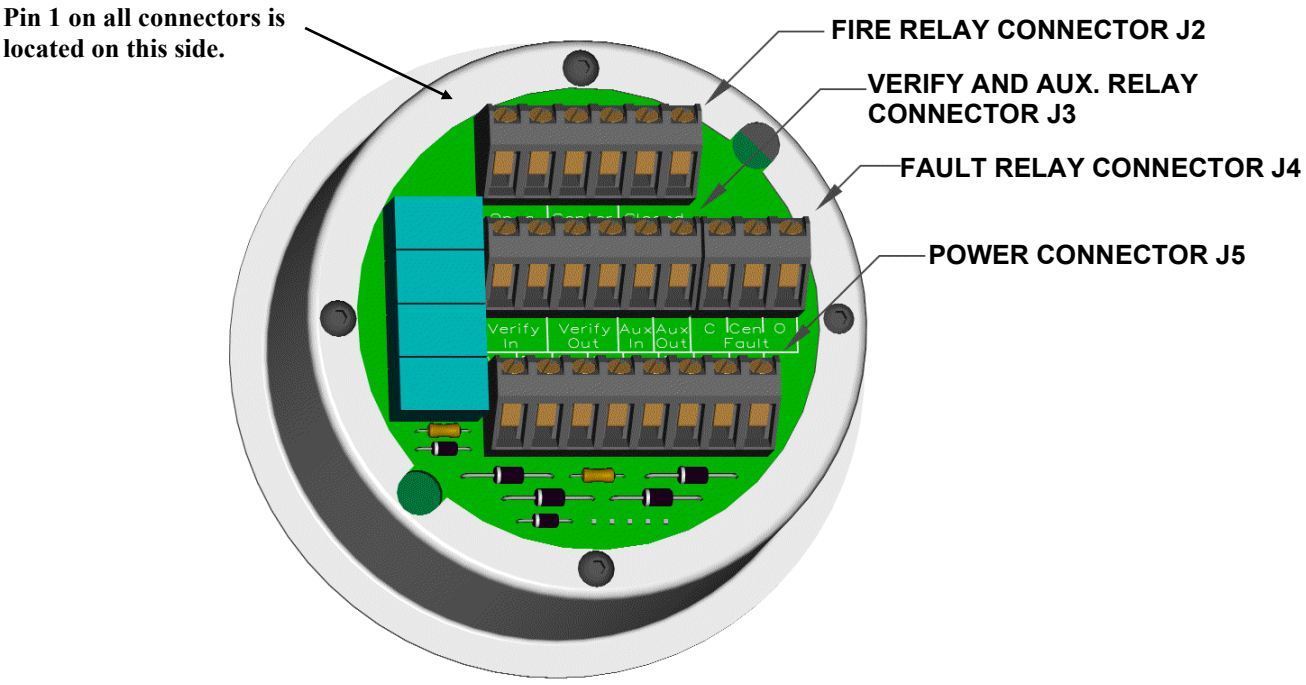


Figure 6

RED1 Field-of-View

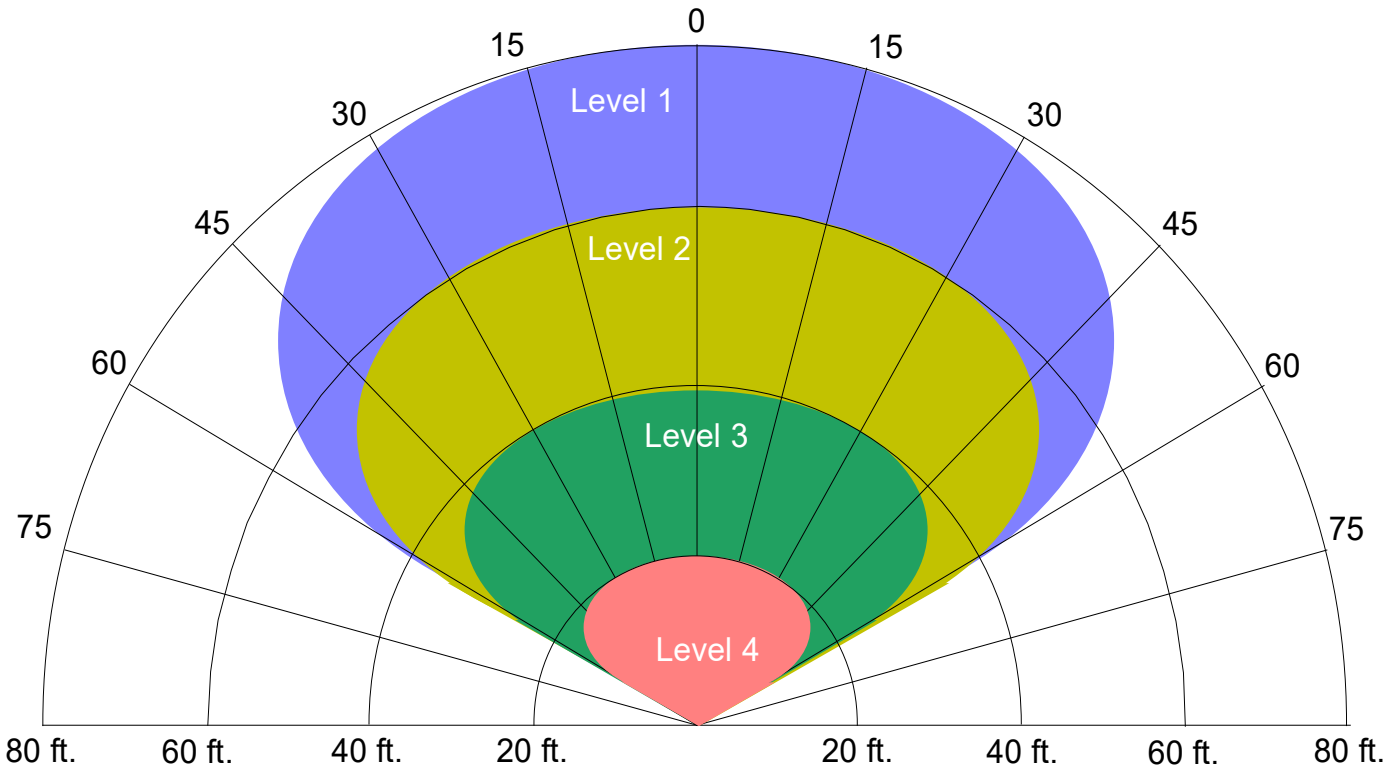
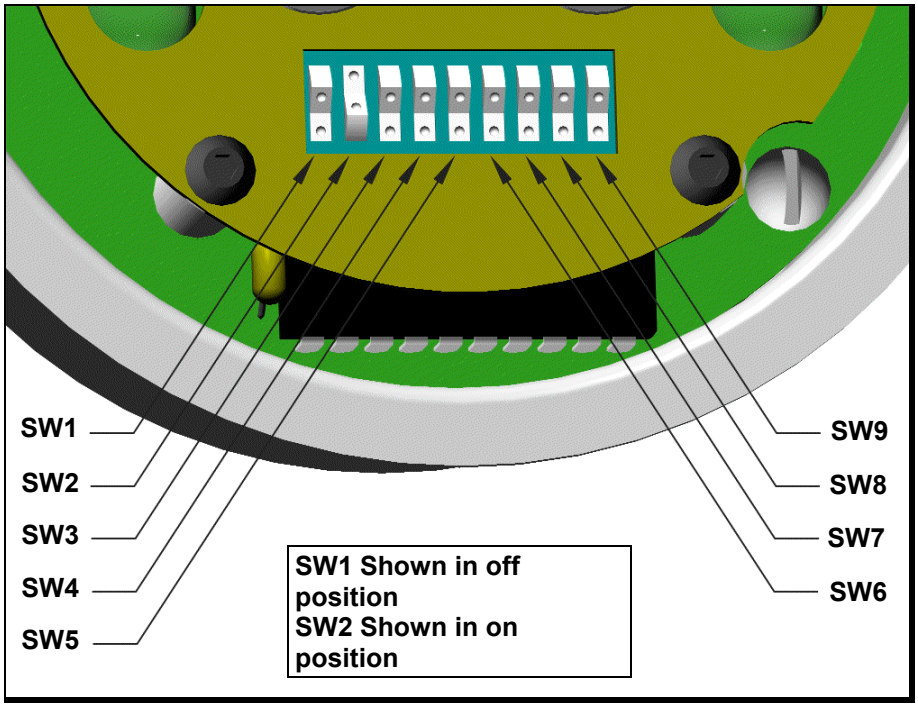


Figure 7
Configuration Switches



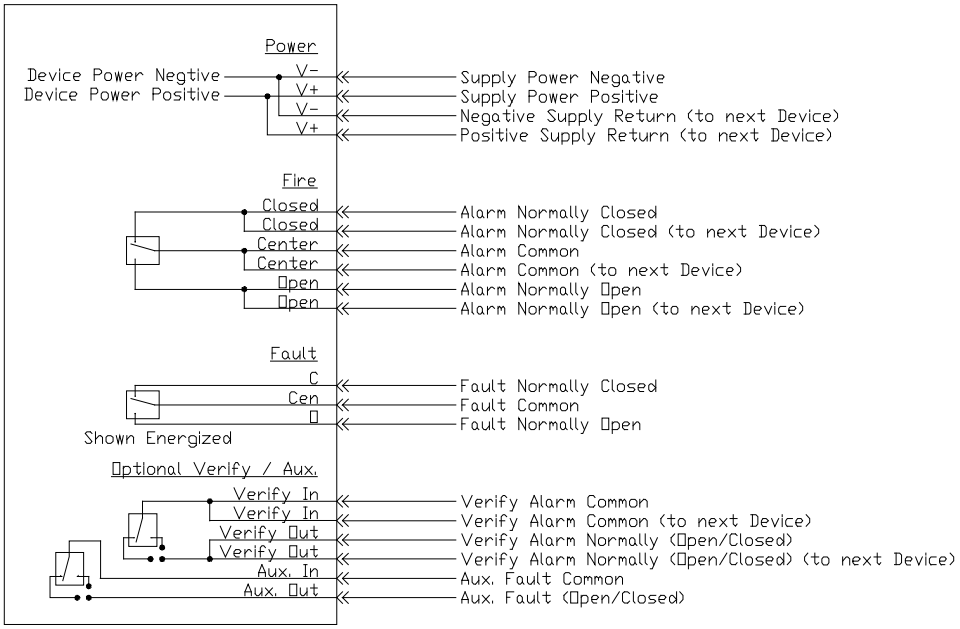


Figure 8
RED1-HE1 to -HE4 Wiring

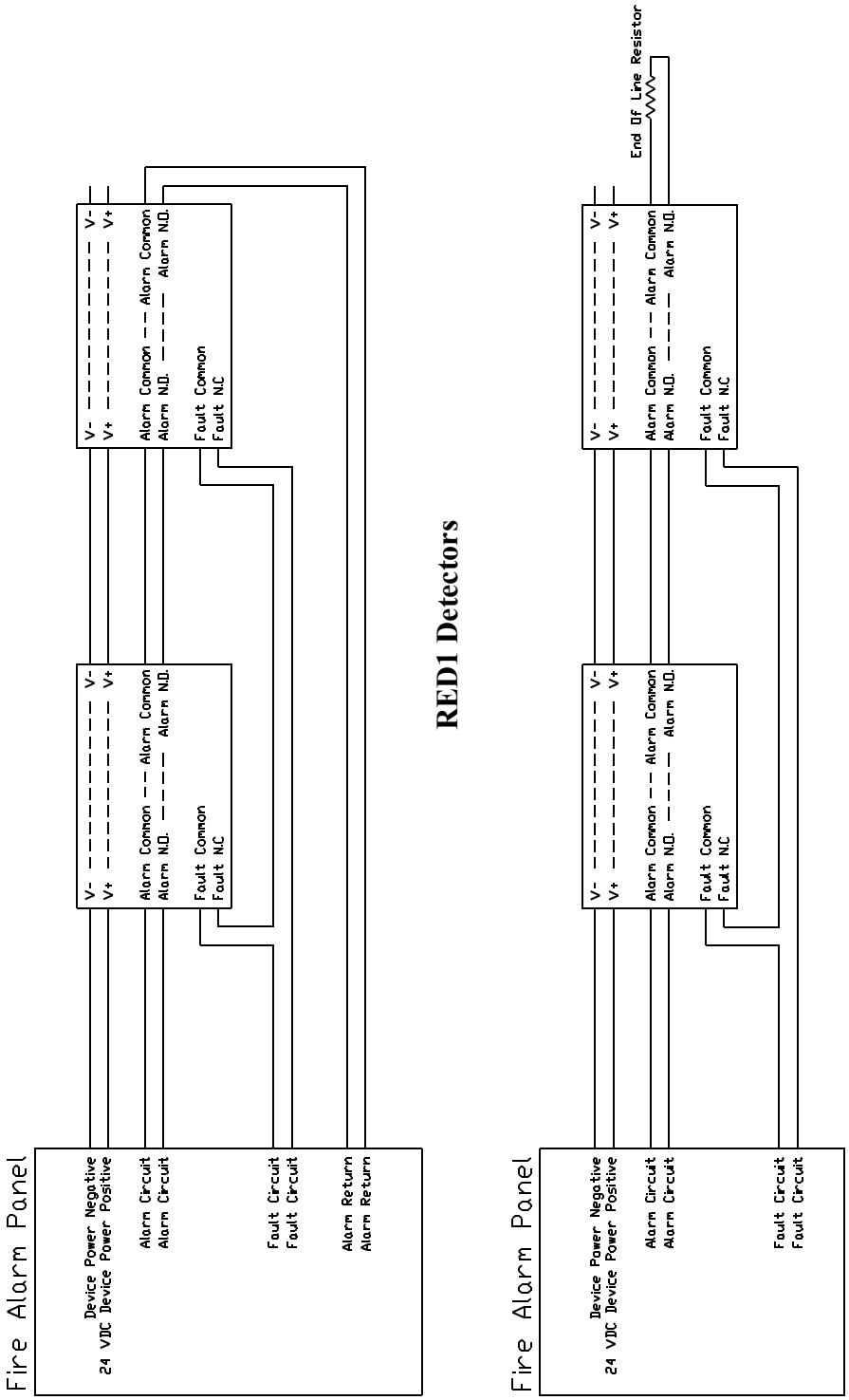


Figure 9
Typical Panel Wiring

7. Tables

7.1 Dip Switch Settings

7.1.1 Sensitivity

Sensitivity	SW1	SW2	Level
20 Foot	ON	ON	4
40 Foot	OFF	ON	3
60 Foot	ON	OFF	2
80 Foot	OFF	OFF	1

7.1.2 Verify Control (-HE1 to -HE4 Models only)

Verify	Description	SW3	SW4	SW5
Level 0	Verify = Fire	OFF	OFF	OFF
Level 1	Min. Verify (shorter)	ON	OFF	OFF
Level 2		OFF	ON	OFF
Level 3		ON	ON	OFF
Level 4		OFF	OFF	ON
Level 5		ON	OFF	ON
Level 6	Max. Verify (longer)	OFF	ON	ON
Level 7	Verify Disabled	ON	ON	ON

7.1.3 Fire Relay "Latching" Control

Fire Relay	Description	SW6
Latching	Alarm Until Power Down Reset	OFF
Non-Latching	Alarm Until No Fire (.5 to 10 sec.)	ON

7.1.4 Verify Relay "Latching" Control (HE1 to HE4 Models only)

Verify Relay	Description	SW7
Latching	Alarm Until Power Down Reset	OFF
Non-Latching	Alarm Until No Fire (.5 to 10 sec.)	ON

SW6 and SW7 must be ON for the Verify Relay to be "Non-Latching".

7.1.5 Detector "Latching" Control

Detector	Description	SW8
Latching	Alarm Until Power Down Reset	OFF
Non-Latching	Alarm Until No Fire	ON

SW6, SW7, and SW8 must be ON for the Detector to be "Non-Latching".

7.1.6 High Speed Disable

High Speed	Description	SW9
Enabled	50 Millisecond Response to a 1" High Butane Flame at 12 Inches	OFF
Disabled	5 Second Response to Standard Fire	ON

7.2 Connectors

7.2.1 Fire Relay Connector

(J2) Fire Relay	Description
Pin 1 & Pin 2 (Left Most)	Normally Open Side of Relay
Pin 3 & Pin 4 (Middle)	Common or Center Side of Relay
Pin 5 & Pin 6 (Right Most)	Normally Closed Side of Relay

7.2.2 Verify and Aux. Connector

(J3) Verify/Aux.	Description
Pin 1 & Pin 2 (Left Most)	Verify Relay Common Side of Relay
Pin 3 & Pin 4	Verify Relay NO or NC Side of Relay
Pin 5	Aux. Relay Common Side of Relay
Pin 6 (Right Most)	Aux. Relay NO or NC Side of Relay

7.2.3 Fault Connector

(J4) Fault Relay	Description (Normally Energized State)
Pin 1 (Left Most)	Normally Closed Side of Relay
Pin 2 (Middle)	Common Side of Relay
Pin 3 (Right Most)	Normally Open Side of Relay

7.2.4 RED1 - Power/Communications Connector

(J5) Power/Communications	Description
Pin 1 & Pin 5 (Left Most)	Power (DC -)
Pin 2 & Pin 6	Communication RS 485 (-)
Pin 3 & Pin 7	Communication RS 485 (+)
Pin 4 & Pin 8 (Right Most)	Power (DC +)

7.3 Verify/Aux. Relay Configurations

Model #	Verify Relay	Aux. Relay
RED1-HE1	Open Contacts	Closed Contacts
RED1-HE2	Closed Contacts	Open Contacts
RED1-HE3	Open Contacts	Open Contacts
RED1-HE4	Closed Contact	Closed Contacts

7.4 Fault Table

Fault #	Fault Label	Description
1	UV Fault	The UV Sensors Didn't Detect Enough UV from the Internal UV Source
2	Configuration Fault	A Failed Program
3	Calibration Fault	Device is Out of Calibration
4	Volt. Low	Input Voltage is Below 15 VDC
5	Photo. Sensor Fault	IR or Visible Sensor Failed to Detect Internal Test Source
6	Relay Fault	Relay Coil Circuit is Open
7	Volt. High	Input Voltage was Above 32 VDC
8	Temp. Out of Range	Internal Device Temperature Went Below -40° C or Above 85° C

7.5 False Alarm Stimuli Table

FALSE ALARM RESPONSE This table shows the detectors ability to tolerate Modulated and Unmodulated false alarm stimuli.			
False Alarm Source	Distance	Unmodulated	Modulated
Resistive Electric Heater 1320 Watt	6 Feet	No Response	No Response
Fluorescent Lights (2) 40 Watt Bulbs	6 Feet	No Response	No Response
Incandescent Light 100 Watt	6 Feet	No Response	No Response
Direct Sunlight	93 Million Miles	No Response	No Response

7.6 Detector Response to Fuels Table

Detector Response To Various Fuels			
Fuel	Distance	Fire Size	Response Time
Heptane	80 Feet	1 Square Foot	Less than 3 Seconds
Silane	50 Feet	18-inch Jet	Less than 3 Seconds
Hydrogen	15 Feet	18-inch Jet	Less than 5 Seconds
Kerosene	75 Feet	1 square Foot	Less than 5 Seconds
Butane	1 Foot	1-inch High	50 Milliseconds

8. Troubleshooting

The RED1 detector has several built-in self-test mechanisms that verify function and calibration. The following procedure covers most faults and problems that may occur during installation or during the course of normal operation.

8.1 No LED blink or erratic LED blink

With power connected to the detector the LEDs on the front of the detector module should begin blinking and blink about every 8 seconds. If they do not blink or blink in an abnormal fashion:

1. Remove the detector module from the housing.
2. Check voltage at the power connector. Pin 1 should be the connected to negative, and Pin 4 should be positive. Voltage should be between 15 and 32 volts DC.
3. If Main power is correct and the detector is not indicating a fault, then contact the factory for further diagnostic instructions or instructions on returning the detector for servicing.

8.2 Detector Indicates Fault

Use the fault table to determine what type of fault is occurring and see appropriate section below to correct. If the corrective actions listed below do not correct the fault, contact the factory for further diagnostic instructions or instructions on returning the detector for servicing.

8.2.1 Fault Type 1 - “UV Test Fault”

Clean the lens and grill per section 4.1. Reset the detector (remove and replace power). If the fault persists it may indicate a bad UV tube or UV source tube, factory service is required.

8.2.2 Fault Type 2 - “Configuration Fault”

The program’s sum check is invalid.

Factory service is required.

8.2.3 Fault Type 3 - “Calibration Fault”

The Calibration constants have been corrupted.

Factory service is required.

8.2.4 Fault Type 4 - “Voltage Low Fault”

The input voltage is below 15 VDC. Remove the Detector Module from the housing. With the detector connected to power, measure the voltage between Pin 1 and Pin 4 on the Power connector (J5). The voltage should be between 15 - 32 VDC. If the voltage is out of range, check external wiring and power supply. There should not be more than 1 volt of AC ripple at 24 VDC. If the measured voltage is in range and there is no AC ripple, then factory service is required.

8.2.5 Fault Type 5 - “Photo Sensor Fault”

One of the Photo Sensors (Visible or IR) did not pass the internal self-test. If both sensors are clean. The fault may be in the sensors or the self-test circuit. Contact the factory for further diagnostic information.

8.2.6 Fault Type 6 - “Relay Fault”

One of the Relay’s coil circuits is open.

Factory service is required.

8.2.7 Fault Type 7 - "Voltage High"

The Detector was exposed to an input voltage above 32 Volts. Factory service is required.

8.2.8 Fault Type 8 - "Temperature Out of Range"

The internal measured temperature was either below -40° C or above 85° C.

Factory service is required.

8.3 Device appears to operate normally but will not alarm to a fire.

When the detector declares an alarm two things should happen. One, both the LEDs on the front of the detector should come on. Two, the fire relay should energize. Check the dipswitch settings. (SW1, SW2, and SW8 should be off, SW3 - SW7 have no impact.) Connect an ohmmeter across the Fire relay connections at the "Fire" connector (Pin 1 and Pin 3 of J2). Run a fire test per section 3.3.

1. If the relay closes (0 ohms on the meter) and the LEDs come on the detector is operating normally. Check external alarm initiating circuit wiring.

2. If the relay closes and the LEDs remain off, or the relay remains open and the LEDs come on, the detector needs factory service.

3. If the relay remains open and the LEDs remain off, contact the factory for further diagnostic information.

NOTE: With software and a computer a more extensive diagnostic may be performed. Contact the factory for information on software and the minimum requirements for a computer.