Simplex 4100 ESi

Cautions and Warnings

READ AND SAVE THESE INSTRUCTIONS - Follow the instructions in this installation manual. These instructions must be followed to avoid damage to this product and associated equipment. Product operation and reliability depend upon proper installation.

DO NOT INSTALL ANY SIMPLEX PRODUCT THAT APPEARS DAMAGED - Upon unpacking your Simplex product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify an authorised Simplex product supplier.

ELECTRICAL HAZARD - Disconnect electrical field power when making any internal adjustments or repairs. All repairs should be performed by a representative or authorised agent of your local Simplex product supplier.

STATIC HAZARD - Static electricity can damage components. Handle as follows:
• Ground yourself before opening or installing components
• Prior to installation, keep components wrapped in anti-static material at all times

SYSTEM REACCEPTANCE TEST AFTER SOFTWARE CHANGES - To ensure proper system operation, this product must be tested in accordance with AS1670.1, after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

In this publication

This publication discusses the following topics:

Introduction

The 4100-6077AU *MX* Digital Loop Card is a 4 x 10 inch (double-height) PDI module that interfaces a single *MX* Digital Loop to the 4100ESi fire panel.

Features:
• 4 x 10 inch double-height PDI module
• Interfaces *MX* Loop to 4100ESi
• Supports up to 250 *MX* devices
• 500mA Loop power
• Electrically isolated *MX* Loop with earth fault monitoring

Introduction to the *MX* Digital Loop Card

Overview

The *MX* Digital Loop Card provides *MX* loop communications for the Simplex 4100ESi fire alarm panel via a single electrically isolated *MX* Digital loop. It supports up to 250 *MX* devices - detectors and modules - and provides up to 500mA of loop power.

Physical Specifications

The 4100-6077AU *MX* Digital Loop Card (Figure 1) is a flat, 4x10-inch form-factor module that plugs into the Power Distribution Interface (PDI) of the 4100ESi panel.

An earlier version of the card was supplied as 4100-6077LIM, which included an extra bracket on which two LIM800 Loop Isolators were mounted and wired.
This version of hardware has been withdrawn, as the 4100-6077AU now includes loop short circuit protection.
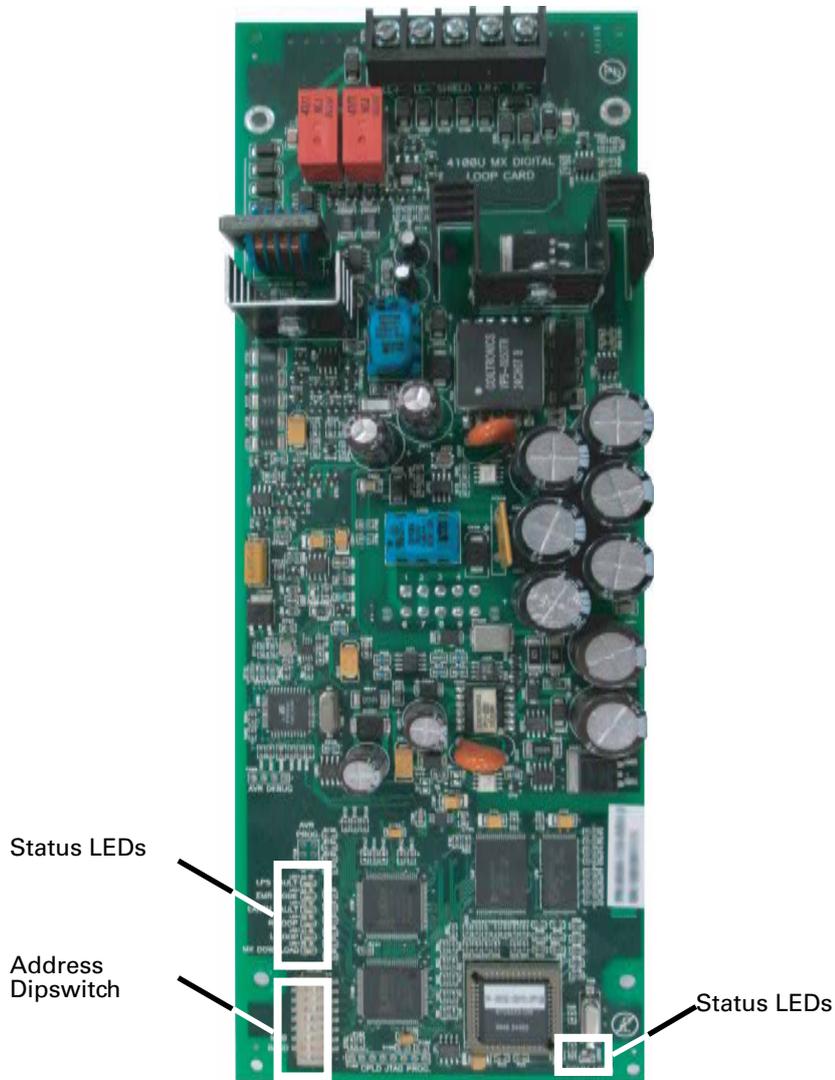

Status LEDs

Address Dipswitch

Status LEDs

Figure 1. *MX* Digital Loop Card

LEDs

The *MX* Digital Loop Card features 7 yellow LEDs that are used to indicate the status of the *MX* Digital Loop Card. See Table 1 for the LED status definition:

Table 1. Status LEDs

LED Name	Interpretation	Coding	Colour
COMM Loss	On when the card is not communicating with the 4100ESi Central Processing Unit (CPU)	On steady during communications loss. Flashing in local mode	Yellow
Earth Fault	Earth fault trouble	On steady when earth fault is detected on the *MX* loop field wiring	Yellow
L Loop	*MX* loop communications left channel fault	On steady when no device response on left channel. Slow blink = open circuit loop; Fast blink = short circuit loop	Yellow
R Loop	*MX* loop communications right channel fault	On steady when no device response on left channel. Slow blink = open circuit loop; Fast blink = short circuit loop	Yellow
MX Download	Service Mode and Download in progress	On steady for Service Mode and download in progress	Yellow
LPS Fault	Indicates loop power supply fault	On steady with loop power supply failure (Signal power)	Yellow
EMR Mode	LED is currently unused	LED is currently unused	Yellow

Input Specifications

Power Supply			
Input Voltage (nominal)			24VDC
Quiescent or Alarm Current	No Load	Card power	30mA
		Signal power	65mA
	Full Load	Card power	30mA
		Signal power	1200mA

Environmental Specifications

Environmental	Operating Temperature	0°C to +45°C
	Operating Humidity	Up to 93% RH, non-condensing @ 32°C maximum

Step 1: Installing the *MX* Digital Loop Card

Installation of the 4100-6077 in Card Cage

The *MX* Digital Loop Card mounts in a Cardcage/PDI bay of a 4100ESi panel. It can be mounted on any available block - see Figure 2. Secure with the screws supplied in the *MX* Digital Loop Card kit.
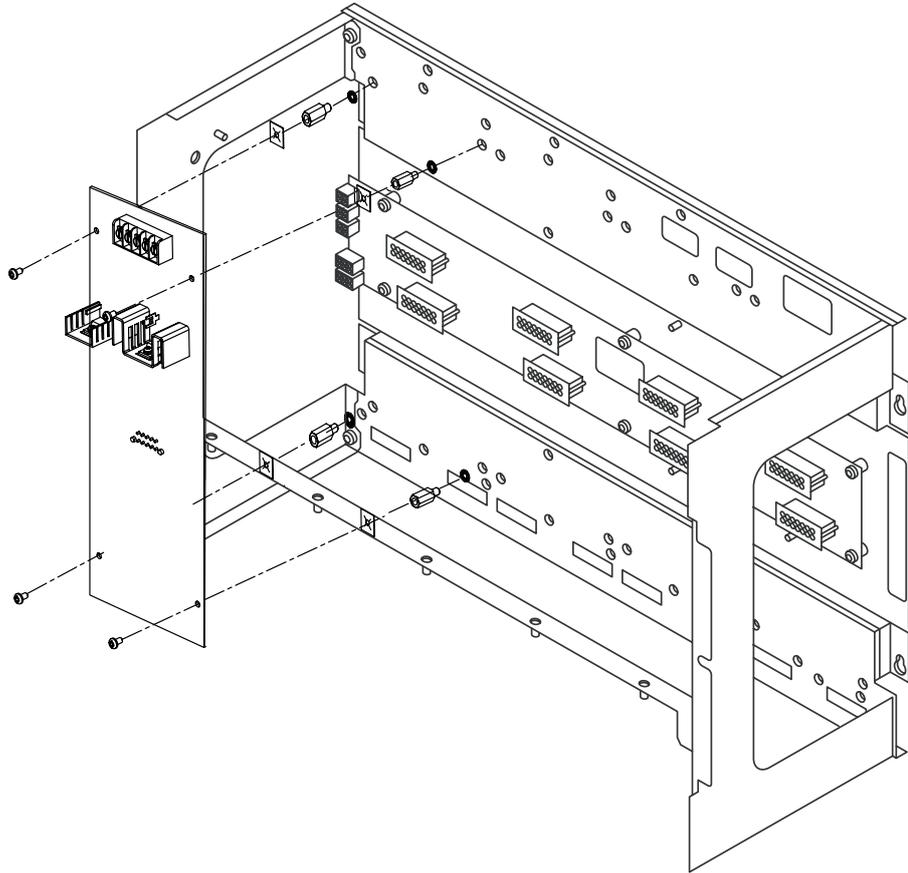
Figure 2. 4100ESi *MX* Digital Loop Card Installation

Installation of the 4100-6077 in a 8U/15U Cabinet

In 15U and 8U cabinets utilising the short PDI backplane (PA1098) the 4100-6077AU *MX* Digital Loop Card is mounted onto the short PDI backplane using the same mounting screws included with the Loop Card kit. For increased density, two 4100-6077AU cards can be mounted on a ME0516 Legacy/Dual Bracket in either the 8U or 15U cabinets. The ME0516 bracket is not suitable for mounting 4100-6077AU cards in the standard Simplex expansion bay.

The earlier 4100-6077LIM version of the loop card should not be mounted on the ME0516 Legacy/Dual Bracket (ME0516), as the resulting module width is too wide and may interfere with other modules and equipment.

Step 2: Configuring the *MX* Digital Loop Card

Setting the *MX* Loop Card Address

Setting the Address

1. The *MX* Digital Loop Card Address is set through a Dual-In-Line Package (DIP) switch SW100, which is a bank of eight switches. From left to right these switches are designated as SW100-1 through SW100-8 (see Figure 4). Their functions are as follows:
   - SW100-1: This switch sets the baud rate for the internal communications line running between the MX Digital Loop card and the CPU. Set this switch to ON.
   - SW100-2 through SW100-8: These switches set the card address within the Fire Alarm Control Panel (FACP). Refer to Table 2 for a complete list of switch settings for all of the possible module addresses.

Note: Set these switches to the value assigned to the *MX* Digital Loop card by the 4100ES Programmer.
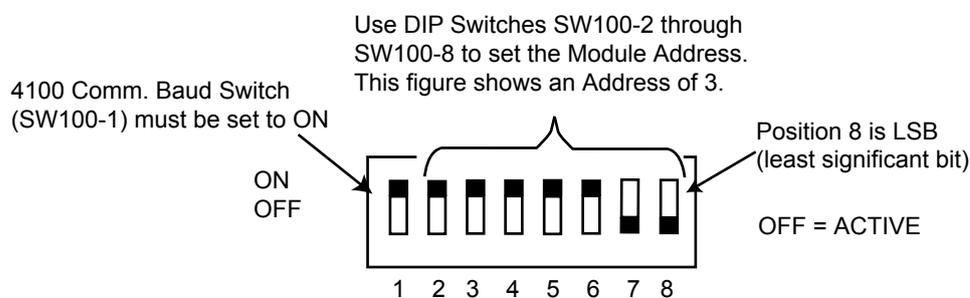
Figure 4. DIP Switch SW100

Programming

The *MX* Digital Loop Card is programed using the 4100ESi Programmer. Refer to LT0619 4100ESi Programming Manual for details.

Table 2. Module DIP Addresses

Address	SW100-2	SW100-3	SW100-4	SW100-5	SW100-6	SW100-7	SW100-8
1	ON	ON	ON	ON	ON	ON	OFF
2	ON	ON	ON	ON	ON	OFF	ON
3	ON	ON	ON	ON	ON	OFF	OFF
4	ON	ON	ON	ON	OFF	ON	ON
5	ON	ON	ON	ON	OFF	ON	OFF
6	ON	ON	ON	ON	OFF	OFF	ON
7	ON	ON	ON	ON	OFF	OFF	OFF
8	ON	ON	ON	OFF	ON	ON	ON
9	ON	ON	ON	OFF	ON	ON	OFF
10	ON	ON	ON	OFF	ON	OFF	ON
11	ON	ON	ON	OFF	ON	OFF	OFF
12	ON	ON	ON	OFF	OFF	ON	ON
13	ON	ON	ON	OFF	OFF	ON	OFF
14	ON	ON	ON	OFF	OFF	OFF	ON
15	ON	ON	ON	OFF	OFF	OFF	OFF
16	ON	ON	OFF	ON	ON	ON	ON
17	ON	ON	OFF	ON	ON	ON	OFF
18	ON	ON	OFF	ON	ON	OFF	ON
19	ON	ON	OFF	ON	ON	OFF	OFF
20	ON	ON	OFF	ON	OFF	ON	ON
21	ON	ON	OFF	ON	OFF	ON	OFF
22	ON	ON	OFF	ON	OFF	OFF	ON
23	ON	ON	OFF	ON	OFF	OFF	OFF
24	ON	ON	OFF	OFF	ON	ON	ON
25	ON	ON	OFF	OFF	ON	ON	OFF
26	ON	ON	OFF	OFF	ON	OFF	ON
27	ON	ON	OFF	OFF	ON	OFF	OFF
28	ON	ON	OFF	OFF	OFF	ON	ON
29	ON	ON	OFF	OFF	OFF	ON	OFF
30	ON	ON	OFF	OFF	OFF	OFF	ON
31	ON	ON	OFF	OFF	OFF	OFF	OFF
32	ON	OFF	ON	ON	ON	ON	ON
33	ON	OFF	ON	ON	ON	ON	OFF
34	ON	OFF	ON	ON	ON	OFF	ON
35	ON	OFF	ON	ON	ON	OFF	OFF
36	ON	OFF	ON	ON	OFF	ON	ON
37	ON	OFF	ON	ON	OFF	ON	OFF
38	ON	OFF	ON	ON	OFF	OFF	ON
39	ON	OFF	ON	ON	OFF	OFF	OFF
40	ON	OFF	ON	OFF	ON	ON	ON
41	ON	OFF	ON	OFF	ON	ON	OFF
42	ON	OFF	ON	OFF	ON	OFF	ON
43	ON	OFF	ON	OFF	ON	OFF	OFF
44	ON	OFF	ON	OFF	OFF	ON	ON
45	ON	OFF	ON	OFF	OFF	ON	OFF
46	ON	OFF	ON	OFF	OFF	OFF	ON
47	ON	OFF	ON	OFF	OFF	OFF	OFF
48	ON	OFF	OFF	ON	ON	ON	ON
49	ON	OFF	OFF	ON	ON	ON	OFF
50	ON	OFF	OFF	ON	ON	OFF	ON
51	ON	OFF	OFF	ON	ON	OFF	OFF
52	ON	OFF	OFF	ON	OFF	ON	ON
53	ON	OFF	OFF	ON	OFF	ON	OFF
54	ON	OFF	OFF	ON	OFF	OFF	ON
55	ON	OFF	OFF	ON	OFF	OFF	OFF
56	ON	OFF	OFF	OFF	ON	ON	ON
57	ON	OFF	OFF	OFF	ON	ON	OFF
58	ON	OFF	OFF	OFF	ON	OFF	ON
59	ON	OFF	OFF	OFF	ON	OFF	OFF
60	ON	OFF	OFF	OFF	OFF	ON	ON
61	ON	OFF	OFF	OFF	OFF	ON	OFF
62	ON	OFF	OFF	OFF	OFF	OFF	ON
63	ON	OFF	OFF	OFF	OFF	OFF	OFF
64	OFF	ON	ON	ON	ON	ON	ON
65	OFF	ON	ON	ON	ON	ON	OFF
66	OFF	ON	ON	ON	ON	OFF	ON
67	OFF	ON	ON	ON	ON	OFF	OFF
68	OFF	ON	ON	ON	OFF	ON	ON
69	OFF	ON	ON	ON	OFF	ON	OFF
70	OFF	ON	ON	ON	OFF	OFF	ON
71	OFF	ON	ON	ON	OFF	OFF	OFF
72	OFF	ON	ON	OFF	ON	ON	ON
73	OFF	ON	ON	OFF	ON	ON	OFF
74	OFF	ON	ON	OFF	ON	OFF	ON
75	OFF	ON	ON	OFF	ON	OFF	OFF
76	OFF	ON	ON	OFF	OFF	ON	ON
77	OFF	ON	ON	OFF	OFF	ON	OFF
78	OFF	ON	ON	OFF	OFF	OFF	ON
79	OFF	ON	ON	OFF	OFF	OFF	OFF
80	OFF	ON	OFF	ON	ON	ON	ON
81	OFF	ON	OFF	ON	ON	ON	OFF
82	OFF	ON	OFF	ON	ON	OFF	ON
83	OFF	ON	OFF	ON	ON	OFF	OFF
84	OFF	ON	OFF	ON	OFF	ON	ON
85	OFF	ON	OFF	ON	OFF	ON	OFF
86	OFF	ON	OFF	ON	OFF	OFF	ON
87	OFF	ON	OFF	ON	OFF	OFF	OFF
88	OFF	ON	OFF	OFF	ON	ON	ON
89	OFF	ON	OFF	OFF	ON	ON	OFF
90	OFF	ON	OFF	OFF	ON	OFF	ON
91	OFF	ON	OFF	OFF	ON	OFF	OFF
92	OFF	ON	OFF	OFF	OFF	ON	ON
93	OFF	ON	OFF	OFF	OFF	ON	OFF
94	OFF	ON	OFF	OFF	OFF	OFF	ON
95	OFF	ON	OFF	OFF	OFF	OFF	OFF
96	OFF	OFF	ON	ON	ON	ON	ON
97	OFF	OFF	ON	ON	ON	ON	OFF
98	OFF	OFF	ON	ON	ON	OFF	ON
99	OFF	OFF	ON	ON	ON	OFF	OFF
100	OFF	OFF	ON	ON	OFF	ON	ON
101	OFF	OFF	ON	ON	OFF	ON	OFF
102	OFF	OFF	ON	ON	OFF	OFF	ON
103	OFF	OFF	ON	ON	OFF	OFF	OFF
104	OFF	OFF	ON	OFF	ON	ON	ON
105	OFF	OFF	ON	OFF	ON	ON	OFF
106	OFF	OFF	ON	OFF	ON	OFF	ON
107	OFF	OFF	ON	OFF	ON	OFF	OFF
108	OFF	OFF	ON	OFF	OFF	ON	ON
109	OFF	OFF	ON	OFF	OFF	ON	OFF
110	OFF	OFF	ON	OFF	OFF	OFF	ON
111	OFF	OFF	ON	OFF	OFF	OFF	OFF
112	OFF	OFF	OFF	ON	ON	ON	ON
113	OFF	OFF	OFF	ON	ON	ON	OFF
114	OFF	OFF	OFF	ON	ON	OFF	ON
115	OFF	OFF	OFF	ON	ON	OFF	OFF
116	OFF	OFF	OFF	ON	OFF	ON	ON
117	OFF	OFF	OFF	ON	OFF	ON	OFF
118	OFF	OFF	OFF	ON	OFF	OFF	ON
119	OFF	OFF	OFF	ON	OFF	OFF	OFF

Step 3: Wiring the *MX* Digital Loop Card to Addressable Devices

Field Wiring Specifications

The field wiring of the *MX* Digital Loop Card shall follow the specifications below:
- Maximum devices per loop: 250
- *MX* device addresses allowed: 1 to 250
- Wire Size: 12 - 18 AWG (3.31 - 0.82 mm^2)
- 2000m cable length
- Maximum resistance: 150 ohms, Maximum Capacitance: 0.2 uF, Inductance 1.5 mH
- Shield terminates at the loop card only (if used)
- Maximum voltage: 40V
- Maximum current: 500mA peak
- Ground fault detection: 10K
- All loop wiring is supervised

Note: "T" tapped wiring is permitted as long as the overall wiring complies with the previously mentioned inductance, capacitance, and resistance parameters and all devices on the spur map to the same zone.

Table 3. *MX* Loop Terminal Block Pin out

| Pins	Description
TB770-1	Left +
TB770-2	Left -
TB770-3	Shield (earth)
TB770-4	Right +
TB770-5	Right -

Step 3: Wiring the *MX* Digital Loop Card to Addressable Devices

Wiring Topologies

The *MX* Loop is run as a loop from the *MX* Digital Loop Card out to the *MX* Devices and back to the *MX* Digital Loop Card. Normally T-Tapping or spurs are not used (as a single fault will stop the devices working). However, if all the devices have the same function and map to the same zone then a spur is permitted. The spur can be connected directly to the loop - as long as all devices on the spur and between the nearest isolators map to the same zone. Otherwise, insert a 545.800.004 LIM800 SCI into the loop and wire the spur cable off the S+, S- terminals. This is shown in Figure 5.

The earlier 4100-6077LIM included two LIM800 short circuit isolators at the start and end of the loop to provide short circuit protection. These are not shown in Figure 5. These are not required with the 4100-6077AU as it includes short circuit protection.

Full details of the *MX* Device and Loop wiring can be found in LT0432 4100ESi Field Wiring Diagrams.

MX DIGITAL ADDRESSABLE LOOP WITH ISOLATORS
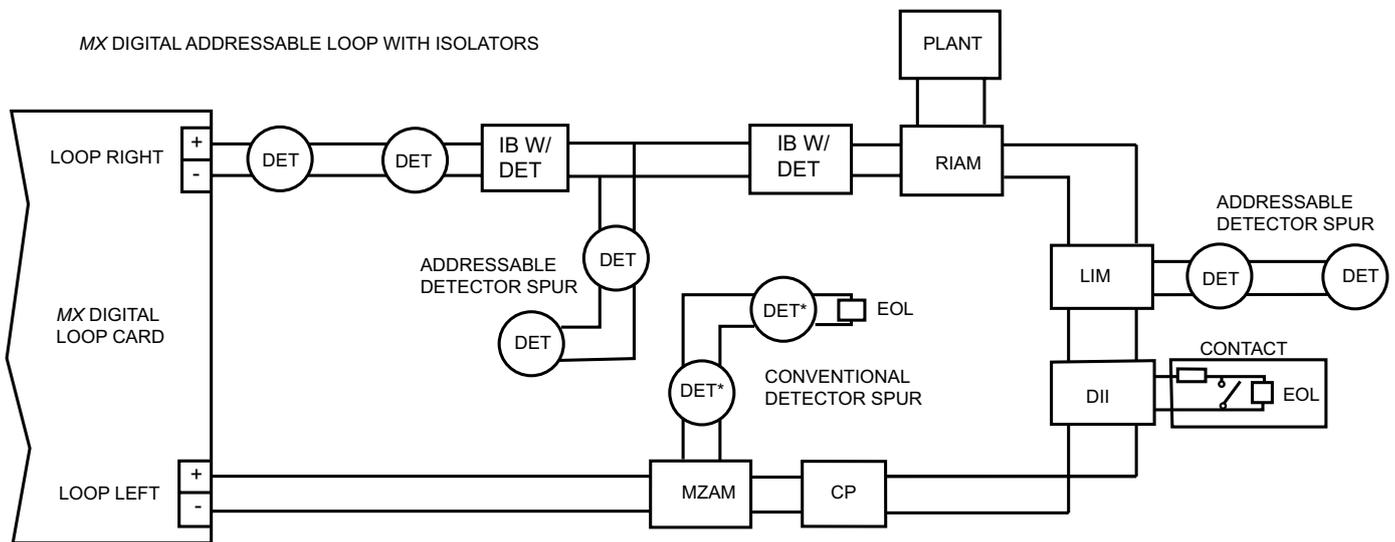
NOTES: 1. MAY BE CONFIGURED WITH UP TO 250 ADDRESSABLE DEVICES

KEY

DET	ADDRESSABLE DETECTOR
DET*	CONVENTIONAL DETECTOR
IB	ISOLATOR BASE
CP	CALL POINT
RIAM	RELAY IAM
LIM	LINE ISOLATOR MODULE
DII	DUAL INPUT IAM
MZAM	MONITOR ZAM
EOL	END-OF-LINE RESISTOR

Figure 5. *MX* Digital Loop Wiring

Appendix A: *MX* Addressable Devices

Compatible Devices

Table 4 lists the *MX* Devices compatible with the *MX* Digital Loop Card.

Table 4. Compatible *MX* Devices

Addressable Interface Modules	
Model	**Description**
516.850.051.E	850PH Photoelectric Smoke & Heat detector with SCI, - Modes A2S, A2R
516.850.052.E	850P Photoelectric Smoke detector with SCI
516.850.053.E	850H Heat detector with SCI, - Modes A2S, A2R, CS, CR
516.850.054.E	850PC CO / Photoelectric Smoke / Heat detector with SCI
CP820	CP820 Indoor Call Point
514.800.604.Y	CP830 Outdoor Call Point
516.800.958	LPAV3000 Loop Powered Sounder/Beacon base
516.800.957	LPSB3000 Loop Powered Sounder base
MIM800	MIM800 Mini IAM Input Module
CIM800	CIM800 Dual Input Module
RIM800	RIM800 Relay Output Module
SNM800	SNM800 Signal Notification Module
DIM800	DIM800 Detector Input Module (Dual)
577.800.006	DDM800 Universal Fire & Gas Detector Module (Dual)
516.018.014	VIO800 VESDA Interface Module
555.800.065	MIO800 Multi-I/O Module
516.800.960	LPSY800R Loop Powered Sounder - Indoor Red
516.800.961	LPSY800W Loop Powered Sounder - Indoor White
516.800.962	LPSY865R Loop Powered Sounder - Outdoor Red
516.800.963	LPAV800R Loop Powered Sounder Beacon - Indoor Red
516.800.964	LPAV800W Loop Powered Sounder Beacon - Indoor White
516.800.965	LPAV865 Loop Powered Sounder Beacon - IP65 Red

Compatible Devices

Table 5 lists the *MX* Ancillary Devices (non-Addressable) compatible with the *MX* Digital Loop Card.

Table 5. Compatible *MX* Ancillary Devices

Non-Addressable Interface Modules	
Model	**Description**
517.050.042	4B-C Continuity Base
516.800.910	802SB Loop Powered Sounder Base
545.800.004	LIM800 Loop Isolator Module
516.800.911	901SB Externally Powered Sounder Base