

521LX and 521LXT Addressable Smoke Detectors

Description

The Model 521LX and 521LXT Smoke Detectors are the industry's finest smoke detectors, with analog features such as remote maintenance reporting (CleanMe™), drift compensation, and multi-criteria detection. These smoke detectors incorporate an addressable single-point module for connection to the Keypad bus or LX-Bus™ of an XR500 and XR100 Series, XR2500F, XR200, or XR200-485 Command Processor™ Panel. The 521LXT also includes multi-criteria fast response heat sensor algorithms for a broad range of fire detection.

Single Point Addressable

Incorporated is a factory mounted, addressable single-point zone expander on the back of the smoke detector. The included 4-wire harness allows a direct connection to the Keypad bus or LX-Bus of an XR500 and XR100 Series, XR2500F, XR200, or XR200-485 panel. The integrated zone expander reports smoke detector alarm and service conditions to the panel as a single zone. A TXD LED is also included, which flashes to confirm device polling.

CleanMe™ Remote Maintenance/Trouble Reporting Feature

These detectors have a unique feature that allows a service signal to be sent to the panel when the smoke detector has drifted outside UL sensitivity ranges or a hardware fault exists. In most cases, the signal is the result of the detector becoming dirty over time and, as a result, has become oversensitive. This condition could result in a false alarm. The CleanMe™ signal enables the panel to receive a service signal allowing an installer time to clean the detector by replacing the inexpensive optical chamber with a new DMP Model 525. This service information can be transmitted to the central station.

Self-Diagnostics with Automatic Sensitivity Testing

Each photoelectric smoke detector monitors its own sensitivity and operational status. Once a day, and immediately upon first power up, the detector performs a full diagnostic test that includes a sensing chamber and internal electronics dynamic test. If the detector drifts out of its sensitivity range or fails internal diagnostics, the alarm LED flashes once every second to indicate trouble. This meets NFPA 72 field sensitivity testing requirements without the need for external meters.

Built-In Drift Compensation

The detector is the industry's first addressable smoke detector with built-in drift compensation. Automatically adjusts sensitivity, up to a maximum of 1.0%/ft., as it becomes dirty. This feature increases immunity to dust and dirt by 30 to 50%.

Installation

Consult the Local Authority Having Jurisdiction (AHJ) and NFPA 72 for specific installation information regarding smoke detector spacing, placement, and special applications.

The detector wires directly to the panel 4-wire Keypad bus or LX-Bus. See **Compatible LX-Bus Interface Cards**. When wired to the LX-Bus, the detector uses only one of the available expansion zone numbers allowing the assignment of additional zone expanders to the next zone number address. See **Addressing the 521LX and LXT**.

Locking the Detector

Each detector head is equipped with a breakaway locking tab slot to prevent unauthorized detector head removal. For installations where unauthorized removal of the detector head is not a concern, such as high ceilings, no action is required. Remove the head by simply turning counterclockwise.

When the head must lock to the base, simply break away the locking tab and the knock out for the screwdriver slot with a pair of pliers. To remove the detector head, insert a small screwdriver through the slot at the side of the base and press in while simultaneously turning the detector head counterclockwise. See Figure 1.

Installing the Mounting Base

The included mounting base makes the smoke detector easy to install and remove if necessary. The detector head simply twists off of its 4.75" mounting base.

The mounting base connects directly to standard single-gang electrical boxes, 3-inch round, or 4-inch octagonal boxes. The base may also be mounted without electrical boxes if approved by the AHJ or if codes allow.

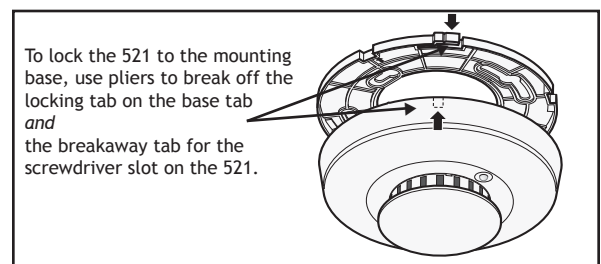


Figure 1: Locking Mount on 521LX/LXT Mount

Mounting the Detector Head

To install a detector head, simply line up the raised marking on the side of the detector with the arrow on the mounting base. Insert the head and rotate it clockwise approximately 15 degrees to snap the locking tab into place. See Figure 2.

Removing the Detector Head

To remove the detector head, simply turn counterclockwise. If the locking tab slot is removed, insert a small screwdriver into the locking tab slot on the side of the base and press in while simultaneously turning the detector head counterclockwise as shown in Figure 2.

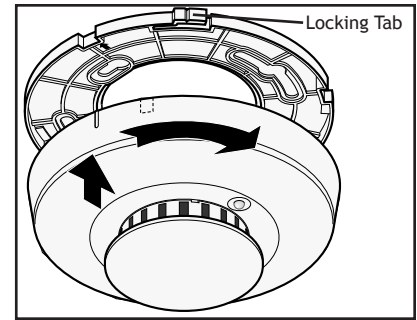


Figure 2: Installing the 521LX/LXT on the Base

Wiring

First, pull wire through electrical box, then through the mounting base center opening. Connect the 4-wire harness to the J1 terminal according to the wiring diagram in Figure 3.

Addressing the 521LX and LXT

Addressing requires setting two on-board rotary switches to match the LX-Bus zone number address. Set the switches to match the last two zone number digits. For example, on an XR500 panel, to assign the detector to zone number 569 on LX-Bus 1, set the left rotary switch (labeled TENS) to 6 and the right rotary switch (labeled ONES) to 9, as shown in Figure 4. To assign to zone number 623 on LX-Bus 2, set the left rotary switch to 2 and the right rotary switch to 3.

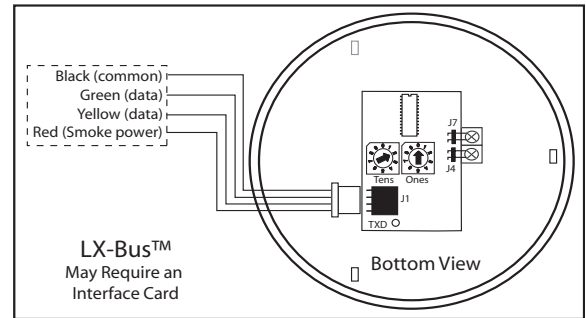


Figure 3: 521LX/LXT Wiring

Testing Each Detector

All 521LX and 521LXT smoke detectors ship with a plastic dust cover for use in areas where construction is continuous. Smoke detectors do not work with the dust cover in place. Remove the dust cover after installation is completed and, prior to testing. Also, disconnect alarm notification appliances, releasing service devices, and extinguishing systems prior to performing detector tests. Be sure to reconnect all devices at testing conclusion.

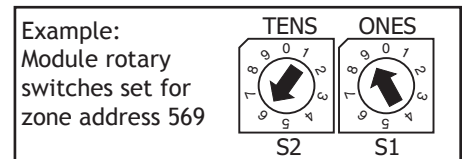


Figure 4: Address switches

Per NFPA 72, “all smoke detectors shall be tested in place annually, to ensure smoke entry into the sensing chamber and alarm response. Testing with smoke or listed aerosol acceptable to the manufacturer, shall be permitted.” Annual functional testing is best accomplished using Smoke! In a can, Model 526, available from DMP. Carefully follow the directions on the can.

The detector performs a smoke test every nine seconds while its LED flashes. If smoke is detected, the rate of sampling increases to every 4.5 seconds. Excessive smoke must be detected in three consecutive tests for the alarm to sound. Therefore, when testing the detector with smoldering punks or cotton wicks, hold the smoke source near the opening for smoke entry and gently direct smoke into the detector for 20 seconds or until an alarm is indicated.

BE SURE TO PROPERLY EXTINGUISH THE SMOKE SOURCE AFTER TESTING!

Testing the detector with Smoke! In a Can or with a smoking punk only serves as a simple go/no go test. If the test is successful, the LED remains lit. For in-depth sensitivity testing see **Sensitivity Level Test Mode**.

If testing is unsuccessful, reset the detector by performing a panel Sensor Reset. Snap off the detector cap by prying it loose with a screwdriver placed in the slot in the base of the cap as shown in Figure 5. Release the tabs on each side of the optical chamber to remove the chamber. Then, blow or brush off the optical block base and snap a new optical block chamber in place, replace the cap and verify sensitivity with the Sensitivity Level Test.

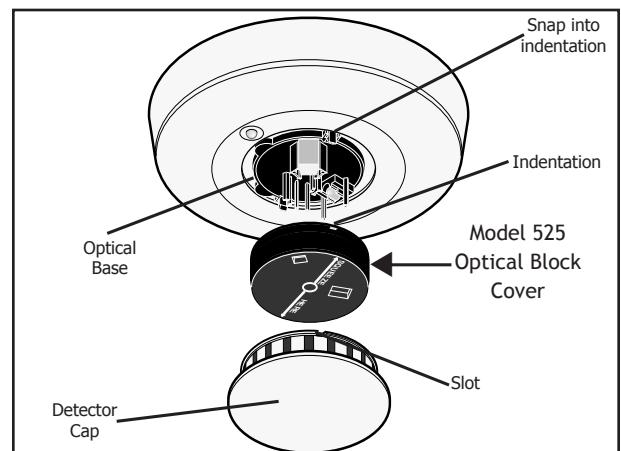


Figure 5: 521LX/LXT Optical Sensing Chamber

Sensitivity Level Test Mode

Each smoke detector also includes a special sensitivity level test mode activated by holding a magnet near the integral reed switch for more than one second. See Figure 6. Once the routine starts, the alarm LED flashes one to nine times, indicating actual sensitivity and whether or not service is required. See the **521 Sensitivity Table**.

After the sequence of blinks, if the sensitivity is found to be within limits and if all other tests pass, the detector goes into alarm until reset by the panel.

If the sensitivity is not within limits, or an unserviceable hardware fault is detected, the alarm LED continues to flash once per second until the detector is reset by the panel. If the sensitivity test is not within guidelines, take action as recommended in the **521 Sensitivity Table**.

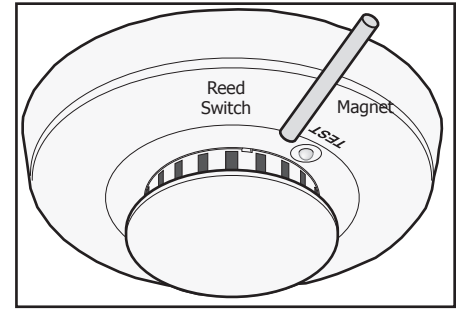


Figure 6: Sensitivity Testing the 521LX/LXT

| Approximate Obscuration (% ft.) | Blinks | Indication | Action |
|---------------------------------|--------|--|---|
| Photo | | | |
| | 1 | | Reset unit and re-run sensitivity test, if indication remains the same, replace unit. |
| 4.35 | 2 | Detector is not sensitive enough. | Clean per instructions. Reset unit and re-run sensitivity test, if indication remains the same, replace unit. |
| 3.85 | 3 | | |
| 3.60 | 4 | Detector is within sensitivity limits. | None |
| 3.10 | 5 | | |
| 2.60 | 6 | | |
| 2.10 | 7 | Detector is too sensitive. | Check to be sure optical block cover is snapped down completely. Clean per instructions. |
| 1.85 | 8 | | |
| 1.35 | 9 | | |

Table 1: 521 Sensitivity Table

Smoke Detector Dip Switches

If there are dip switches to the left of the screw terminals, they are factory preset and must not be changed.

Maintenance, Cleaning, and Sensitivity

The smoke detectors are designed for easy field service and maintenance. If a smoke detector drifts beyond its approved sensitivity range for more than 24 hours or fails internal diagnostic tests during power-up, the unit automatically indicates trouble by flashing its LED every second. Under normal conditions the LED flashes every nine seconds. Therefore, a simple visual check of the LED status meets NFPA 72 field sensitivity testing requirements without the need for external meters or ladders. In accordance with NFPA 72-7-3.2.1, smoke detector sensitivity should be checked within one year after installation and every alternate year thereafter, in commercial installations, or every three years in residential sites.


The photoelectric detector sensing chamber unsnaps for easy field cleaning and service. Whenever the status LED indicates cleaning is necessary, remove the photoelectric detector cap, snap off and throw away the optical block. Then blow or brush off the optical block base and snap a new optical block chamber back in place (see Figure 5), replace the cap and verify sensitivity with the Sensitivity Level Test.

Wiring Specifications

When planning an LX-Bus™ and keypad bus installation, keep in mind the following specifications:

1. DMP recommends using 18 or 22-gauge **unshielded** wire for all keypad and LX-Bus circuits. **Do Not** use twisted pair or shielded wire for LX-Bus and keypad bus data circuits. To maintain auxiliary power integrity when using 22-gauge wire do not exceed 500 feet. When using 18-gauge wire do not exceed 1,000 feet. Install an additional power supply to increase the wire length or add devices.
2. Maximum distance for any one circuit (length of wire) is 2,500 feet regardless of the wire gauge. This distance can be in the form of one long wire run or multiple branches with all wiring totaling no more than 2,500 feet. As wire distance from the panel increases, DC voltage on the wire decreases.
3. Maximum number of devices per 2,500 feet circuit is 40.
Note: Each panel allows a specific number of supervised keypads. Add additional keypads in the unsupervised mode. Refer to the panel installation guide for the specific number of supervised keypads allowed.
4. Maximum voltage drop between the panel (or auxiliary power supply) and any device is 2.0 VDC. If the voltage at any device is less than the required level, add an auxiliary power supply at the end of the circuit. When voltage is too low, the devices cannot operate properly.

For additional information refer to the 710 Installation Sheet (LT-0310) and or the LX-Bus/Keypad Bus Wiring Application Note (LT-2031).

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|--|---|-----------------|-----------------|-----------------|-------|---------------|------|----------------|--------------------------------|---------------------------|----------------------|-----------------------|-----------------|--------------------------|-------------------------|--------------|-----------------------------|------------------------|--------|--------------|------------------------|---------------|------------|--------------------|---------------|--------------------------|------------------------|---------------------|----------------------------|-------|---------------------|
| <p>Listings and Approvals Underwriters Laboratories (UL) Listed UL 268 Smoke-Automatic Fire Detectors New York City (MEA) California State Fire Marshal (CSFM)</p> <p>LX-Bus Interface Cards 462N, 462P, 472, and 481</p> <p>Accessories 521LXTPCB Replacement Smoke Detector Board 525 Replacement Optical Chamber 526 Smoke! in a Can™</p> <p>Trademark CleanMe™ is a trademark of Sentrol, Inc.</p> | <p>Specifications</p> <table><tbody><tr><td>Operating Range</td><td>8.8 to 15.0 VDC</td></tr><tr><td>Standby Current</td><td>8.8mA</td></tr><tr><td>Alarm Current</td><td>28mA</td></tr><tr><td>Maximum Ripple</td><td>10% (V_{p-p}) peak to peak</td></tr><tr><td>Sensitivity Photoelectric</td><td>3.1% + 0.50 to 1.00%</td></tr><tr><td>Operating Temperature</td><td>32° F to 100° F</td></tr><tr><td>Operating Humidity Range</td><td>0 to 95% non-condensing</td></tr><tr><td>RFI Immunity</td><td>20V/m minimum; 0 to 1000MHz</td></tr><tr><td>Heat Sensor (LXT Only)</td><td>135° F</td></tr><tr><td>Rate of Rise</td><td>15° F/min and > 105° F</td></tr><tr><td>Power Up Time</td><td>15 seconds</td></tr><tr><td>Drift Compensation</td><td>1.0%/ft. max.</td></tr><tr><td>Detector Head Dimensions</td><td>5" Diameter, 2" Height</td></tr><tr><td>Mounting Dimensions</td><td>4.75" Diameter, .3" Height</td></tr><tr><td>Color</td><td>White Head and Base</td></tr></tbody></table> | Operating Range | 8.8 to 15.0 VDC | Standby Current | 8.8mA | Alarm Current | 28mA | Maximum Ripple | 10% (V_{p-p}) peak to peak | Sensitivity Photoelectric | 3.1% + 0.50 to 1.00% | Operating Temperature | 32° F to 100° F | Operating Humidity Range | 0 to 95% non-condensing | RFI Immunity | 20V/m minimum; 0 to 1000MHz | Heat Sensor (LXT Only) | 135° F | Rate of Rise | 15° F/min and > 105° F | Power Up Time | 15 seconds | Drift Compensation | 1.0%/ft. max. | Detector Head Dimensions | 5" Diameter, 2" Height | Mounting Dimensions | 4.75" Diameter, .3" Height | Color | White Head and Base |
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| Color | White Head and Base | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  <p>800-641-4282 www.dmp.com Made in the USA</p> | <p>INTRUSION • FIRE • ACCESS • NETWORKS 2500 North Partnership Boulevard Springfield, Missouri 65803-8877</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |