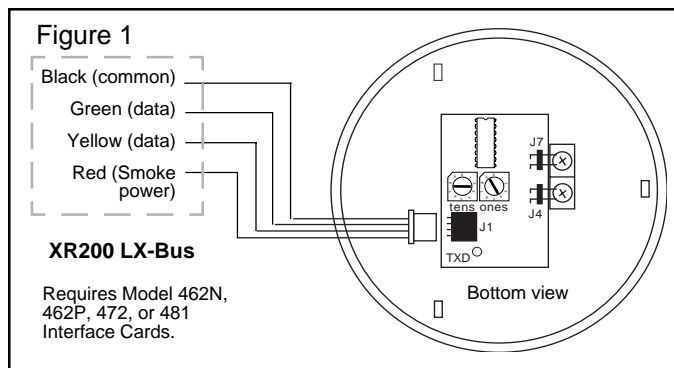


## Description

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 LX-Bus™ of an XR200 Command Processor™ Panel with firmware version 1.04 (6/11/98) or higher. The 521LXT also includes multi-criteria fast response heat sensor algorithms for detection of a broad range of fires.

## Single Point Addressable

The 521 incorporates 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 LX-Bus of an XR200 panel. The integrated zone expander reports smoke detector alarm and service conditions to the panel as a single zone. Also included is a TXD LED that flashes when data is sent to the XR200 panel.



**521 Power and Data Bus Wiring**

## CleanMe™ Remote Maintenance/Trouble Reporting Feature

The 521 detectors have a unique feature that allows a service signal to be sent to the XR200 when the smoke detector has drifted outside UL sensitivity ranges or a hardware fault exists. In most cases, the signal will be the result of the detector becoming dirty over time and, as a result, are over sensitive. This condition could result in a false alarm. The CleanMe™ signal enables the XR200 to receive a service signal allowing an installer time to clean the detector by replacing the inexpensive optical chamber with a new one (DMP Model 525). This service information can be transmitted to the Central Station.

## Self-Diagnostics with Automatic Sensitivity Testing

Each 521 photoelectric smoke detector monitors its own sensitivity and operational status. Once a day, and immediately upon first power up, it performs a full diagnostic test that includes a dynamic test of the sensing chamber and internal electronics. 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.

## Drift Compensation Built-In

The 521 detector is the industry's first addressable smoke detector with built-in drift compensation. The 521 automatically adjusts sensitivity, up to a maximum of 1.0%/ft., as it becomes dirty. This feature increases immunity to dust and dirt by 30-50%.

## Installation

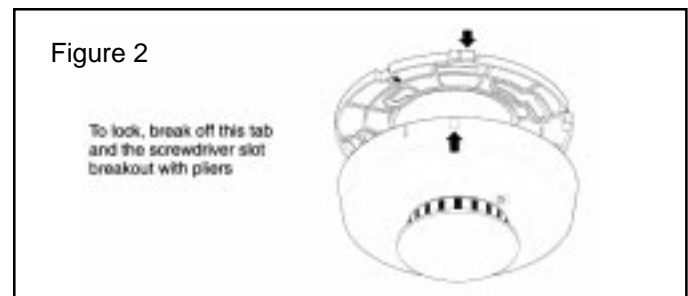
Consult Local Authority Having Jurisdiction (AHJ) and NFPA 72 for specific installation information regarding smoke detector spacing, placement, and special applications.

The 521 detectors wire directly to the XR200 panel 4-wire LX-Bus™. See **Compatible LX-Bus Interface Cards**. When wired to the panel LX-Bus, the 521 uses only one of the available expansion zone numbers allowing you to assign additional zone expanders to the next zone number address. See **Addressing the 521LX and LXT**.

## Consider the Locking Mechanism BEFORE Installation

Each 521 detector head is equipped with a break away locking tab slot to prevent unauthorized removal of the detector head. For installations where unauthorized removal of the detector head is not a concern, i.e. high ceilings, no action is required. The head can be removed by simply turning counterclockwise.

However, 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. Then, to remove the detector head, insert a small screwdriver into the slot of the side of the base and press in while simultaneously turning the detector head counterclockwise (see Figure 2).



CleanMe™ is a trademark of Sentrol, Inc.



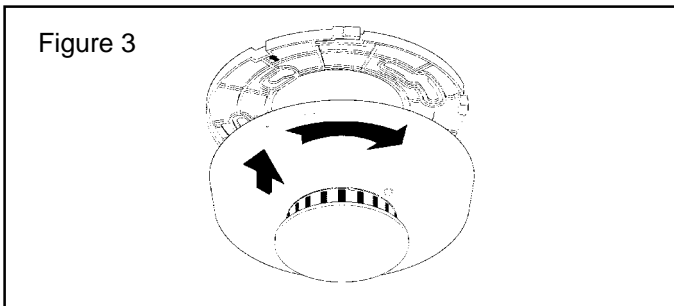
## Installing the Mounting Base

The mounting base included with each 521 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, three-inch round, or four-inch octagonal boxes. The base may also be mounted without electrical boxes if approved by the AHJ or if codes allow.

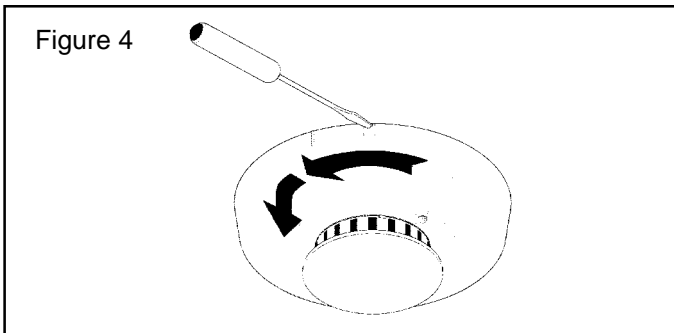
## Installing the Detector Head to Mounting Base

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 into place (see Figure 3).



## Removing the Detector Head

To remove the detector head, simply turn counterclockwise. However, if the locking tab slot has been 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 (see Figure 4).



## Wiring

First, pull wire through electrical box, then through center opening of the 521 mounting base. Connect the 4-wire harness to the J1 terminal according to the wiring diagram in Figure 1.

Follow the wiring in Figure 1 when connecting the 521 detector to the XR200 LX-Bus. The maximum distance for any one LX-Bus circuit is 2,500 feet. The maximum number of LX-Bus devices on any one 2,500 foot circuit is 40. To increase the wiring distance and/or number of devices, you must install a DMP 710 Bus Splitter/Repeater Module. Refer to page 4 for more information about the Model 710.

## Addressing the 521LX and LXT

Addressing the 521 requires setting two on-board rotary switches to match the address of the XR200 LX-Bus zone number. For zone numbers 100 to 199, set the switches to match the last two digits of the zone number. For example, to assign the 521 detector to zone number 120, you would set the left rotary switch (labeled "TENS") to 2 and the right rotary switch (labeled "ONES") to 0.

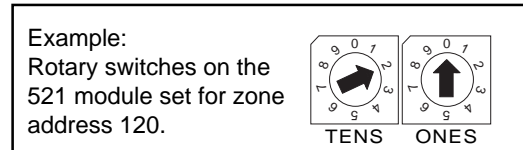


Figure 5: Address switches

## Testing Each Detector

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

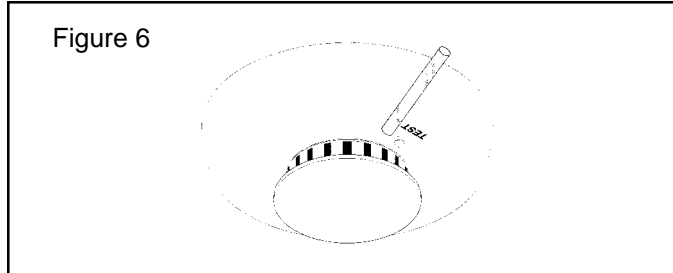
Per NFPA 72, "all smoke detectors shall be tested in place annually, to ensure smoke entry into the sensing chamber and alarm response. Testing with smoke or listed aerosol acceptable to the manufacturer, shall be permitted." Annual functional testing is best accomplished using Smoke! In a can, Model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

The detector performs a smoke test every 9 seconds while flashing its LED. 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!**

This is a gross, go/no-go test and is not a reliable indication of detector sensitivity. If it is successful, the LED will remain lit. For in-depth sensitivity testing, see Sensitivity Level Test Mode below. Reset the detector, then blow or brush off the optical block base and snap a new optical block chamber (see Figure 8) back in place, replace the cap and verify sensitivity with the Sensitivity Level Test.

## Additional Diagnostics Available with Sensitivity Level Test Mode

Each smoke detector also includes a special sensitivity level test mode that is 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 will flash one to nine times, indicating actual sensitivity and whether or not service is required.



After the sequence of blinks, if the sensitivity is found to be within limits and if all other tests pass, the detector will go into alarm until reset by the panel. If the sensitivity is not within limits, or an unserviceable hardware fault has been detected, the alarm LED will continue to flash once per second until the detector is reset by the panel. If sensitivity test indicates an unacceptable level, take action recommended above. See the 521 Sensitivity Table.

Approximate Obscuration (%ft.)	Blinks	Indication	Action
<b>Photo</b>			
	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	<b>Detector is within sensitivity limits</b>	<b>None</b>
3.10	5		
2.60	6		
2.10	7		
1.85	8	Detector is too sensitive	Check to be sure optical block cover is snapped down completely. Clean per instructions.
1.35	9		

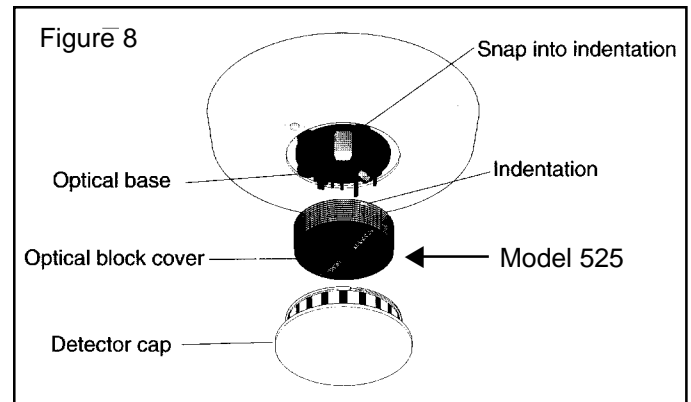
Figure 7: 521 Sensitivity Table

## Smoke Detector Dip Switches

If the 521 smoke detector includes dip switches to the left of the screw terminals, they are factory preset and must not be changed.

## Maintenance, Cleaning & Sensitivity

The 521 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 9 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 sensing chamber of the 521 photoelectric detector 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 (see Figure 8) back in place, replace the cap and verify sensitivity with the Sensitivity Level Test.

## Compatible LX-Bus Interface Cards

The following Expansion Interface Cards are compatible with the 521 smoke detectors: 462N, 462P, 472, and 481.

## Specifications

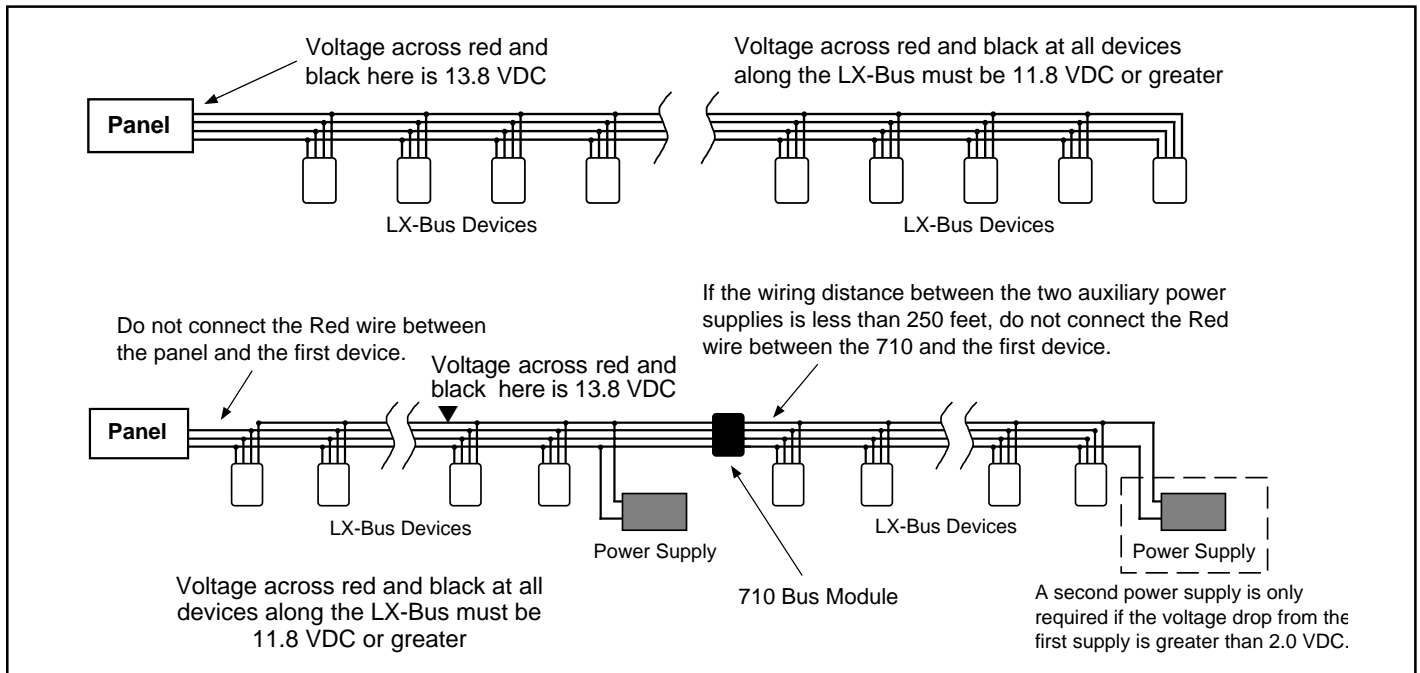
Operating range	8.8 - 15.0 VDC
Maximum ripple (pk to pk)	10% ( $V_{P-P}$ )
Standby operating current	8.8 mA
Alarm operating current	28 mA
Sensitivity photoelectric	3.1% +0.50-1.00%
Operating temperature	32°F to 100°F
Operating humidity range	0 to 95% Non-condensing
RFI Immunity	20V/m minimum; 0-1000 MHz
Color	White head and base
Heat sensor (LXT only)	135°F
Rate of rise:	15°F/min and >105°F
Power-up time	15 seconds
Drift compensation adjustment	1.0%/ft. max.
Detector head dimensions:	5" diameter 2" height
Mounting dimensions:	4.75" diameter .3" height
Listings	UL 268

# LX-Bus™ Installation Specifications

Three factors determine the performance characteristics of the DMP LX-Bus™: the *length* of wire used, the *number* of devices connected, and the *amount* of current required by the devices. The three specifications to keep in mind when planning an LX-Bus installation are:

1. **Maximum cumulative distance** for any one LX-Bus circuit is 2,500 feet. This number can be increased to 50 if the wire run remains under 2,000 feet.
2. **Maximum number of LX-Bus devices** per 2,500 feet is 40 regardless of the gauge of wire. This distance can be in the form of one long wire run or multiple branches with all wiring totalling no more than 2,500 feet.
3. **Maximum voltage drop** between the panel (or auxiliary power supply) and any device connected to the LX-Bus is rated at 2.0 VDC. As an example of the voltage drop, if the voltage across the red and black wires at the panel is 13.8 VDC the voltage measured at each device on the circuit must be equal to or greater than 11.8 VDC.

If the voltage at any device, including a 710 module, is less than the required level, a UL listed auxiliary power supply should be added at the end of the circuit. (The voltage drop can also be reduced by increasing the gauge of wire used on the circuit.) The 2.0 VDC rule applies to LX-Bus circuits powered either by the panel or by an auxiliary power supply.



## Multiple LX-Bus circuits

In this example, the first 710 module is in close proximity to the panel. At this point, the 710 is used to branch the LX-Bus into three separate circuits. Each of these circuits can be run a distance of 2,500 feet. At the end of the 2,500 feet, another 710 module can be installed to add another 2,500 feet of LX-Bus capability.

**Note:** The total distance of all circuits cannot exceed 15,000 feet.

