

# D7050/D7050TH Multiplex Photoelectric Smoke Detectors

## Installation Guide

### 1.0 Notice

These instructions cover the installation of Radionics' D7050/D7050TH Multiplex Photoelectric Smoke Detectors on a Radionics' D7024 24 VDC Fire Alarm Control /Communicator with a D7039 Multiplex Expansion Module installed. The D7024 requires ROM version 2.0 or greater.

Install, test and maintain the D7050/D7050TH according to these instructions, NFPA 72, Local Codes and the Authority Having Jurisdiction (AHJ). Failure to follow these instructions may result in failure of the device to operate properly. Radionics is not responsible for improperly installed, tested or maintained devices.

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.



**These instructions contain procedures to follow in order to avoid personal injury and damage to equipment.**

### 2.0 Device Description

The D7050/D7050TH is UL Listed, open-area multiplex photoelectric smoke detectors. The D7050TH has a built-in 135°F  $\pm 5^\circ\text{F}$  (57°C  $\pm 2.7^\circ\text{C}$ ) heat detector. These detectors are designed for use with the D7024 FACP with a D7039 Multiplex Expansion Module. Each detector requires the use of a D7050-B6 detector base.

For commercial and industrial installations, 30 ft. (9.2 m) spacing between detectors is recommended (in accordance with NFPA 72).

**Note:** Smoke detectors mounted on a wall must be at least 4 in. (10.2 cm), but no more than 12 in. (30.5 cm), below the ceiling.

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.

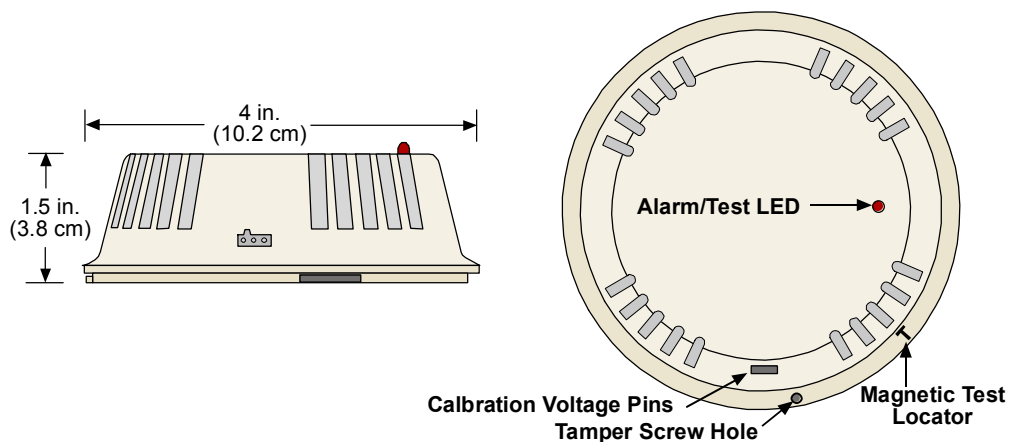


Figure 1: D7050/D7050TH Side and Top View

# D7050/D7050TH

## Installation Guide

### 3.0 Installing the D7050/D7050TH



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 calculation (also refer to the documentation for the D7024 FACP and the D7039 Multiplex Expansion Module). Max line resistance should not exceed 30 ohms.

#### Calculations:

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

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

| Wire Size           | D7050/D7050TH Wire Lengths |                        |                      |                      |
|---------------------|----------------------------|------------------------|----------------------|----------------------|
|                     | 5,000 ft.<br>(1,520 m)     | 4,000 ft.<br>(1,320 m) | 3,000 ft.<br>(910 m) | 2,500 ft.<br>(760 m) |
| #18 AWG<br>(1.2 mm) | 66                         | 82                     | 110                  | 120                  |
| #16 AWG<br>(1.5 mm) | 106                        | 120                    | 120                  | 120                  |

Table 1: Maximum number of Detectors Allowed per MUX Bus

**Note:** For multiplex bus wiring requirements, refer to the D7039 Multiplex Expansion Module Installation Guide (P/N: 38685).



Do not use shielded cable.

### 4.0 Wiring the D7050-B6 Base

The D7050-B6 Base may be wired in Series or "T"-tap. See Figure 2.

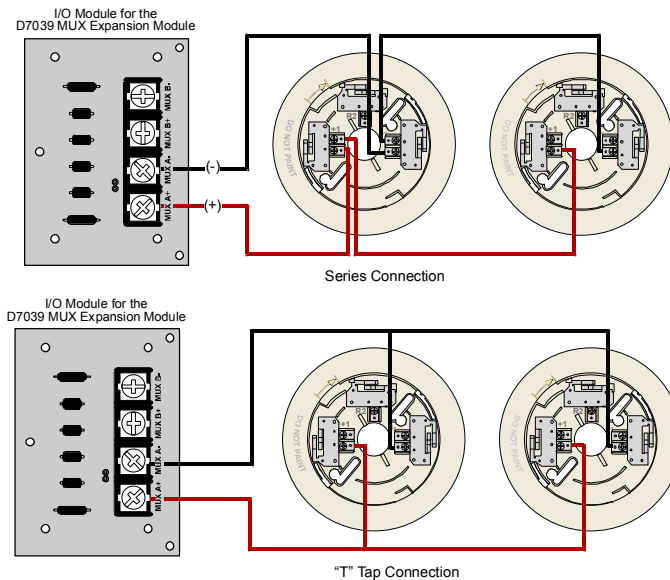


Figure 2: D7050-B6 Base Wiring

**Note:** When using the multiplex bus for smoke detectors on a D7024, you cannot connect conventional types of detectors to the same multiplex bus. Use a separate bus for other detectors.



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

## 4.0 Setting the Address



*The D7050'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 D7050'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 009 to 255.

Use a flat-bladed, single point screwdriver to position each switch when setting the D7050's address. See Figure 3 for details.

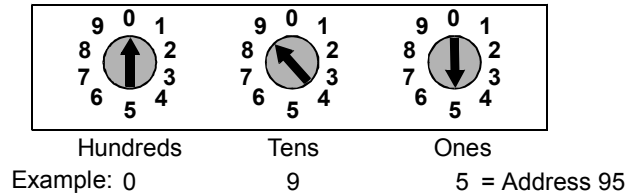


Figure 3: Setting the D7050's Address

## 5.0 Mounting the D7050/D7050TH

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 4).

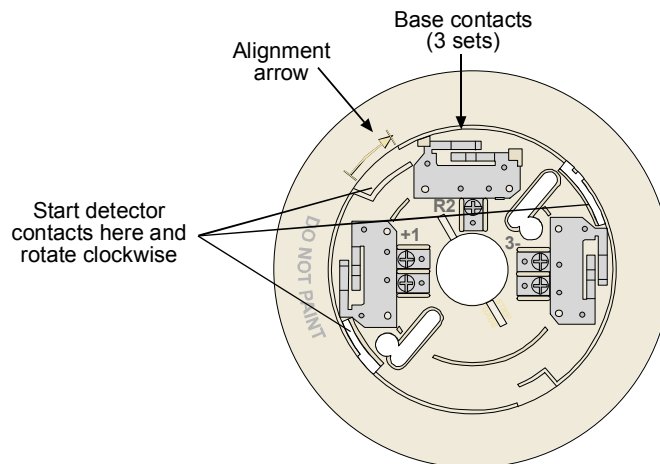


Figure 4: Mounting to the Base

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

## 6.0 Programming the D7050/D7050TH

See the control panel reference guide for multiplex programming instructions.

# D7050/D7050TH

## Installation Guide

### 7.0 Testing the D7050/D7050TH



**Test in accordance with NFPA Chapter 7-1.6.2 (1999)**

Test detection devices immediately after installation. Test smoke detectors according to Chapter 7, NFPA 72 or more often as required by local code.

### 7.1 Operational Testing



**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.*

### 7.2 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. NFPA72 recommends calibration tests be made at installation, then every other year, and functional testing should be done monthly.**

Sensitivity can be tested to meet NFPA 72 requirements by conducting a magnet test (see Section 7.3), or by measuring the calibration voltage pins using a TC2000 Test Cable (see Section 7.4). The calibration can also be quickly determined by a visual inspection of the detector's LED (see Section 7.2.2). These tests will confirm whether or not the detector is within its factory marked calibration range.

#### 7.2.1 Sensitivity Test

The control panel constantly monitors the D7050/D7050TH smoke detectors. Should the detector exceed the limits of the sensitivity thresholds, the panel will report the detector in question and generate a fault condition.

#### 7.2.2 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 during power up or 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

- 1) Plug a TC2000 Test Cable (an option) into the calibration voltage pin.
  - 2) Connect a digital voltmeter to the TC2000 Test Cable.
  - 3) 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 D7050 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 7.1.
  - 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 (D7050TH 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 Maintaining the D7050/D7050TH

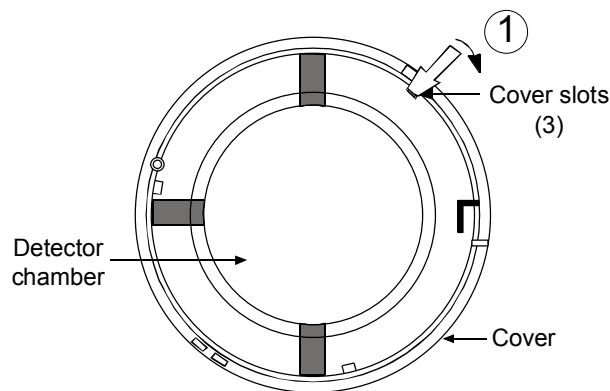


**Notify all concerned parties prior to any maintenance or testing of the fire alarm system, and then again after completion.**

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. If cleaning the chamber is not a desirable option, it can be replaced using the RC3-10 Replacement Chamber.

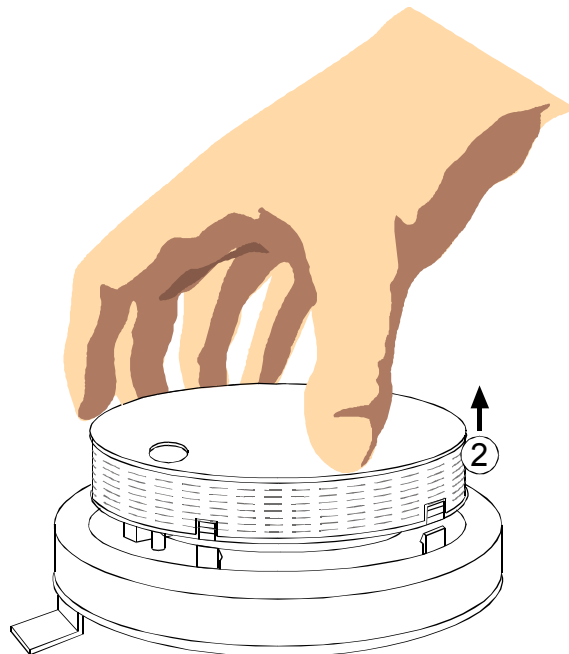
To clean the detectors, perform the following:

- 1) Remove the detector from the base. Clean the base with a clean cloth and common window cleaner.
- 2) 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 5 Step 1 ). Remove the cover of the detector chamber.



**Figure 5: Remove the Detector Cover**

- 3) Gently pull the chamber cover up and away from the chamber (see Figure 6 Step 2 )



**Figure 6: Remove the Detector Chamber Cover**

# D7050 /D7050TH

## Installation Guide

- 4) With the chamber cover removed, clean the inside of the cover with a vacuum or clean/dry compressed air. Do not clean with water. At this point, instead of cleaning the chamber, you may chose to replace it with an RC3-10 Replacement Chamber.
- 5) 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.
- 6) Replace the detector's cover. Be careful to line up the holes for the LED (and thermistor).
- 7) Return the detector to its base.



***The detectors should be tested for proper calibration after cleaning or replacing the chamber. Use one of the tests described in Section 7.0.***



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

### D7050/D7050TH Specifications

| D7050/D705TH Specifications |                                |
|-----------------------------|--------------------------------|
| Standby Current             | 0.5 mA @ 12 VDC                |
| Alarm Current               | 0.56 mA @ 12 VDC               |
| Minimum Operating Voltage   | 8 VDC peak                     |
| Power-up Time               | 22 seconds max.                |
| Installation Temperature    | +32°F to +100°F (0°C to +38°C) |
| Relative Humidity           | 0 to 93% non-condensing        |
| Required Accessories        | D7050-B6 Detector Base         |
| Options                     | RC3-10 Replacement Chamber     |

