

# 2551HR Plug-in Intelligent Photoelectronic Sensors with Communications



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## Specifications

Diameter:	6.1 inches (15.5 cm) installed in B501B 4.0 inches (10.2 cm) installed in B501
Height:	3.2 inches (8.1 cm) Add 0.5 inches (1.3 cm) for thermal models
Weight:	9.6 ounces (272 g)
Installation Temperature Range	2551: 32° to 120° F (0° to 49° C) 2551T: 32° to 100° F (0° to 38° C)
Installation Humidity Range:	10% to 93% Relative Humidity
Mounting:	B501B flanged base B501 flangeless base B501 with RMK400 recessed mounting kit
Maximum Air Velocity:	3000 Ft./Min. (15 m/S)
Voltage Range:	15 to 32 Volts DC Peak
Standby Current:	230 $\mu$ A @ 24 VDC
LED Current:	6.5 mA @ 24 VDC

## Before Installing

Please thoroughly read the system wiring and installation manual, which provides detailed information on sensor spacing, placement, zoning, and special applications. Copies of these manuals are available from System Sensor.

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

**IMPORTANT:** These detectors must be tested and maintained regularly following NFPA 72 requirements. These detectors should be cleaned at least once a year.

## General Description

The model 2551HR photoelectronic sensors utilize a state-of-the-art, optical sensing chamber. These sensors are designed for use with duct housings DH500 and DH500AC/DC only, and to be used with compatible control panels only. Connect detectors only to compatible control units. (For installation in Canada, refer to CAN/ULC-S524-M86, Standard for the Installation of Fire Alarm Systems and CEC Part 1, Sec. 32.)

Two LEDs on each sensor light to provide a local 360° visibility of the sensor indication. The LEDs can be latched ON by code command from the panel for an alarm indication. The LEDs can also be unlatched to the normal condition by code command. Remote LED annunciator

capability is available as an optional accessory (part no. RA400Z).

## Wiring Guide

Refer to the installation instructions for the particular plug-in base being used: 1) for the B501B base (D550-01-01); 2) for the B501 base (D550-02-00); 3) for the RMK400 used with the B501 base (D450-07-00). Bases are provided with screw terminals for power, ground, and remote annunciator connections (see Figure 1).

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

**NOTE:** Verify that all sensor bases are installed and that the wiring polarity is correct at each base.

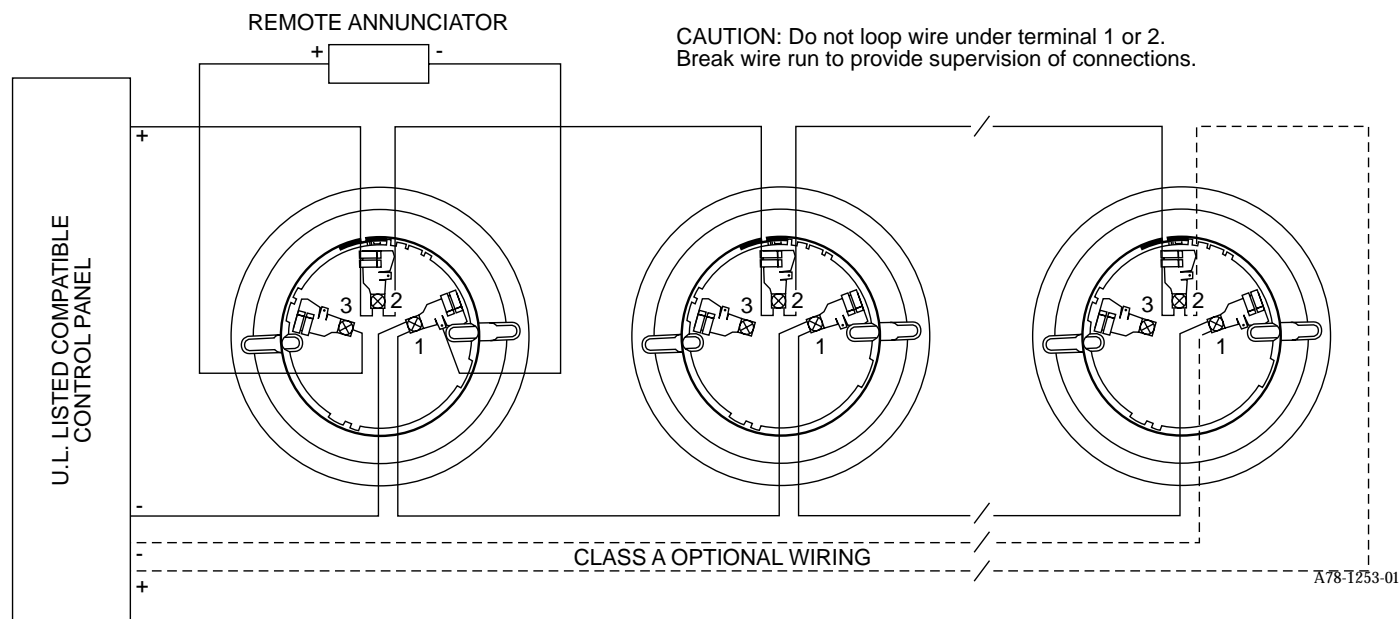


Remove power from the loop before installing sensors.

## 1. Install sensors:

- Verify that the sensor type matches the type written on the label on the base.
- Set the sensor to a desired address and then write the address on the label on the base.
- Place the sensor into the sensor base.

Figure 1. Wiring Diagram:



- d. Turn the sensor clockwise until it drops into place.
- e. Continue turning the sensor clockwise until it locks into place.

**WARNING**

Sensor will not detect smoke if dust cover is installed.

2. Tamper-proof feature:

The sensor bases include a tamper-proof feature that, when activated, prevents removal of the sensor without the use of a tool. See the installation instruction manual for the sensor base for details in using this feature.

3. After all sensors have been installed, apply power to the control unit.
4. Test all sensors per the TESTING section of this manual.

Testing

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

Sensors must be tested after installation and periodic maintenance. The sensor may be tested in the following ways:

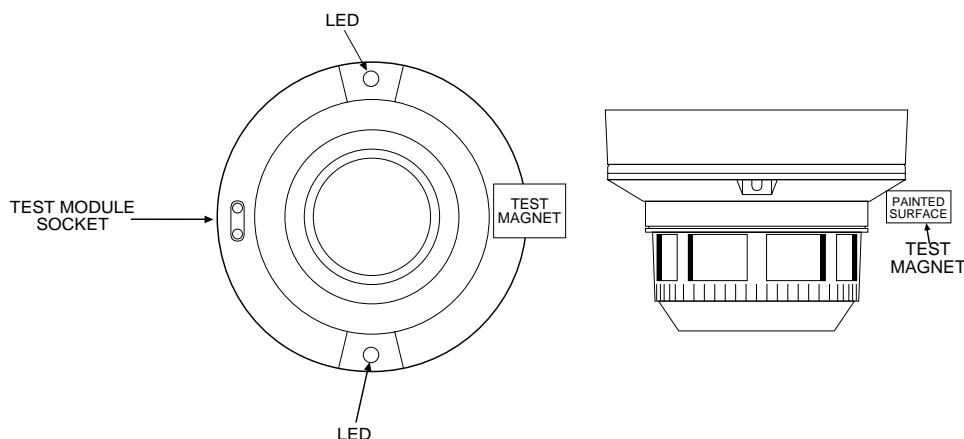
A. Test Magnet (Model No. M02-04-00)

1. Place the magnet against the cover opposite the test module socket to activate the test feature (see Figure 2).
2. The LEDs should latch on within 10 seconds indicating alarm and annunciating the panel.

B. Test Module (Model No. MOD400R)

The MOD400R is used with your DMM or voltmeter to check the sensor sensitivity as described in the MOD400R's manual.

Figure 2. Views showing position of test magnet (model 2551HR shown):



A78-1410-02

**NOTE:** If the sensor's sensitivity limits or the MOD400R limits do not appear on the back of the sensor, the MOD400R is not suitable for field sensitivity testing of that unit.

#### C. Smoke Entry Test per NFPA 72

The field test tool is the Gemini Model 501 aerosol generator. Set the generator to represent 4%/ft to 5%/ft obscuration as described in the Gemini 501 manual. Using the bowl shaped applicator, apply aerosol until unit alarms. If the Gemini unit is not available, a punk, cotton wick, or cigarette are acceptable means of generating smoke to test all System Sensor ionization and photo-electronic sensors.

**NOTE:** This test only verifies proper operation of the sensor and is not used to test sensitivity.

After testing, detectors must be reset from the control panel. Notify the proper authorities that the system is back on line.

Sensors that fail these tests should be cleaned as described under CLEANING and retested. If the sensors still fail these tests they should be returned for repair.

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#### **CAUTION**

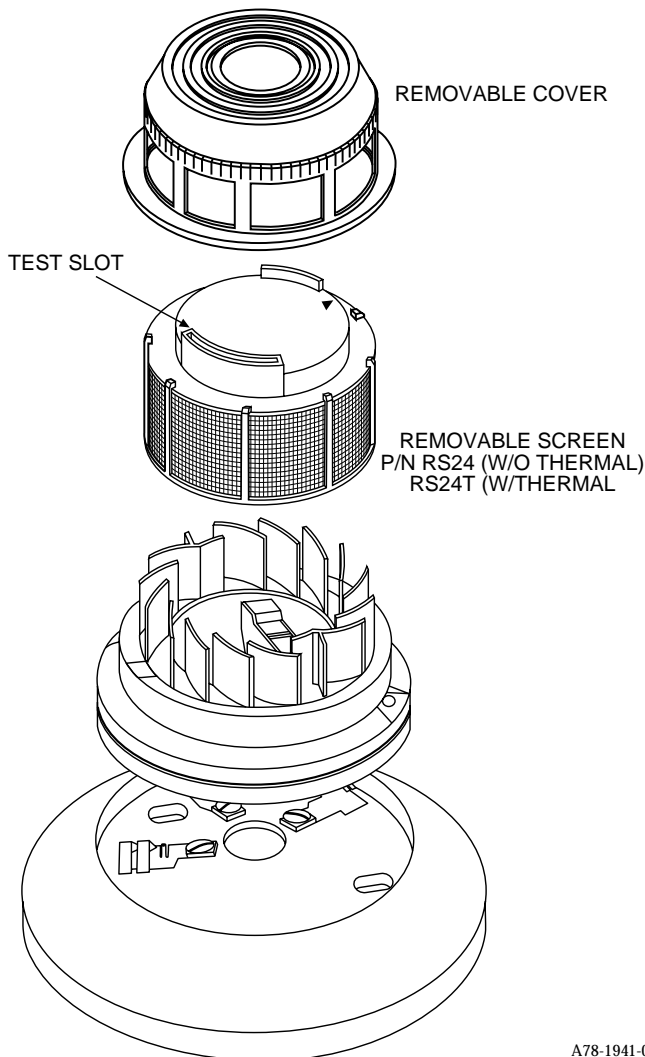
Dust cover is not a substitute for removing sensor during new construction or heavy remodeling. Cover only helps limit dust entry.

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#### Cleaning the Sensor

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

Figure 3:



It is recommended that the sensor be removed from its mounting base to facilitate easier cleaning (see Figure 3). The sensor is cleaned as follows:

1. Remove the sensor cover by placing a small bladed screwdriver in the side slot of the sensor cover, twisting it slightly until the cover can be turned counterclockwise for removal.
2. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 3, otherwise skip to Step 6.
3. Remove the screen by pulling it straight out. Vacuum the inside.
4. Clean the vaned chamber piece by vacuuming or blowing out dust and particles.
5. To replace the screen, orient it so that the arrow on top aligns with the field test slot on the base of the detector. Carefully push the screen onto the base making sure it fits tightly to the chamber.
6. Replace the cover by gently rotating it clockwise until it locks in place.

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**⚠ WARNING**

The Limitations of Property Protection Smoke Detectors

This smoke detector is designed to **activate and initiate** emergency action, but will do so only when it is used in conjunction with an authorized fire alarm system. This detector must be installed in accordance with NFPA standard 72.

**Smoke detectors will not work without power.** AC or DC powered smoke detectors will not work if the power supply is cut off.

**Smoke detectors will not sense fires which start where smoke does not reach the detectors.** Smoldering fires typically do not generate a lot of heat which is needed to drive the smoke up to the ceiling where the smoke detector is usually located. For this reason, there may be large delays in detecting a smoldering fire with either an ionization type detector or a photoelectric type detector. Either one of them may alarm only after flaming has initiated which will generate the heat needed to drive the smoke to the ceiling.

Smoke from fires in chimneys, in walls, on roofs or on the other side of a closed door(s) may not reach the smoke detector and alarm it. A detector cannot detect a fire developing on another level of a building quickly or at all. For these reasons, detectors **shall be located on every level and in every bedroom within a building.**

**Smoke detectors have sensing limitations, too.** Ionization detectors and photoelectric detectors are required to pass fire tests of the flaming and

smoldering type. This is to ensure that both can detect a wide range of types of fires. Ionization detectors offer a broad range of fire sensing capability but they are somewhat better at detecting fast flaming fires than slow smoldering fires. Photoelectric detectors sense smoldering fires better than flaming fires which have little, if any, visible smoke. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is always best, and a given detector may not always provide early warning of a specific type of fire.

In general, detectors cannot be expected to provide warnings for fires resulting from inadequate fire protection practices, violent explosions, escaping gases which ignite, improper storage of flammable liquids like cleaning solvents which ignite, other similar safety hazards, arson, smoking in bed, children playing with matches or lighters, etc. Smoke detectors used in high air velocity conditions may have a delay in alarm due to dilution of smoke densities created by frequent and rapid air exchanges. Additionally, high air velocity environments may create increased dust contamination, demanding more frequent maintenance.

**Smoke detectors cannot last forever.** Smoke detectors contain electronic parts. Even though smoke detectors are made to last over 10 years, any part can fail at any time. Therefore, smoke detectors shall be replaced after being in service for 10 years. The smoke detector system that this detector is used in must be tested regularly per NFPA 72. This smoke detector should be cleaned regularly per NFPA 72 or at least once a year.

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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 Depart-

ment, 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.