MX 850 Series Addressable Devices

*UL Listed**

Addressable Multi-Sensors (Smoke and Heat), Triple Sensors (Smoke, Heat & CO), Isolator Bases, Sounder Bases, and Accessories

Features

MX Technology addressable smoke sensor, heat sensor and multi-sensor features:

- **Smoke Sensors** provide accurate photoelectric sensing
- **Heat Sensors** provide electronic heat sensing with multiple alarm options
- **Multi-Sensors** combine photoelectric sensing with heat sensing
- **Triple Sensors** combine photoelectric, heat and CO sensing
- **Built-in Isolation features** are contained in each sensor, removing the need for individual isolator devices
- **Sounder Bases** provide multiple tone and volume selections and are available as MX Loop powered, or powered from separate 24 VDC
- **Sounder-Beacon Bases** are loop powered and provide the sounder base functions plus a visible flashing light
- **Accessories** include remote LED indicators, address flags and labels, and base adapters
- Smoke sensors and accessories are listed to UL 268, heat sensors to UL 521

Compatibility:

- For use with Simplex® 4100ES, 4010ES and 4100U Series fire alarm control panels equipped with an MX Loop Module
- Analog sensor information is communicated to the host control panel and analyzed using the MX Fastlogic algorithm
- The MX Fastlogic algorithm uses real fire data as a basis for the alarm decision

Installation and Service Features:

- Each sensor provides an infrared link for use with the MX 850 Engineering Management Tool
- Each sensor comes with an integral dust cover for protection during storage and installation and you easily remove it when commissioning the system
- Unique 'park' position for commissioning and service
- The address flag is attached to the base to minimize errors during service
- You can conveniently program detector addressing using the MX 850 EMT Programming Tool
- Bases with multiple mounting options simplify installation

Description

Rugged Construction. MX compatible 850-Series sensors provide robust and reliable construction which has undergone stringent environmental testing. Electrical contacts are molded into the plastic to eliminate movement. Construction uses durable, fire resistant FR110 plastic.

Detection Modes. MX Sensors communicate to the MX Loop Module using MX Technology communications. Each detector can operate in one or two of several detection modes, thus it is easily optimized to the risk.

4098-5252 Photoelectric Sensor and 4098-5251 Photoelectric Sensor with Heat Sensing

4098-5253 Heat Sensor

Photo Sensor on 4098-5215 Sounder Base

Photo Sensor on 4098-5212 Sounder-Beacon Base

* Listings under Simplex Time Recorder Co. are the property of Tyco Fire Protection Products.

MX Fastlogic Sensor Operation

MX Fastlogic sensor operation is an algorithm that takes into account the pattern of smoke build up over time and applies fuzzy logic to calculate the level of risk. This algorithm uses over 200 years of fire test data from research at the University of Duisburg, Germany to determine the likelihood that there is a real fire and achieves faster detection of real fires and slower, preferably no detection, of false alarm sources.

MX Fastlogic Sensor Basics. The MX Fastlogic algorithm is an expert algorithm because it uses real fire data as a basis for the alarm decision. For any given application we are obliged to employ the most suitable detection in terms of response to an actual fire while minimizing false alarms. This general requirement is clearly reflected in local and national standards governing fire detection system designs.

Traditionally, attempts at reducing the occurrence of false alarms involve degrading the level of fire protection afforded, either by raising the alarm threshold of smoke detectors, introducing delays, or generally employing less responsive detection. MX Fastlogic sensors give us the opportunity to offer an improved level of protection while simultaneously increasing immunity to false alarm.

MX Fastlogic Algorithm - Principle Elements. Several elements of the detector output are monitored and the MX Fastlogic algorithm uses this raw data to execute a series of processes to evaluate the probable presence of fire including:

- Background filtering
- Instantaneous smoke density
- Rate of change of smoke density
- Smoke density weighting
- Smoke density peak suppression
- Real fire 'experience' comparison

Elements synonymous with false alarms are filtered while those elements indicative of fire are weighted. These results are continually compared against data derived from real fires to produce a measure of fire risk. Using this risk measurement, the decision to alarm is made.

Maintain Sensitivity and Minimizing False Alarms. MX Fastlogic sensors are designed to maintain sensitivity to fire while minimizing false alarms. You can select different smoke detector sensitivity settings in many analog detection systems e.g. High, Normal, or Low sensitivity. Lowering the sensitivity setting is a typical reaction to unwanted alarms but it usually means that the detector requires a greater density of smoke to initiate an alarm. This is not the case for detectors using MX Fastlogic operation which compares the real fire experience against recognized fire patterns. Changing sensitivity from 'normal' to 'low' for example, would delay responses to less likely fire patterns while maintaining a normal response to more likely fire patterns. The net result is a reduced sensitivity to possible false alarms without reducing sensitivity to clearly identifiable fires.

MX Fastlogic availability. MX Fastlogic operation is available for MX photoelectric sensors and photoelectric/heat sensors. These devices are used in both life protection and property protection applications providing reliable, early detection of real fires.

Soft Addressing

MX technology sensors and addressable devices are addressed using the 850 EMT Programming Tool which presents a simple menu driven user interface that can automatically increment addresses following each write operation. This simple to use soft addressing technique avoids misaddressing errors that often occur when coded switches are used.

Using the 850 EMT Programming Tool you can also change addresses stored in a sensor or other addressable device's non-volatile memory, which makes addressing errors easy to rectify.

MX 850 EMT Programming Tool

Sensor Details

4098-5253 Heat Sensor with Isolator

4098-5253 Heat Sensor with Isolator. The 4098-5253 Heat Sensor with built-in isolator returns analog temperature readings to the fire alarm control panel for evaluation. Construction includes a high quality thermistor with very low thermal mass so the sensor can provide fast and accurate temperature readings for heat detection determination.

Heat detection settings are selectable at the fire alarm control panel for 135° F (57.2° C) or 200° F (93° C) either with or without rate-of-rise detection.

Application Note: When you use the Heat Sensor 4098-5253 for 200° F setting applications, use only the following bases:

- 4" Continuity Base UL 4B-C 4098-5260
- Sounder Base 4098-5215

Sensor Details *(Continued)*

4098-5252 Photoelectric Sensor with Isolator

4098-5252 Photoelectric Sensor with Isolator incorporates a unique optical chamber design with a signal-to-noise ratio that provides high resilience to dust, dirt, and small insects for reduced service cost. The unique chamber cover actually draws slow moving smoke into the chamber to provide more responsive detection.

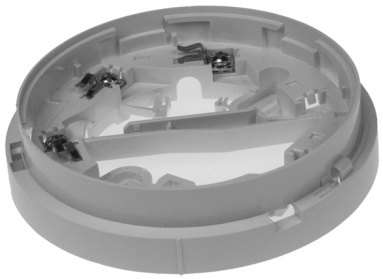
4098-5251 Photoelectric Sensor with Heat Sensing and Isolator

4098-5251 Multi-Sensors provide the features of the 4098-5252 photoelectric sensor with the addition of the heat sensor from the 4098-5253, so the 4098-5251 can satisfy detection applications with multiple risks.

4098-5254 Triple Sensor

4098-5254 Triple Sensor with Isolator incorporates the same 850 series optical and heat sensors, combined with a CO sensor. The Triple Sensor uses powerful algorithms for use in life safety applications, and those where environmental conditions present challenges to standard sensors. It is a multi-sensor device which monitors smoke, heat and CO levels simultaneously to accurately determine the presence of fire.

Base and LED Indicator Details



4098-5260 4” Continuity Base

4098-5260 4” Continuity Base provides the features of a Standard Mounting Base and allows for internal short circuit isolation in the sensors to protect them from electrical shorts on the SLC.

2098-9808 Remote LED Indicator

2098-9808, Remote LED Alarm Indicator. Red LED indicator provides a remote indication that the sensor is in Alarm. Refer to Specifications on page 5 for dimensions.

Additional MX Loop Module Information

For additional information about the MX Loop Module, refer to data sheet S4100-0059.

Sounder and Sounder-Beacon Base Details

4098-5215 Loop Powered
Sounder Base

4098-5212 Loop Powered
Sounder-Beacon Base

General Features:

- Low power sounder and sounder-beacon bases are loop powered from the MX Loop Module
- Provides one point of installation for detector, isolator, and sounder or sounder-beacon
- Listed to UL 464 for general signaling operation

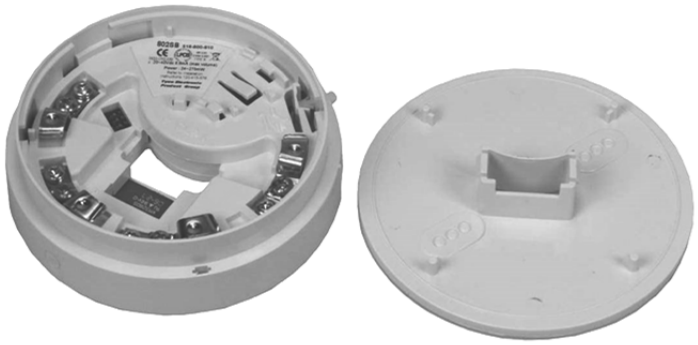
Sounder Base Details:

- Select one of four sounder output levels by programming from the host fire alarm control panel with MX Loop Module:
  - Low, 60 dB
  - Mid Low, 70 dB
  - Mid High, 80 dB
  - High, 90 dB
  - Sound output levels are at 3 ft (1 m)
- Output is set at the sounder or sounder-beacon base for Continuous and then one of five output patterns is selected from the host fire alarm control panel with MX Loop Module:
  - Continuous Tone (970 Hz)
  - Temporal pattern 3 (Fire evacuation)
  - Temporal pattern 4 (CO warning)
  - March Time (60 beats per second)
  - Slow March Time (20 beats per second)
- Sounder bases require a separate address; with sensor, 2 addresses are required for each sounder base with sensor

Sounder-Beacon Base Details:

- Provides the sounder operation detailed above and includes a multiple LED 1.5 cd beacon for local visible notification
- You can select beacon flash rate at the host fire alarm control panel with MX Loop Module as either Slow Flash at ½ Hz, or Fast Flash at 1 Hz
- Sounder-beacon bases require 2 addresses; with sensor, 3 addresses are required for each sounder-beacon base with sensor

Sounder Base Details



4098-5209, 4098-5210, and 4098-5211 Sounder Bases,
Appearance Reference (shown with supplied mounting flange)

You can use sounder bases with the following sensors:

- 4098-5253, Heat Sensor with Isolator
  See application note on page 2
- 4098-5252, Photoelectric Sensor with Isolator
- 4098-5203, Photoelectric/Heat Sensor with Isolator
- 4098-5254, Triple Sensor with Isolator

Multiple output tones are available:

- Tones are activated for each individual address as controlled from the MX Loop Module
- Eight tone selections are available, see detailed list below
- You can select the tone using the DIP switch at the base to satisfy local requirements

You can adjust tone volume at each base:

- For applications requiring reduced sound level, you can adjust output volume at the sounder base using Volume Trimmer Tool 517.050.015

MX Loop Module provides the following tone control selections:

- Temporal 3
- Slow March Time (20 bpm)
- March Time (60 bpm)
- Steady-on (continuous)

Local tone selection options:

- **Continuous** – ***Note****: Select this for use with Temporal 3, Slow March Time, or March Time control from the MX Loop Module*
- The following local tone selections are available for use with the Steady-on (continuous) command from the MX Loop Module:
  - **Temporal 4**
  - **Slow sweep**
  - **March time beep**
  - **Fast sweep**
  - **Temporal 3**
  - **Two tone**
  - **German DIN**
  - **Dutch Slow Sweep**

4098-5209 Addressable Loop Powered (LP) Sounder Base, Low Output:

- MX Loop powered, no separate power connection is required
- Maximum sound level output is 85 dBA @ 3 ft (1 m)
- Maximum alarm current is 6.8 mA, from the MX Loop
- **Note:** Only use 4098-5209 is for supplemental use and not in lieu of notification appliances

4098-5210 Addressable Loop Powered (LP) Sounder Base, Standard Output:

- MX Loop powered, no separate power connection is required
- Maximum sound output is 85 dBA @ 10 ft (3 m)
- Maximum alarm current is 24 mA, from the MX Loop

4098-5211 Addressable 4-Wire Sounder Base:

- Sounder is activated from the MX Loop
- A separate 24 VDC fire alarm power supply using a separate wiring loop supplies power
- Maximum sound output is 90 dBA @ 10 ft (3 m)
- Maximum alarm current is 20 mA, from the separate fire alarm power supply

Product Selection

Model	Description	Installation Instructions
4098-5251	Photoelectric/Heat Sensor with Isolator	579-1088
4098-5252	Photoelectric Smoke Sensor with Isolator	579-1088
4098-5253	Heat Sensor with Isolator	579-1088
4098-5254	Triple Sensor with Isolator	579-1088
4098-5215	Addressable Loop Powered Sounder Base, selectable volume	579-1085
4098-5212	Addressable Loop Powered Sounder-Beacon Base, selectable volume and selectable flash rate	
4098-5209	Addressable Loop Powered Low Power Sounder Base, 85 dB maximum @ 3 ft (1 m)	579-939
4098-5210	Addressable Loop Powered Standard Power Sounder Base, 85 dB maximum @ 10 ft (3 m)	579-925
4098-5211	Addressable 4-Wire Sounder Base, 90 dB maximum @ 10 ft (3 m)	579-926
4098-5260	4” Addressable Continuity Base 4B-C UL	579-1089
4098-5261	4” Detector Base for use when isolation is not required	579-1089
2098-9808	Remote LED Alarm Indicator for use with the bases listed above	—

Sensor Accessories

Model	Description	Installation Instructions
4098-5276	Address Flags (pack of 100)	Refer to base instructions
4098-5277	Address Flag Labels	
516.850.900	850 EMT Programming Tool (infrared com link to head)	120.515.058
516.800.922	Spare ancillary programming lead for 850 EMT	—
516.800.924	Package of 10 spare pins for ancillary programming lead	—
516.800.923	Accessory Kit; carrying case, shoulder strap, and 12 V automobile adaptor	—
517.050.060	Ceiling Tile Adaptor (CTA), use to mount sensors to suspended ceilings; allows commissioning and testing before ceiling is installed	Refer to base instructions
517.050.058	Ceiling Tile Adaptor Plate, use to mount beacon or sounder bases to the Ceiling Tile Adaptor	
516.800.959	DAB3-4 Mounting Flange-type B for conduit; use to mount 40980-9515 Sounder Bases and 4098-9512 Sounder-Beacon Bases	

Specifications

Current Requirements and Sound Output, Current Supplied by MX Loop (except as noted)

Product	Supervisory	In Alarm/Activated (Note: Does not include Remote LED current)
4098-5253 Heat Sensor	350 µA	4.0 mA maximum in alarm
4098-5252 Photoelectric Sensor	350 µA	
4098-5251 Multi-Sensor	350 µA	
4098-5254 Triple Sensor	350 µA	

Product	Supervisory	Activated Current (Note: Does not include Remote LED current)		
		Flash Rate	Activated Current per Audio Output	
			Low or Mid Low	Mid High or High
4098-5215 Sounder Base	440 µA	—	3.1 mA	5.2 mA
4098-5212 Sounder-Beacon Base	440 µA	½ Hz	6.5 mA	8.5 mA
		1 Hz	7.7 mA	9.7 mA

	Audio Output per Sound Level Selected @ 3 ft (1 m)			
Product	Low	Mid Low	Mid High	High
4098-5215 Sounder Base	60 db	70 dB	80 dB	90 db
4098-5212 Sounder-Beacon Base				

Product	Supervisory	Activated (Note: Does not include Remote Indicator LED current)
4098-5209 LP Sounder Base	200 µA	6.8 mA at full volume of 85 dB @ 3 ft (1 m)
		1.2 mA at low volume
4098-5210 LP Sounder Base	10 µA	24 mA at full volume of 85 dB @ 10 ft (3 m)
4098-5211 4-Wire Sounder Base	5 µA	20 µA from MX Loop
		20 mA **from external 24 VDC power,** full volume of 90 dB @ 10 ft (3 m)

General Specifications

Communications	MX Loop, 1 address for each sensor base
Sounder Base Voltage	18 to 32 VDC; (24 VDC nominal) from fire alarm power supply
Sensor Base Wire Connections	Terminal blocks, for wire size 20 to 14 AWG (0.5 to 2.5 mm^2, or two, 1.5 mm^2)

Operating Temperature Range (for Indoor Use Only)

Product	Operating Temperature
4098-5251 Multi-Sensor with Isolator	32° to 100° F (0° to 38° C)
4098-5254 Triple Sensor with Isolator	
2098-9808 Remote LED Annunciator	
4098-5252 Photoelectric Sensor with Isolator	-13° to 158° F (-25° to 70° C) continuous; up to 194° F (90° C) short term
4098-5260 4" Continuity Base 4B-C UL	
4098-5253 Heat Sensor with Isolator — 135° F (57.2 °C) setting	100° F (38° C) maximum ceiling ambient temperature
4098-5253 Heat Sensor with Isolator — 200° F (93° C) setting	150° F (65.6° C) maximum ceiling ambient temperature

4098-5215 Sounder Base	0° to 38° C (32° to 100° F)	-25° C to 70° C (-13° F to 158° F)
4098-5212 Sounder-Beacon Base		
4098-5209, 4098-5210, and 4098-5211 Sounder Base		
2098-9808 Remote LED Annunciator		

Additional Specifications:

Humidity Range (for indoor use only)		up to 93% RH at 32° C (90° F)
Sensor Dimensions		109 mm x 43 mm (4 ¼" x 1 $^{11}/_{16}$")
Sensors Mounted on	4098-5215 Sounder Base	112 mm x 68 mm (4 ⅜" x 2 $^{11}/_{16}$")
	4098-5212 Sounder-Beacon Base	
	4098-5209, 4098-5210, or 4098-5211 Sounder Base	110 mm x 68.5 mm (4 $^{11}/_{32}$" x 2 $^{11}/_{16}$")
2098-9808 Remote LED Indicator	Dimensions	Overall: 114 mm H x 70 mm W (4 ½" x 2 ¾") Mounting holes: 83 mm (3 $^{9}/_{32}$") apart (standard US single-gang box mounting)
	Current	1 mA
	Connections	Color coded wire leads, 18 AWG (0.82 mm^2)