

## Features

### Connect MX Technology addressable devices to a Simplex 4100ES or 4010ES fire alarm control unit (FACU)

- Connect up to 250 MX addressable devices, with up to 1 A of output current per ESMX Loop module
- Share loop power and addresses across two loops using the optional ESMX loop mezzanine card
- Up to 30 ESMX Loop Interface Modules per 4100ES FACU
- Up to four ESMX Loop Interface Modules per 4010ES FACU
- Provides dual isolated Class B loops that can be connected together for Class A operation
- Device LEDs for alarm activation are selectable per loop as 5, 10, 20 or 30 to be activated simultaneously; LED blink on poll is also selectable per loop
- On-board LED diagnostics indicated module status for installation and service convenience
- Compatible with 4100ES FACUs using ES-PS power supplies and with 4010ES FACUs. You must use software revision 2.03 or higher and MX loop module software 2.01 or higher.
- Supports Local Mode operation when module is mounted in MINIPLEX transponders
- UL listed to Standard 864

### MX Loop communications

- Compatibility with many types of existing cable for convenient retrofit with typical communications distances up to 2 km (6560 ft)
- Wiring lengths may be longer depending on wiring characteristics and other conditions, consult your Simplex product representative for additional details

### Advanced ESMX Loop Module features

- Information communicated to the control panel is analyzed using the MX Fastlogic algorithm
- The MX Fastlogic algorithm is considered an expert algorithm that uses real fire data as a basis for the alarm decision
- WALKTEST system testing with automatic self-resetting is available for silent mode (select SIG OFF)

### MX Peripherals

- Soft addressing of devices performed using the 850EMT programming tool
- Device addresses may be changed at the front panel

### Compatible addressable devices include:

- Smoke sensors, heat sensors, and combination smoke/heat sensors
- Sensor base operation is available with loop powered sounder or sounder-beacon, or with separately powered sounder
- Loop powered beacons and sounder-beacons
- Single, dual, and multiple I/O modules
- Relay, signal, monitor, and separate line-powered isolator modules
- Indoor and outdoor break glass call points
- Single and dual action manual stations
- Voltage Regulator Module 4100-5130 or 4010-9917 provides compatible regulated DC voltage for use with Monitor ZAMS

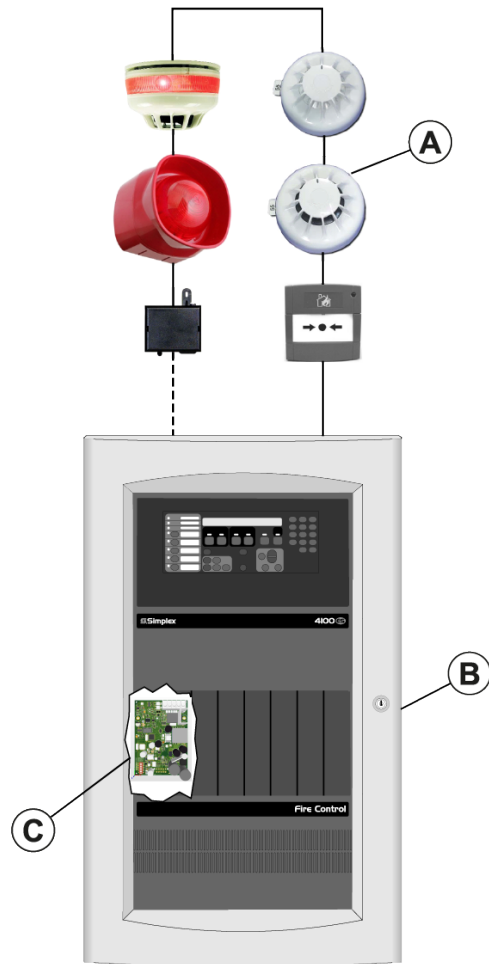


Figure 1: ESMX Loop Interface Module Basic Reference

Callout	Description
A	MX loop with typical device types
B	4100ES FACU shown for reference
C	ESMX loop module

## Description

### System compatibility

For applications requiring compatible Simplex FACU features to be applied to UL listed versions of MX Technology peripherals, the ESMX Loop Interface Module provides the necessary communications, monitoring, and control for up to 250 addressable MX devices per loop. Multiple ESMX Loop Interface Modules can be installed for increased capacity.

### On-board LEDs

LEDs provide service level module status indications for communications, earth monitoring, device response, and loop power status.

### MX Technology features

MX Fastlogic operation for photoelectric sensors and photoelectric/heat combination sensors.

\* This product was not ULC listed or approved by FM, MEA (NYC), or CSFM as of document revision date. Additional listings may be applicable, contact your local Simplex® product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co.

## 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 (Duisburg, Germany) to determine the likelihood that there is a real fire and is designed to achieve faster detection of real fires and slower (preferably no detection) of false alarm sources.

### MX Fastlogic sensor basics

The MX Fastlogic algorithm can be described as an Expert algorithm since 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 have involved degrading the level of fire protection afforded, either by raising the alarm threshold of smoke sensors, 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 sensor output are monitored and this raw data is used by MX Fastlogic algorithm 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. It is against this risk measurement that 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. Many analog detection systems allow the user to select different smoke sensor sensitivity settings e.g. High, Normal, or Low sensitivity. Lowering the sensitivity setting is a typical reaction to unwanted alarms but it usually means that a greater density of smoke is required to initiate an alarm. This is not the case for sensors using MX Fastlogic operation which is comparing 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 algorithm 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 850EMT 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.

The 850EMT programming tool can also change addresses stored in a sensor or other addressable device's non-volatile memory, which makes addressing errors easy to rectify.

## Additional information

**Table 1: Additional Information**

Subject		Document
4100ES	Installation Instructions	579-1390
	Product Reference	S4100-1031
4010ES	Installation Instructions	579-1390
	Product Reference	S4010-0006
4100-5130 and 4010-9916, 25 V Regulator Module Installation Instructions		579-812
Compatible MX Devices		Refer to <a href="#">Product selection and peripherals reference</a>

## Product selection and peripherals reference

**Table 2: ESMX Loop Interface Module**

Model	Description	Details
4100-6311	ESMX Loop Interface Module for 4100ES FACUs	For the 4100ES with ES-PS, the module mounts in available CPU bay block spaces. To connect power from the CPU bay to the second bay, use harness 4100-0642. Order the harness separately, see Table 3. The module uses only one 5 in. x 4 in. block. Power up to four modules from one ES-PS.
4100-6312	ESMX Optional Loop Mezzanine Card for 4100ES FACUs	Install directly on top of the ESMX Loop Interface Module to provide a second dual-isolated Class A loop. The addresses and loop power are shared between the ESMX Loop Interface Card and the ESMX Optional Loop Mezzanine Card.
4010-6311	ESMX Loop Interface Module for 4010ES FACUs	For the 4010ES, the module mounts in available CPU bay block spaces. To connect power from the CPU bay to the second bay, use harness 4100-0642. Order the harness separately, see Table 3. The module uses only one 5 in. x 4 in. block. Power up to four modules from one PSU. Refer to datasheet <i>S4010-0006</i> for additional mounting information
4010-6312	ESMX Optional Loop Mezzanine Card for 4010ES FACUs	Install directly on top of the ESMX Loop Interface Module to provide a second dual-isolated Class A loop. The addresses and loop power are shared between the ESMX Loop Interface Card and the ESMX Optional Loop Mezzanine Card.

**Table 3: ESMX Loop Interface Module Mounting Accessories**

Model	Description	Details
4100-0642	MX Loop Interface Module Power Harness for ES-PS Master Controller	Use to provide power from an ES-PS Master Controller Power Supply to up to three 4100-6311 MX Loop Modules mounted in a second bay without requiring a power supply in that bay. The connection to the second bay requires block G.

**Table 4: Compatible addressable smoke and heat sensors and accessories**

Model	Description	Datasheet
4098-5255	Photoelectric Smoke Sensor with Heat Sensor	S4906-0017
4098-5256	Photoelectric Smoke Sensor	S4906-0017
4098-5257	Heat Sensor	S4906-0017
4098-5265	Photoelectric Smoke Sensor with Heat Sensor with Isolator	S4906-0017
4098-5266	Photoelectric Smoke Sensor with Isolator	S4906-0017
4098-5267	Heat Sensor with Isolator	S4906-0017
4098-5268	Triple Sensor with Isolator	S4906-0017
4098-5260	4B 4 in. Standard Base	S4906-0017
4098-5261	4B-C 4 in. Continuity Base	S4906-0017
2098-9808	Remote LED Alarm Indicator	S4906-0017
4098-5276	Address Flags (pack of 100)	S4906-0017
4098-5277	Address Flag Labels	S4906-0017
4098-5214	Duct Housing and Accessories	S4098-0046

**Note:** Refer to datasheets *S4098-0045*, *S4098-0046*, and *S4906-0016* for more information.

**Table 5: Addressable manual stations and callpoints**

Model	Description	Datasheet
4099-5202	Double Action Manual Station, break glass	S4099-0003-1
4099-5201	Single Action Manual Station	S4099-0003-1
4099-5208	Indoor Call Point with LED, break glass, with Isolator	A0001-0008
4099-5209	Outdoor Call Point with LED, break glass, with Isolator	A0001-0009

**Table 6: Addressable interface modules**

Model	Description	Datasheet
4090-5201	Mini-IAM, supervised contact monitoring module	S4090-0012
4090-5202	Dual Input IAM, dual supervised contact monitoring module	S4090-0012
4090-5203	Relay IAM	S4090-0012
4090-5204	Signal IAM	S4090-0012
4090-5205	Monitor ZAM. <b>Note:</b> For conventional devices requiring 25 VDC power, use Voltage Regulator Module 4100-5130 for 4100ES or 4010-9916 for 4010ES FACUs. Order separately.	S4090-0012
4090-5206	Line Isolator Module	S4090-0012
4090-5213	Addressable Module Cover	S4090-0012
4090-5250	Multiple I/O Module; 3 Class B inputs and 2 Form C relay outputs	S4090-0016
577.201.401	D800 Ancillary Housing for 4090-5250	S4090-0016

**Note:** Refer to data sheets *S4090-0012* and *S4090-0016* for more information.

**Table 7: Addressable Loop Powered Sounders and Sounder-Beacons**

Model	Description	Datasheet
4906-5201	Sounder, indoor, red	S4906-0014
4906-5202	Sounder, indoor, white	S4906-0014
4906-5203	Sounder, outdoor, red	S4906-0014
4906-5205	Sounder-Beacon, indoor, red	S4906-0015
4906-5206	Sounder-Beacon, indoor, white	S4906-0015
4906-5207	Sounder-Beacon, outdoor, red	S4906-0015
4098-5215	Loop Powered Sounder Base with selectable sound output	S4906-0016
4098-5212	Loop Powered Sounder-Beacon Base with selectable sound output and selectable flash rate	S4906-0016
4098-5209	Loop Powered Sounder Base, 85 dB at 3 ft (1 m)	S4906-0017
4098-5210	Loop Powered Sounder Base, 85 dB at 10 ft (3 m)	S4906-0016
4098-5217	Addressable Base Sounder	S4906-0018
4098-5220	Addressable A/V Base VID	S4906-0018
4906-5210	Addressable Wall Sounder White	S4906-0018
4906-5211	Addressable Wall Sounder Red	S4906-0018
4906-5212	Addressable Wall Sounder WP	S4906-0018
4906-5213	Addressable Wall A/V VID White	S4906-0018
4906-5214	Addressable Wall A/V VID Red	S4906-0018
4906-5215	Addressable Wall A/V VID WP	S4906-0018

**Table 8: Device accessories and service tools**

Model	Description
4100-5130	4100ES Voltage Regulator Module, 25 VDC nominal; isolated and resettable output; includes earth detection circuit and trouble relay for status monitoring
4010-9916	Same as above except for the 4010ES
516.850.900	850EMT Programming Tool
516.800.917	Sensor Head Removal Tool, ref. MX Model 800RT
516.800.922	Spare ancillary programming lead for 850EMT
516.800.923	Accessory Kit; carrying case, shoulder strap, and 12 V automobile adaptor
516.800.924	Package of 10 spare pins for ancillary programming lead

**System Installation Reference**

Figure 2 features the following products:

- Duct Sensor Housing 4098-5214.
- 4100-6311 MX Loop Module and 4100-5130 Voltage Regulator Module; required for powering 4090-5205 Monitor ZAMs, both installed in fire panel.

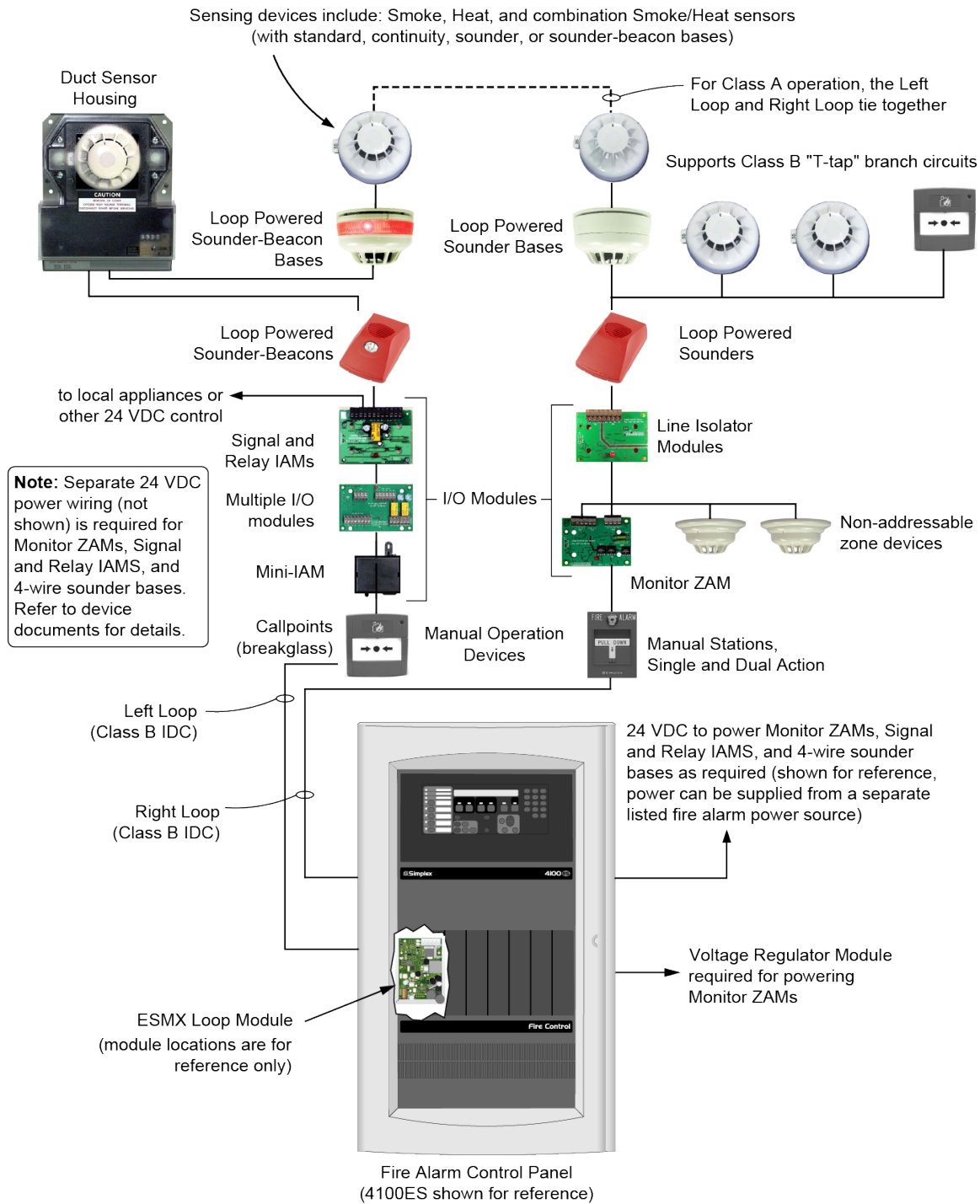


Figure 2: System Installation Reference

## Specifications

**Table 9: MX Loop Output Reference**

Specification		Rating
MX Loop Output	Voltage	40 VDC maximum
	Current	1 A maximum
Addresses per Loop		250 maximum
4100ES Panel Capacity		Up to 30, 4100-6311 ESMX Loop Modules maximum
4010ES Panel Capacity		Up to 4, 4010-6311 ESMX Loop Modules maximum
Loop Distance		6560 ft (2000 m) typical maximum <b>Note:</b> Wire lengths may be longer depending on wiring characteristics and other conditions, consult your Simplex product representative for additional details
Loop Resistance		150 $\Omega$ maximum
Loop Capacitance		0.2 $\mu$ F maximum
Loop Inductance		1.5 mH maximum
Communications Voltage		40 V peak maximum

**Table 10: Module Power Requirements**

Specification	Rating
Module Voltage	24 VDC nominal, supplied from control panel power supply
Module Input Current	100 mA for module only (no devices) 1235 mA maximum, fully loaded at 250 devices; actual current depends on connected devices

**Table 11: LED Status Indicators (yellow LEDs)**

LED	Description
COMM LOSS	On steady upon loop communications loss, flashing if not communicating with panel
EARTH FAULT	On steady when an earth fault is detected on field wiring
Loop Status LED	On steady if no device response
	Slow flash if Class A open trouble
	Fast flash if short circuit trouble
MX DOWNLOAD	On steady when module is in service mode and download is in progress
LPS FAULT	On steady upon loop power supply failure

**Table 12: 4100-5130 or 4010-9916 Voltage Regulator Module**

Specification	Rating	
Input Voltage	System supplied 24 VDC	
Input Current	Supervisory = 3 A max. with 2.5 A output load; Alarm = 4.9 A max. with 4 A output load	
Output Voltage	22.8 VDC to 26.4 VDC (25 VDC nominal); output is resettable, will track state of RESET input	
Output Current	2.5 A maximum supervisory; 4 A maximum alarm	
Ripple	600 mV pk-pk maximum	
Trouble Relay	1 Form C dry contact for monitoring; rated 400 mA @ 30 VDC; changes state for Earth or output voltage trouble; normally held energized	
Mounting Requirements	4100ES	4 x 5 single block module
	4010ES	4 x 5 single block module

**Table 13: General Specifications**

Specification	Rating
Operating Temperature Range	32° F to 120° F (0° C to 49° C)
Operating Humidity Range	Up to 93% RH, non-condensing @ 90° F (32° C)
Output Wiring Connections	On-board terminal blocks for field wiring 18 to 12 AWG (0.82 mm <sup>2</sup> to 3.31 mm <sup>2</sup> )