

Installation Instructions for the MX250 and MX250TH Multiplex Photoelectric Smoke Detectors

1.0 Description

The MX250 and MX250TH are UL Listed, open-area multiplex photoelectric smoke detectors. The MX250TH has a built-in 135°F ±5°F (57°C ±2.7°C) heat detector.

For commercial and industrial installations, 30 ft. (9.2 m) spacing between detectors is recommended (in accordance with NFPA 72). An LED indicator flashes every 3 to 8 seconds to verify that the detector has power and that the smoke sampling circuitry is functioning. The LED will flash at least once per second in the event of an alarm, allowing the user easy verification of individual detector alarms. The detector will automatically reset after the alarm condition has been cleared.

2.0 Specifications

- Control Panel Requirements:** The MX250 and MX250TH are designed for use with the DS7400Xi series Control Communicators with a DS7430 or DS7436 Multiplex expansion Module installed. The DS7400Xi requires ROM Version 3.09 or greater. The DS9400M AddressiFire 255 Series Fire Alarm Control/Communicator or the DS9400i equipped with a DS9431. The DS9400i and DS9400M must have software revision 2.0 or greater. D8125MUX Multiplex Bus Interface.
- Base Requirements:** Requires a MXB2W detector base.
- Installation Temperature:** +32 to +100°F (0 to +38°C). 0 to 93% relative humidity (non-condensing).
- Minimum Voltage:** 8 VDC peak
- Standby Current:** 0.5 mA @ 12 VDC
- Alarm Current:** 0.56 mA @ 12 VDC
- Power-up Time:** 22 seconds maximum.
- Patents:** The MX250 and MX250TH smoke detectors are protected by one or more of the following patents: #5,400,014, #5,543,777, #D339,078, and #DES,293,089.

3.0 Installation

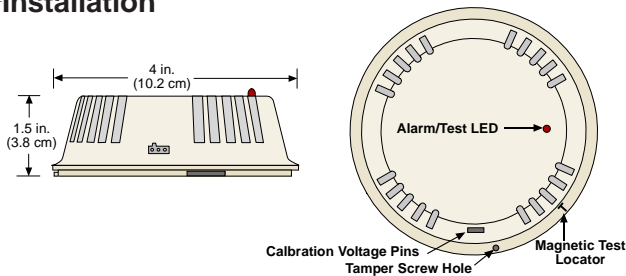


Figure 1: Side and Top View of MX250



The number of multiplex smoke detectors allowed on the multiplex bus is determined by the wire gauge and the total wire length of the bus. See Table 1 below, or refer to the following calculations. (Also refer to the documentation for the panel and the multiplex interface). Maximum line resistance should not exceed 30 ohms.

Calculations:

$$[(2.2/\text{Total line resistance})/1.02] \times 1000 = \text{Max. number of detectors}$$

$$[1000/(1.02 \times \text{number of detectors})] \times 2.2 = \text{Total line resistance max}$$

Wire Size	Wire Length			
	5,000 ft. (1,520 m)	4,000 ft. (1,320 m)	3,000 ft. (910 m)	2,500 ft. (760 m)
#18 AWG (1.2 mm)	66	82	110	120
#16 AWG (1.5 mm)	106	120	120	120

Table 1: Max. number of Smoke Detectors allowed per Mux Bus.

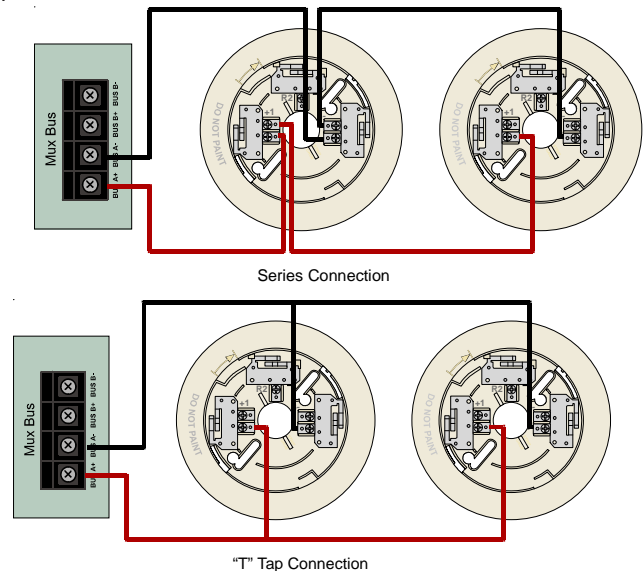


Do not use shielded cable.

For DS9400 FACP wiring requirements, refer to the DS9431 Multiplex Expansion Module Installation Guide (P/N: 41381).

For D8125MUX Multiplex Bus Interface module wiring requirements, refer to *Operation and Installation Guide* (P/N: 36796).

MXB2W Base Wiring The MXB2W bases may be wired in a series or "T" tap method.



When using the Multiplex Bus for smoke detectors on a DS7400Xi, you cannot connect other types of detectors to the same multiplex bus. Use a separate bus for the other detectors.

Before mounting, remove the dust cover from the detector. The dust cover may be replaced during construction periods, but **must be removed once the alarm system is enabled.**

3.0 Setting the Address



The MX250's address must be set before connecting to the control panel and applying power. The Address number will be the same as the Input Point or Zone number.

The MX250's address is set by positioning three rotary switches located on the front side of the device. The switches will click when turned. The valid address range is 9 to 255.

Use a flat-bladed, single point screwdriver to position each switch when setting the MX250's address. See Figure 2 for details.

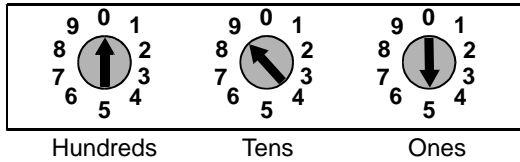


Figure 2: Setting the MX250's Address

4.0 Mounting

Before mounting, remove the dust cover from the detector. The dust cover may be replaced during construction periods, but must be removed once the alarm system is enabled.

NOTE: The Tamper screw is located in the recess on the top of the dust cover.

Mount and wire the base in accordance with its instructions.

Mount the detector to the base by turning it clockwise until it clicks into place. When it is secure, the alignment line will be lined-up with the tamper screw hole (see Figure A).

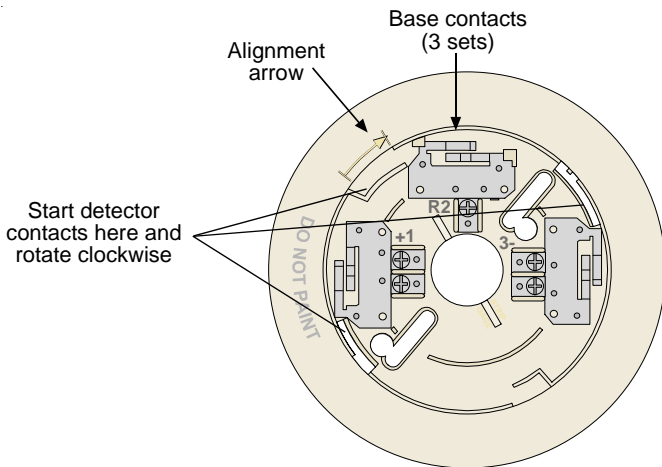


Figure A - Mounting to the base

Note: The detectors are "keyed" and should not be forced onto the bases.

5.0 Control Panel Programming

See the control panel reference guide for multiplex programming information.

6.0 Operational Testing



It is important to notify all concerned parties prior to any maintenance or testing of the fire alarm system, and then again after completion.

Apply power to the system. Check for alarms.

NOTE: if any detectors are in alarm (as indicated by 1 flash or more per second) and then shut the system down if there are any alarms. Remove these detectors and recheck for proper wiring. If the problems persist, replace the affected detectors or swap them with known good units. This will determine if the problem is caused by the detector.

When the system is free of alarms, check each detector to ensure that the red LED indicator is flashing approximately every 3 to 8 seconds. This verifies that the detector is operating properly.

Test each detector to ensure it will cause a control panel alarm.

To alarm the detectors, do one of the following:

- Place a magnet horizontally against the detector's side (centered over the T marked on the head) to activate an internal reed switch,
- Use a UL Listed Aerosol smoke detector tester such as the Home Safeguard Industries' 25S to simulate an alarm. Follow the instructions with the Aerosol smoke detector tester.

NOTE: When a detector alarms, the red LED indicator will activate and flash at least once per second. Be sure to clear the alarm by initiating a System Reset before proceeding to the next detector.

7.0 Sensitivity Testing



The calibration of the detector is very important in determining its continued operation. Depending on local regulations, the frequency of calibration testing may be required more often than once a year. The National Fire Protection Association (NFPA) Standard 72, "The National Fire Alarm Code" recommends calibration tests be made at installation, then every other year, and Functional testing should be done monthly.

The sensitivity can be tested (to meet NFPA 72 "The National Fire Alarm Code" requirements) using either the magnet test or measuring the calibration voltage pins using a TC2000 Test Cable. The calibration can also be quickly determined by a visual inspection of the detector's LED (see the Visual Check section below). These tests will confirm whether or not the detector is within its factory marked calibration range.

7.1 Sensitivity Test (DS9400M FACP)

The FACP is able to run an automatic sensitivity test on the smoke sensors and display the results at the panel. Refer to the control's reference guide for details.

7.2 Visual Check

This detector includes the Chamber Check Automatic Trouble Indication which allows the detector to automatically indicate if its calibration is out of the factory listed range. This allows you to meet the NFPA guidelines for sensitivity testing by visually inspecting the detector and checking the flash rate of the LED.

If the calibration is out of range for more than 24 hours, the alarm LED on the detector will begin to double flash. The LED will flash approximately once every 3 to 8 seconds when the detector is operating normally.

NOTE: Perform the visual check on all detectors before disconnecting the multiplex bus. Disconnecting the multiplex bus will erase this indication. If the detector has been disconnected or the panel has been fully depowered within the last 24 hours, you should use the magnet test or voltage output to confirm the sensitivity.

7.3 Magnet Test



When performing the Magnet Test, the control panel must be in the "Fire Walk Test" mode prior to performing the test. If not in the "Fire Walk Test" mode, the control panel will send fire reports to the central station. See your control panel reference guide for Fire Walk Test information.

Hold a magnet horizontally against the detector, centered over the "T" on the housing, for about ten seconds. Observe the LED.

- If the detector is within the factory marked calibration range, it will go into alarm and the alarm LED will blink at least once per second.
- If the detector is too sensitive, the LED will flash six times rapidly (once every 1/2 second) and then the detector will go into alarm.
- If the detector is not sensitive enough, the LED will flash four times slowly (once every two seconds) and then the detector will go into alarm.
- If the detector is not operational, it will not signal an alarm. Return the unit for repair.

7.4 Voltage Measurement Test

Plug a TC2000 Test Cable (an option) into the calibration voltage pin.

Connect a digital voltmeter to the TC2000 Test Cable. Connect the negative terminal of the meter to the black wire of the TC2000 and connect the positive terminal of the meter to the test cable's red wire.

The white wire of the TC2000 is not used.

- The voltage measured by the voltmeter equals 1/2 the sensitivity (in %/ft. obscuration) of the MX250 smoke detector.
- Multiply the voltage by 2. The result should be within the factory marked calibration range printed on the label on the bottom of the detector.

If the detector is outside of the factory marked calibration range, it should be removed and cleaned, or replaced as described in Section 8.0.

After cleaning:

- Recheck the calibration voltage measurement.
- If the detector is still outside of the factory marked calibration range after cleaning, return the unit to the factory for recalibration.

7.5 Thermistor Test (MX250TH only)

Expose the thermistor to a heat source such as a hair dryer or a shielded heat lamp. Expose the thermistor until the detector goes into alarm and the alarm LED latches on. Do not touch the thermistor directly.

NOTE: Be sure to clear each alarm for each test before proceeding to the next detector.

8.0 Maintenance

NOTE: It is important to notify all concerned parties prior to any maintenance or testing of the fire alarm system, and then again after completion of these activities.

At least once a year, the detector and base should be cleaned. Use a vacuum or clean/dry compressed air. Particular attention should be paid to the screens. In dusty areas or areas of heavy insect concentration, cleaning may be required more often.

To clean the detectors, perform the following:

- Remove the detector from the base. Clean the base with a clean cloth and common window cleaner.
- Remove the cover of the detector. Use a thin, flathead screwdriver to pry the chamber from the cover. Insert the screwdriver into the cover slots and pry up (See Figure B ①). Remove the cover of the detector chamber.

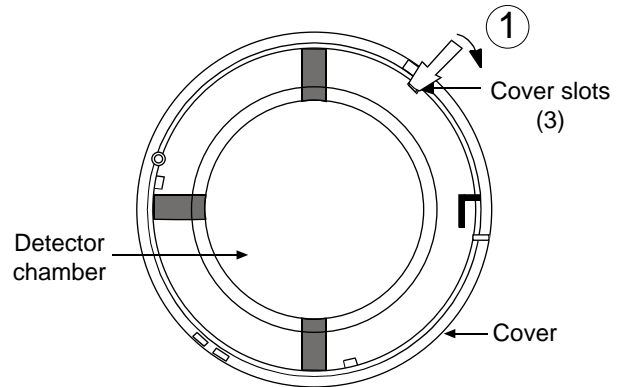


Figure B - Removing the detector's cover

- Gently pull the chamber cover up and away from the chamber (See Figure C ②).

FCC COMPLIANCE NOTICE:

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry and Science Canada. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

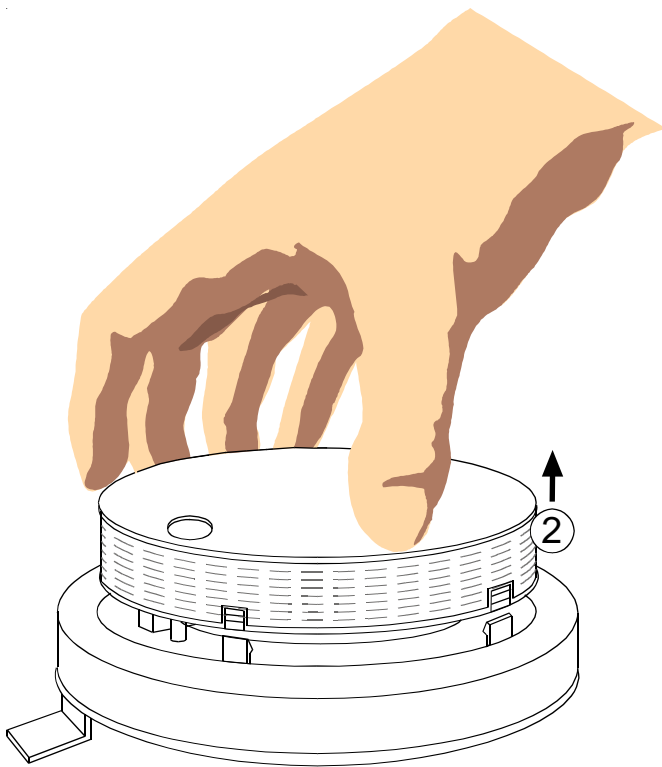


Figure C - Removing the detector chamber cover

- With the chamber cover removed, clean the inside of the cover with a vacuum or clean/dry compressed air. Do not clean with water.
- Replace the chamber cover. Make sure the hole for the LED (and thermistor) is properly aligned over the LED (and thermistor). For easiest results, place the cover parallel to the chamber, then gently snap the locking tabs into place.
- Replace the detector's cover. Be careful to line up the holes for the LED (and thermistor).
- Return the detector to its base.



The detectors should be tested for proper calibration after cleaning. Use one of the tests described in Section 6.0.

IMPORTANT

- Do not paint the detectors. Paint or other foreign matter covering the screens may prohibit or retard smoke from entering the detector.

