

2251EIS Intrinsically-Safe Plug-in Intelligent Photoelectronic Smoke Detector

Specifications

Operating Voltage Range:	17 to 24 VDC
Standby Current:	330 μ A @ 24 VDC (one communication every 5 sec. with LED blink enabled)
Max. Alarm Current (LED on):	2.5 mA @ 24 VDC
Operating Humidity Range:	10% to 93% Relative Humidity, Noncondensing
Operating Temperature Range:	
Europe-	-10° to 60° C
U.S.-	32° to 120° F (0° to 49° C)
Compatible Bases:	B501

Before Installing

This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed in compliance with the National Fire Protection Association (NFPA); see NFPA 72.

NOTICE: This manual should be left with the owner/user of this equipment.

IMPORTANT: This sensor should be cleaned at least once a year. If cleaning is performed with non-intrinsically safe equipment, it must be conducted outside the hazardous area.

General Description

Model 2251EIS is an intrinsically-safe, plug-in type smoke sensor that combines a photoelectronic sensing chamber with addressable-analog communications. The sensor transmits an analog representation of smoke density over a regulated communication line, through a barrier, to an intelligent system translator (sold separately, IST200). The translator then relays the analog information to a control panel. Rotary-decade switches are provided for setting the sensor's address. Two LEDs on the sensor are controlled by the panel to indicate sensor status.

Wiring Instructions

All wiring must be installed in compliance with all applicable national codes of practice and regulations (e.g. in the UK, EN60079-14; 1997). The installation wires should be shielded and properly grounded.

NOTE: The maximum length of wire that can be connected to the detector side of the barrier is limited by the barrier resistance, the wiring capacitance, and the characteristics of the control panel. For more detailed information, refer to the literature supplied with the control panel.

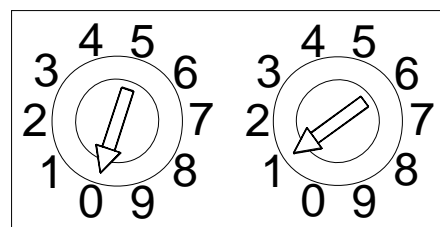
The system must be marked with a system label that is packed with the 2251EIS. This label must be placed on or adjacent to the principal item of electrical apparatus in the system, or at the interface between the intrinsically safe and non-intrinsically safe circuits.

Remove power from the communication line before installing sensors.

All wiring must conform to applicable local codes, ordinances, and regulations.

1. Wire the sensor base (supplied separately) per the wiring diagram.
2. Set the desired address on the sensor address switches, see Figure 1.
3. Install the sensor into the sensor base. Push the sensor into the base while turning it clockwise to secure it in place.
4. After all sensors have been installed, apply power to the control unit and activate the communication line.
5. Test the sensor(s) as described in the **TESTING** section of this manual.

Figure 1. Rotary decade address switches:



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CAUTION

Dust covers provide limited protection against airborne dust particles during shipping and must be removed before the sensors can sense smoke. Remove sensors prior to heavy remodeling or construction. Be sure to remove the dust covers from any sensors left in place during construction prior to returning the system to service

Testing

Before testing, notify the proper authorities that the system is undergoing maintenance, and will temporarily be out of service. Disable the system to prevent unwanted alarms.

All sensors must be tested after installation and periodically thereafter. Testing methods must satisfy the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when tested and maintained in compliance with NFPA 72.

IMPORTANT: If testing is done with non-intrinsically safe methods, it should be conducted outside the hazardous area.

The sensor can be tested in the following ways:

A. Functional: Magnet Test (P/N M02-04-01)

This sensor can be functionally tested with a test magnet. The test magnet electronically simulates smoke in the sensing chamber, testing the sensor electronics and connections to the control panel.

- 1. Hold the test magnet in the magnet test area as shown in Figure 2.
- 2. The sensor should alarm the panel.

Two LEDs on the sensor are controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, can cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.

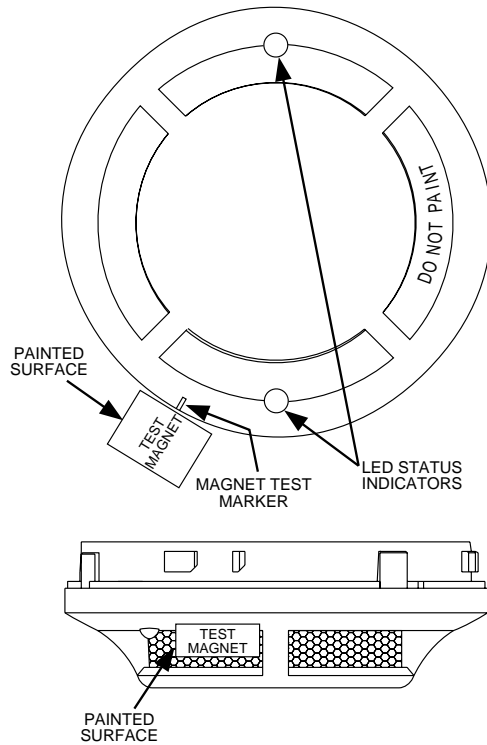
B. Smoke Entry: Aerosol Generator

Aerosol generations for smoke entry testing are available from a number of third party manufacturers (e. g., Gemini Scientific). Following the manufacturer’s instructions, apply aerosol until the panel alarms.

A sensor that fails any of these tests should be cleaned as described under **CLEANING**, and retested. If the sensor fails after cleaning, it must be replaced and returned for repair.

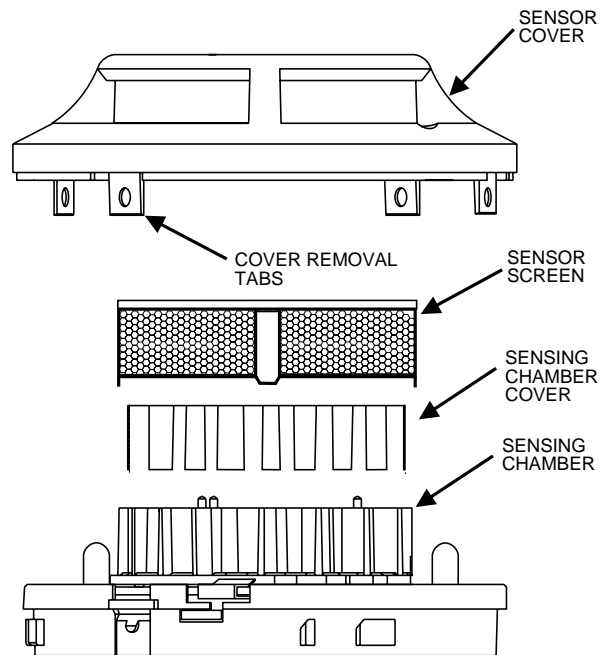
When testing is complete, restore the system to normal operation and notify the proper authorities that the system is back in operation.

Figure 2. Test magnet position:

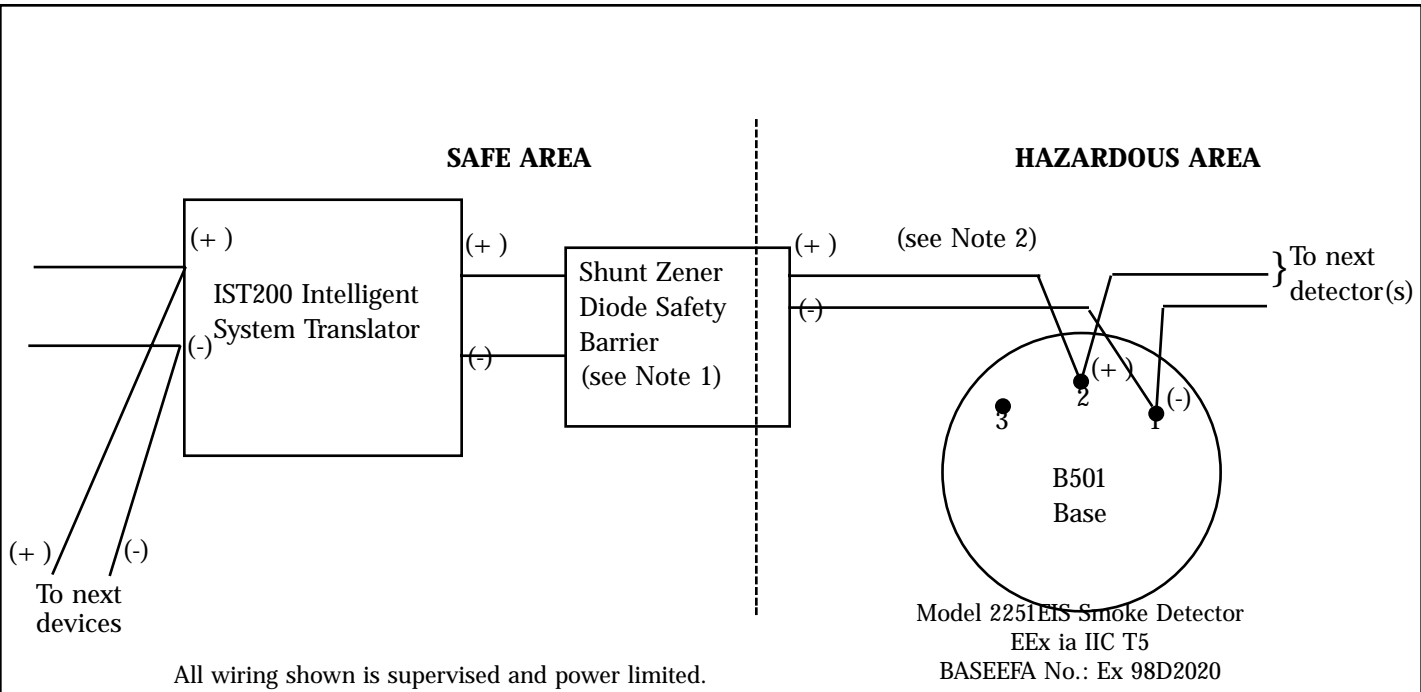


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Figure 3. Sensor assembly:



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Group	Capacitance μF	Inductance mH	L/R Ratio $\mu\text{H}/\text{ohm}$
IIC	0.083	4.20	55
IIB	0.65	12.6	165
IIA	2.15	33.6	440

Table 1: Terminals 1 and 2 (B501 Base)

NOTE:

1. Any single channel shunt zener diode safety barrier, or single channel of a dual channel shunt zener diode safety barrier certified by BASEEFA or any EEC approved certification body to [EEx ia] IIC having the following, output parameters may be used:

$U_o = 28\text{V}$	OR	$U_z = 28\text{V}$
$I_o = 93.3\text{mA}$	OR	$I_{\text{max: out}} = 93.3 \text{ mA}$
$P_o = 0.66 \text{ W}$	OR	$W_{\text{max: out}} = 0.66 \text{ W}$

In any safety barrier used, the output current must be limited by an internal resistor “R”, such that $I_{\text{max: out}} = U_z/R$.

2. The capacitance and inductance or inductance/resistance (L/R) ratio of the cable connected to the hazardous area between power terminals 1 and 2 (B501) must not exceed the value shown in Table 1 (above).

Cleaning

It is recommended that the detector be removed from its mounting base to facilitate cleaning. The detector is cleaned as follows:

NOTE: Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

1. Remove the detector cover by prying away the four side tabs with a small-bladed screwdriver, and then pulling the cover from the base.
2. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 3, otherwise skip to Step 8.
3. Remove the screen assembly by pulling it straight out (see Figure 3).
4. Remove the sensing chamber cover by pulling it straight out.
5. Clean the vaned chamber piece by vacuuming or blowing out dust and particles.
6. Replace the sensing chamber cover, aligning the arrow on the top with arrow on the printed circuit board.
7. To replace the screen, place it over the chamber assembly, turning it until it snaps into place.
8. Replace the cover using the LEDs to align the cover and then gently pushing it until it locks into place.
9. Reinstall the detector.
10. Test the detector as described in **TESTING**.
11. Reconnect disabled circuits.
12. Notify the proper authorities that the system is back on line.

Please refer to insert for the Limitations of Fire Alarm Systems

Three-Year Limited Warranty

System Sensor warrants its enclosed smoke detector to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this smoke detector. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the repair or replacement of any part of the smoke detector which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Repair

Department, RA # _____, 3825 Ohio Avenue, St. Charles, IL 60174. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to repair or replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

IST200 Intelligent System Translator

For Use With Intrinsically Safe Detectors

Specifications

Input Voltage (V in):	15 to 32 VDC
Output Voltage:	20 to 24 VDC
Input Current:	17mA @ V in = 15V 9.7mA @ V in = 24V
Output Current:	7.6mA maximum

NOTE: Input and output currents assume there are no wiring faults and that the IST200 is loaded per the panel manufacturer's instructions.

Before Installing

This information is included as a quick reference installation guide. Refer to the control panel installation manual for detailed system information. If the IST200 will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect power to the control panel before installing the IST200.

NOTICE: This manual should be left with the owner/user of this equipment.

General Description

The IST200 is intended for use in intelligent, intrinsically safe systems. This translator serves as an interface, allowing the control panel to communicate through a shunt-diode safety barrier to intrinsically safe detectors.

Compatibility Requirements

To insure proper operation, the IST200 shall be connected to listed compatible system control panels only.

Mounting IST200 Devices

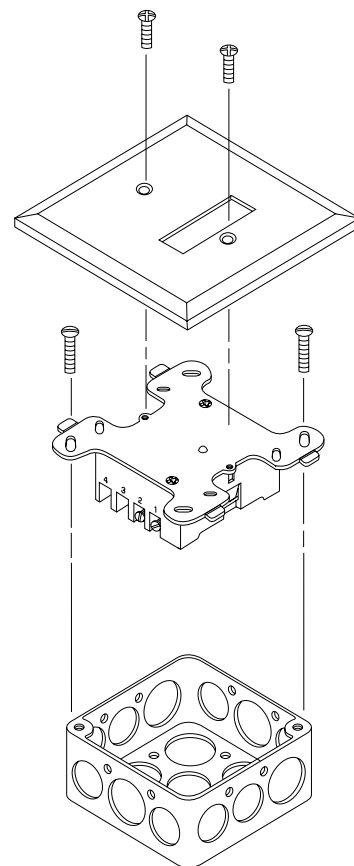
The IST200 mounts directly to a 4" square electrical box, as shown in Figure 1A. The box must have a minimum depth of 2 1/8".

Wiring

NOTE: All wiring must conform to applicable local codes, ordinances and regulations. The translator must be inserted into and attached to a 4"x4"x2 1/8" electrical box.

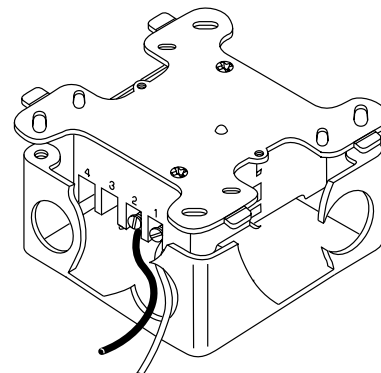
1. Install translator wiring in accordance with the job drawings and appropriate wiring diagrams (Figure 2).
2. Secure translator to electrical box (supplied by installer), as shown in Figure 1A.

Figure 1A. IST200 mounting:



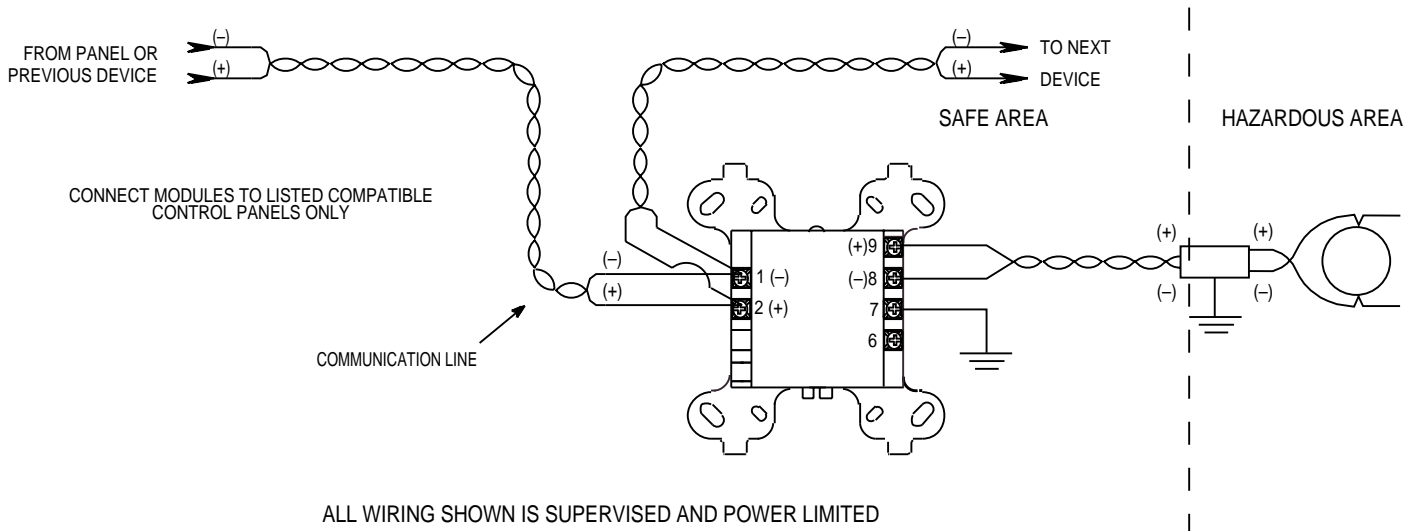
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Figure 1B. Electrical box cut-away view:



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Figure 2. System wiring diagram:



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NOTE:

1. Any single channel shunt zener diode safety barrier, or single channel of a dual channel shunt zener diode safety barrier certified by BASEEFA or any EEC approved certification body to [Ex ia] IIC having the following, output parameters may be used:

$$U_z = 28V$$

$$I_{max: out} = 93.3 \text{ mA}$$

$$W_{max: out} = 0.66 \text{ W}$$

In any safety barrier used, the output current must be limited by an internal resistor "R", such that $I_{max: out} = U_z/R$.

2. It is recommended that all installation wires be shielded and properly grounded.

Three-Year Limited Warranty

System Sensor warrants its enclosed translator to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this translator. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the repair or replacement of any part of the translator which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Repair Depart-

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