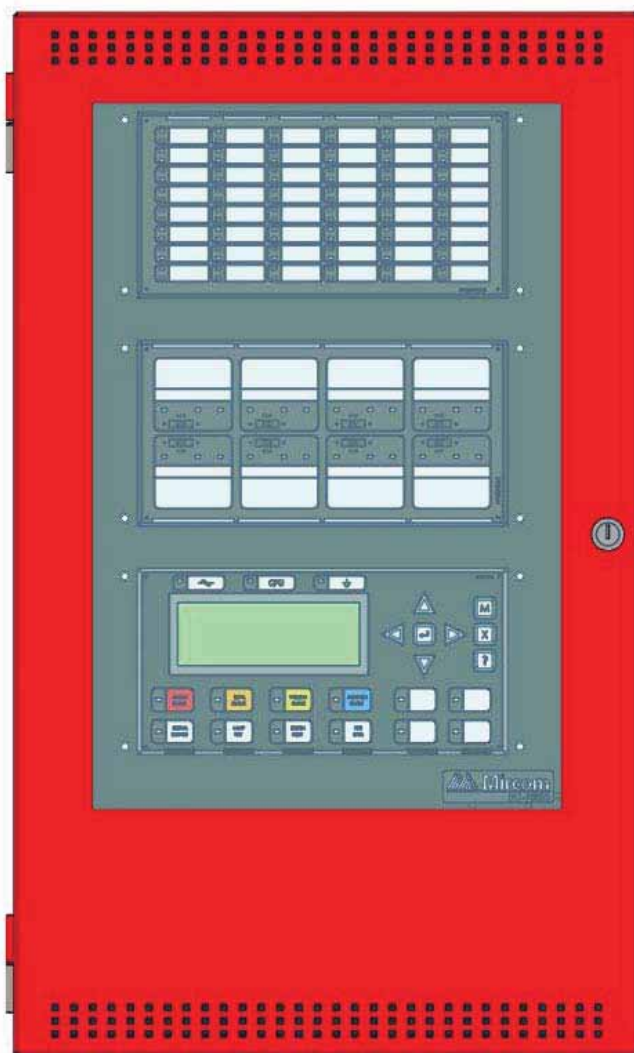


FX-2000

Intelligent Analog Fire Alarm Control Panel



Installation and Operation Manual

LT-657 Rev 14
September 2015

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1.0 Introduction

1.1 About the FX-2000

Mircom's cost-effective FX-2000 Intelligent Analog Fire Alarm Control Panel (FACP) is a flexible and easy-to-use analog system. The FX-2000 base panel consists of: one intelligent analog loop controller capable of supporting 99 analog sensors and 99 addressable modules that can be wired in Class A (Style 6 or 7) or Class B (Style 4). Analog sensors and addressable modules consist of all compatibility listed devices including Advanced Protocol devices. Loop adder modules are available for additional addressable (SLC) loops. The ALC-198S provides one additional addressable loop, and the ALC-396S provides two addressable loops each capable of supporting 99 analog sensors and 99 addressable modules. In addition, the base panel supports up to 16 conventional adder modules such as the DM-1008A Initiating Circuit Module, SGM-1004A NAC Circuit Module, and the RM-1008A Relay Circuit Module. The base panel also includes 4 Class A/B (Style Z/Y) NAC circuits rated at 1.7 amperes each, and either a 6- or 12-ampere power supply. The ALC-H16 adder board provides expansion for 16 additional conventional hardwire modules.

1.2 Overall Features

- Large system capacity and modular design.
- Each Analog Loop is capable of supporting 99 analog sensors and 99 addressable modules which can be wired as Class A (Style 6 or 7) or Class B (Style 4).
- The base system supports 16 conventional hardwire adder modules.
- 6 or 12 Ampere Power Supply.
- Four Class A/B (Style Z/Y) NAC Circuits rated at 1.7 Amperes each, which can be configured as Audible or Visual (silenceable or non-silenceable circuits). Audibles may be steady, Temporal Code, California Code, or March Time.
- NAC circuits may be configured to provide additional auxiliary power or resettable auxiliary power.
- Fault isolators are present on all in panel addressable loops.
- Configurable Signal Silence Inhibit, Auto Signal Silence, Two-Stage Operation, One-Man Walk Test.
- Outputs for 4 Wire resettable Smoke Power Supply, Auxiliary Power Supply, and an interface to the Mircom RTI Remote Trouble Indicator.
- RS-485 Interface for Remote Multiplex Annunciators.
- Three Level Password Protection with field settable definition which enables the installer to determine what functions are accessible for each of the three levels of pass
- Four Queues for Alarm, Supervisory, Trouble, and Monitor, with LED indicators and selector keys.
- Auxiliary Form-C Relay Contacts for Common Alarm, Common Supervisory, and Common Trouble.
- RS-232 Port for remote system printer or "CRT terminal".
- Two Event History Logs; one for Alarm related events and one for all events.
- Front Panel Auto-Configure and / or Personal Computer Configuration.
- Large 4 line by 20 character alphanumeric, back-lit LCD Display with user-friendly menu system.

- Common controls and indicators for System Reset, Visual Indicator Test, Fire Drill, Signal Silence, General Alarm,
- Acknowledge, AC On, Pre-Alarm, and Ground Fault.
- Two Spare configurable Keys and LED Indicators.
- 16 configurable LEDs (bi-coloured) with slide-in labels, available with the DSPL-420-16TZDS display.
- Provides drift compensation for photoelectric smoke detectors.
- Provides Signal Coding of signal circuits for easy alarm identification (code consists of 1 to 4 digits, each digit consisting of 1-15 pulses on the signal).
- Selection for Canadian (ULC) or USA (ULI) requirements for Smoke Sensor sensitivity.
- Extensive transient protection.
- Surface Mountable Enclosures with removable doors for easy installation and service. Flush Trims available.
- Removable Terminal Blocks for easy wiring and service.
- Loop Adder modules ALC-198S and ALC-396S for expanding addressable loops by 1 and 2 respectively.
- Adder module ALC-H16 hardwire loop interface board for expanding conventional input, output, relay capability.

2.0 Document Conventions

2.1 Circuits and Zones

The term **circuits** refers to an actual electrical interface, initiating (detection), NAC (signal), or relay.

The term **zone** is a logical concept for a fire alarm protected area, and will consist of at least one circuit.

Often the terms **zone** and **circuit** are used interchangeably, but in this manual the term circuit is used.

On the FX-2000, circuits can be hardwired inputs and outputs or addressable inputs and outputs. Both hardwired inputs and outputs, and addressable inputs and outputs may be grouped together to form logical zones.

2.2 Wiring Styles





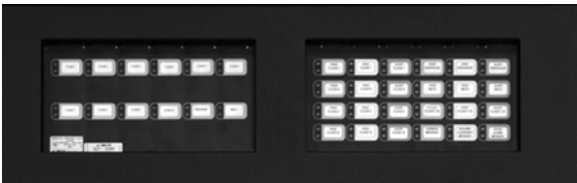
Initiating circuits are configured by default as Class B (Style B). They may be globally (all or none) configured as Class A (Style D) as described in the system configurator. This operation uses odd and even pairs of two-wire Class B (Style B) circuits to make one four-wire Class A (Style D) circuit, thus cutting in half the number of available initiating circuits.

Notification Appliance Circuits (NAC) circuits (also known as NAC circuits) may be individually wired as Class A (Style Z) or Class B (Style Y) without affecting the number of circuits available.

Addressable Loops may be configured system wide as Class B (Style 4) or Class A (Style 6). With the addition of isolators, a Class A (Style 6) will become a Class A (Style 7).

3.0 System Components

FX-2000 Chassis Types

 <p>FX-2003-6DS (pictured on the left) FX-2003-6DS-16LED (pictured on the right) FX-2003-12DS (pictured on the left)</p>	 <p>FX-2017-12ADS FX-2017S-12ADS</p>
 <p>FX-2009-12DS FX-2009S-12DS</p>	 <p>FX-2003-12XTDS</p>
 <p>ECX-0012 Expander Chassis</p>	

All FX-2000 Series Panels have the following features:

- Main Chassis with one analog loop
- 4 Style Y or Z NAC Circuits
- 4 line by 20 character back-lit LCD display

Table 1 details the specifics of each chassis type. Some models may not be available in all markets. Verify with your local distributor.

Table 1 FX-2000 Chassis Types

Model	Amps	# of Addressable loops	# of NACs	# of Adder Modules	# of Conventional Adder Modules	Max # of Display Adders	Mounts into
FX-2003-6DS	6	1	4	3	3	2	UB-1024DS
FX-2003-6DS-16LED	6	1	4	3	3	2	UB-1024DS
FX-2003-12DS	12	1	4	3	3	2	UB-1024DS
FX-2003-12XTDS	12	1	4	9	9	2	BBX-1024XT or BBX1024XTR
FX-2009-12DS	12	1	4	9	16	3	BB-5008 or BB-5014
FX-2009S-12DS	12	0	4	9	16	3	BB-5008 or BB-5014
FX-2017-12ADS	12	1	4	17	16	3	BBX-1072ADS or BBX-1072ARDS
FX-2017S-12ADS	12	0	4	17	16	3	BBX-1072ADS or BBX-1072ARDS
EXC-0012	12	0	0	12	0	2	BB-5008 or BB-5014

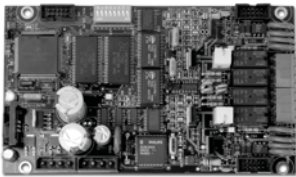


3.1 Adder Modules

The following table describes the adder modules used with the FX-2000.

Table 2 FX-2000 Adder Modules

	Models	Description
	ALC-198S	Single Intelligent Analog Loop Controller Module



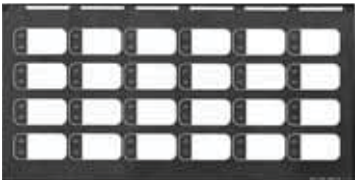
Table 2 FX-2000 Adder Modules

	Models	Description
	ALC-396S	Dual Intelligent Analog Loop Controller Module
	DM-1008A, SGM-1004A, RM-1008A	Conventional Circuit Adder Modules, Detection, Signal and Relay.
	DSPL-420-16TZDS	Optional main display with 16 configurable bi-coloured LEDs. This display is included in the FX-2003-6DS-16LED chassis package.

3.2 Auxiliary Modules

The following table describes the auxiliary modules used with the FX-2000.

Table 3 FX-2000 Auxiliary Modules

	Model	Description
	PR-300	Polarity Reversal and City Tie Module
	UDACT-300A	Digital Communicator/Dialer Module
	IPS-2424DS	Programmable Input Switches Module

3.3 Enclosures

The following table describes the enclosures used with the FX-2000.

Table 4 FX-2000 Enclosures


	Model	Description
	BB-5008	Backbox 36"H x 30"W x 7"D
	BB-5014	Backbox 60"H x 30"W x 7"D

Table 4 FX-2000 Enclosures





	Model	Description
	UB-1024DS DOX-1024DS DOX-1024DSR	UB-1024DS Universal Backbox 26"H x 14.5"w x 4.2"D DOX-1024DS white door for universal backbox. DOX-1024DSR red door or universal backbox.
	FX-2003-6DS-16LED	Complete system with DSPL-420-16TZDS display and UB-1024DS backbox and DOX-1024DSR door.

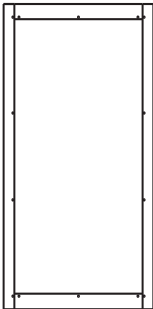
Table 4 FX-2000 Enclosures

	Model	Description
	BBX-1024XT BBX-1024XTR	Enclosure 35.5"H x 14.5"W x 5.25"D, white door Enclosure 35.5"H x 14.5"W x 5.25"D, red door
	BBX-1072ADS BBX-1072ARDS	Enclosure 24.8" x 32.5" x 6.4", white door Enclosure 24.8" x 32.5" x 6.4", red door

3.4 Flush Trim Ring

The following table describes the flush trim ring used with the FX-2000.

Table 5 FX-2000 Flush Trim Ring

	Model	Description
	FA-XT-TRB	Black flush trim ring for BBX-1024XT and BBX-1024XTR.

3.5 Remote Annunciators

The following table describes the remote annunciators used with the FX-2000.

Table 6 FX-2000 Remote Annunciators


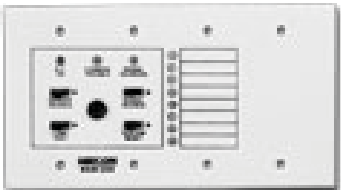
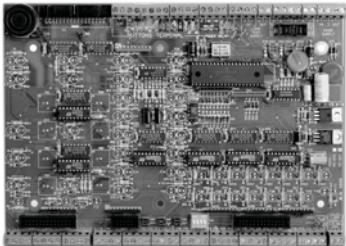

	Model	Description
	RA-1000 Series	Remote multiplex annunciator panels. For Canada, ULC-S527 Standard requires a Common Alarm, Common Supervisory, and a Common Ground Fault LED indicator on the Remote Annunciators. To meet this requirement, use the FX-2000 Configurator to correlate one LED for Common Alarm, one LED for Common Supervisory and one LED for Common Ground Fault.
	RAM-208/216	Remote multiplex annunciator panels. For Canada, ULC-S527 Standard requires a Common Alarm, Common Supervisory, and a Common Ground Fault LED indicator on the Remote Annunciators. To meet this requirement, use the FX-2000 Configurator to correlate one LED for Common Alarm, one LED for Common Supervisory and one LED for Common Ground Fault.

Table 6 FX-2000 Remote Annunciators

	Model	Description
	MGD-32, AGD-048	Remote graphic annunciator drivers. The AGD-048 must be installed in the same enclosure as the MGD-032.
	RAX-LCD	Remote Shared Display Annunciator

3.6 Batteries

The following table describes the batteries used with the FX-2000.

Table 7 Batteries

Model	Description
Batteries	10 to 55 AH

3.7 FX-2000 Accessories

Table 8 Accessories

Model	Description
MP-300/R/S	End-of-line Resistor Plate, Beige, R for red, S for stainless steel finish
RTI-1	Remote Trouble Indicator (ULC and ULI listed)
BC-160	External Battery Cabinet (ULC and ULI listed)

4.0 Mechanical and Chassis Installation

The following chapter describes the Mechanical and Chassis installation for all FX-2000 FACPs.

4.1 Mechanical Installation Diagrams

Mechanical Installation Instructions for the following enclosures:

- BB-5008
- BB-5014
- UB-1024DS and DOX-1024DS/R
- BBX-1024XT
- BBX-1024XTR
- BBX-1072ADS
- BBX-1072ARDS

4.1.1 BBX-1072ADS and BBX-1072ARDS Mechanical Installation

Material	Cold rolled steel 18GA (0.048") thick cold rolled steel 16GA (0.059") thick for backbox 14GA (0.075") thick for door
-----------------	--

The BBX-1072ADS and BBX-1072ARDS are suitable for flush or surface mounting, and have a built-in trim ring.

Dimensions of Enclosure (minus built in trim ring)	24.8" x 6.4" x 32.5"
Distance between horizontal mounting screws	16"
Distance between vertical mounting screws	23.6"
Complete Dimensions of Enclosures	26.4" x 7.7" x 34"

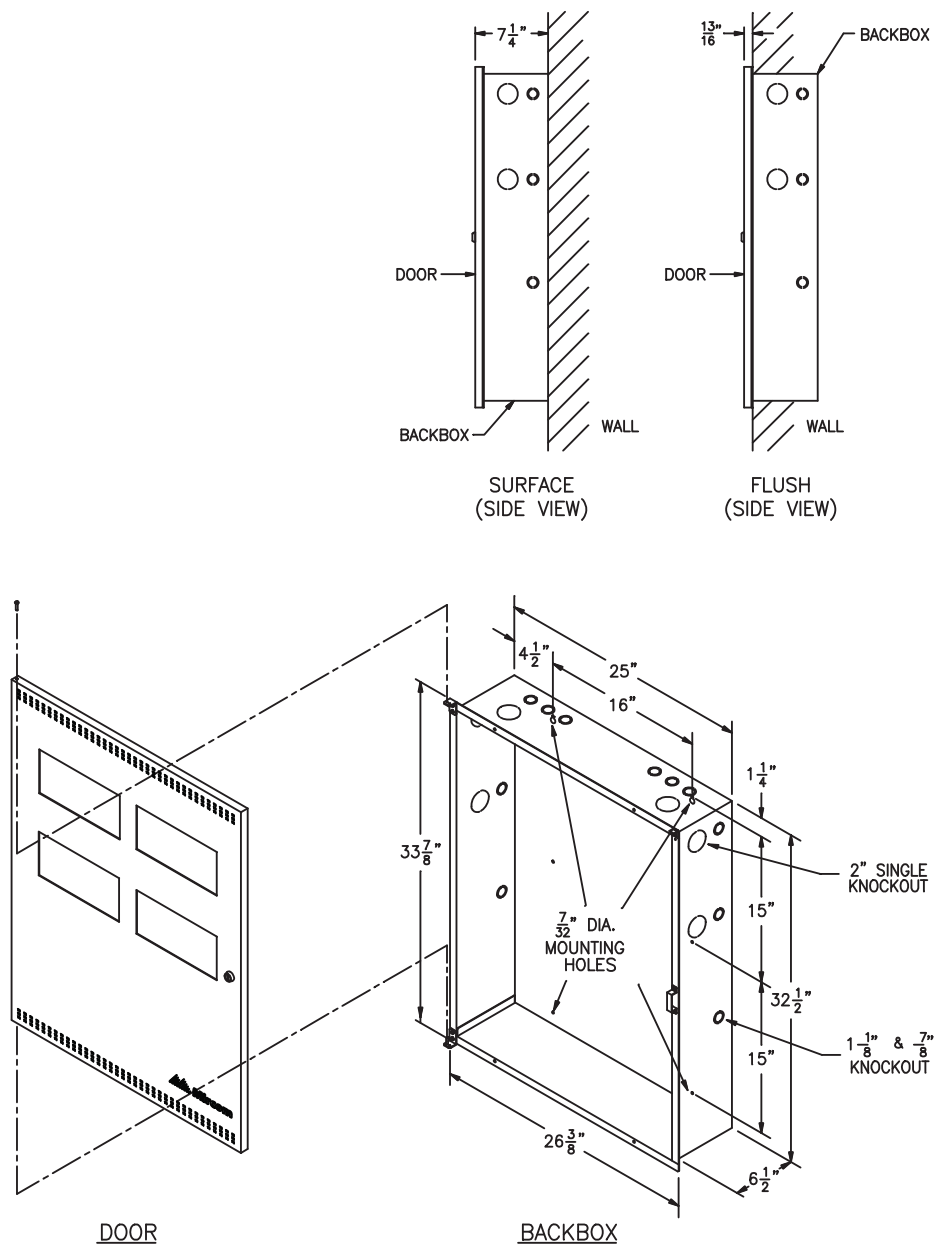


Figure 1 BBX-1072ADS and BBX-1072ARDS Flush or Surface Enclosure Installation and Dimensions

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Note: Leave bottom of box conduit free for batteries.

4.1.2 BB-5008 Mechanical Installation

Material

Cold rolled steel 18GA (0.048") thick cold rolled steel
 16GA (0.059") thick for backbox
 14GA (0.075") thick for door

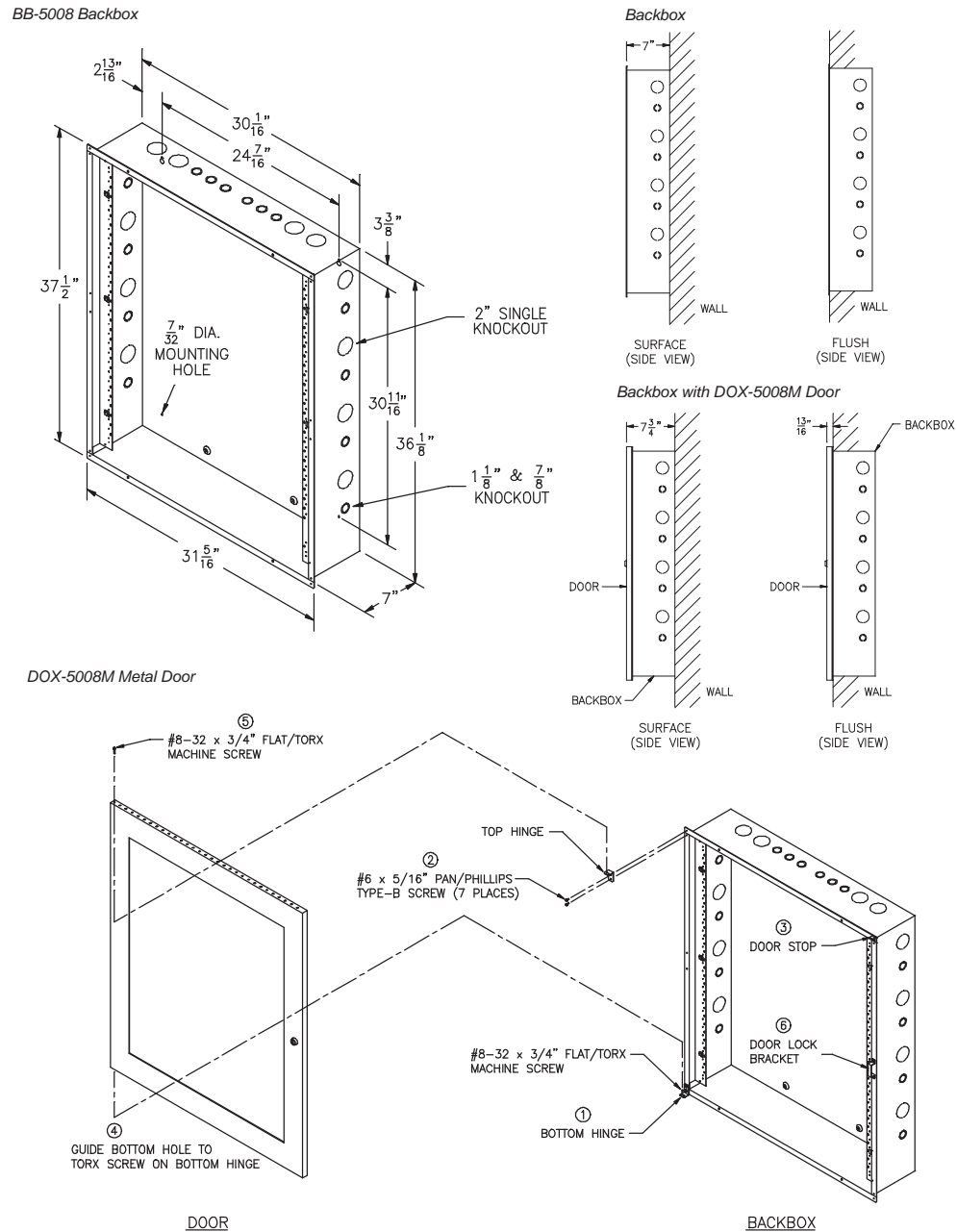


Figure 2 BB-5008 Enclosure Installation Instructions and Dimensions



Note: Leave bottom of box conduit free for batteries.

4.1.3 BB-5014 Mechanical Installation

Material	Cold rolled steel 18GA (0.048") thick cold rolled steel 16GA (0.059") thick for backbox 14GA (0.075") thick for door
Finish	Painted except for hinges

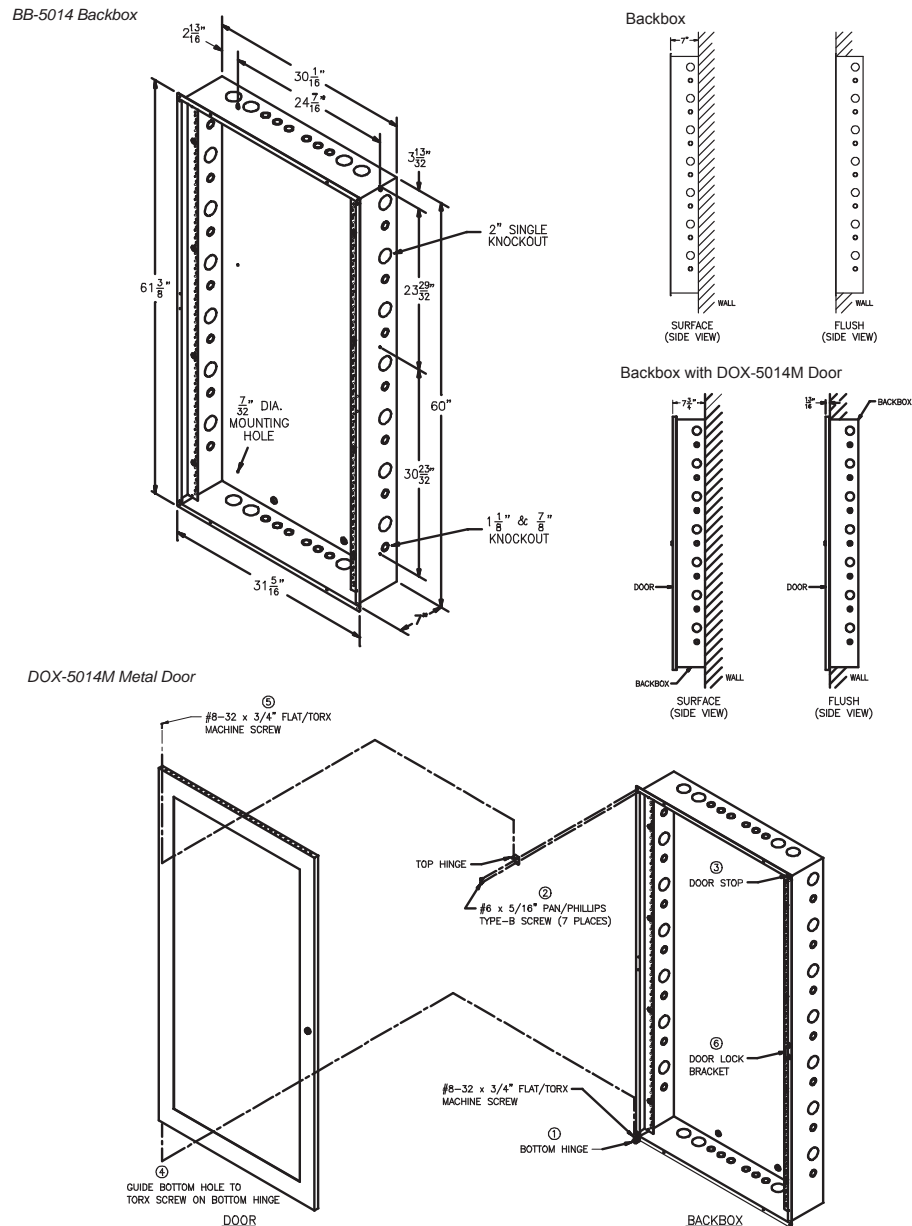


Figure 3 BB-5014 Installation Instructions and Dimensions



Note: Leave bottom of box conduit free for batteries.

4.1.4 UB-1024DS and DOX-1024DS/R Mechanical Installation

The universal enclosure is suitable for flush or surface mounting, and have a built-in trim ring.

Dimensions of backbox (minus built in trim ring)	26" x 14.5" x 4.25"
Distance between horizontal mounting screws	12"
Distance between vertical mounting screws	23.5"
Complete Dimensions of Enclosure with door	28" x 17" x 5.6"

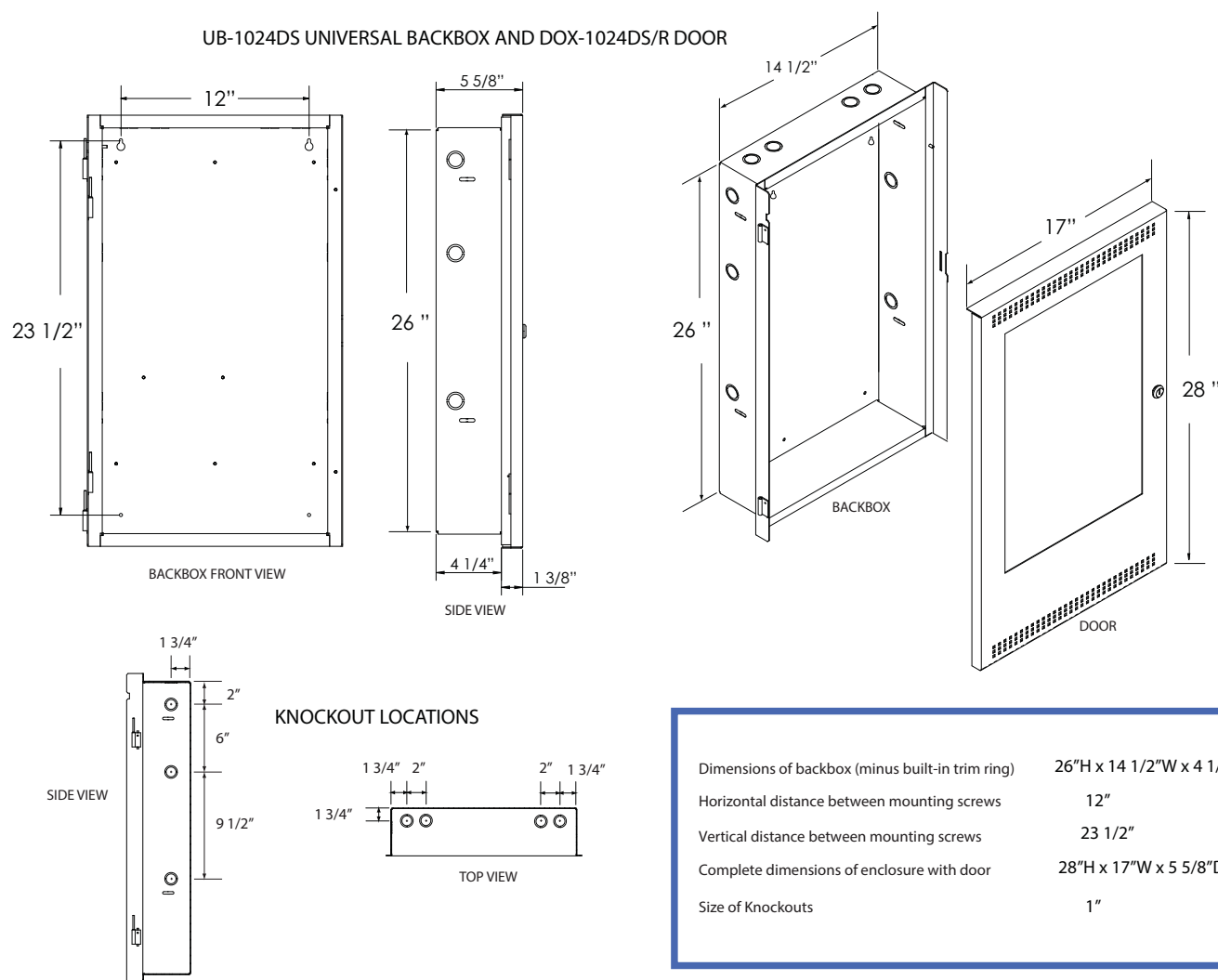


Figure 4 UB-1024DS and DOX-1024DS/R Installation Instructions and Dimensions

4.1.5 FX-2003-12XTDS Mechanical Installation

FX-2003-12XTDS is an expanded version of the FX-2003-12DS.

Dimensions	14.76" wide by 35.8" long by 5.45" 16GA (0.059") thick for backbox 14GA (0.075") thick for door
Finish	Painted except for hinges

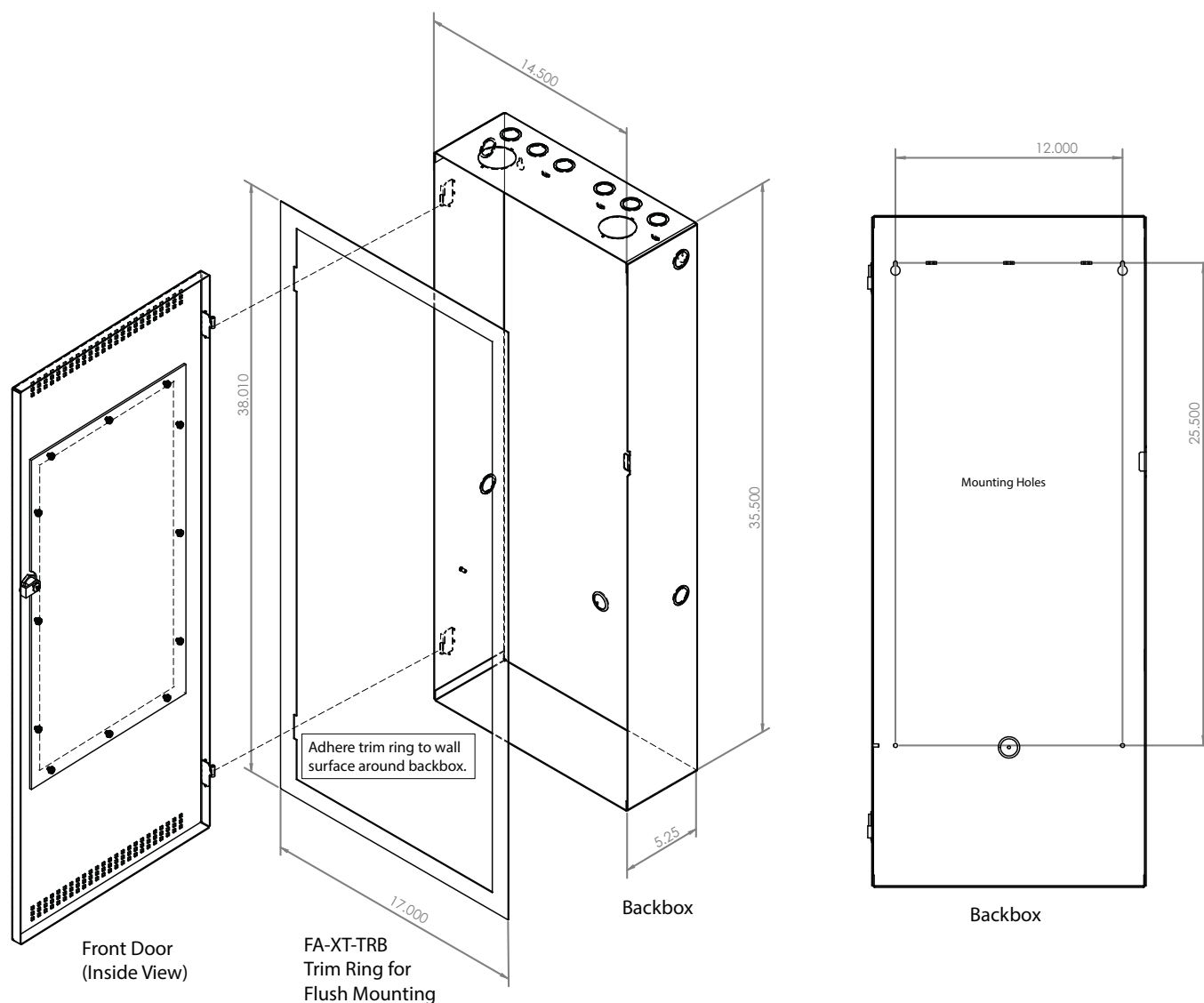


Figure 5 BBX-1024XT/R Backbox Enclosure with Trim Ring

4.1.6 Surface and Flush Mounting Views of the BBX-1024XT/R

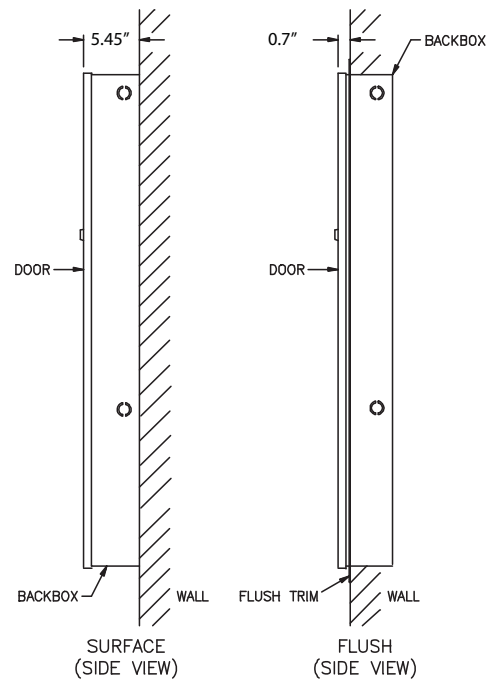


Figure 6 BBX-1024XT/R Surface and Flush Side Views

4.1.7 BBX-1024XT Flush Mounted Box with FA-XT-TRB Trim Ring

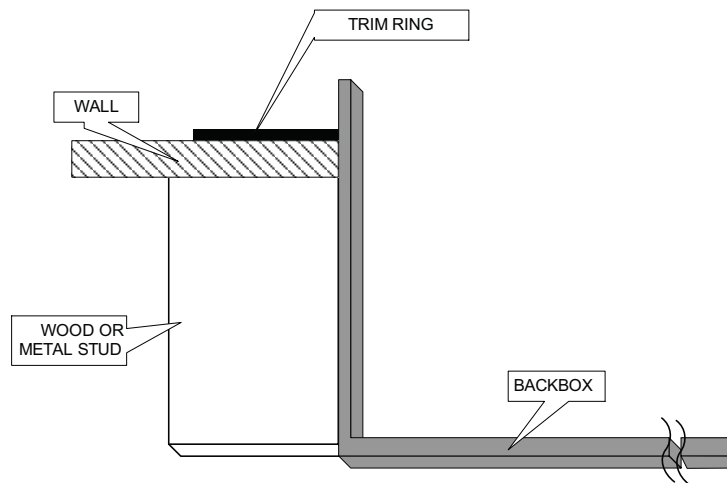


Figure 7 Cross section view of mounted BBX-1024XT/R enclosure

4.2 Chassis Installation

Chassis Installation Instructions for the following:

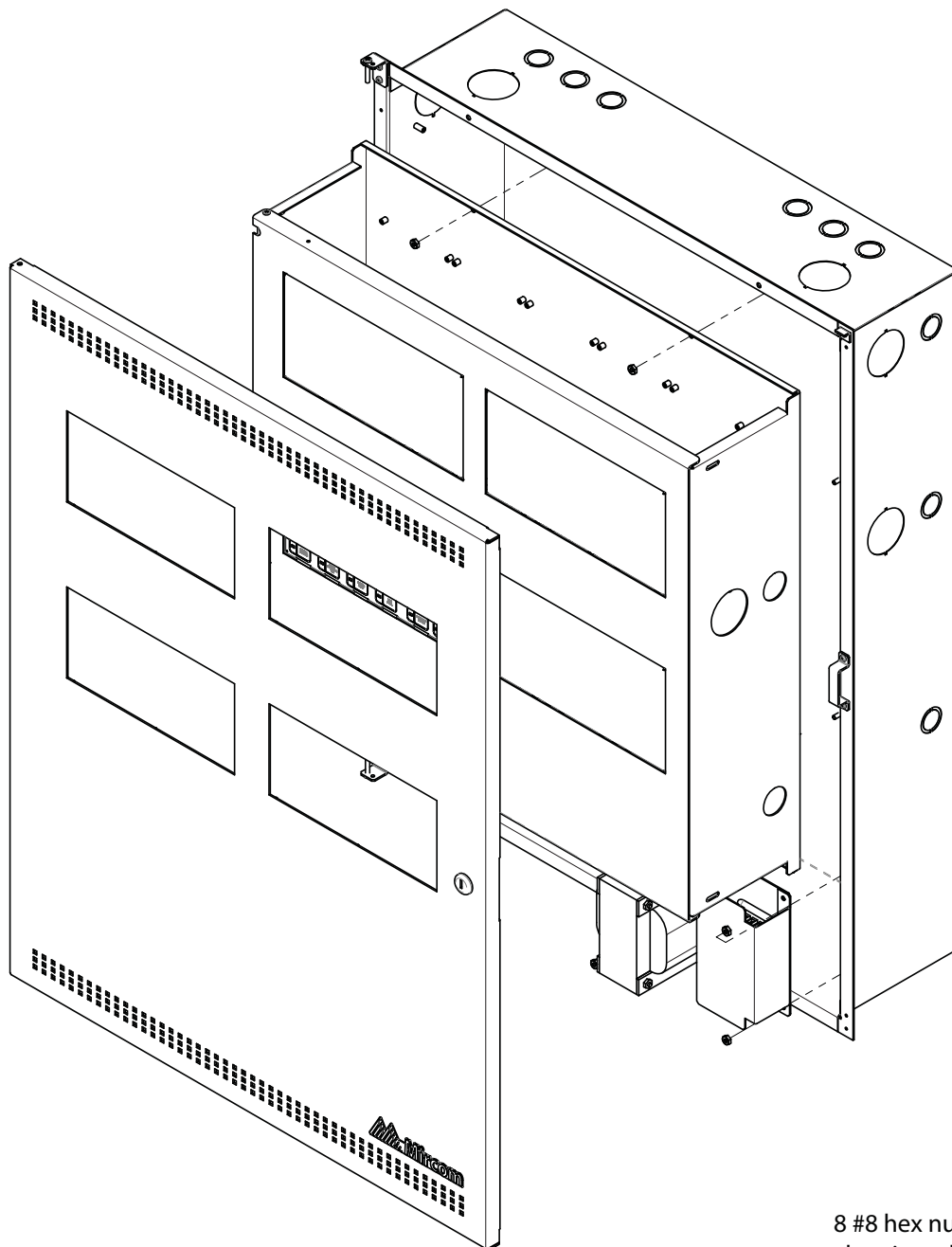
- FX-2003-6DS
- FX-2003-12DS
- FX-2003-12XTDS
- FX-2009-12DS
- FX-2009S-12DS
- FX-2017-12ADS
- FX-2017S-12ADS
- ECX-0012

For proper chassis installation do the following

1. Group the incoming wires through the top of the enclosure to prepare it for wiring the modules. Do not run the wires in-between the modules since it could cause a short circuit.
2. Use a wire tie to group wires for easy identification and neatness.
3. Be sure to connect a solid earth ground (from building system ground / to a cold water pipe) to the chassis earth ground mounting lug, and to connect the earth ground wire lugs from the main chassis to the ground screw on the backbox.
4. Mount chassis using the supplied hex nuts.

4.2.1 Mounting the Chassis into the BBX-1072ADS or BBX-1072ARDS Enclosure

Mount chassis FX-2017-12ADS or FX-2017S-12ADS into backbox BBX-1072ADS or BBX-1072ARDS using the supplied four #6 hex nuts (two at the top and two at the bottom) as shown below. The transformer chassis is also mounted using four hex nuts.



8 #8 hex nuts, 4 for inner chassis and 4 for the transformer chassis.

Figure 8 Chassis Installation into BBX-1072ADS or BBX-1072ARDS Module Mounting Locations

4.2.2 Mounting the Chassis into the BB-5008 or BB-5014

The chassis is mounted using the four #6 hex nuts provided. Two across the top portion and two across the bottom of the chassis. The inner door is mounted using four hex nuts on the left side and secured with two screws on the right side.

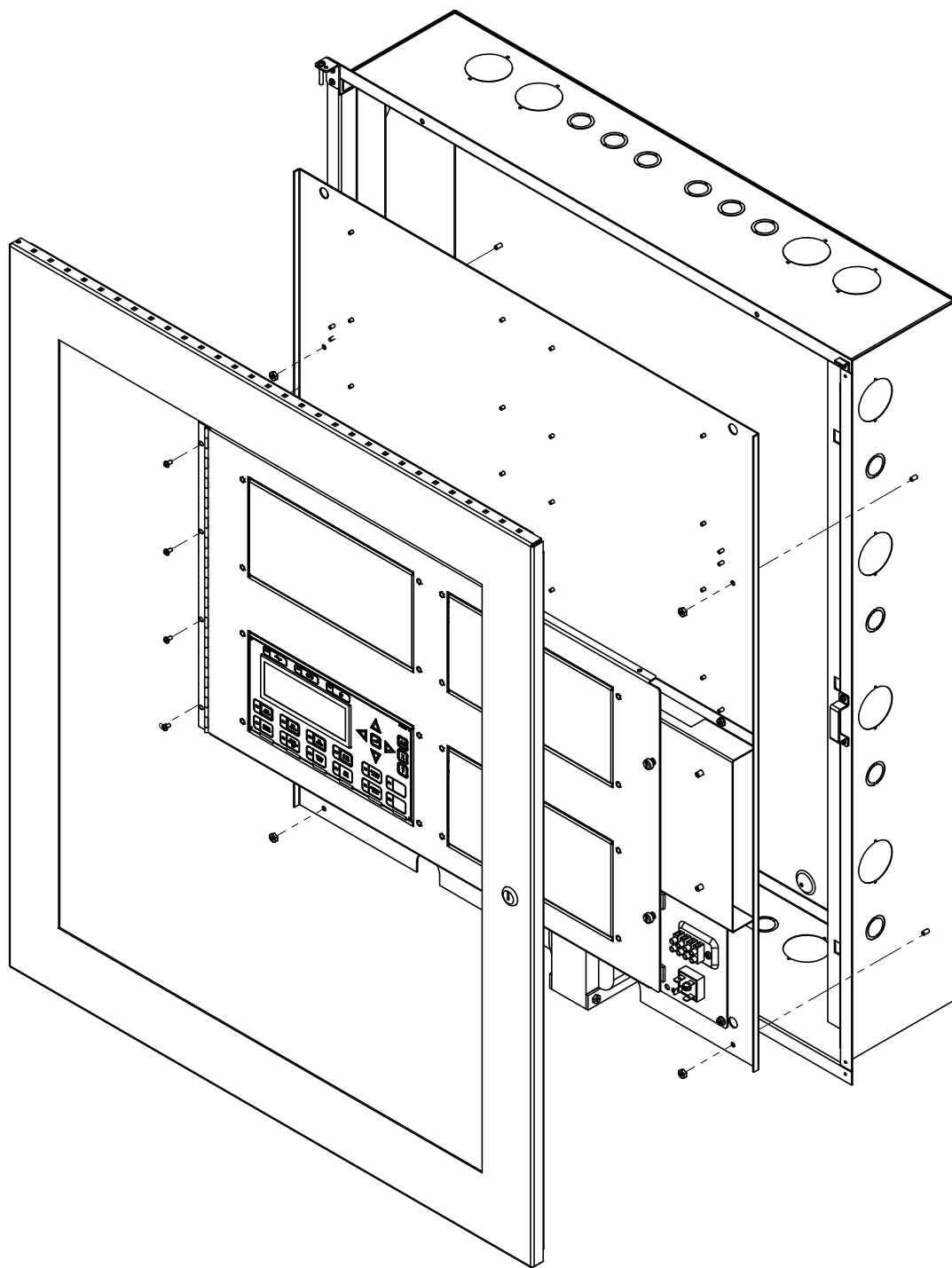


Figure 9 Chassis Installation into backbox BB-5008 and BB-5014

4.2.3 Mounting the Chassis into the UB-1024DS and DOX-1024DS/R Enclosure

The chassis is mounted using the six #8 hex nuts provided. Three across the top and three across the bottom of the chassis. The inner door mounts over the chassis with two #8 hex nuts.

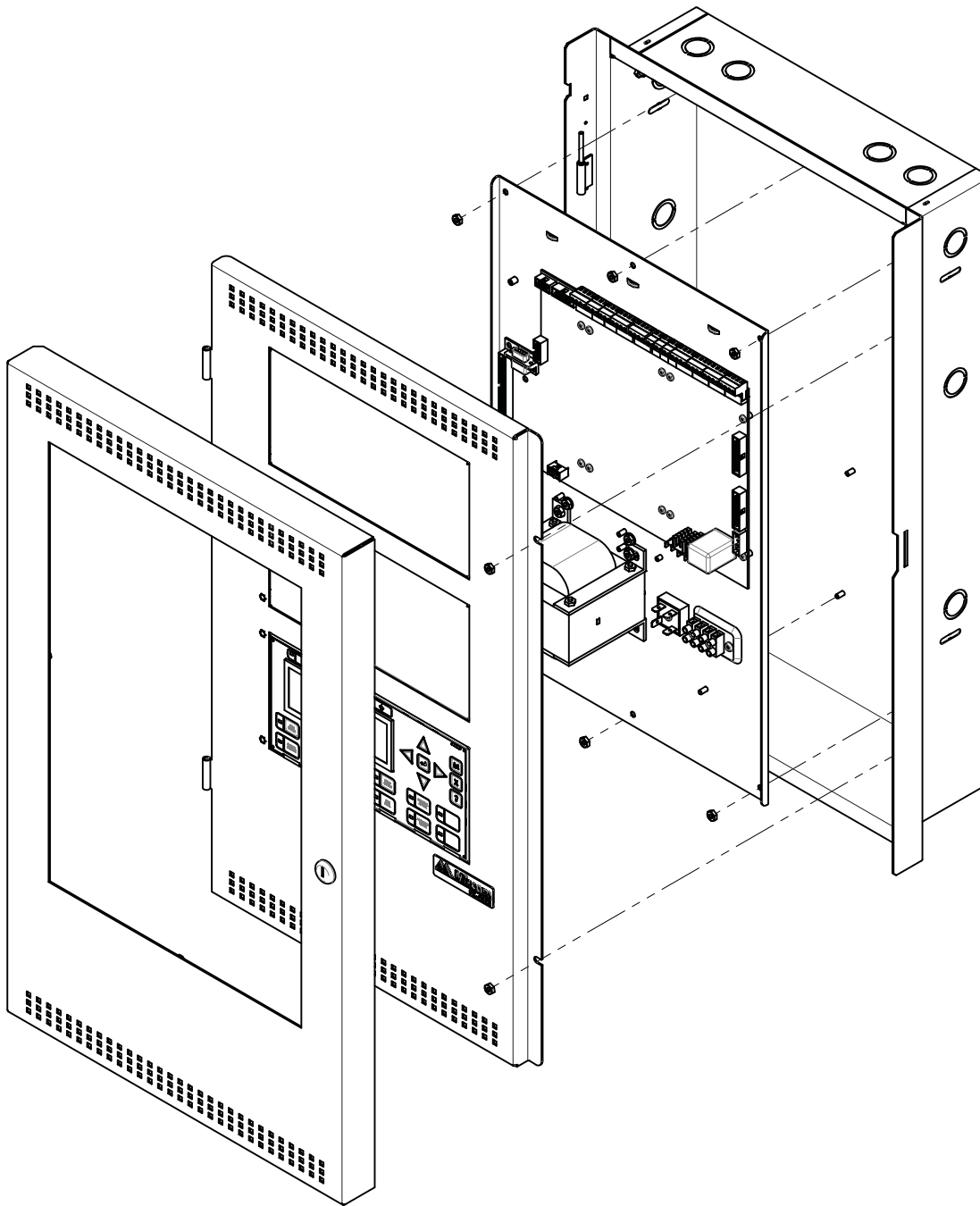


Figure 10 Chassis Installation into Universal Enclosure UB-1024DS and DOX-1024DS/R



Note: Leave bottom of box conduit free for batteries.

5.0 Module Mounting Locations

The FX-2003-6DS/12DS or FX-2017-12ADS Main Chassis come pre-assembled with a main chassis, display components and boards. Install adder modules of different types as shown in the diagrams on the following pages.

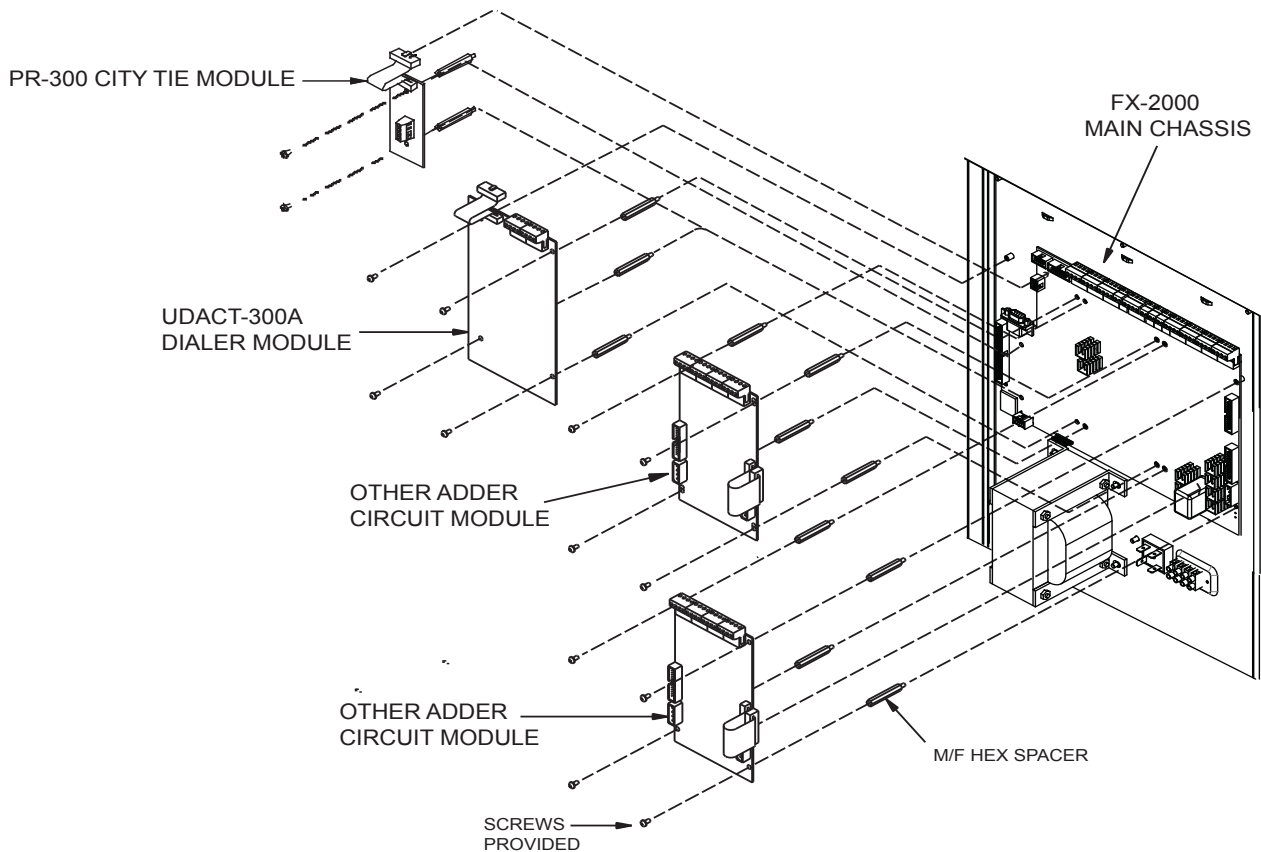


Figure 11 Module Mounting Locations View #1

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Note: To enable communication from the main module to all of the adder modules, it is necessary to add a continuity jumper on the last adder module in a chain (see the appropriate module settings section to verify the location of the continuity jumper on a particular circuit adder module). Only the last circuit adder module should have a jumper plug on its continuity jumper; all others must be left without a jumper plug.

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Notes: Front plate is not shown. Reserved for PR-300 or UDACT-300A. Other circuit adder modules may be:

- DM-1008A Detection Circuit Adder Module
- SGM-1004A Signal Circuit Adder Module
- RM-1008A Relay Circuit Adder Module
- ALC-198S Loop Adder Module
- ALC-396S Loop Adder Module
- ALC-H16 Hardwire Loop Controller Module

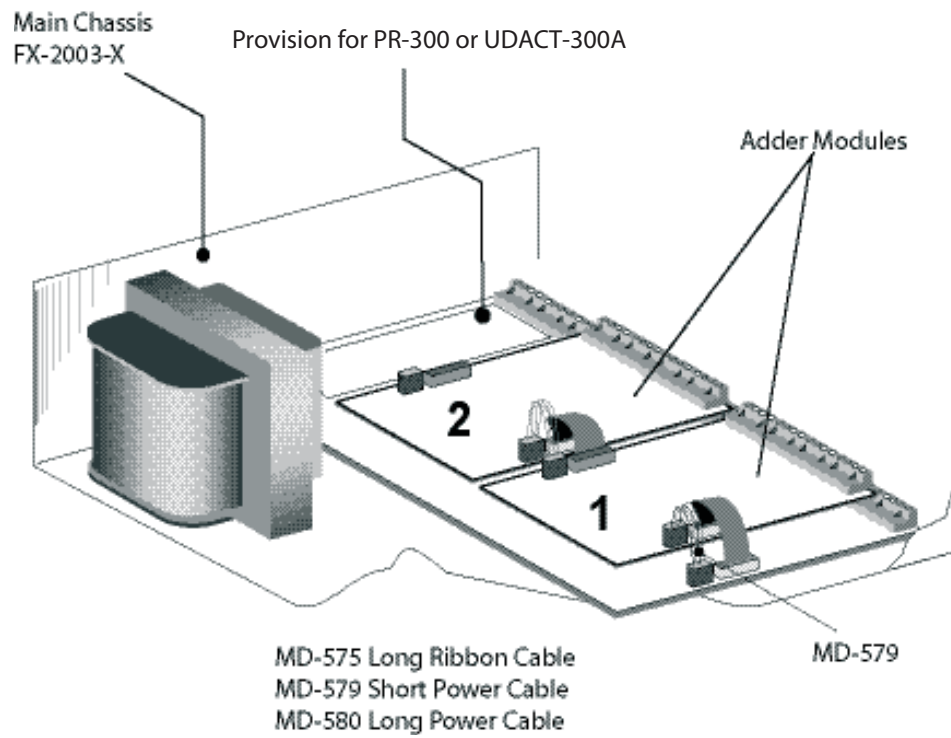
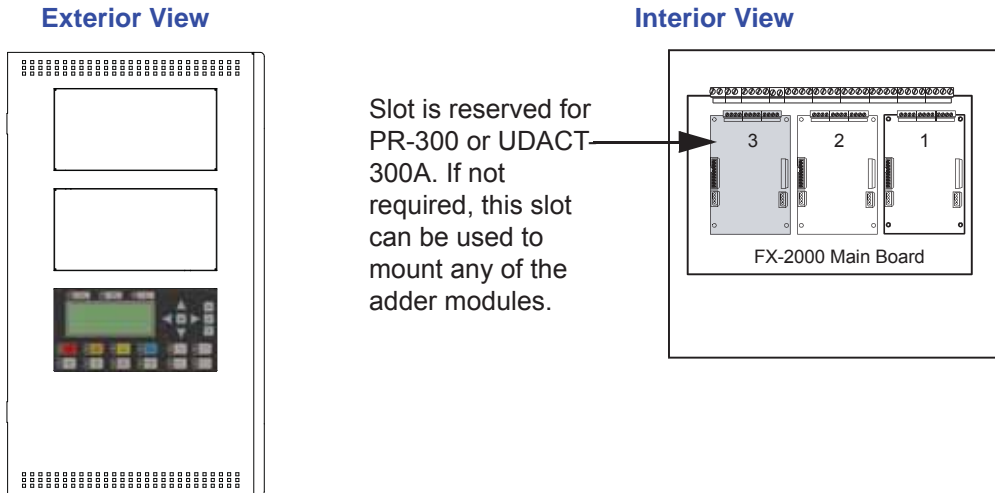


Figure 12 Module Mounting Locations View #2

6.0 Display and Adder Modules Mounting Locations

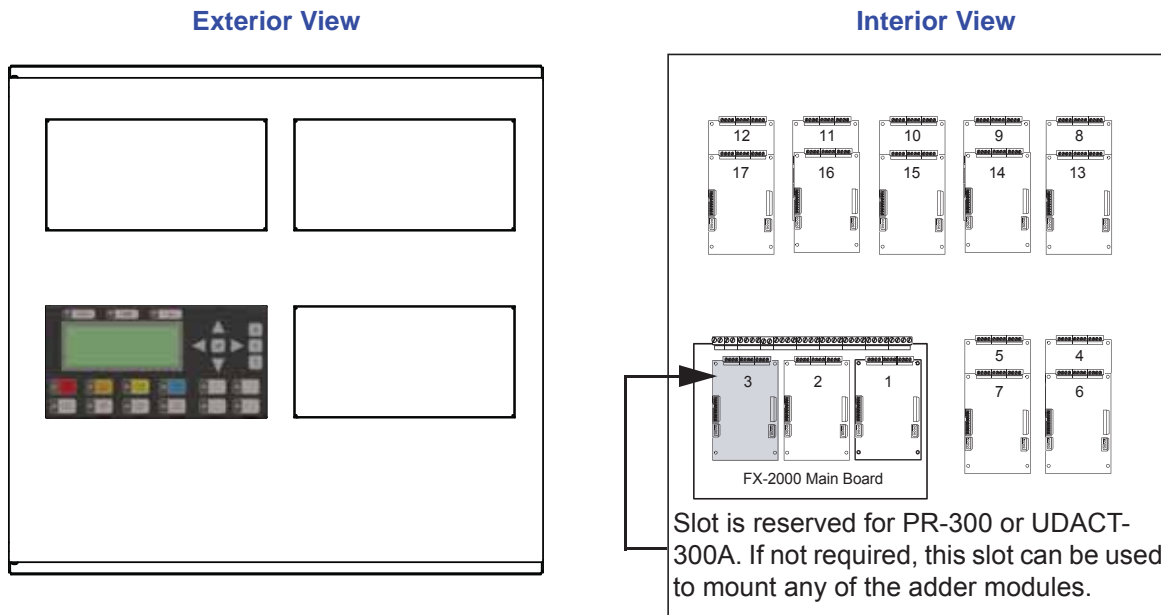
6.1 FX-2003-6DS/FX-2003-12DS/FX-2003-6DS-16LED Compact Main Chassis

Mounts in the UB-1024DS backbox and supports three circuit adder modules.



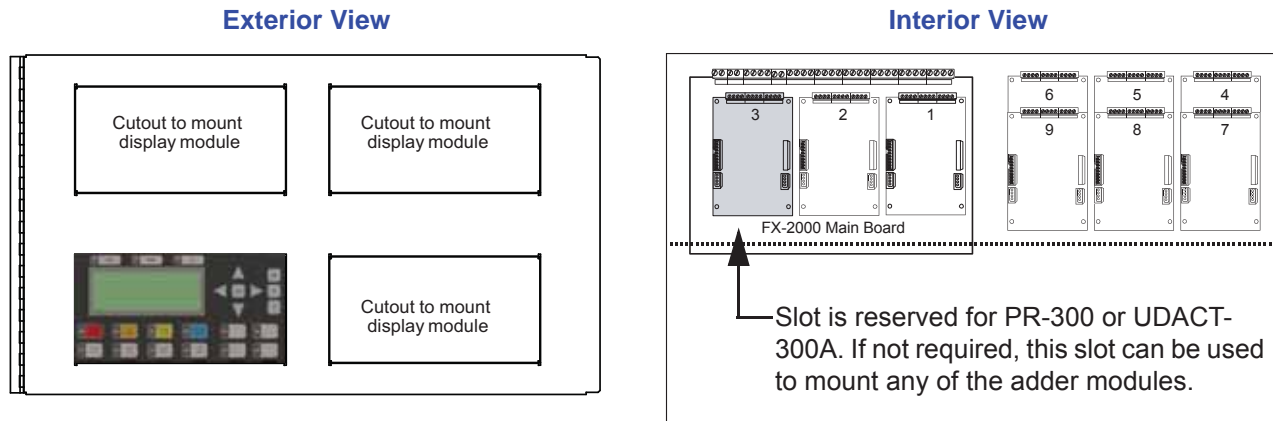
6.2 FX-2017(S)-12DS Mid-size Main Chassis

Mounts in the BBX-1072ADS or BBX-1072ARDS Enclosure, and supports three display modules and 17 adder modules.



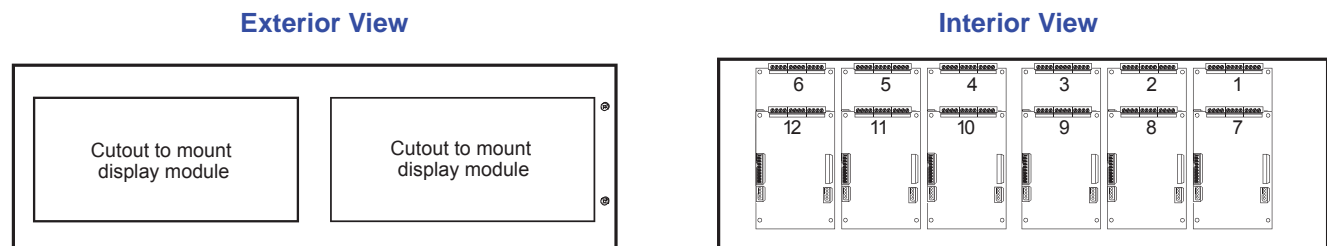
6.3 FX-2009(S)-12DS Large Main Chassis

Mounts and occupies four display positions in BB-5008 or BB-5014 Enclosures, and supports two display modules and nine adder modules.



6.4 ECX-0012 Expander Chassis for FX-2009-12DS

Mounts and occupies two display positions in BB-5008 or BB-5014 Enclosures, and supports two display and 12 adder modules.

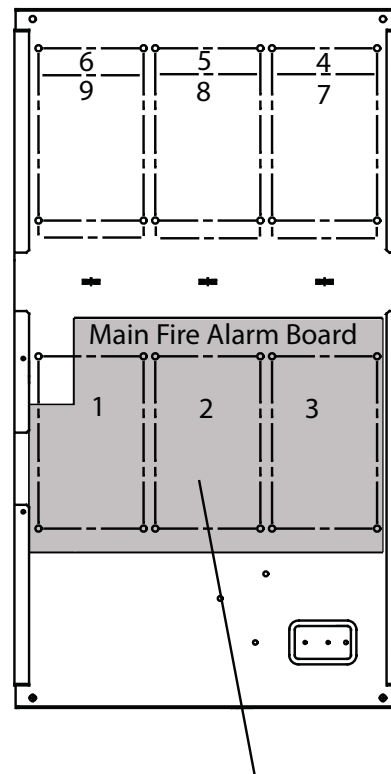


6.5 Mounting the Boards to the BBX-1024XT Chassis

The main board is mounted to the chassis and is shipped out this way. Mounts up to 9 adder modules and one display module such as RAX-1048TZDS Programmable 48 Zone and Trouble LED display module, IPS-2424DS Programmable Input Switches module and FDX-008 Fan Damper module.



Inside Chassis for mounting adder modules. Three modules can be mounted over the main fire alarm board and six above the main fire alarm board stacked three over three.



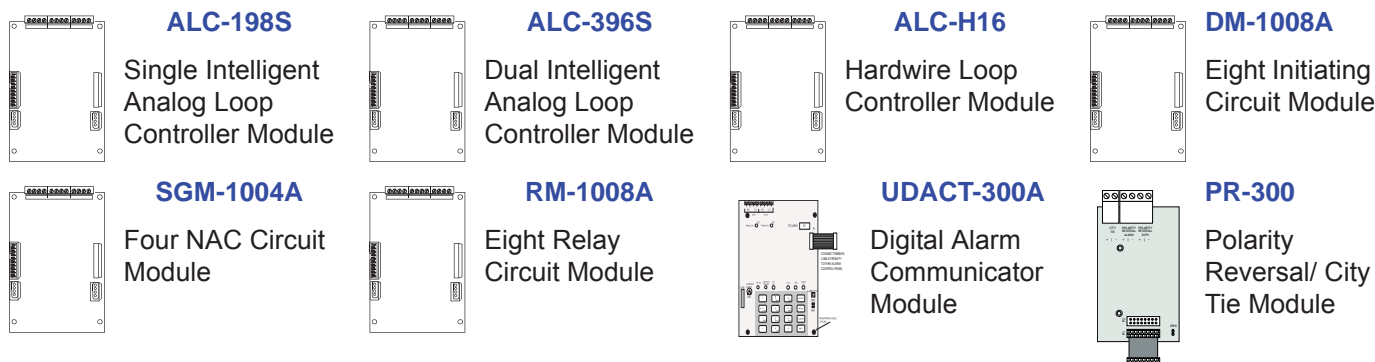
Three adder modules mounted over main fire alarm board.

Figure 13 FX-2003-12XT in a BBX-1024XT Enclosure

6.5.1 Adder Modules

Each adder module occupies one module slot and mounts inside the following chassis:

- FX-2003-6DS/FX-2003-12DS/FX-2003-12XT/FX-2003-12XTDS Chassis
- FX-2017-12DS Mid-size Main Chassis and FX-2009-12DS Large Main Chassis
- ECX-0012 Expander Chassis for FX-2009-12DS



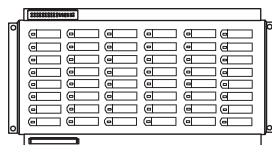
6.5.2 Display Modules

Each display module occupies one display position and mounts to the display cutouts on the following chassis:

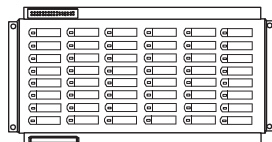
- FX-2003-6/FX-2003-12 Compact Main Chassis
- FX-2003-6DS/FX-2003-6DS-16LED/FX-2003-12DS Compact Main Chassis
- FX-2003-12XT/FX-2003-12XTDS Mid-size Main Chassis
- FX-2017-12DS Mid-size Main Chassis
- FX-2009-12DS Large Main Chassis
- ECX-0012 Expander Chassis for FX-2009-12

These modules can also be mounted in the standard BB-5000 cutouts (with brackets), and the BBX-1000 enclosures (requires RAX-LCD as a driver).

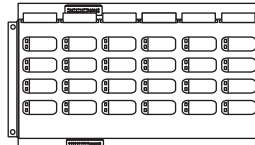
RAX-1048TZDS
Programmable Zone LED Annunciator Module



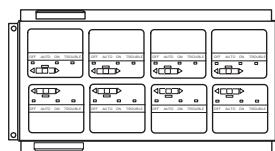
RAX-1048TZDS
Programmable Zone LED Annunciator Module



IPS-2424DS
Programmable Input Switches Module



FDX-008
Fan Damper Module



7.0 Module Settings

7.1 Main Fire Alarm Modules (MD-764 Part of Main Chassis)

JW1	Remove jumper if a PR-300 or UDACT-300A is installed.
JW2 to JW4	Jumpers are factory set and should not be changed.
P3	Black RS-485 Connector connects to the Adder Loop ALC-198S, ALC-396S or ALC-H16 if used (Address Loops 3, 4, etc)
P4	Connector for PR-300 module or UDACT-300A.
P6	Connector for first eight conventional hardwire circuit adder modules (Loop 0).
P5	Connector for next eight conventional hardwire circuit adder modules (Loop1).
P7	White BDM Connector for factory use only.
P8	Power Connector for Adder Modules.
P9	RS-232C for printer or CRT monitor.
P10, P11	Factory connection to bridge rectifier.
P12, P13	Connection to 24VDC battery. Observe correct polarity
P14	Connector for display module.
F1	20 Amp slow blow non-replaceable fuse.

TO CONFIGURE THE FIRE ALARM PANEL USE THE RS-485 CONNECTOR P4 OF THE LAST ADDER LOOP CONTROLLER MODULE INSTALLED.

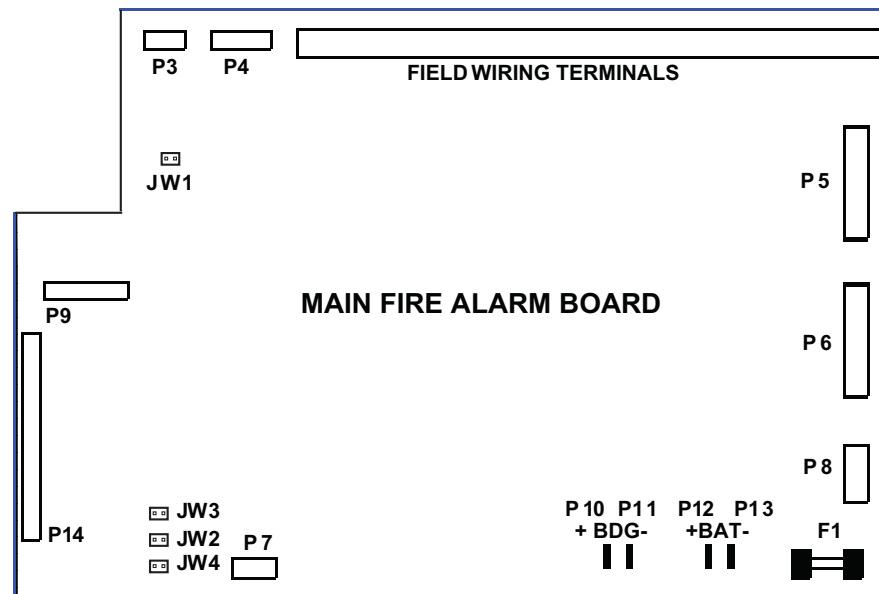


Figure 14 Main Fire Alarm Board



Note: To enable communication from the Main Module to all of the Adder Modules, it is necessary to add a Continuity Jumper on the last Adder Module in a chain (see the appropriate Module Settings section to verify the location of the Continuity Jumper on a particular Circuit Adder Module). Only the last circuit adder module should have a jumper plug on its continuity jumper; all others must be left without a jumper plug.

7.2 Main Fire Alarm Super Module (MD-757 Part of “S” Version Main Chassis)

This super main board does not have any addressable loops on it. For an addressable loop, adder boards are required.

JW1	Remove jumper if a PR-300 or UDACT-300A is installed.
JW2 to JW4	Jumpers are factory set and should not be changed.
P3	Black RS-485 Connector connects to the Adder Loop ALC-198S, ALC-396S or ALC-H16 if used (Address Loops 3, 4, etc)
P4	Connector for PR-300 module or UDACT-300A. NO HARDWIRE CIRCUIT ADDER MODULES ARE CONNECTED TO THIS MAIN FIRE ALARM SUPER MODULE
P7	White BDM Connector for factory use only.
P8	Power Connector for Adder Modules.
P9	RS-232C for printer or CRT monitor.
P10, P11	Factory connection to bridge rectifier.
P12, P13	Connection to 24VDC battery. Observe correct polarity
P14	Connector for display module.
F1	20 Amp slow blow non-replaceable fuse.

TO CONFIGURE THE FIRE ALARM PANEL USE THE RS-485 CONNECTOR P4 OF THE LAST ADDER LOOP CONTROLLER MODULE INSTALLED.

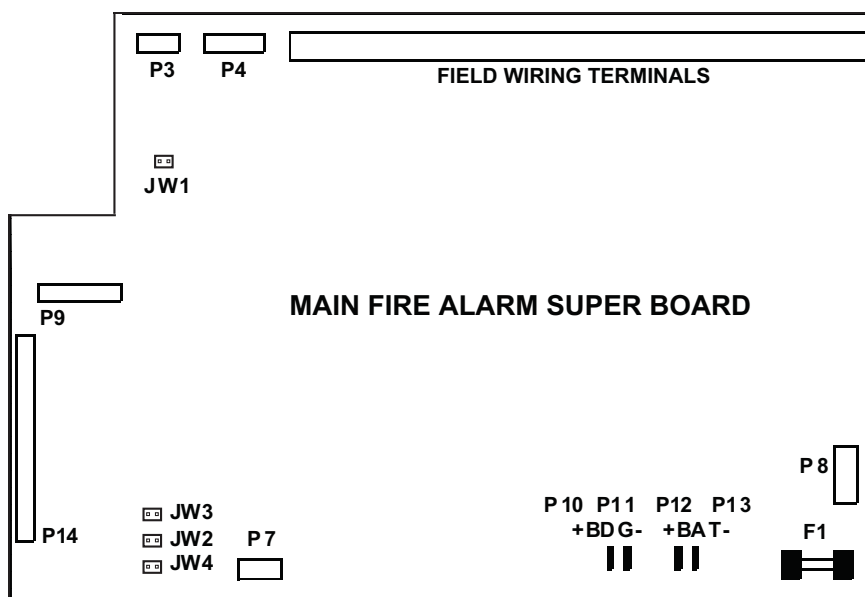


Figure 15 Main Fire Alarm Super Module (MD-757 Part of “S” Version Main Chassis)



Note: To enable communication from the Main Module to all of the Adder Modules, it is necessary to add a Continuity Jumper on the last Adder Module in a chain (see the appropriate Module Settings section to verify the location of the Continuity Jumper on a particular Circuit Adder Module). Only the last circuit adder module should have a jumper plug on its continuity jumper; all others must be left without a jumper plug.

7.2.1 DSPL-420 Main Display Module

- P1** Cable connects to P14 of main fire alarm module
- P2** Connection to P1 of any adder display module if used.



Figure 16 DSPL-420 Main Display Module

i

Note: The main display module comes with slide-in paper labels including both English and French slide-ins, and laser printer-compatible blanks for zone labelling.

7.2.2 Optional DSPL-420-16TZDS Display Module

- P1** Cable connects to P14 of main fire alarm module
- P2** Connection to P1 of any adder display module if used.

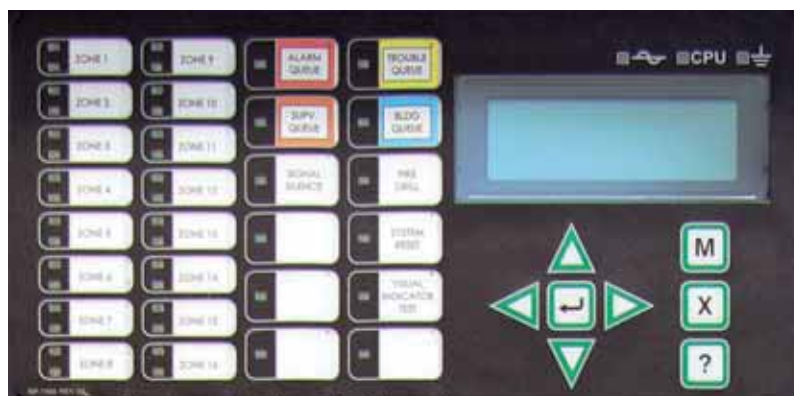


Figure 17 DSPL-420-16TZDS Main Display Module with 16 Zone LEDs

i

Note: The main display module comes with slide-in paper labels including both English and French slide-ins, and laser printer-compatible blanks for zone labelling.

7.3 RAX-1048TZDS Zone Display Module

P1 Cable connects to P2 of previous display module.

P2 Cable connects to P1 of next display module.

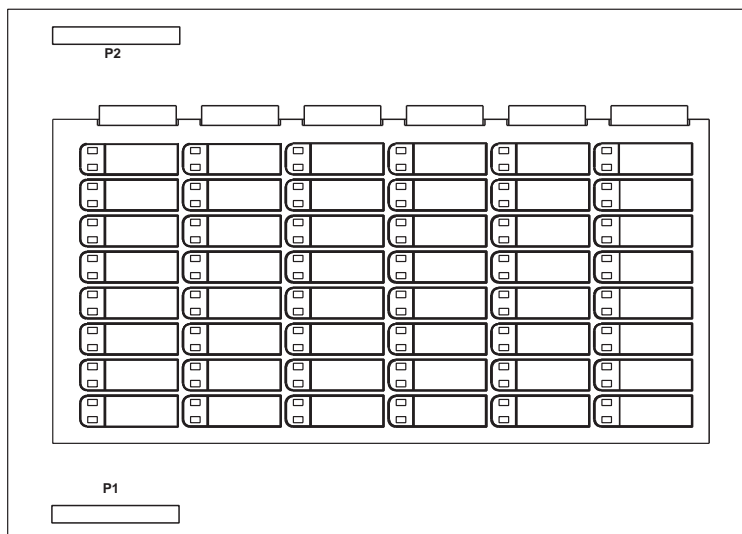


Figure 18 Zone Display Module (RAX-1048TZDS)

7.4 IPS-2424DS Programmable Input Switches Module

P1 Cable connects to P2 of previous display module.

P2 Cable connects to P1 of next display module.

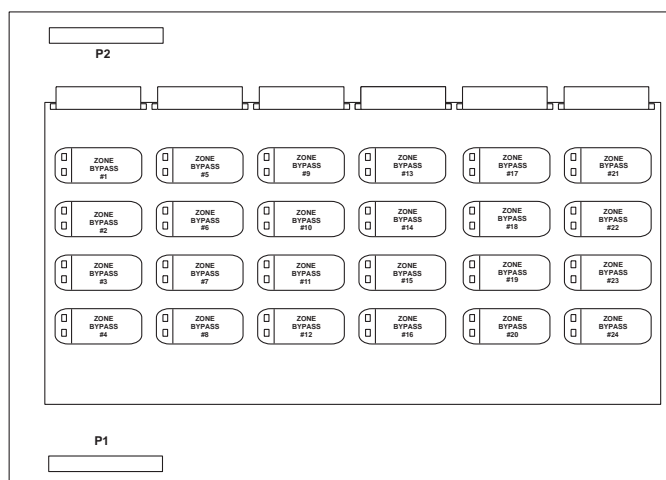


Figure 19 IPS-2424DS Programmable Input Switches Module.



Note: The zone display modules comes with laser printer-compatible slide-in paper labels for zone labelling.

7.5 Fan Damper Control Display Module (FDX-008/KI)

There are two models of the Fan Damper Control Display modules available. The FDX-008 provides switch control and LED indication of 8 fan damper zones. The FDX-008KI provides switch control of 7 fan damper zones with the eighth zone activated by keyswitch. LED indication is provided for all 8 fan damper zones on the FDX-008KI. Both the FDX-008 and the FDX-008KI are used in conjunction with a FX-2000 Fire Alarm Control Panel.

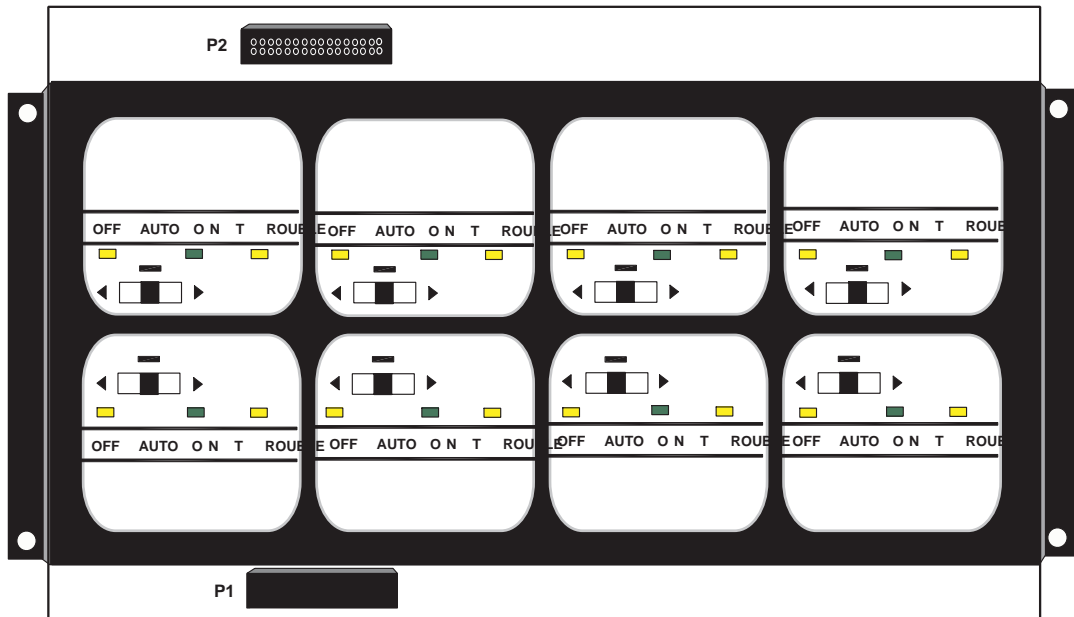


Figure 20 Fan Damper Control Display Module (FDX-008/KI)

7.5.1 Fan Damper Operation

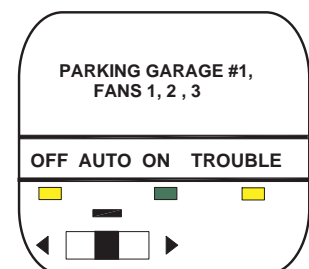
The FDX-008 Fan Damper Control Display module has eight configurable output circuits, each with a three position switch. The FDX-008KI operates in the same manner as the FDX-008 except zone 8 is controlled by a remote keyswitch. Each switch has an ON and OFF position, plus an AUTO position. If the switch is placed in the AUTO position, the output will activate as programmed or configured. The output can be manually turned ON or OFF by placing the switch in the ON or OFF position, respectively.

Basically each switch can be configured to operate multiple fans or dampers. For each switch, there are 3 operations provided; outputs to turn ON, same outputs to turn OFF and inputs to bypass.

An example of the most common use of the FDX-008 or FDX-008KI Fan Damper Control Display module is to operate exhaust fans and confirm fan operation (via monitor modules). See FDX-008 Block Diagram on the next page for a block diagram of fan and monitor set up.

7.5.2 Example

As shown in the figure to the right, Parking Garage #1 has 3 exhaust fans. The three position switch is configured to operate (to turn ON) fans 1, 2 and 3 in stairwell #1. The switch is set in the AUTO position. Upon activation (via alarm or some other programmed trigger) with the switch in AUTO, the 3 fans (1,2, and 3) in stairwell #1 are turned ON automatically. Monitor modules in the Parking Garage #1 detect that all 3 fans are operating,



therefore the ON LED will illuminate steadily. If one of the fans did not turn ON (due to malfunction), the ON LED will flash. The TRBL (trouble) LED will illuminate steady amber based on feedback from the monitor module that one or more of the fans is not working.

ON LED shows steady for all outputs operating and confirmed.

OFF LED shows steady for all outputs NOT operating and confirmed.

TRBL LED shows steady for one or more outputs NOT operating and confirmed.

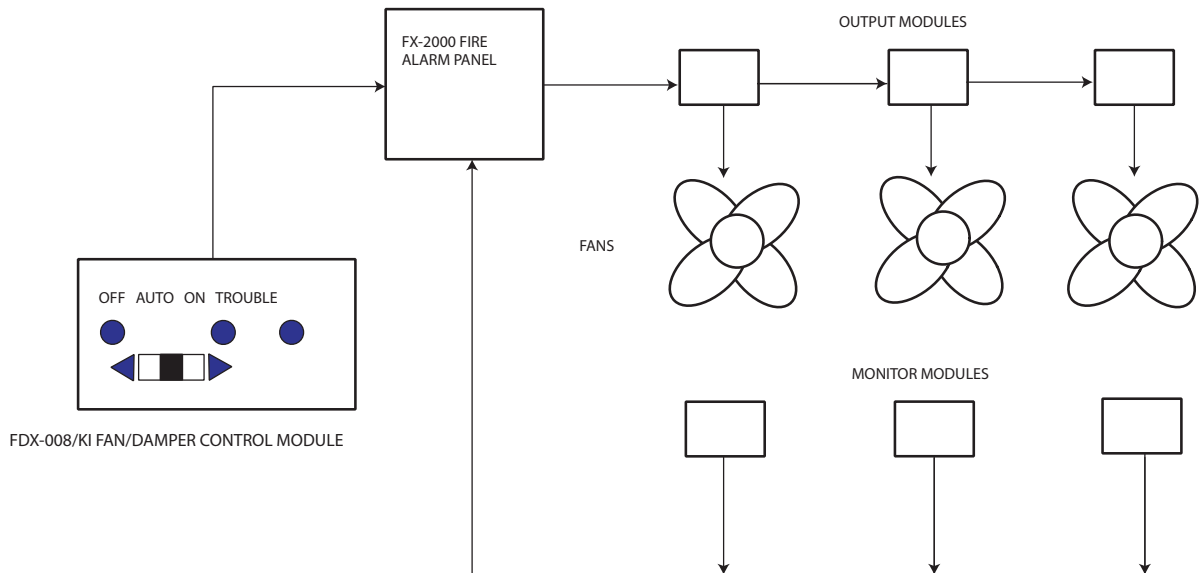


Figure 21 FDX-008 Block Diagram of Fan and Monitor Setup



Note: A bypass function always has priority, so that if a circuit is bypassed by moving the switch manually or by loop bypass (FX-2000 Fire Alarm Panel), no other action will operate this switch other than again moving the switch manually or by un-bypassing the loop.

Before mounting the FDX-008KI module, if a keyswitch is to be connected, wire the keyswitch to terminals at TS1 as shown in Figure 22 on page 35.



Note: There are also terminals located behind TS1 on the other side of the board for the convenience of wiring the keyswitch. The last fan damper zone in the bottom right position of the FDX-008KI is controlled by the keyswitch.

Mount the FDX-008 and FDX-008KI Fan Damper Control Display modules in any position on the front part of the FX-2000 chassis.

TERMINALS AT TS1 ARE WIRED TO A KEYSWITCH.

NOTE: IF FAN DAMPER MODULE IS MOUNTED TO THE DOOR USE TERMINALS LOCATED AT THE BACK OF THIS BOARD, BEHIND TS1.

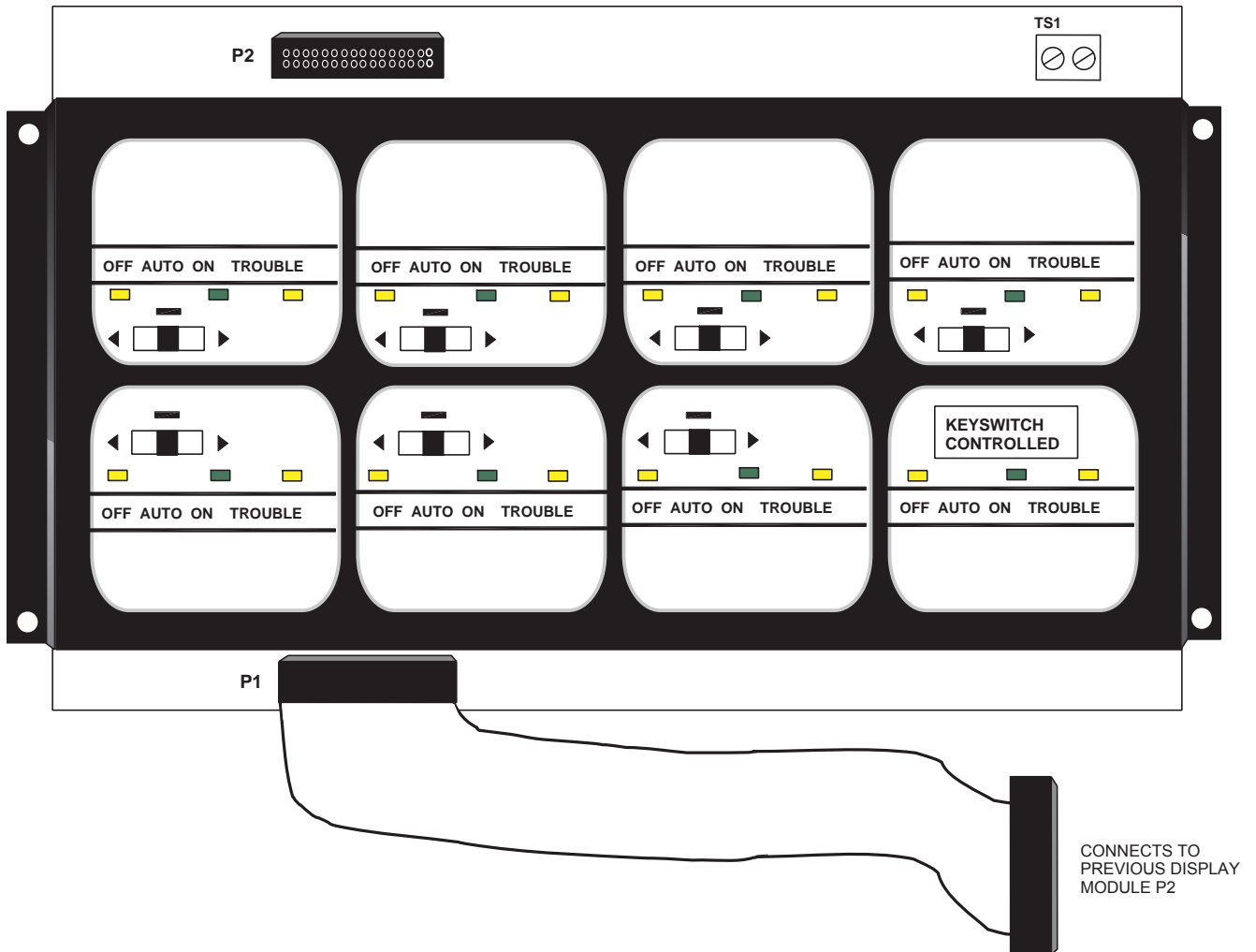


Figure 22 FDX-008KI Fan Damper Control Display Module

7.6 DM-1008A Hardwire Detection Adder Module

- JW1** Install jumper for Class A (Style D) operation of initiating circuits 1 and 2.
- JW2** Install jumper for Class A (Style D) operation of initiating circuits 3 and 4.
- JW3** Install jumper for Class A (Style D) operation of initiating circuits 5 and 6.
- JW4** Install jumper for Class A (Style D) operation of initiating circuits 7 and 8.
- JW5** Remove continuity jumper if there are any more adder modules installed.

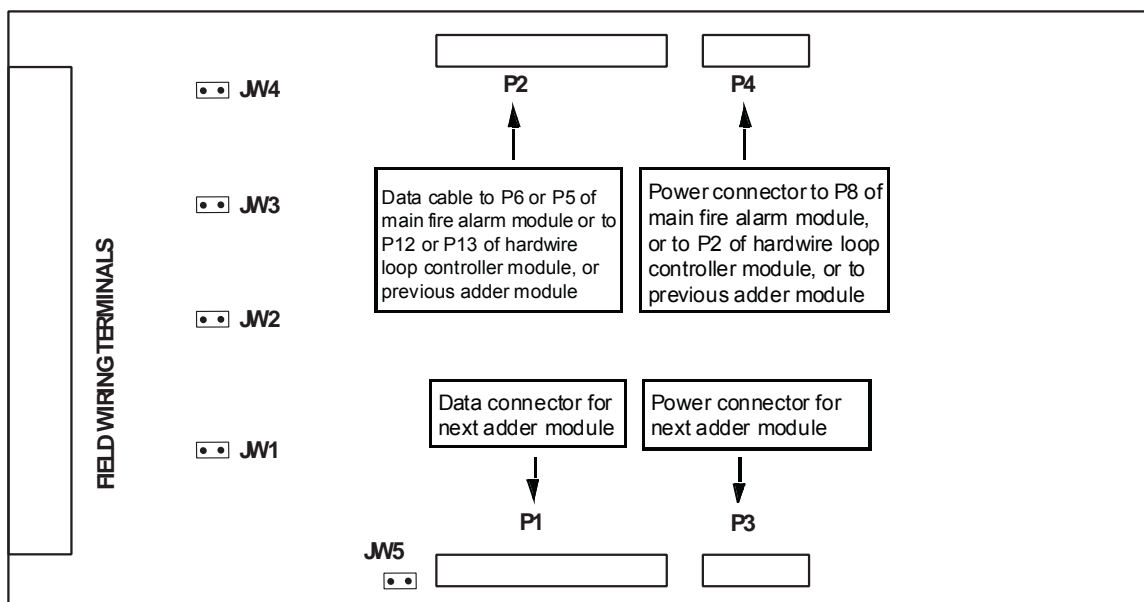


Figure 23 Hardwire Detection Adder Module (DM-1008A)



Note: For Class A (Style D) operation the FX-2000 must be configured as Class A via the configuration program.

7.7 SGM-1004A Hardwire NAC Signal Adder Module

- JW1** Remove continuity jumper if this is not the last adder module installed.
- JW2** Jumper pins for bell cut or isolators on Zone 1.
- JW3** Jumper pins for bell cut or isolators on Zone 2.
- JW4** Jumper pins for bell cut or isolators on Zone 3.
- JW5** Jumper pins for bell cut or isolators on Zone 4.
- JW11** For basic operation do not wire these terminals.

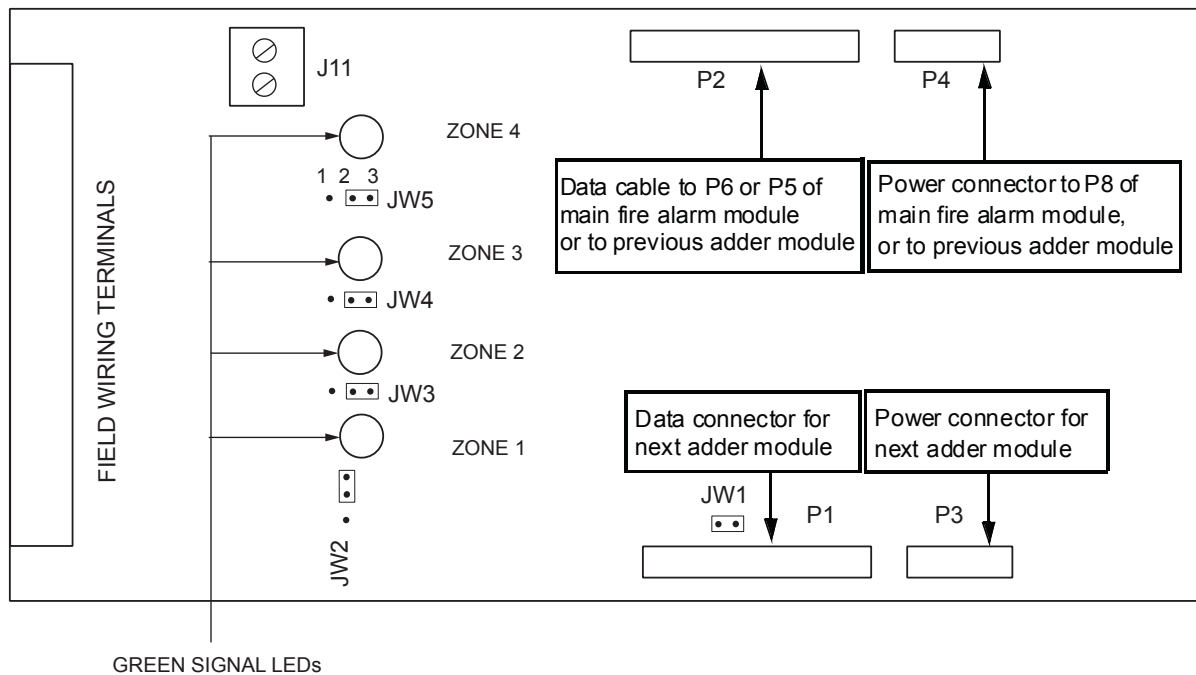


Figure 24 Hardwire NAC Signal Adder Module (SGM-1004A)

7.7.1 SGM-1004A Components

There are four green LEDs on the board, one for each signal zone. The LED will illuminate or flash following the NAC signal rate sent to its zone. It will be off when the system is normal and they will illuminate when a NAC signal zone is activated. The LED does not reflect what is happening on the NAC signal zone, just that it is receiving data to activate that NAC signal zone.



Note: Jumpers JW2, JW3, JW4 and JW5 are positioned on pins 2 and 3 (right two pins with board orientation as shown above) from factory.

7.7.2 SGM-1004A Operation

There are three modes of operation for this module. The basic mode of operation does not involve any bell cut relay or isolators connected to the signal zones. For this case, leave jumpers JW2, JW3, JW4 and JW5 as they come on pins 2 and 3, and do not make any connection to terminal block J11. The second mode provides bell cut operation which allows the silencing of the bells. The third mode is used when isolators are to be connected to the signal circuits. For further information on bell cut relays or isolators, please refer to the specific fire alarm panel manual or the isolator instruction manual.

7.7.3 SGM-1004A Jumpers for the Bell Cut Mode

JW2	Place jumper over pins 1 and 2 for the ability to remotely silence the bells on Zone 1.
JW3	Place jumper over pins 1 and 2 for the ability to remotely silence the bells on Zone 2.
JW4	Place jumper over pins 1 and 2 for the ability to remotely silence the bells on Zone 3.
JW5	Place jumper over pins 1 and 2 for the ability to remotely silence the bells on Zone 4.
JW11	Wire these terminals to a bell cut relay (for details see QRM-1001 Bell Cut Module Installation and Operating Instructions, LT-666).



Attention: Discard jumpers on zones that are not configured for bell cut.

7.7.4 SGM-1004A Jumpers for the Isolator Mode

JW2	Place jumper over pins 2 and 3 for the ability to connect an isolator on Zone 1.
JW3	Place jumper over pins 2 and 3 for the ability to connect an isolator on Zone 2.
JW4	Place jumper over pins 2 and 3 for the ability to connect an isolator on Zone 3.
JW5	Place jumper over pins 2 and 3 for the ability to connect an isolator on Zone 4.
JW11	Wire these terminals to an alarm relay. These may be tapped if more signal modules are used in this manner.



Attention: Discard jumpers on zones that are not configured for isolators.

7.8 RM-1008A Hardwire Relay Adder Module

- P2** Data cable to P6 or P5 of main fire alarm module, or to P12 or P13 of Hardwire loop controller module, or to previous adder module.
- P1** Data connector for next adder module.
- P4** Power connector to P8 of main fire alarm module, or to P2 of Hardwire loop controller or to previous adder module.
- P3** Power connector for next adder module.
- JW1** Remove continuity jumper if there are any more adder modules installed. If this is the last module installed, leave JW1 on.
- JP1-JP8** Move jumpers from pins 1 and 2 to 2 and 3 to connect relay commons between two or more relays.

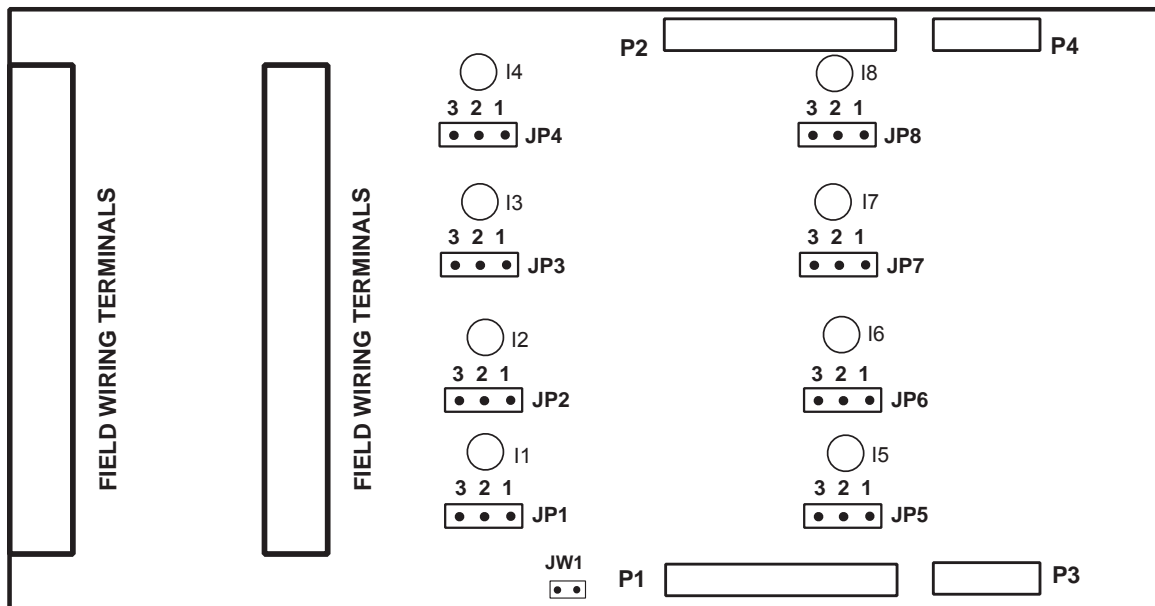


Figure 25 Hardwire Relay Adder Module (RM-1008A)

7.9 Polarity Reversal and City Tie Module (Model PR-300)

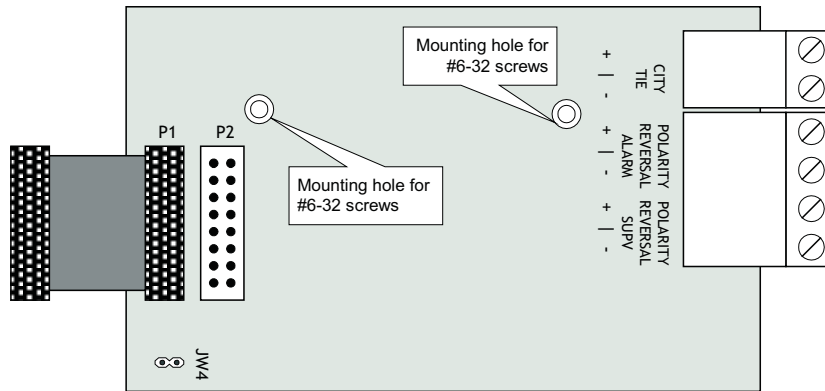


Figure 26 Polarity reversal and city tie module

The following hardware configuration must be performed before installing the PR-300.

- P1** Cable connects to **P5** on the **FX-2000 Main Fire Alarm Board**
- P2** P2 is for connecting the UDACT-300A if both PR-300 and UDACT-300A are installed on the FX-2000.
- JW4** If the PR-300 is used this is the last module jumper. JW1 on the main board should be removed and JW4 on the PR-300 should be set. If both PR-300 and UDACT-300A are installed, then JW1 on the main board and JW4 on the PR-300 should be removed.

Table 9 PR-300 jumper settings

The Alarm Transmit signal to the PR-300 can be programmed to turn OFF when signal silence is active. This allows the City Tie Box to be manually reset. On subsequent alarms the silenceable signals will resound and the City Tie Box will be retriggered. Please refer to the Configurator for more information.

The Trouble Transmit signal to the PR-300 can be programmed to delay AC power fail. Please refer to the Configurator for more information.



Note: Jumper JW1 on the FX-2000 main fire alarm board must be removed if a city tie module is installed.

7.10 UDACT-300A Main Board

There are two jumpers on the UDACT-300A which are used for operation/configuration purposes. Jumper JW1 is used to reset the default passcode. Jumper JW2 is required for configuring the UDACT-300A. Refer to Figure 22 below for location of jumpers, cable connections, pushbutton and LEDs. Table 2 following, provides a description of the user items on the UDACT-300A.

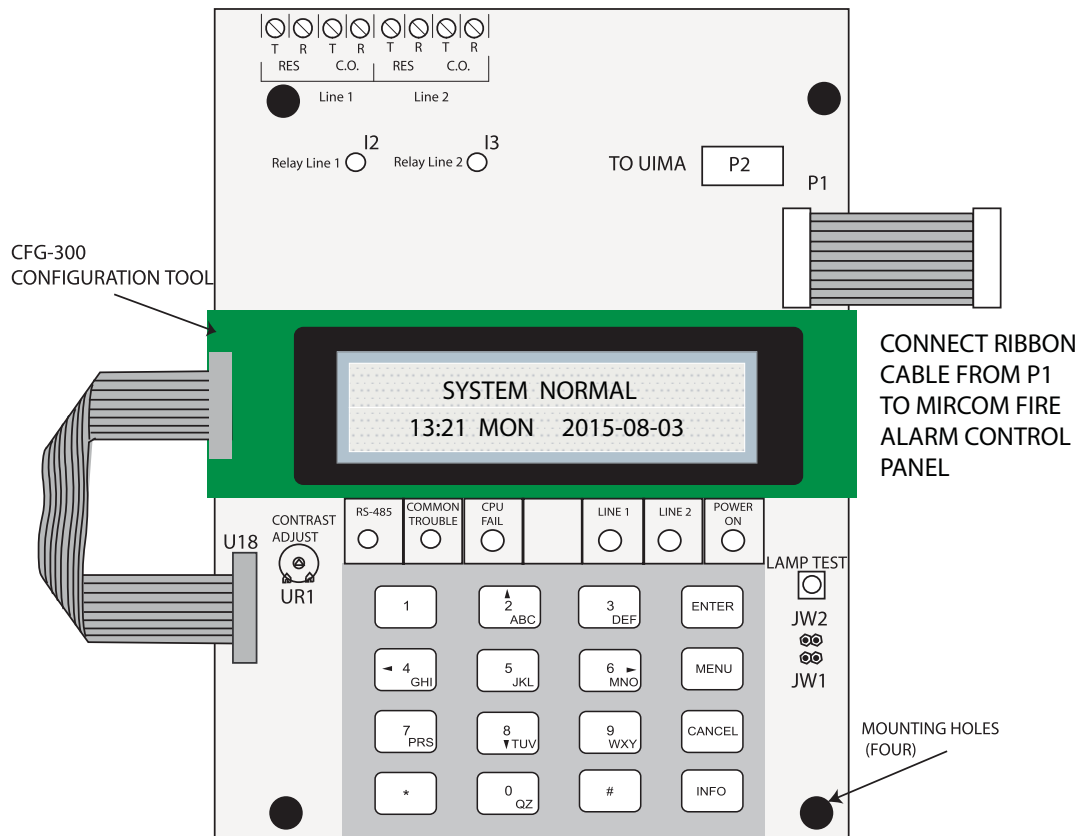


Figure 27 UDACT-300A Board Layout

Table 10 UDACT-300A Cable Connectors and Miscellaneous

Cable Connector	Function
P1	Ribbon Cable for connecting to P4 of FX-2000 FACP main board.
P2	RS-232C/RS-485 Connection for computer configuration.
U18	Connector for CFG-300 Configuration Tool
Visual Indicator Test button	Connector for CFG-300 Configuration Tool
UR1 Potentiometer	This potentiometer is for adjustment of the CFG-300 LCD contrast.

The following table lists all the LEDs located on the UDACT-300A board and states the function of each LED.

Table 11 UDACT-300A List of LEDs and their Functions

Cable Connector	Function
Relay Line 1	Located below Line 1 terminal block. When Line 1 relay is energized, this green LED will illuminate
Relay Line 2	Located below Line 2 terminal block. When Line 2 relay is energized, this green LED will illuminate.
RS-485	Status LED for communication, will flash when RS-485 communication is active.
Common Trouble	Steady amber for any troubles on the Fire Alarm panel or UDACT-300A.
CPU Fail	Steady amber for any on board CPU trouble.
Telephone Line 1	Telephone status indicator LED; Red when the line is in use, Amber when there is a line trouble.
Telephone Line 2	Telephone status indicator LED; Red when the line is in use, Amber when there is a line trouble.
Power ON	Green LED is ON steady when power is supplied to the board.

The following table lists the user jumpers available on the UDACT-300A and their functions.

The following table lists the user jumpers available on the UDACT-300A and their functions..

Table 12 UDACT-300A List of Jumpers for Operation and Configuration

Cable Connector	Function
JW1	Normally open. Place jumper here and power down the UDACT-300A by disconnecting P1 or power down the fire alarm panel (AC and Batteries), then power back to revert to default passcode. After reset, remove the jumper. Leave normally open.
JW2	Normally open to BLOCK remote configuration via modem, PC with a UIMA converter module or using the LCD and keypad at the UDACT-300A. Place jumper here to ALLOW any type of configuration. Remove jumper once configuration is complete.



Note: Can be installed with the PR-300 City Tie but not in the same location. If using this configuration the PR-300 must be installed on the left and it is recommended that the UDACT-300A be installed in the middle, although it can be installed on the right if needed.

See the *UDACT-300A Installation and Operation Manual (LT-888)* for more information.

7.11 ALC-198S Single Intelligent Analog Loop Controller Module

The ALC-198S Single Intelligent Analog Loop Controller module provides a single addressable loop. It may be mounted over the main chassis of the FX-2000 Fire Alarm Panel or on any chassis which supports adder boards. Refer to *Module Mounting Locations View #2 on page 24*. The module is mounted using four #6 screws and (if necessary) four 1 1/2" spacers.

- | | |
|---------------------|---|
| Power | The power is supplied to the board via cable from the main chassis board or from the previous loop controller module into the P1 Power IN connector. The P2 Power OUT connector is connected to the next loop controller module or other adder module. Two power cables are supplied with the module. |
| RS-485 | The RS-485 cable comes attached at P3 and is connected to the main chassis board or from the previous loop controller module or other adder board. The RS-485 OUT at P4 is connected to the next loop controller module if used or left without connection. |
| DIP switches | The dip switches are used to set the address of the board. The address is binary, with the SW-1 switch as the lowest significant digit and OFF being active. For example an address of two is SW-1 ON, SW-2 OFF, and all the other dip switches SW-3 to SW-8 ON. Refer to <i>Appendix E: DIP Switch Settings Summary on page 96</i> for more information. |
| Loop 1 | This is the addressable loop for all initiating devices. Wire the loop as shown in <i>Field Wiring on page 49</i> . |
| Jumpers | A jumper is provided at JW2 for normal operation. To reset the board the jumper is left at JW2 and the pins at position JW1 are shorted momentarily. |
| BDM Port | This connection is for factory use only. |

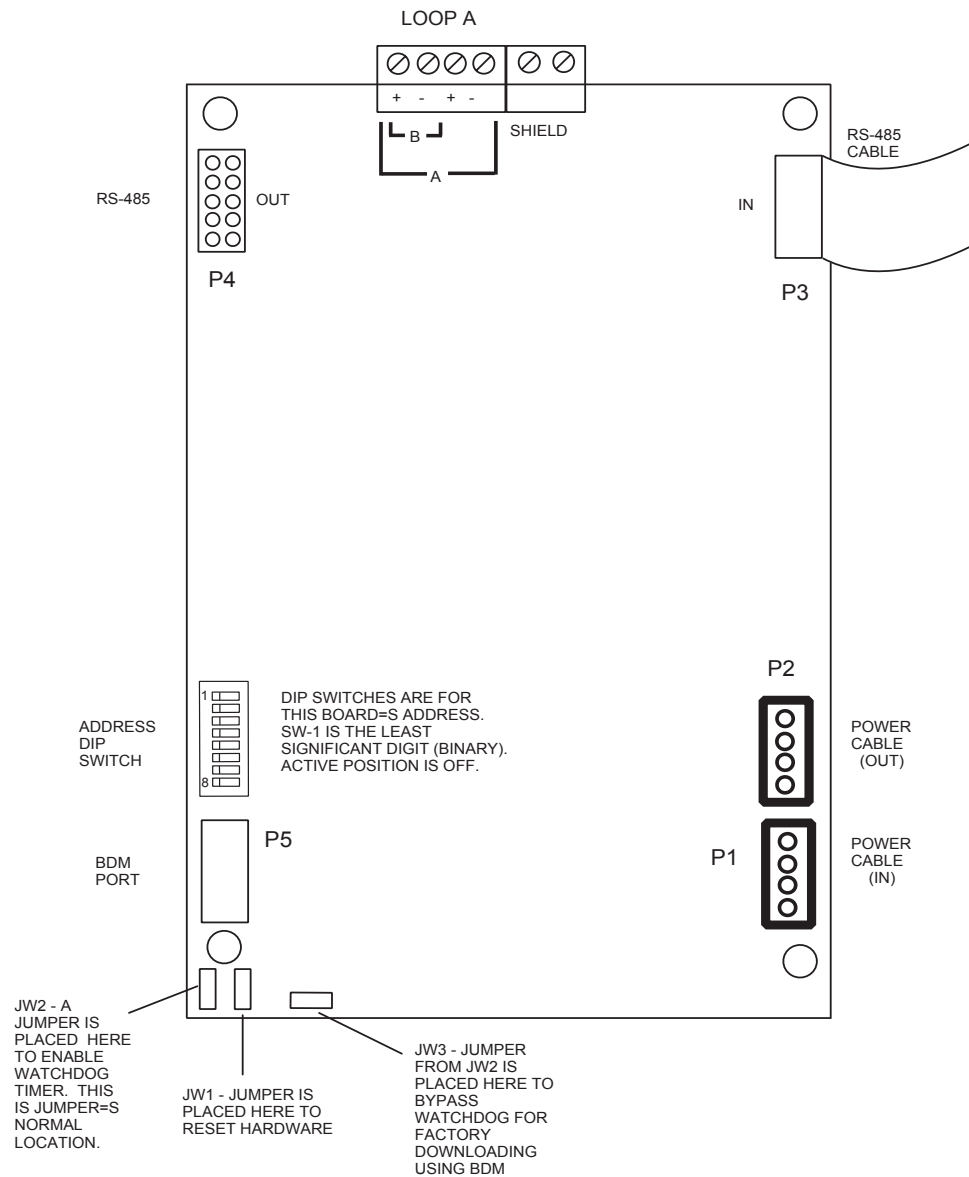


Figure 28 ALC-198S Single Intelligent Analog Loop Controller Module

Mount the ALC-198S Single Intelligent Analog Loop Controller module as described in the section *Display and Adder Modules Mounting Locations* on page 25. The module may be mounted over the main chassis board or in any position that an adder module is mounted.

7.12 ALC-396S Dual Intelligent Analog Loop Controller Module

The ALC-396S Dual Intelligent Analog Loop Controller module provides a two addressable loops. It may be mounted over the main chassis of the FX-2000 Fire Alarm Panel or on any chassis that supports adder boards. Refer to page *Module Mounting Locations View #2 on page 24* for mounting applications. The module is mounted using four #6 screws and (if necessary) four 1 1/2" spacers.

Power	The power is supplied to the board via cable from the main chassis board or from the previous loop controller module into the P1 power in connector. Connect the P2 power out connector to the next loop controller module or other adder module. Two power cables are supplied with the module.
RS-485	The RS-485 cable comes attached at P3 and is either connected to the main chassis board or connected from the previous loop controller module or other adder board. If the next loop controller module is used, connect the RS-485 out at P4 to the next loop controller module; if it is not used, leave without connection.
DIP switches	Use the DIP switches to set the binary address of the board. SW-1 is the lowest significant digit and OFF is active. For example, an address of two would be created by turning SW-1 on, SW-2 off and DIP switches SW-3 to SW-8 on. Refer to <i>Appendix E: DIP Switch Settings Summary on page 96</i> for DIP switch settings.
Loop 1	This is the addressable loop for all initiating devices. Wire the loop as shown in <i>Single Loop Terminal Connections - Class B on page 54</i> or <i>Single Loop Terminal Connections - Style 7 on page 55</i> and <i>Single Loop Terminal Connections - Style 6 on page 56</i> .
Loop 2	This is the addressable loop for all initiating devices. Wire the loop as shown in <i>Single Loop Terminal Connections - Class B on page 54</i> or <i>Single Loop Terminal Connections - Style 7 on page 55</i> and <i>Single Loop Terminal Connections - Style 6 on page 56</i> .
Jumpers	A jumper is provided at JW2 for normal operation. To reset the board, leave the jumper at JW2 and momentarily short the pins at position JW1.
BDM Port	This connection is for factory use only.

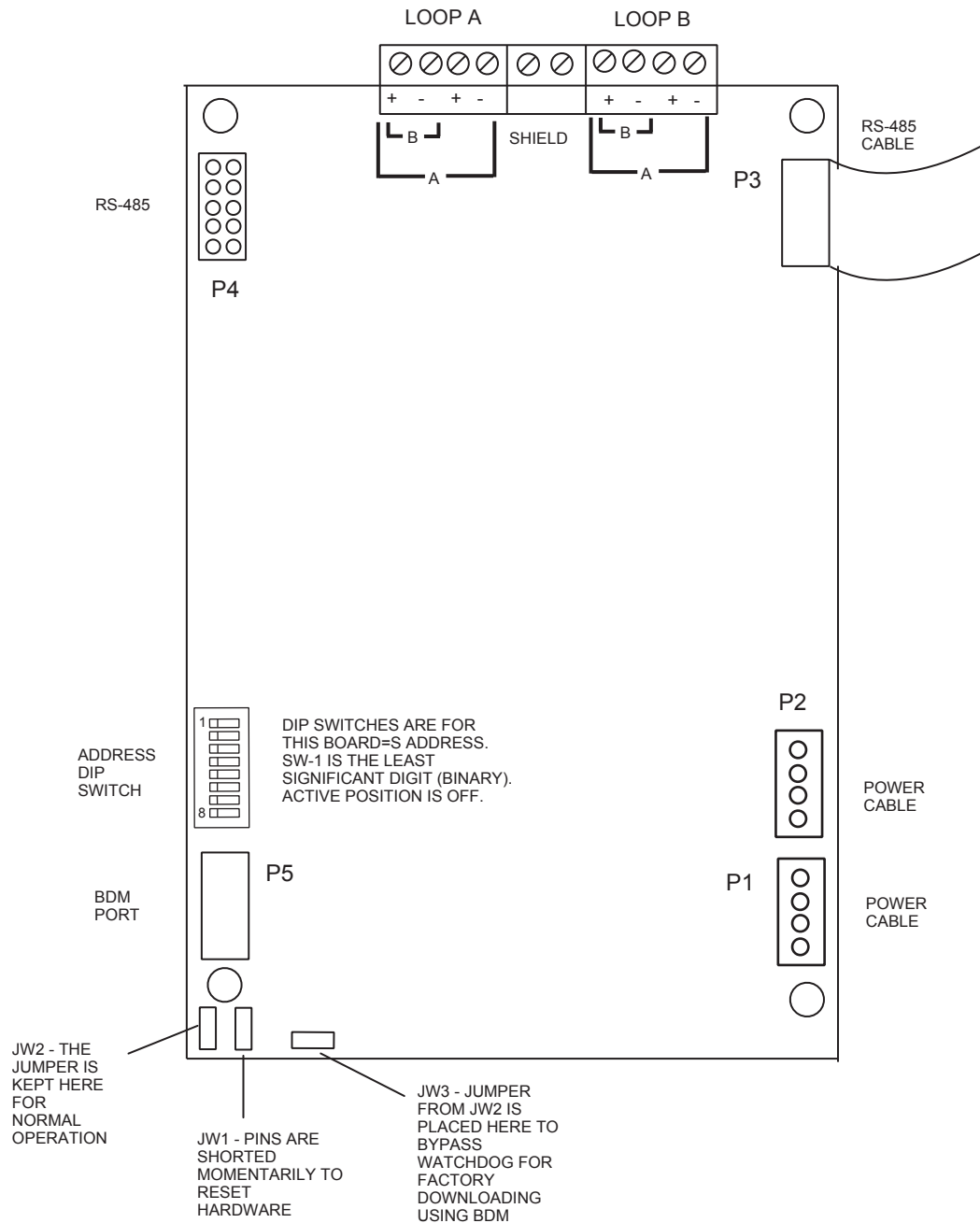


Figure 29 ALC-396S Dual Intelligent Analog Loop Controller Module

Mount the ALC-396S Dual Intelligent Analog Loop Controller module as shown in *Module Mounting Locations View #2 on page 24*. The module may be mounted over the main chassis board or in any position that an adder module is mounted.



Note: There are two addressable loops present on this board (ALC-396S) that are wired in the same manner as shown in the wiring diagrams beginning with *Main Fire Alarm Module Terminal Connections on page 49*. Although these drawings show only Loop 1, Loop 2 is wired in the same way as Loop 1 is. Note that Loop 1 and Loop 2 do not have to be wired in the same class, such as Class A or Class B or Style 7. Therefore Loop 1 may be wired as Class A and Loop 2 may be wired as Class B.

7.13 ALC-H16 Hardwire Loop Controller Module

The ALC-H16 Hardwire Loop Controller module provides an interface in order to add 16 conventional adder boards. This board may be mounted over the main chassis of the FX-2000 Fire Alarm Panel or on any chassis which supports adder boards. Refer to page *Module Mounting Locations View #2 on page 24* for mounting applications. Mount the module using four #6 screws and (if necessary) four 1 1/2" spacers.

- | | |
|-------------------------------|---|
| Power | The power is supplied to the board via cable from the main chassis board or from the previous loop controller module into the P1 power in connector. Connect the P2 power out connector to the next loop controller module or other adder module. Two power cables are supplied with the module. |
| RS-485 | The RS-485 cable comes attached at P3 and is either connected to the main chassis board or connected from the previous loop controller module or other adder board. If the next loop controller module is used, connect the RS-485 out at P4 to the next loop controller module; if it is not used, leave without connection. |
| Jumpers | A jumper is provided at JW2 for normal operation. To reset the board, leave the jumper at JW2 and momentarily short the pins at position JW1. |
| BDM Port | This connection is for factory use only. |
| P13 and P12 Connectors | Connect the P13 connector (via ribbon cable included with this module) to the first module of the first group of eight conventional adder modules. Connect the P12 connector (via ribbon cable included with this module) to the first module of the second group of eight conventional adder modules |

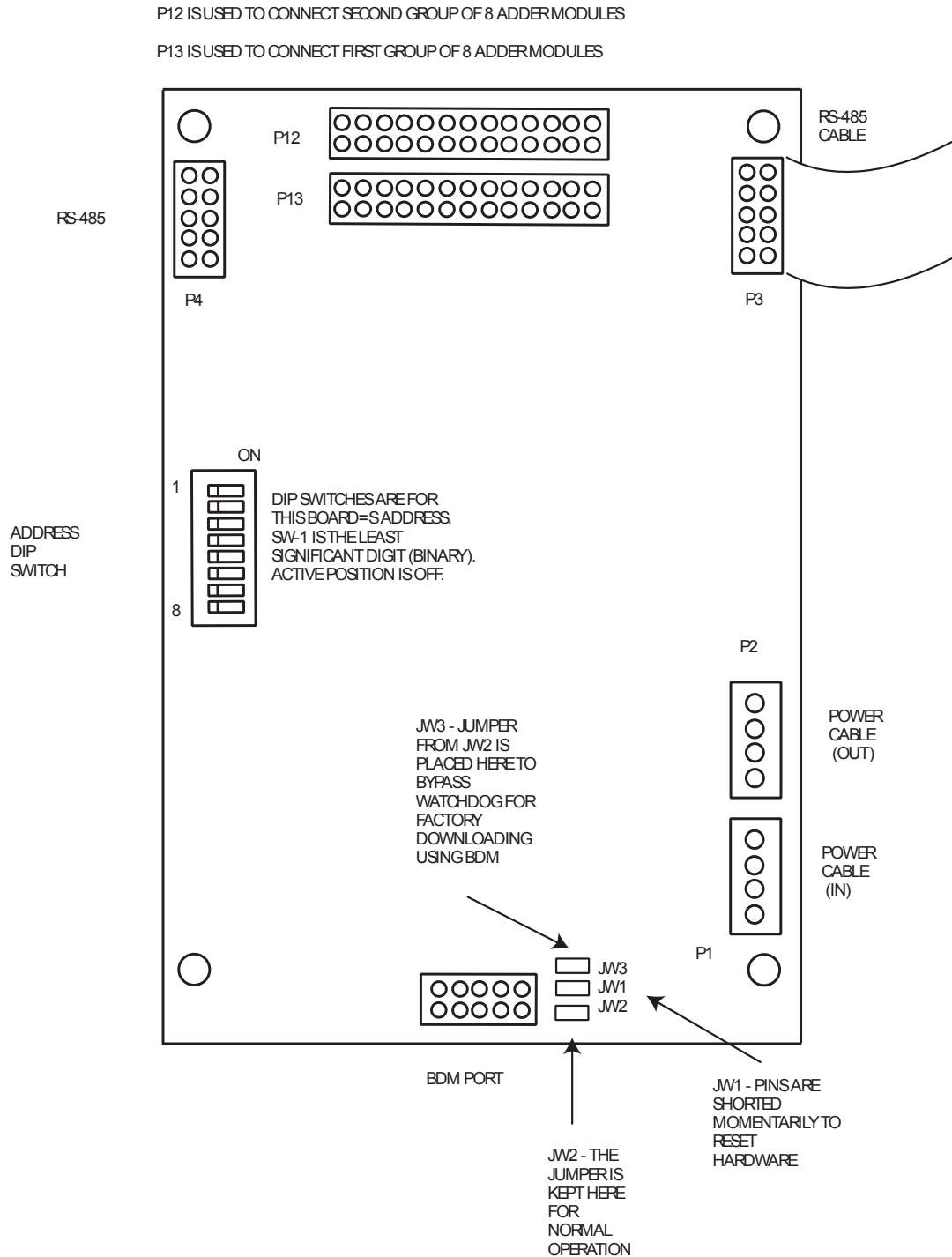


Figure 30 ALC-H16 Hardwire Loop Controller Module

Mount the ALC-H16 Hardwire Loop Controller module as shown on *Module Mounting Locations View #2* on page 24 and *ECX-0012 Expander Chassis for FX-2009-12DS* on page 26. The module may be mounted over the main chassis board or in any position that an adder module is mounted.

There is no wiring at the ALC-H16 Hardwire Loop Controller module, but there is wiring at the 16 standard conventional adder modules. For conventional hardwire circuit wiring refer to *Hardwire Detection Module (DM-1008A) Terminal Connections* on page 57, *Hardwire Signal Module Terminal Connections* on page 58, and *Hardwire Relay Module Terminal Connections* on page 59 for the specific module you are wiring.

8.0 Field Wiring

8.1 Main Fire Alarm Module Terminal Connections

Wire devices to terminals as shown in *Figure 31* below. See Wiring Tables and Information on page 63. See *Appendix A: Specifications* on page 79 and *Appendix B: Compatible Devices* on page 85 for compatible devices..



Attention: Do not exceed power supply ratings:

Main Chassis FX-2003-6DS and FX-2003-6DS-16LED total current for NAC circuits is 5A max.

Main Chassis FX-2003-12DS, FX-2003-12XTDS, FX-2017-12ADS or FX-2017S-12ADS total current for NAC circuits is 10A max.

Main Chassis FX-2009-12DS and FX-2009S-12DS: total current for NAC circuits is 10A max.



Notes: The terminal blocks are "depluggable" for ease of wiring.

All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

8.1.1 Main Fire Alarm Module Terminal Connections.

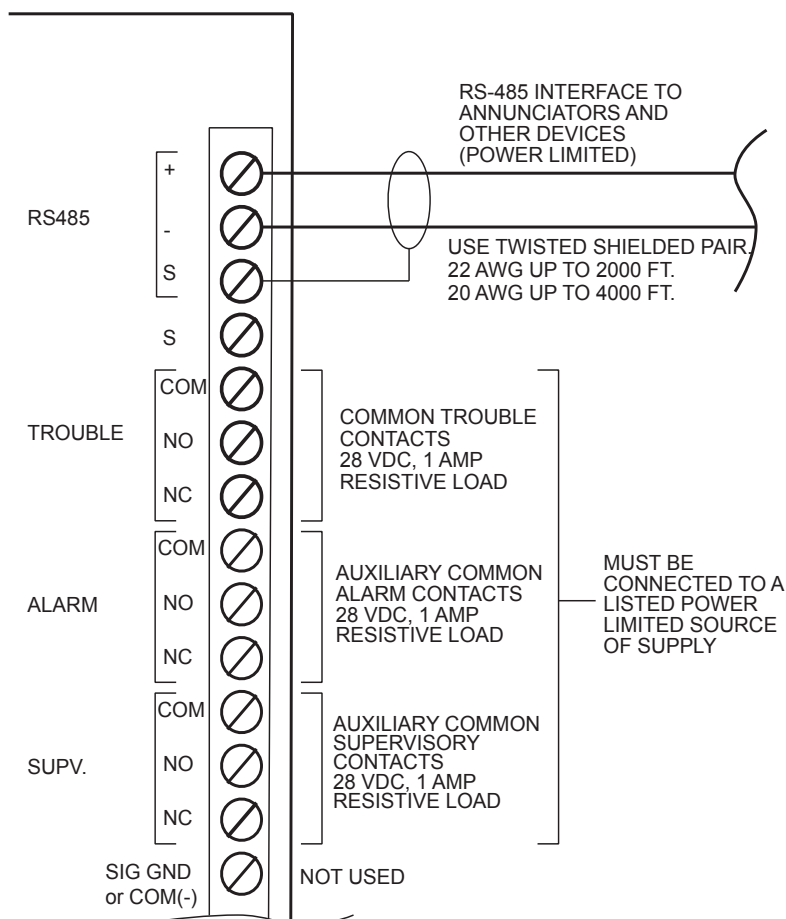


Figure 31 Main Fire Alarm Module Terminal Connections

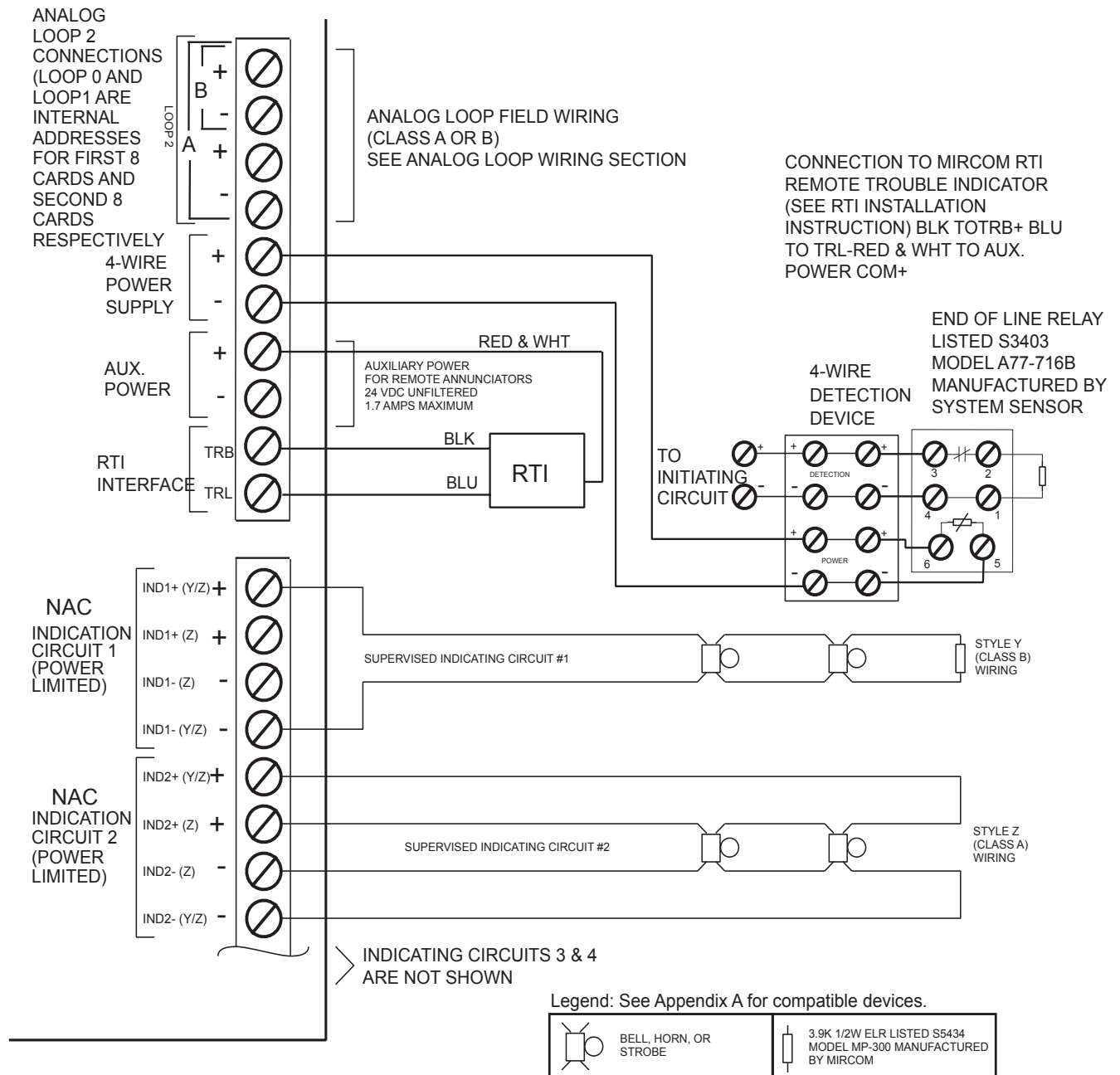


Figure 32 Main Fire Alarm Module Terminal Connections (continued)

i

Notes: The terminal blocks are "depluggable" for ease of wiring.

All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

i

Notes: All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

Indicating (NAC) circuits are fully supervised and rated for 24 VDC unfiltered 1.7A max. Use wire size as stated in *Table 15 NAC Circuit Wiring Table* on page 63.

8.2 Analog Loop Wiring

8.2.1 Loop Terminal Connections - Class B

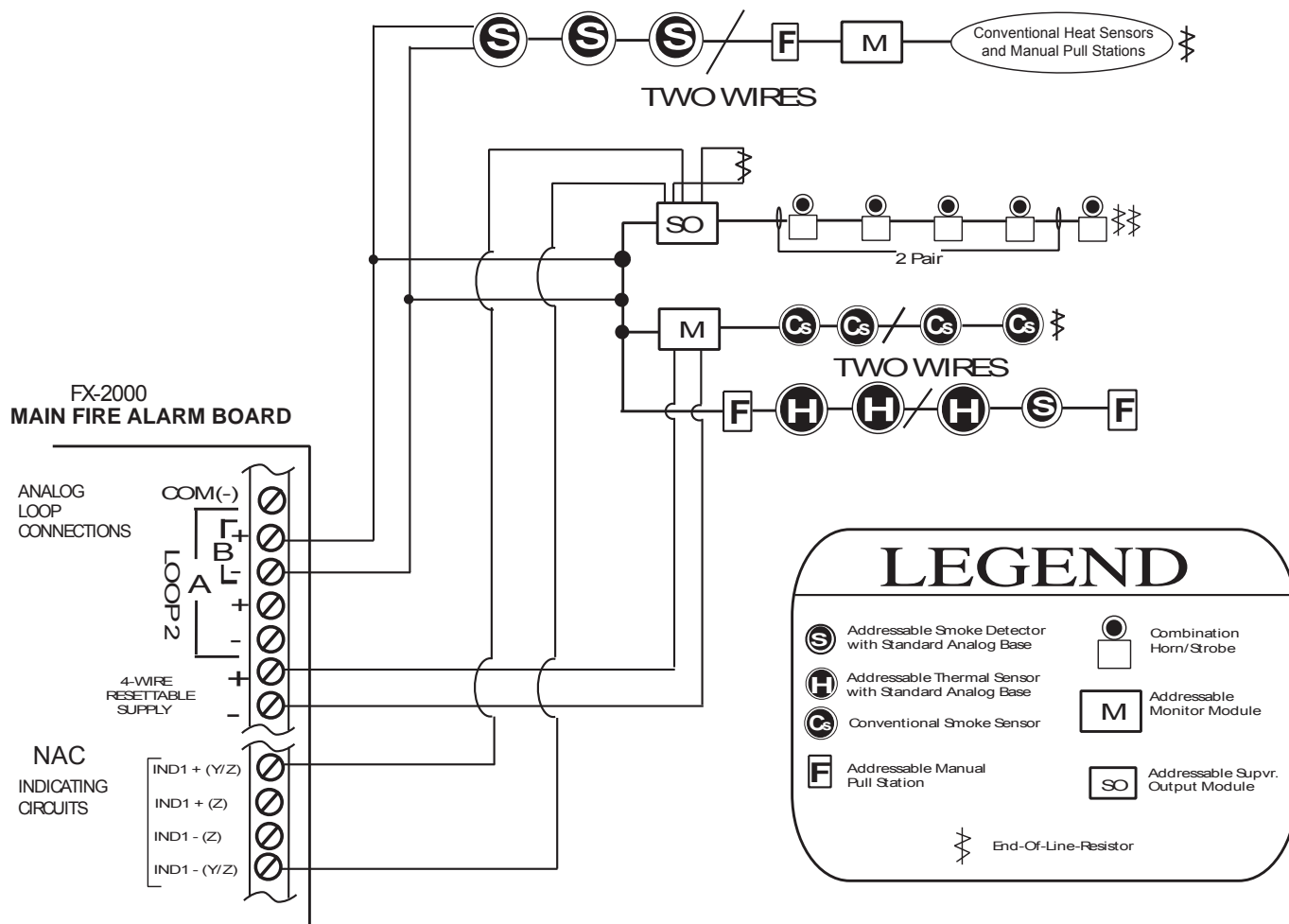


Figure 33 Loop Terminal Connections - Class B

i

Notes: Terminal blocks are “depluggable” for ease of wiring.

All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

Loop wiring: maximum loop resistance is 40 ohms total. These lines are fully supervised.

Observe in and out polarity when using module and base isolators.

8.2.2 Loop Terminal Connections - Style 7

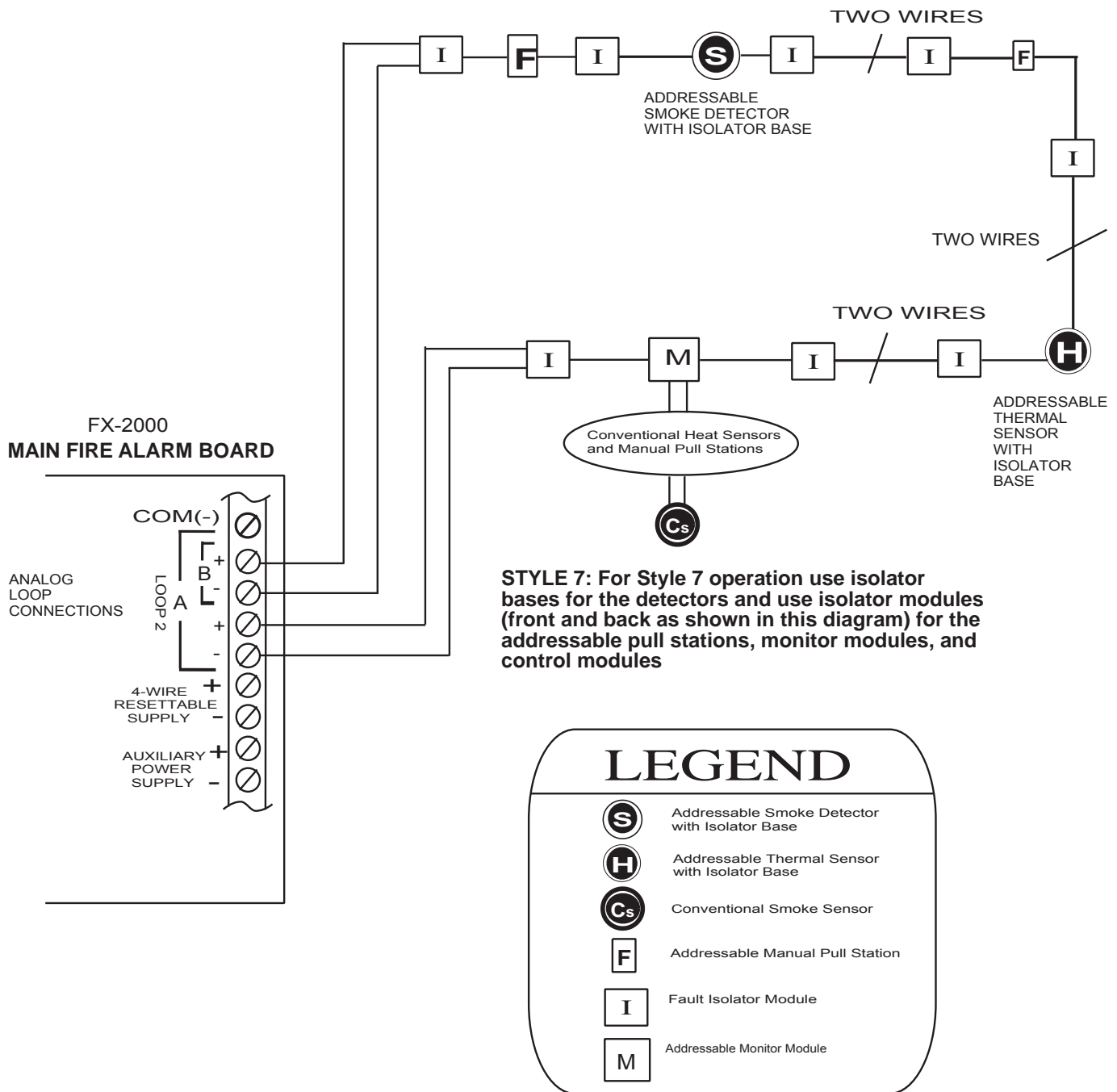


Figure 34 Loop Terminal Connections - Style 7

i

Notes: All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

Isolators need to be close nipple connected to the device being protected.

Loop wiring: maximum loop resistance is 40 ohms total. These lines are fully supervised.

8.2.3 Loop Terminal Connections - Style 6 (Formerly Class A)

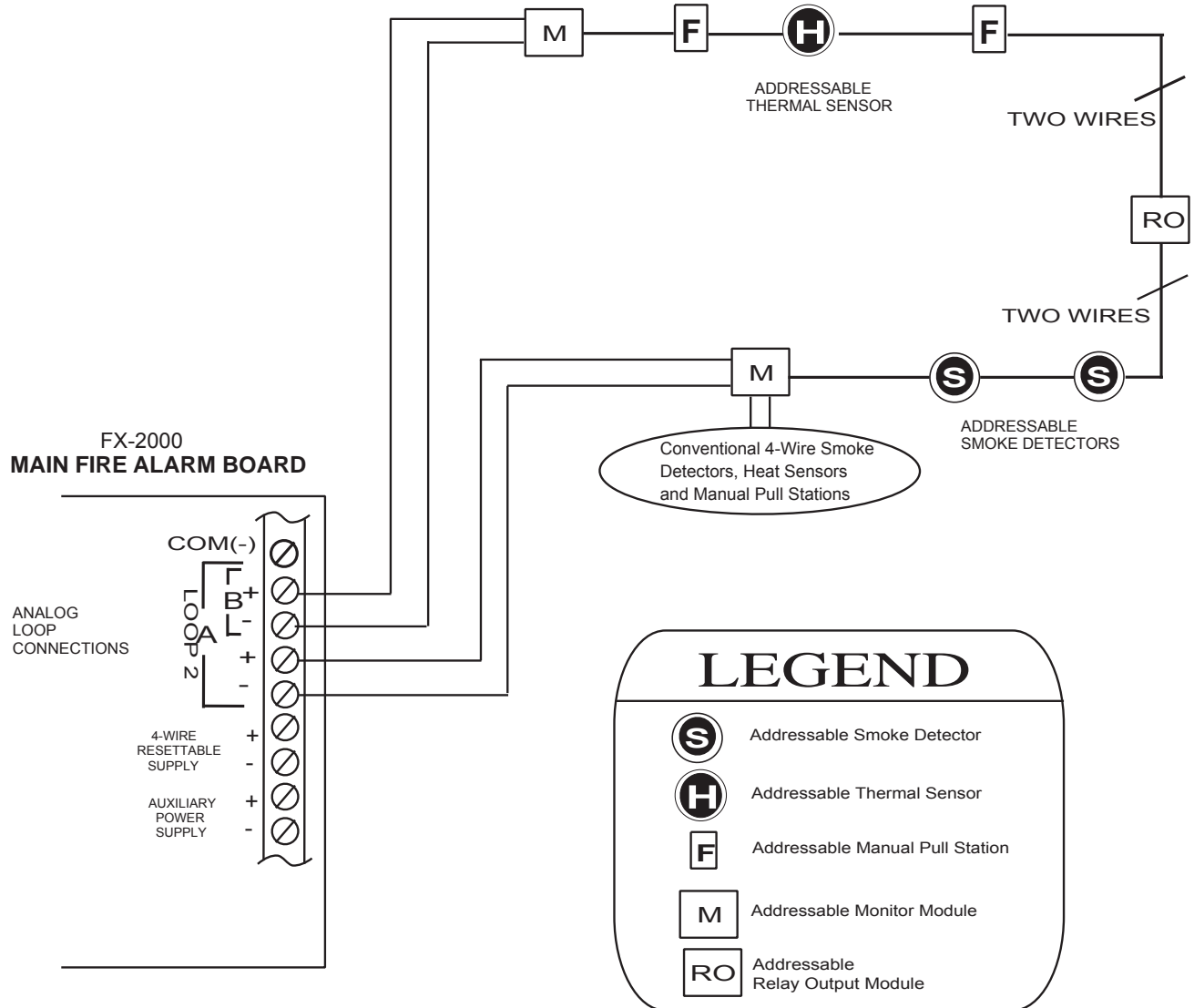


Figure 35 Loop Terminal Connections - Style 6 (Formerly Class A)

8.2.4 Single Loop Terminal Connections - Class B

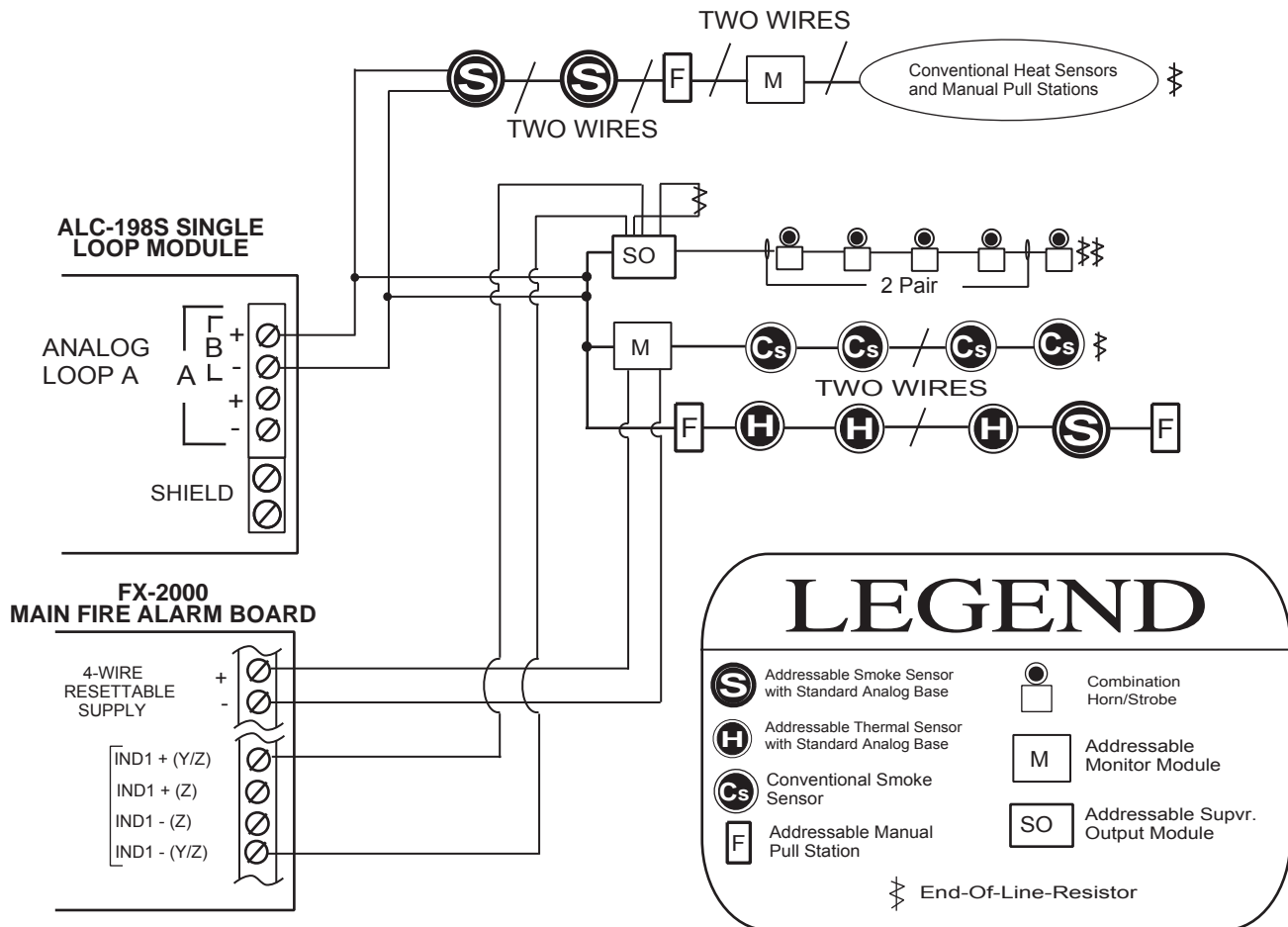


Figure 36 Single Loop Terminal Connections - Class B

i

Notes: All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

Loop wiring: maximum loop resistance is 40 ohms total. These lines are fully supervised.

8.2.5 Single Loop Terminal Connections - Style 7

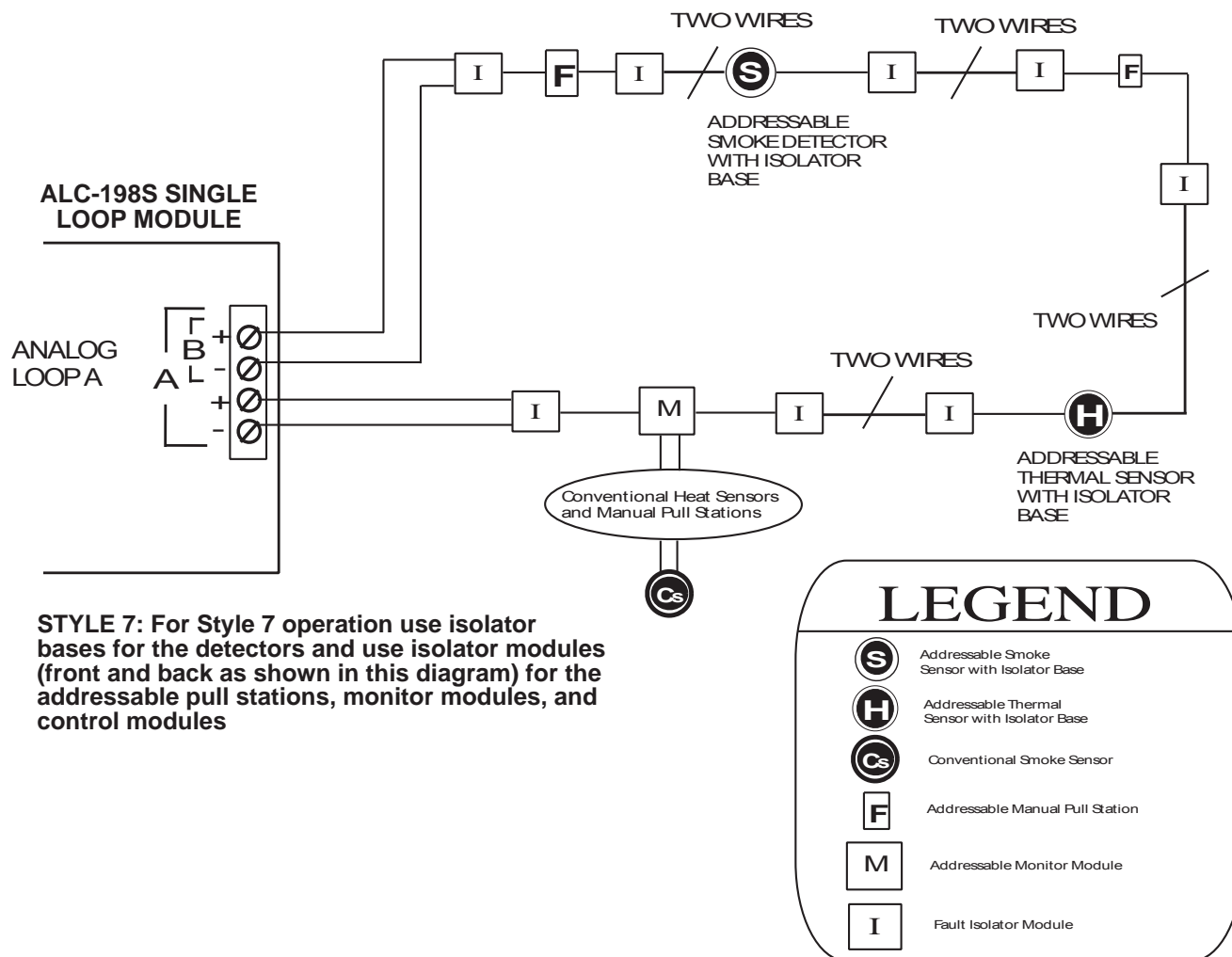


Figure 37 Single Loop Terminal Connections - Style 7

i

Notes: All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

Isolators need to be close nipple connected to the device being protected.

Loop wiring: maximum loop resistance is 40 ohms total. These lines are fully supervised.

8.2.6 Single Loop Terminal Connections - Style 6

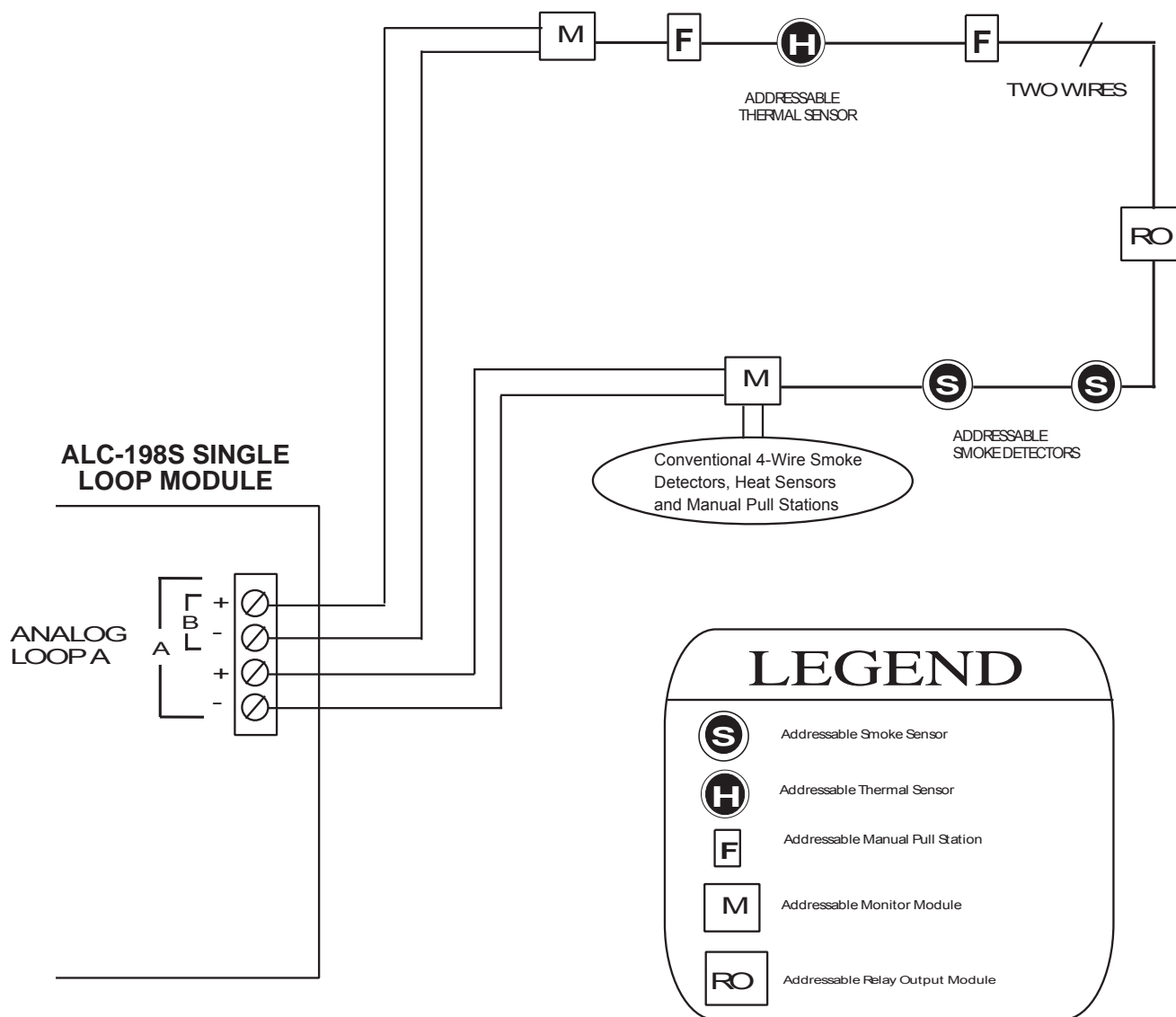


Figure 38 Single Loop Terminal Connections - Style 6

i

Notes: All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

Loop wiring: maximum loop resistance is 40 ohms total. These lines are fully supervised.

8.2.7 Detection Module (DM-1008A) Terminal Connections

Wire devices to terminals as shown in Figure 39. For further wiring information 8.8 Wiring Tables and Information. For specifications 12.0 Appendix A: Specifications. For compatible devices 13.0 Appendix B: Compatible Devices. Jumpers are required for Class A operation.

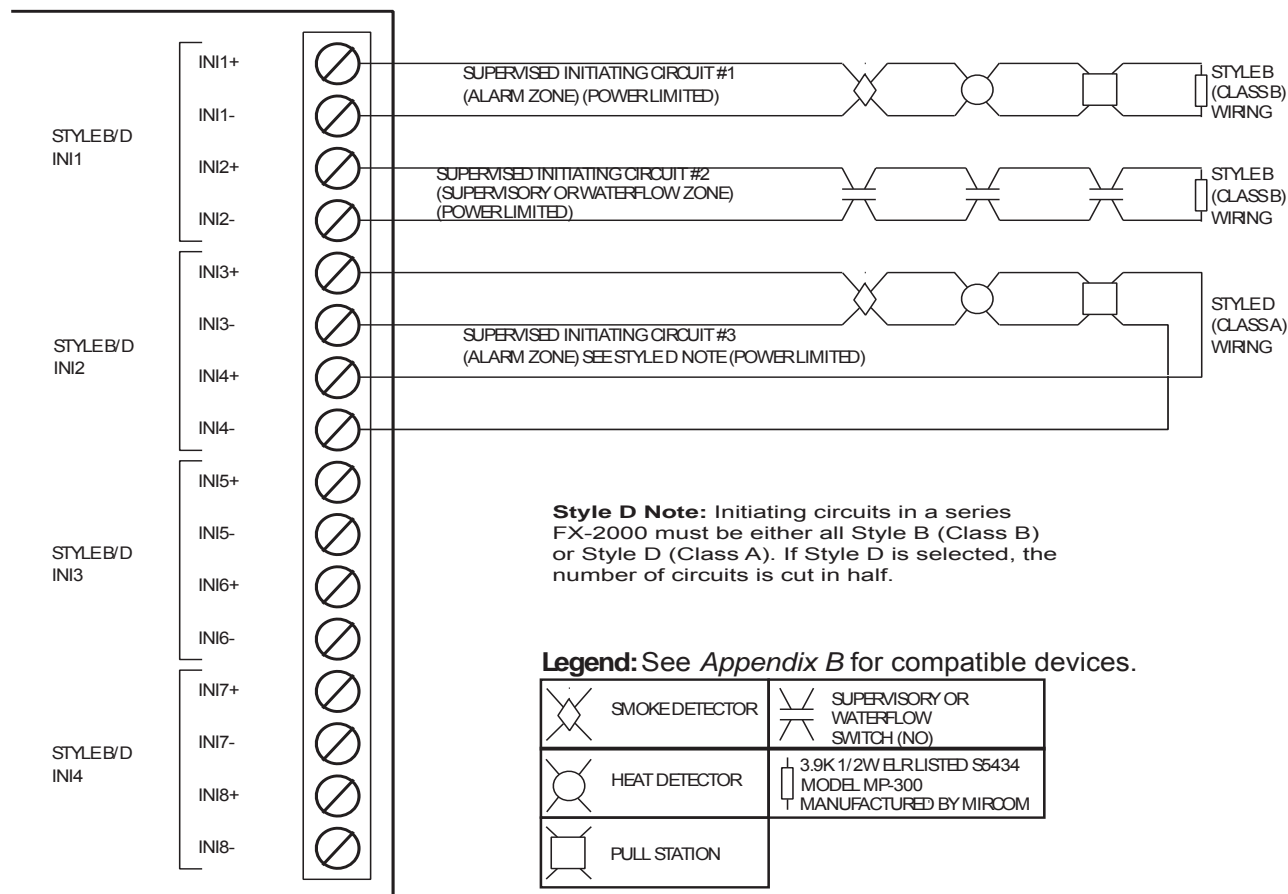


Figure 39 Hardwire Detection Module (DM-1008A) Terminal Connections

i

Notes: Terminal blocks are “depluggable” for ease of wiring.

All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

Initiating circuits are fully supervised and rated for 22 VDC, 3 mA standby, 5 mV ripple, 50 mA max alarm. They may be configured as required. The alarm threshold is 21 mA. Maximum loop resistance is 100 ohms, 50 ohms per side.

All conventional hardwire initiating circuits are Compatibility ID "A".

8.3 NAC Signal Module (SGM-1004A) Terminal Connections

Wire devices to terminals as shown in Figure 40. For further wiring information 8.8 Wiring Tables and Information. For specifications 12.0 Appendix A: Specifications. For compatible devices 13.0 Appendix B: Compatible Devices.

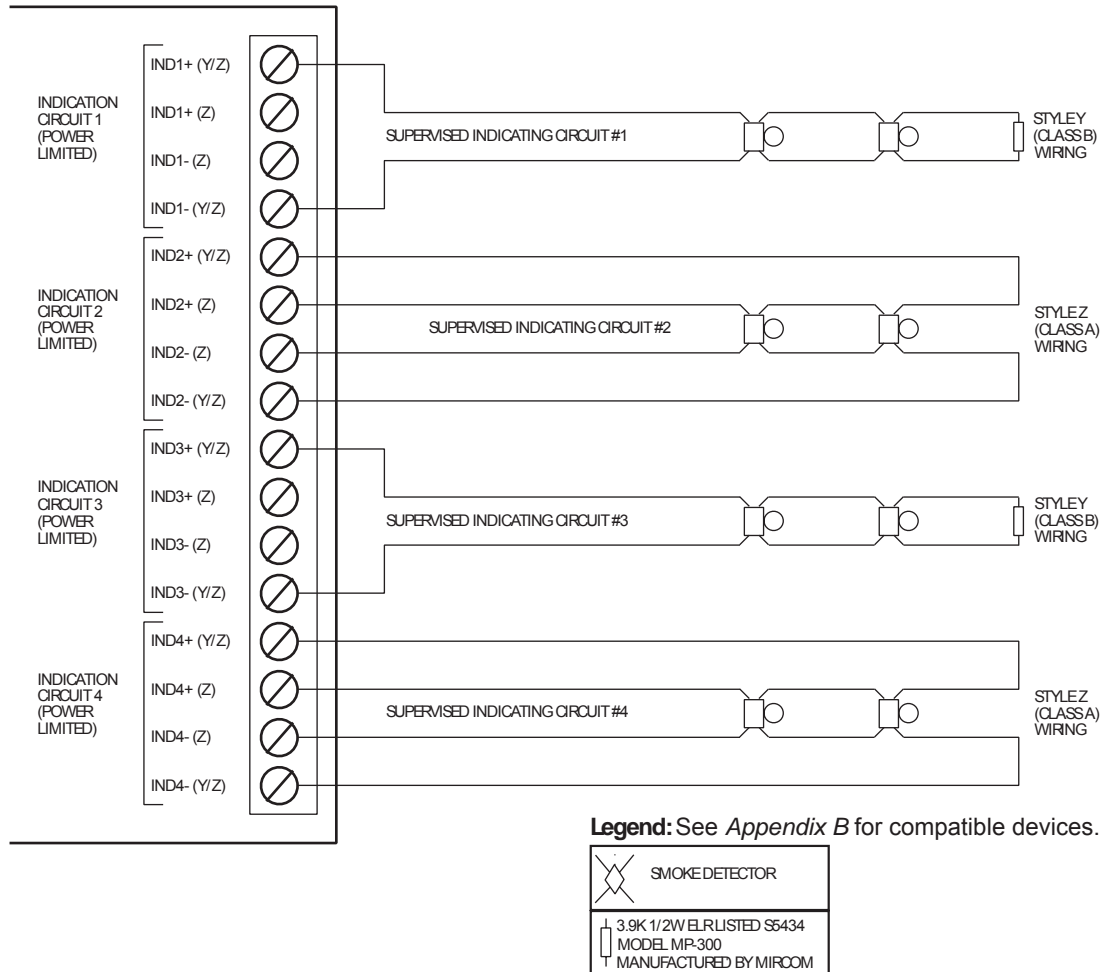


Figure 40 Hardwire Signal Module Terminal Connections



Notes: The terminal blocks are “depluggable” for ease of wiring.

All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

SGM-1004A NAC circuits are fully supervised and rated for 24 VDC unfiltered 1.7A max. They must use wire size as stated in the wiring tables on page 63.

8.4 Relay Module (RM-1008(A)) Terminal Connections

Relays are available as shown in Figure 41

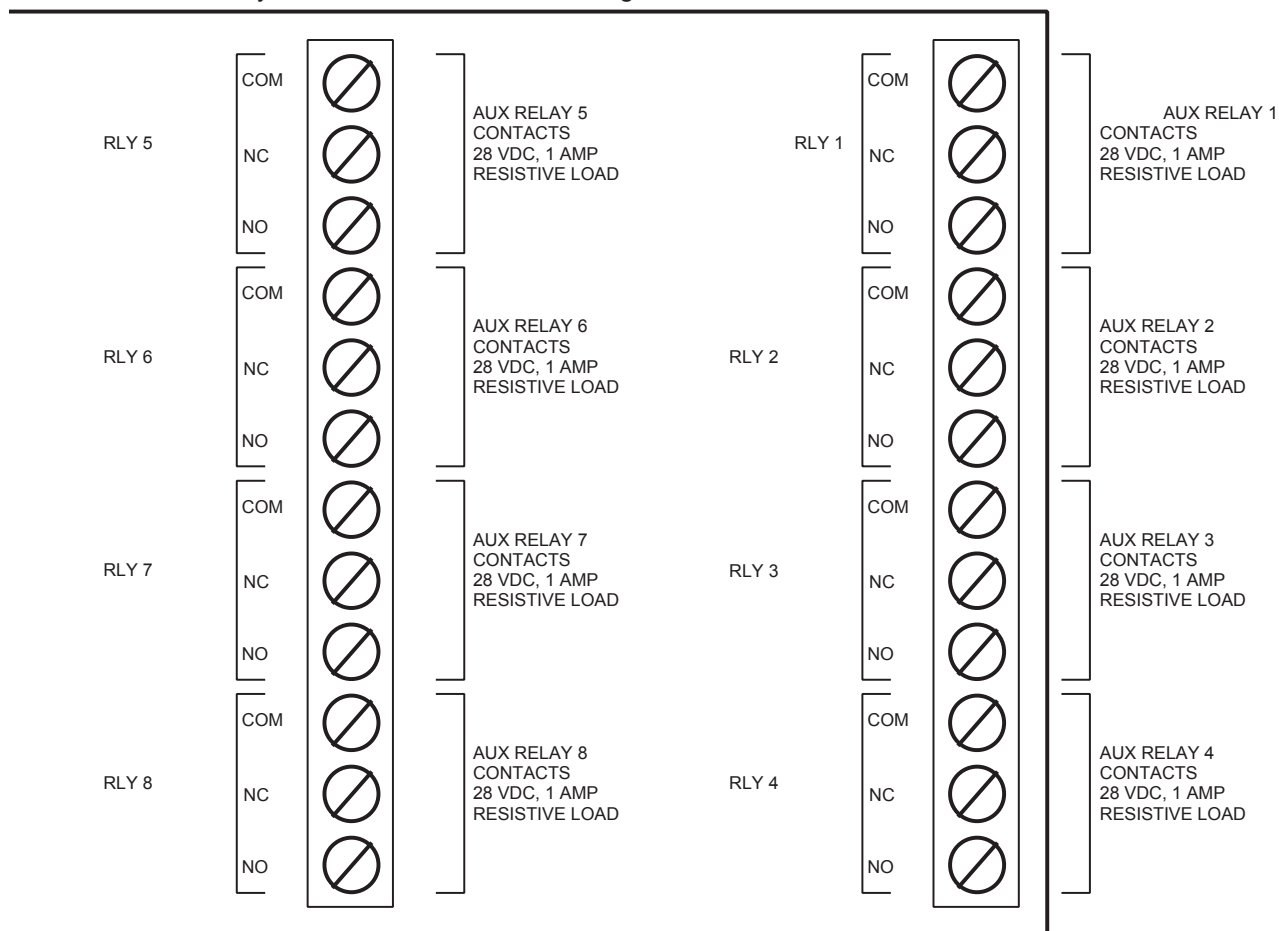


Figure 41 Hardwire Relay Module Terminal Connections



Notes: All relay circuits are power limited and must use type FPL, FPLR, or FPLP power limited cable.

All relay circuits must be connected to a listed power limited source of supply.



Attention: Do not connect 120 VAC directly to these relays.

8.5 Polarity Reversal and City Tie Module (PR-300) Wiring

Wire PR-300 Polarity Reversal and City Tie Module (if used) as shown in Figure 42 below. Power Limited cable type FPL, FPLR or FPLP must be used.

For USA installation, the installer must use **Atlantic Scientific (Tel: 407-725-8000), Model #24544 Protective Device**, or similar **UL-Listed QVRG secondary protector**, as shown.

For use in Canada, the Protective Device is not required but still recommended.

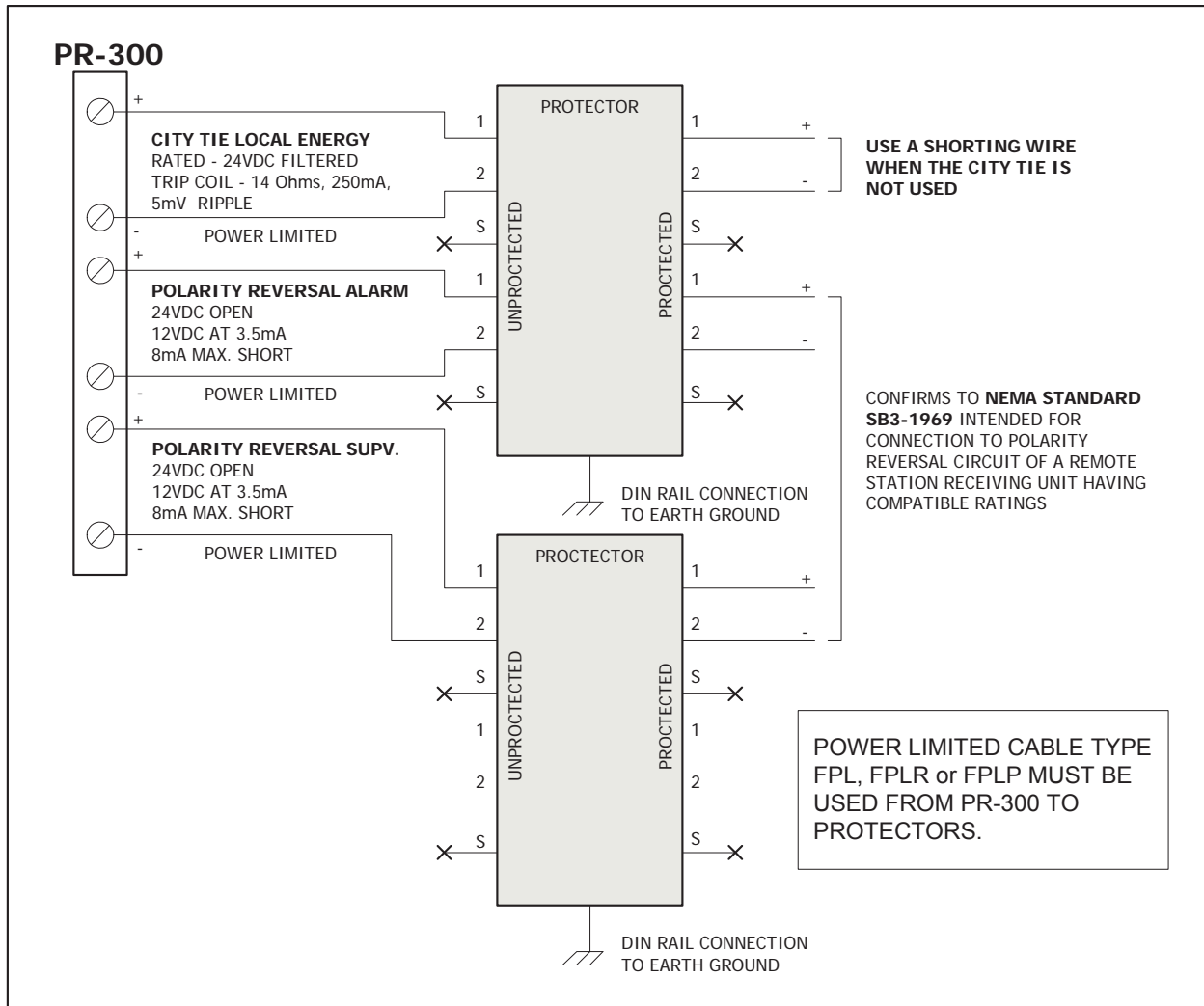


Figure 42 Polarity reversal and city tie module terminal connection



Notes: Either the PR-300's city tie or polarity reversal interface may be used, but not both. The city tie interface is not power limited. Plug PR-300 ribbon cable (P1) into connector (P4) of the FX-2000 main fire alarm module. Cut jumper (JW1) on the PR-300 module in order to transmit a trouble condition to the monitoring station. Remove jumper plug from jumper JW4 on the main fire alarm module. The polarity reversal interface is power limited and must use type FPL, FPLR, or FPLP power limited cable. For polarity reversal operation, short the city tie connection.

8.6 UDACT-300A Main Board Terminal Connections

Wire the two telephone lines to RJ31X Connector terminals as shown in Figure 43. The UDACT-300A terminals are located on the top left hand corner of the board. If using a cellular or wireless service, use the Line 2 interface connection only.

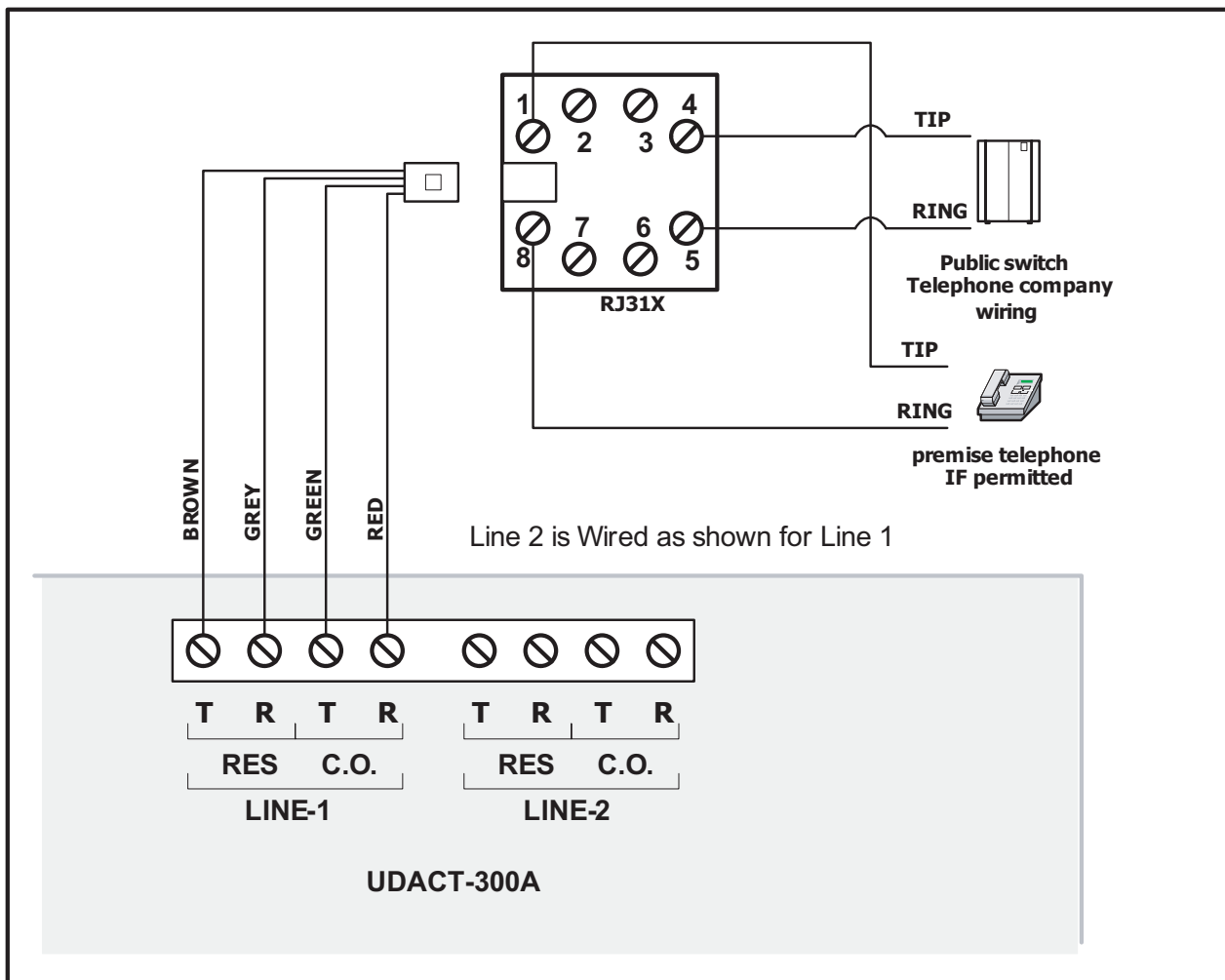


Figure 43 Telephone Line Wiring Diagram



Note: Most Authorities Having Jurisdiction (AHJ) do not allow the connection of premise telephones. see specifications for more information.

The power supply is part of the main chassis. The ratings are outlined in Table 13.

Model	Electrical Input Ratings	Power Supply Total Current	Battery Fuse on Main Module
FX-2003-6DS & FX-2003-6DS-16LED Main Chassis	120 VAC, 60 Hz, 2A / 240VAC, 50hz, 1A	6 amps maximum	Replace with 20 Amp, 1-1/4" Fuse
FX-2003-12DS, FX-2003-12XTDS,FX-2017-12ADS & FX-2017S-12ADS Main Chassis	120 VAC, 60 Hz, 2A / 240VAC, 50hz, 1A	12 amps maximum	Replace with 20 Amp, 1-1/4" Fuse
FX-2009-12DS & FX-2009S-12DS Main Chassis	120 VAC, 60 Hz, 2A / 240VAC, 50hz, 1A	12 amps maximum	Replace with 20 Amp, 1-1/4" Fuse

Using proper wire gauge, connect as shown in Figure 44. For specifications see 12.0 Appendix A: Specifications.

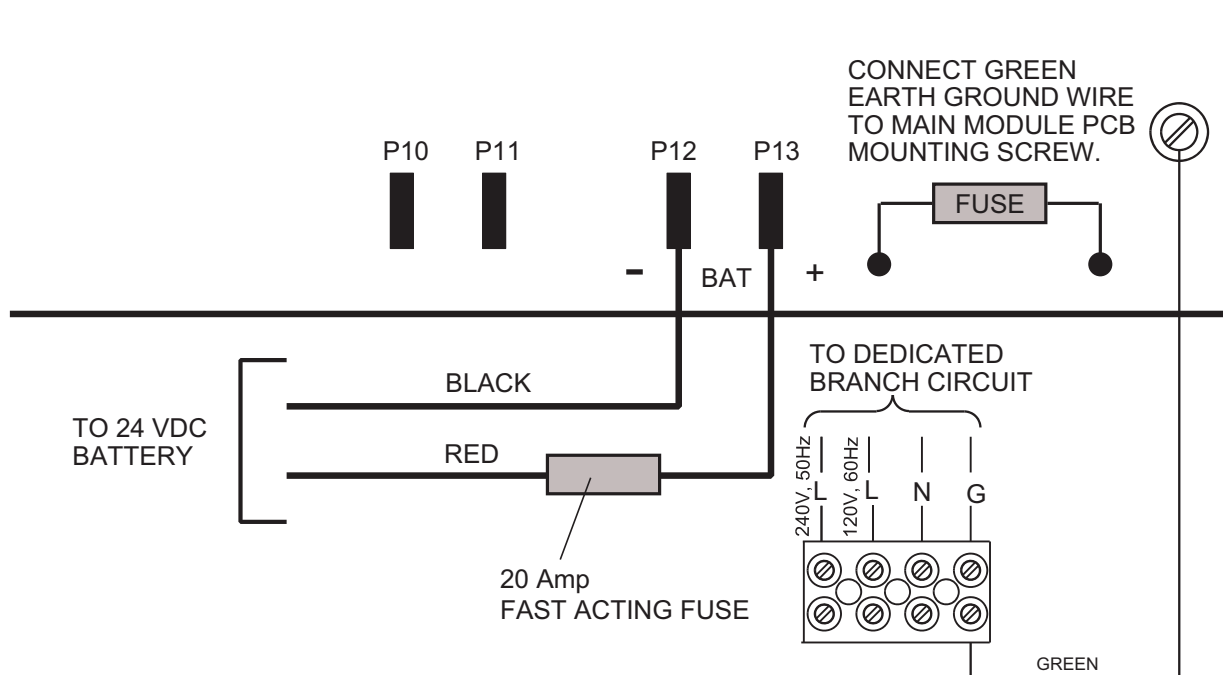


Figure 44 Power Supply Connections



Caution: To prevent sparking, connect batteries after the system's main A.C. power is turned ON. Do not exceed power supply ratings.

8.8 Wiring Tables and Information

Table 14 Wiring Table for Initiating Circuits

Wire Gauge (AWG)	Maximum Wiring Run to Last Device (ELR)	
	ft.	m
22	2990	910
20	4760	1450
18	7560	2300
16	12000	3600
14	19000	5800
12	30400	9200



Note: Maximum loop resistance should not exceed 100 Ohms.

Main board NAC circuits are rated for 1.7 amps each. The SGM-1004A NAC circuits are rated for 1.7 amps each.

Table 15 NAC Circuit Wiring Table

TOTAL SIGNAL LOAD	MAXIMUM WIRING RUN TO LAST DEVICE (ELR)								MAX. LOOP RESISTANCE
	18AWG		16AWG		14AWG		12AWG		
Amperes	ft	m	ft	m	ft	m	ft	m	Ohms
0.06	2350	716	3750	1143	6000	1829	8500	2591	30
0.12	1180	360	1850	567	3000	915	4250	1296	15
0.30	470	143	750	229	1200	366	1900	579	6
0.60	235	71	375	114	600	183	850	259	3
0.90	156	47	250	76	400	122	570	174	2
1.20	118	36	185	56	300	91	425	129	1.5
1.50	94	29	150	46	240	73	343	105	1.2
1.70	78	24	125	38	200	61	285	87	1.0



Note: Maximum voltage drop should not exceed 1.8 volts.

Table 16 Analog Loop Wiring

Wire Gauge (AWG)	Maximum Wiring Run to Last Device (ELR)	
	ft	m
18	3132	955
16	4980	1518
14	7971	2429
12	10,000	3049



Notes: Line capacitance shall not exceed 0.5 mF

Inductance shall not exceed 1 mH.

Resistance shall not exceed 40 ohms.

Power Wiring

Use Table 15 NAC Circuit Wiring Table on the previous page to see the wiring information for the remote annunciator being used.

RS-485 Wiring

See the wiring information for the remote annunciator being used.

4-Wire Smoke Wiring

The maximum allowable current is 0.2 amperes. The maximum allowed voltage drop is 1 volt. Refer to Table 15 NAC Circuit Wiring Table on the previous page.

Shield for Analog Loop Wiring

Only twisted pair is recommended, but if shielded twisted pair is used, wire shield at the start and the end of the loop to the terminals marked Shield at the loop adder board.

9.0 System Checkout

9.1 Before Turning the Power On

1. To prevent sparking, *do not* connect the batteries. Connect the batteries after powering the system from the main AC supply.
2. Check that all modules are installed in the proper location with the proper connections.
3. Check all field (external) wiring for opens, shorts, and ground.
4. Check that all interconnection cables are secure, and that all connectors are plugged in properly.
5. Check all jumpers and switches for proper setting.
6. Check the AC power wiring for proper connection.
7. Check that the chassis is connected to EARTH GROUND (cold water pipe).



Note: When using Class A and isolators on an addressable loop, configure system as Class B, wire loop as Class A, except do not connect the last device back to the panel. Do a system checkout. Then connect the return of the Class A circuit and configure as Class A.

9.2 Power-Up Procedure

1. After completing the above procedures, power up the panel (AC only). The green AC On LED and the Common Trouble LED should illuminate, and the buzzer should sound.
2. Press the System Reset button. Since the batteries are not connected, the Battery Trouble LED should illuminate, the trouble buzzer should sound intermittently, and the Common Trouble LED should flash.
3. Connect the batteries while observing correct polarity: the red wire is positive (+) and the black wire is negative (-). All indicators should extinguish except for the AC On LED and the LCD should show a normal status condition.
4. Auto-Configure or PC Configure the fire alarm control panel as described in the configurator software.

9.3 Troubleshooting

Table 17 Troubleshooting

Message	Description
Circuit Trouble	Normally when a circuit trouble occurs, its designated trouble indicator will be illuminated, as well as the Common Trouble indicator and Trouble buzzer. To correct the fault, check for open wiring on that particular circuit loop or see if the circuit disconnect switch is in the ON or CLOSED position. <i>Note: disconnecting a circuit will cause a system trouble (off-normal position).</i>
Ground Fault	The FX-2000 panel has a Ground Fault Detector. To correct the fault, check for any external wiring touching the chassis or other earth ground connection.
Battery Trouble	Check for the presence of batteries and their condition. Low voltage (below 20.4V) will cause a battery trouble. If battery trouble condition persists, replace the batteries as soon as possible.

10.0 Indicators and Controls

Refer to Figure 45 and Figure 46 below for LED indicators, control buttons, and switch locations associated with the main control displays.

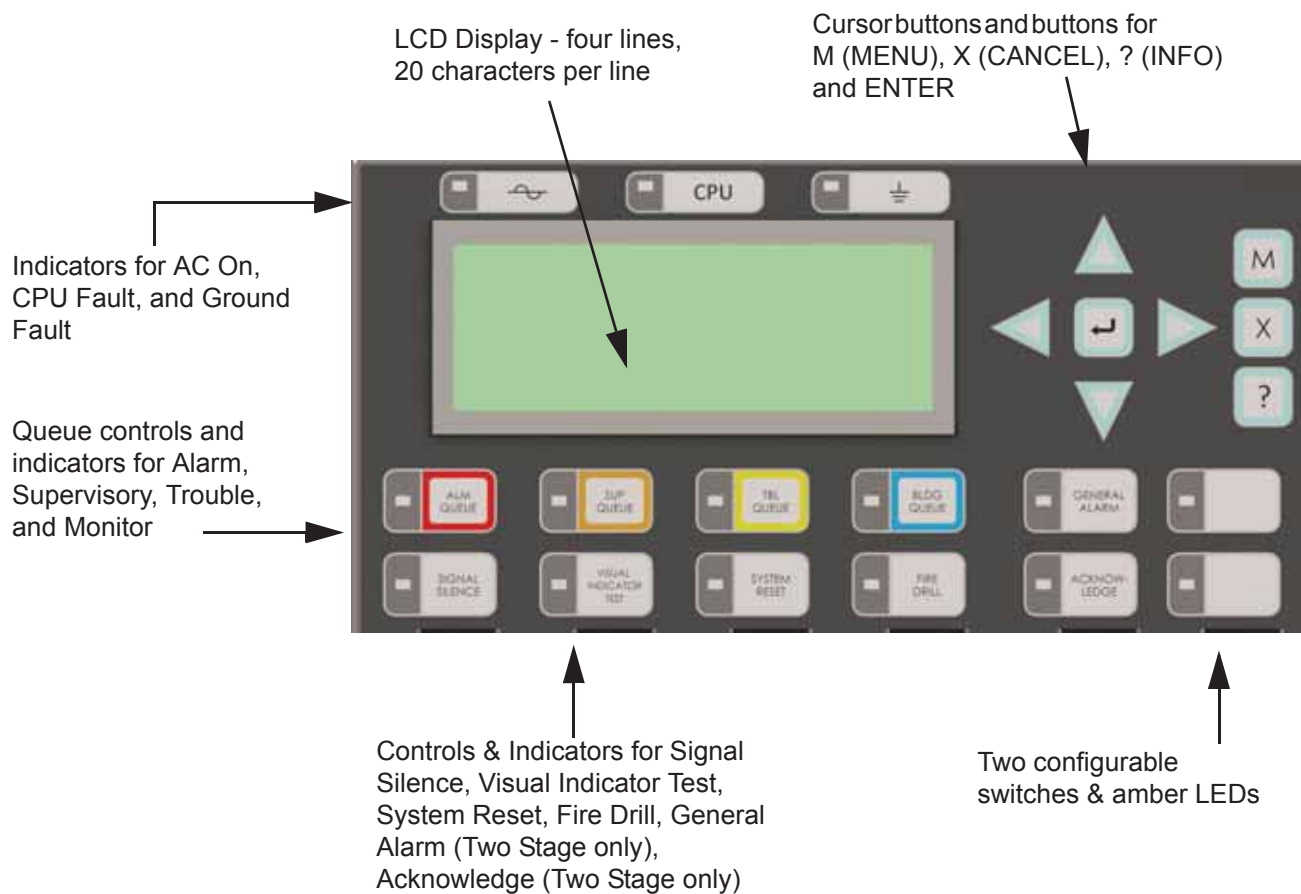


Figure 45 DSPL-420 Main Display Indicators and Controls

Refer to Figure 46 below for main display model DSPL-420-16TZDS. This display is similar to the DSPL-420 shown in Figure 45 except for the extra 16 configurable bi-coloured LED zone indicators and 16 trouble LED indicators.

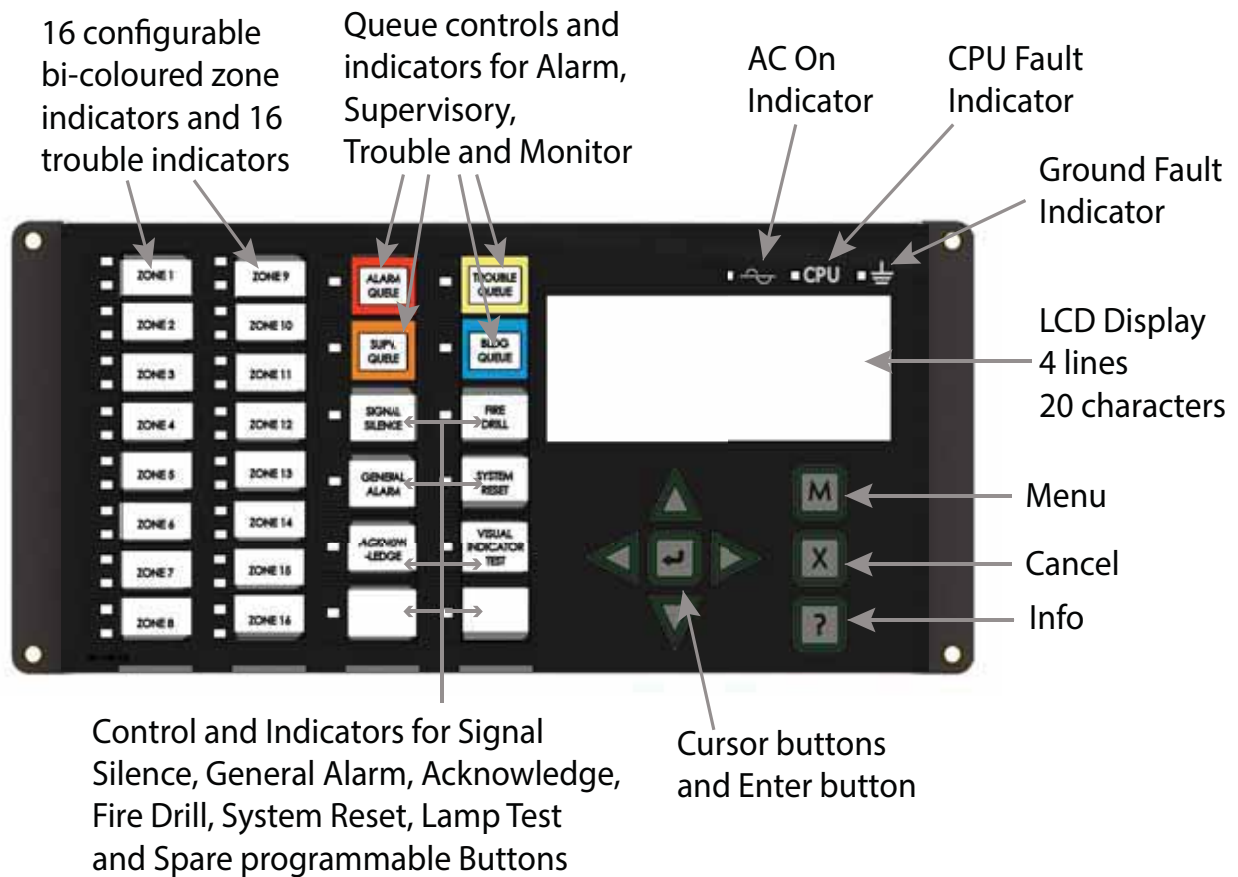


Figure 46 DSPL-420-16TZDS Main Display Indicators and Controls

LED indicators are amber (trouble or supervisory), red (alarm), or green (AC On), and may illuminate continuously (steady) or at one of two flash rates:

Fast Flash	120 flashes per minute, 50% duty cycle
Trouble Flash	20 flashes per minute, 50% duty cycle



Note: The General Alarm LED and pushbutton, and the Acknowledge LED and pushbutton, are active only on a system configured for “Two Stage.”

10.1 Paper Labels for Buttons and Indicators

Buttons and indicators are supplied with paper labels. These labels slide into the plastic label templates on the face of the panel. Paper labels allow for easy English / French selection and custom-printed zone information.

10.2 Common Indicators

Table 18 Common Indicators

Indicators	Description
Buzzer	<p>The Buzzer is activated by any of the following</p> <p>Fire Alarm - Steady</p> <p>Supervisory Alarm - Fast Rate</p> <p>Trouble - Trouble Rate</p> <p>Monitor - Configurable to sound at Trouble Rate</p> <p>If the Buzzer is turned on in response to a Non-Latching Trouble or Supervisory, it will be turned off if the condition causing it goes away and there is no other reason for it to be on.</p>
AC On LED	<p>The AC On Indicator is activated steady green while the main AC power is within acceptable levels. It is turned off when the level falls below the power-fail threshold and the panel is switched to standby (battery) power.</p>
Alarm Queue LED	<p>The Common Alarm LED flashes red whenever the Panel is in Alarm. An alarm results from any alarm on any point or input programmed as Alarm or activation of the manual red General Alarm Button (if the Panel is set for Two Stage Operation). The Alarm Queue LED will go steady, once all alarms in the queue have been reviewed using the Alarm Queue button. Since all Alarms are latched until the Panel is reset, the Common Alarm LED will remain on until then.</p>
Supervisory Queue LED	<p>The Common Supv. (Supervisory) LED flashes amber at the Fast Flash Rate when there is a Supervisory Alarm in the Panel, as the result of any Latching or Non-Latching Supervisory Circuit. The LED turns off if all Non-Latching Supervisory Circuits are restored and there are no Latching Supervisory Circuits active. The Supv. Queue LED will go steady, once all supervisory alarms in the supervisory queue have been reviewed using the Supv. Queue button. Latching Supervisory Alarms remain active until the Panel is reset.</p>
Trouble Queue LED	<p>The Common Trouble LED flashes amber at the Trouble Flash Rate when there is any Trouble condition being detected on the panel. It is turned off when all Non-Latching Troubles are cleared. The Trouble Queue LED will go steady, once all troubles in the trouble queue have been reviewed using the Trouble Queue button.</p>
Monitor Queue LED	<p>The Monitor Trouble Indicator flashes amber at the Trouble Flash Rate when there is any Monitor condition being detected on the panel. It is turned off when all Monitors are cleared.</p>
CPU Fault LED	<p>The CPU Fault Indicator is flashed yellow at the Trouble Flash Rate if the CPU is faulty.</p>
Fire Drill LED	<p>The Fire Drill Indicator turns on steady amber while Fire Drill is active.</p>

Table 18 Common Indicators

Indicators	Description
Acknowledge	If the Panel is configured as Two Stage, the Acknowledge Indicator flashes amber at the Fast Flash Rate while the Auto General Alarm Timer is timing out. It turns on steady amber when that Timer is cancelled by activating the Acknowledge or Signal Silence buttons. If the Auto General Alarm Timer times-out and puts the Panel into General Alarm, the Indicator is turned off.
General Alarm LED	In Two Stage Operation only, the General Alarm Indicator is activated steady red when General Alarm is activated due to the red General Alarm button being pushed, a General Alarm Initiating Circuit being activated, or the Auto General Alarm Timer timing out. Once the General Alarm Indicator has been turned on it will stay active until the Panel is reset.
Signal Silence LED	The Signal Silence indicator is flashed amber, at the trouble rate when Indication Circuits are Silenced either by the Signal Silence button, or by the Auto Signal Silence Timer. It is turned off when the Signals are re-sounded by a subsequent Alarm.
Ground Fault LED	The Ground Fault Indicator flashes amber at the Trouble Rate when the Ground Fault Detector detects a Ground Fault on any field wiring. It turns off immediately when the Ground Fault is cleared.









10.3 Common Controls

10.3.1 LCD Display

The display is a large 4 line by 20 character back-lit alphanumeric LCD. It displays information on the panel and its devices. There are cursor buttons for menu selection and control. Information provided by the LCD display is an alarm log, an event log, current levels, device information, verification and maintenance reports.

10.3.2 Queue Buttons

Use the queue buttons to select a particular queue to review.

- Use the **Alarm Queue** button to view all alarms. Pressing this button will show the latest alarm on the LCD display. Use  and  to view all previous alarms.
- Use the **Supervisory Queue** button to view all supervisory conditions. Pressing this button will show the latest supervisory information on the LCD display. Use  and  to view all previous supervisory conditions on the LCD display.
- Use the **Trouble Queue** button to view all trouble conditions. Pressing this button will show the latest trouble condition on the LCD display. Use  and  to view any previous troubles.
- Use the **Monitor Queue Button** to show all monitor conditions. Pressing this button will show the latest monitor information on the LCD display. Use  and  to view all queued monitor conditions.

Queues are displayed on the screen according to a priority sequence. Queue priority ranking from highest to lowest is as follows: alarm, supervisory, trouble, and monitor. If, for example, you are viewing a monitor queue and an alarm occurs, the display will immediately display the alarm condition. Also, if there is no activity on the system for 10 seconds after you have pressed a queue button, the display will switch to the highest priority condition.

QUEUE BUTTONS



10.3.3 Cursor Buttons

These four buttons around the Enter Button are used for up (previous), down (latest), left, and right selection of items on the LCD Display.

Enter Button

This button is used to select a displayed item on the LCD Display.

Cancel Button

This button is used to cancel an operation.

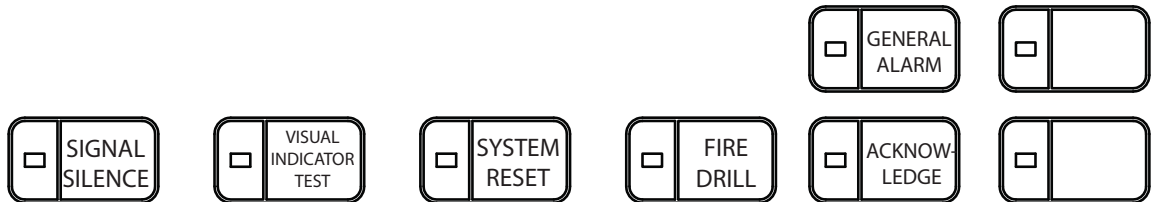
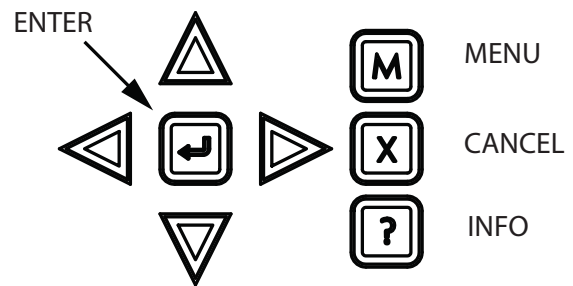
Menu Button

This button is used to initiate the FX-2000 Menu System.

Info Button

This button is used to get more details about a displayed item.

CURSOR BUTTONS



10.3.4 Signal Silence Button

Activation of the Signal Silence button when the Panel is in Alarm, turns on the Signal Silence Indicator and deactivates any Silenceable NAC Circuits. Non-Silenceable Circuits are unaffected. Signals will re-sound upon any subsequent Alarm. This button does not function during any configured Signal Silence Inhibit Timer period. It also does not function if the NAC Circuits are active as the result of a Fire Drill. In a Two Stage System, if the Auto General Alarm Timer has timed out, this Signal Silence button also performs the same function as the Acknowledge button.

10.3.5 Visual Indicator Test Button

Activation of the Visual Indicator Test button turns all front panel Indicators on steady in whichever colour they would normally be activated and turns the buzzer on steady. If Visual Indicator Test is active for more than 10 seconds, Common Trouble is activated.

10.3.6 System Reset Button

The System Reset button causes the Fire Alarm Control Panel, and all Circuits, to be reset

- Resets all Latching, Trouble Conditions
- Resets all Initiating Circuits
- Resets 4-Wire Smoke Supply and Aux. Power Supply
- Turns off all NAC Circuits
- Turns off Signal Silence, Ack & GA Indicators
- Turns off Fire Drill
- Stops and resets all Timers
- Processes inputs as new events
- Aux Disconnect is not affected
- Reset cannot be activated until the Signal Silence Inhibit timer has expired.

10.3.7 Signal Silence Button

Activation of the Signal Silence button when the Panel is in Alarm, turns on the Signal Silence Indicator and deactivates any Silenceable NAC Circuits. Non-Silenceable Circuits are unaffected. Signals will re-sound upon any subsequent Alarm. This button does not function during any configured Signal Silence Inhibit Timer period. It also does not function if the NAC Circuits are active as the result of a Fire Drill. In a Two Stage System, if the Auto General Alarm Timer has timed out, this Signal Silence button also performs the same function as the Acknowledge button.

10.3.8 Fire Drill Button

The Fire Drill button activates all programmed and non-Disconnected NAC Circuits, but does not transmit any Alarms via the City Tie, or Common Alarm Relay. Fire Drill may be programmed to operate specific NAC Circuits. Fire Drill is cancelled by pressing the button again (toggle switch), or if the Panel goes into a real Alarm.

10.3.9 Acknowledge Button (Two Stage Only)

If the Panel is not configured for Two Stage Operation, this button does nothing. If the Panel is configured for Two Stage Operation, activation of the Acknowledge (2 STAGE AUTO CANCEL) button while the Auto General Alarm Timer is timing (there is an Alarm in the Panel, but it is still in the First Stage), that timer is cancelled, and the Acknowledge (2 STAGE AUTO CANCEL) Indicator is on steady amber.

10.3.10 General Alarm Button (Two Stage Only)

If the Panel is not configured for Two Stage Operation, this button does nothing. If the Panel is configured for Two Stage Operation, activation of the General Alarm button immediately sends the Panel into Second Stage - General Alarm. It will also re-activate the Signals if they have been Silenced during General Alarm. The General Alarm condition remains active until the Panel is reset.

11.0 Operation

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES

This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below.

Program feature or option	Permitted in UL 864? (Y/N)	Possible settings	Settings permitted in UL 864
Delay Output Timer	YES	4 seconds maximum (due to worst case loop delay of 6 seconds)	10 seconds
Monitor Buzzer	NO	Sounding at the Fast Rate or OFF	OFF

The following chapter describes operation of the FX-2000 Series FACP's including:

- Single Stage Operation
- Two Stage Operation
- Pre-Signal Operation
- UUKL Feature
- Output Circuit Delay Operation
- Circuit Types
- Initiating (Detection) Circuit Type
- NAC (Signal) Circuits Types
- Evacuation Codes

11.1 Single Stage Operation

In a single stage system, all alarm inputs are treated in a similar manner. Alarm inputs include any of the following: non-verified alarm, verified alarm, sprinkler alarm, water-flow alarm, and general alarm circuits. Any of these alarm inputs occurring when the panel is not already in alarm cause the following:

- The buzzer sounds steadily
- If fire drill is active, it is cancelled
- The Common Alarm LED turns on
- The Common Alarm relay activates if Aux disconnect is not active
- The Auto Signal Silence timer, if configured, starts
- The Signal Silence Inhibit timer, if configured, starts
- All non-disconnected NAC programmed to the input are activated provided that Aux disconnect is not active
- Non-disconnected strobes associated with the input are activated
- Non-disconnected signals associated with the input are activated at the evacuation rate
- Subsequent alarms when the panel is already in alarm, cause the following:
- The alert buzzer sounds steadily

- If Signals have been silenced, they are resounded, the Signal Silence LED turns off, and the Auto Signal Silence timer, if configured, is restarted
- Any additional non-disconnected strobes associated with the input are activated continuously
- Any additional non-disconnected signals associated with the new input are activated at the evacuation rate

11.2 Two Stage Operation

In a two stage system, alarm inputs are either first stage (alert) inputs or second stage (general alarm) inputs. First stage inputs include inputs from the following types of circuits: non-verified alarm, verified alarm, sprinkler alarm, and water-flow alarm. Second stage inputs include alarms on the general alarm circuits, activation of the General Alarm button, or expiration of the Auto General Alarm timer. Any of these alarm inputs occurring when the panel is not already in alarm cause the following:

- The buzzer sounds steadily
- If fire drill is active, it is cancelled
- The Common Alarm LED turns on
- The Common Alarm relay activates if Aux disconnect is not active
- The Auto Signal Silence timer, if configured, starts
- The Signal Silence Inhibit timer, if configured, starts
- All Non-disconnected NAC programmed to the input are activated provided that Aux disconnect is not active

If the alarm is a second stage alarm,

- All non-disconnected strobe circuits are activated continuously
- All non-disconnected signal circuits are activated at the evacuation rate
- The General Alarm LED turns on.

If the alarm is a First Stage alarm,

- Non-disconnected strobe circuits programmed to that circuit are activated continuously
- Non-disconnected signal circuits programmed to that circuit are activated with the alert code
- The Auto General Alarm timer, if configured, starts
- The Acknowledge LED starts flashing.

Subsequent First Stage alarms when the panel is already in alarm, cause the following:

- The buzzer sounds steadily
- If signals have been silenced as a result of the silence button or the Auto signal silence timer, signals are resounded as they were before signal silence, the Signal Silence LED turns off, and the Auto Signal Silence timer, if configured, is restarted
- If the panel is not already in General Alarm, additional non-disconnected signals programmed to the new input are activated with the Alert Code (*see NAC (Signal) Circuit Types on page 77*).
- If the panel is not already in General Alarm and if the Acknowledge LED is on steady NAC that the Auto General Alarm timer has been Acknowledged the timer is restarted and the Acknowledge LED is extinguished.

A second stage alarm (general alarm) when the panel is already in alarm causes the following:

- The buzzer sounds steadily
- All non-disconnected signals are activated at the evacuation rate
- If the Signal Silence LED is on, it turns off and the Auto Signal Silence timer, if configured, is restarted
- The Acknowledge LED if on, turns off

Alarm inputs are latching: they remain active until system reset.



Note: If the system is configured for correlations, any second stage / general alarm condition activates all NAC circuits whether they are correlated or not.

11.3 Pre-Signal Operation

To configure the panel for pre-signal, all alarm inputs must be correlated to one NAC circuit that is wired to a Notification Appliance in the Control Room that is constantly monitored by an Operator. Using the FX-2000 Configurator, “Subsequent Alarm” in “Common System Status” must be correlated to turn on the Remaining NAC circuits in the system. To confirm the alarm (i.e. subsequent alarm) the operator can press the “General Alarm” button on the panel or activate a Manual Station in the Control Room.



Note: Pre-Signal is not permitted to be used in Canada.

11.4 UUKL feature

The UUKL Feature on the FX-2000 Configurator is used only in conjunction with the FDG-008 and FDX-008 Fan Damper Controller modules.

In each UUKL relay/equipment set, the user could set up the “Any of” operation. If this option is selected, the panel will still go into alarm directly if any detector is tripped. The only difference is that if a relay which is part of the smoke control is configured for “any of” operation, that relay will only activate after a configurable number of detectors are active.

This operation is meant to be used in an atrium where multiple detector operation is required to start the smoke control operation but the signaling within the building is based upon the first detector to activate.

For complete details refer to manual LT-966.

11.5 Output Circuit Delay Operation

The relay function associated with an alarm initiating circuit may be delayed. There is a Output Delay timer associated with this, refer to Table below. This is programmed using the FX-2000

Configuration software. The Output Delay timer is limited to elevator recall purpose only and has a maximum setting of 4 seconds.

11.6 Circuit Types

The term **circuits** refers to an actual electrical interface, either initiating (detection) or NAC (signal). The term **zone** is a logical concept for a fire alarm protected area, and will consist of at least one circuit. Often the terms zone and circuit are used interchangeably, but in this manual the term circuit is used.

11.6.1 Initiating (Detection) Circuit Type

Table 19 Initiating (Detection) Circuit Types

Initiating (Detection) Circuit Type	Description
Non-Verified Alarm	This is a "normal" type of alarm which may have pull stations, smoke detectors, or heat detectors attached. Any activation of these devices will immediately result in an alarm condition in the fire alarm control panel. An alarm condition causes the associated circuit Status LED and the Common Alarm LED to illuminate red.
Verified Alarm	These alarms are verified by a reset and timing procedure, and may have Manual Stations, smoke detectors attached. Any activation of Manual Stations will result in an alarm condition in the fire alarm control panel within four seconds. Smoke detectors will be verified for a real alarm within 60 seconds depending upon the startup time of the smoke detectors being used. If four seconds is too long a response time for pull stations, then they should be wired separately on a non-verified alarm circuit. An alarm condition causes the associated circuit Status LED and the Common Alarm LED to illuminate red. Verified Alarm is not permitted for heat detectors, 4-wire smoke detectors and smoke detectors with built-in alarm verification. Refer to <i>Appendix F: Alarm Verification Timing</i> on page 98 for details.
Water-Flow Alarm	An alarm for water-flow sensors. These alarms are identical to normal non-verified alarms except that any NAC circuits programmed to these circuits (all are by default) are non-silenceable. Also, if water-flow retard operation is enabled, then these circuits are sampled every one second; if ten samples are active within any 15 second interval, the water-flow alarm is confirmed and processed. An alarm condition causes the associated circuit Status LED and the Common Alarm LED to illuminate red. Note: Do not use the retard operation with any external retarding device; maximum retard may not exceed 120 seconds.

Table 19 Initiating (Detection) Circuit Types (Continued)

Initiating (Detection) Circuit Type	Description
Sprinkler Alarm	<p>An alarm for sprinkler flow sensors. These alarms are identical to normal non-verified alarms unless the water-flow retard operation is enabled. If water-flow retard operation is enabled, then these circuits are sampled every one second; if ten samples are active within any 15 second interval, the sprinkler alarm is confirmed and processed. An alarm condition causes the associated circuit Status LED and the Common Alarm LED to illuminate red.</p> <p>Note: Do not use the retard operation with any external retarding device; maximum retard may not exceed 120 seconds.</p>
General Alarm	<p>These alarms provide remote general alarm such as for remote key switches. In a two stage system, these inputs perform exactly the same function as the front panel or remote annunciator general alarm button. In a single stage system, these inputs act the same as non-verified alarms, but if correlations are enabled, general alarm initiating circuits are correlated to <i>all</i> NAC circuits.</p>
Non-Latching Supervisory	<p>These alarms are for supervisory devices. An activation on these circuits will cause the Circuit Status LED and the Common Supervisory LED to illuminate amber. The buzzer will sound continuously. If the circuit activation is removed, the supervisory condition will clear (so long as there are no other supervisory conditions in the system) and the circuit Status LED will extinguish.</p>
Latching Supervisory	<p>These alarms are for supervisory devices. An activation on these circuits will cause the Circuit Status LED and the Common Supervisory LED to illuminate amber. The buzzer will sound continuously. If the circuit activation is removed, the Supervisory condition will <i>not</i> clear.</p>
Monitor	<p>This is a supervised general purpose non-latching input used mainly for correlating to a relay circuit. No other system condition occurs as a result of its activation (short-circuit), although it is supervised for trouble (open-circuit).</p>
Trouble-Only	<p>This circuit is used for monitoring a trouble condition from an external device such as a Mircom QX-5000 Audio System. Both open and short circuits generate a non-latching trouble condition.</p>

11.6.2 NAC (Signal) Circuit Types

Table 20 NAC (Signalling) Circuit Type

NAC (Signalling) Circuit Type	Description
Silenceable Signal	For audible devices such as bells and piezo mini-horns that may be silenced either manually or automatically. While sounding, these follow the pattern appropriate for the condition: the configured evacuation code (default is temporal code) during single-stage alarm, or two stage general alarm, or the alert code during a two stage system's alert (first) stage.
Non-Silenceable Signal	For audible devices such as bells and piezo mini-horns that may not be silenced either manually or automatically. While sounding, these follow the pattern appropriate for the condition: the configured evacuation code (default is temporal code) during single-stage alarm, or two-stage general alarm, or the alert code during a two stage system's alert (first) stage.
Coded Signal	<p>For audible devices such as bells and piezo mini-horns that may be activated in code. The code consists of 4 digits with each digit consisting of 1-15 pulses on the signals. Each coded circuit can sound the complete code 1 to 15 times after which signals go silent or revert to programmed General Alarm rate.</p> <p>Note: The NFPA-72 and ULC-S527 specify temporal tone. However, for retrofits of systems that were previously approved, coded signalling is allowed.</p>
Strobe	For visual devices such as strobes that use no code patterns (they are continuous).

11.6.3 Evacuation Codes

Single stage codes

Continuous	On 100% of the time
Temporal Code	3 of 0.5 second on, 0.5 second off then, 1.5 second pause
March Code	0.5 second on, 0.5 second off
California Code	5 seconds on, 10 seconds off

Two-stage codes:

Alert Code	0.5 second on, 2.5 seconds off
General Alarm	Evacuation code as selected from above.

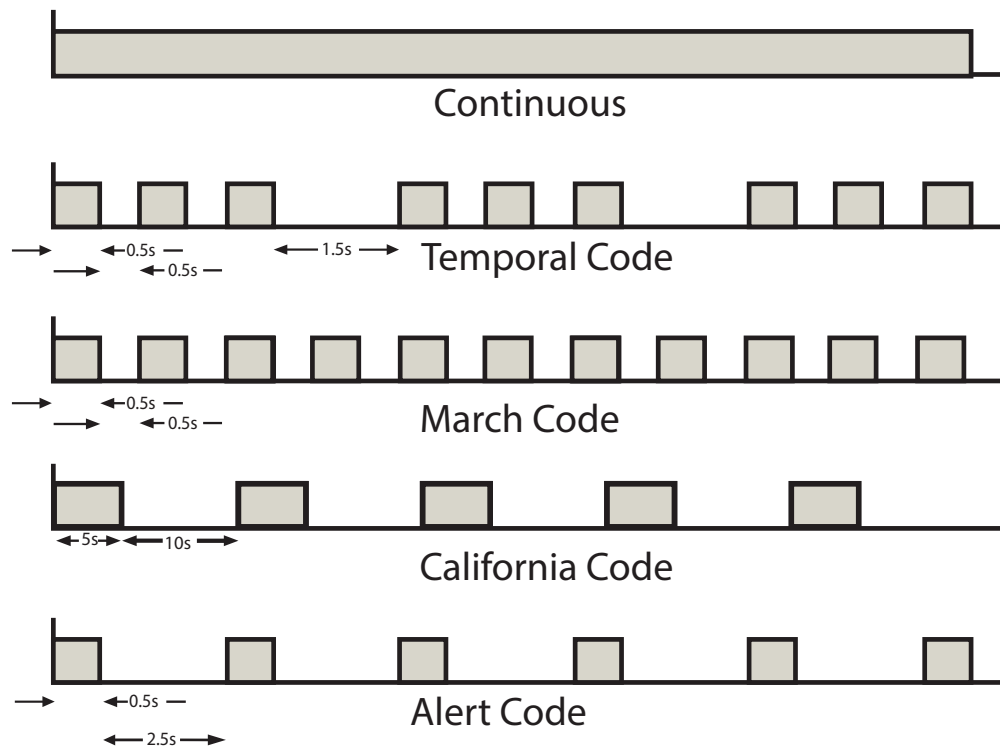


Figure 47 Evacuation Codes

12.0 Appendix A: Specifications

12.1 FX-2003-6DS and FX-2003-6DS-16LED Specifications

Table 21 FX-2003-6DS and FX-2003-6DS-16LED Specifications

FX-2003-6DS and FX-2003-6DS-16LED Chassis		
Analog Loop	One Analog Loop capable of monitoring 99 Sensors and 99 Modules	
	Line voltage	22 VDC, 400 mA max, max loop resistance 40
NAC Circuits	4 Style Y or Z (Class B or A) NAC circuits, configured as strobes or audibles. Terminals are labelled "IND".	
	Rating	Power limited / 24 VDC unfiltered, 1.7 A @ 49°C per circuit
	Max power allowed	5A
Aux Power Supply for remote annunciators	Terminals are labelled "AUX PWR".	
	Rating	Power Limited 24 VDC unfiltered, 1.7 A @ 49°C
Resettable 4-Wire Smoke Supply	Terminals are labelled "4-WIRE".	
	Rating	22 VDC, 400 mA max., 5mV ripple
RS-485 port	For Remote Annunciators or interface to Audio Systems. Terminals are labelled "RS-485".	
	Rating	Power limited to 300 mA.
Auxiliary relays (resistive loads)	Terminals are labelled "ALARM, TROUBLE, SUPV".	
	Alarm/Supv/Trouble	Must be connected to a Listed Power Limited Source of Supply. Form C, 1 Amp, 28 VDC
Electrical ratings	AC Line Voltage	120V 60Hz / 240V, 50Hz 2 Amps / 1 Amp (primary)
	Power Supply ratings	12 Amps. Max. (secondary)
Battery	Type	24VDC, Gel-Cell/Sealed Lead-Acid
	Charging capability	10-24 AH batteries
	Charging current	3A maximum
	Current Consumption	standby: 230 mA alarm: 380 mA
Other	Displays (incl LCD) and Controls for all Common Functions, and 16 Zone Displays. Micro-controller based design. Fully Configurable with PC software. Full walk test function.	

12.2 FX-2003-12DS, FX-2003-12XTDS, FX-2009-12DS, FX-2009S-12DS Specifications

Table 22 FX-2003-12DS, FX-2003-12XTDS, FX-2009-12DS, and FX-2009S-12DS Specifications

FX-2003-12DS, FX-2003-12XTDS, FX-2009-12DS, and FX-2009S-12DS Chassis		
Analog Loop	One Analog Loop capable of monitoring 99 Sensors and 99 Modules or 99 Advanced Protocol (AP) devices and 99 AP Modules.	
	Line voltage	22 VDC, 400 mA max, max loop resistance 40
NAC Circuits	4 Style Y or Z (Class B or A) NAC circuits, configured as strobes or audibles. Terminals are labelled "IND".	
	Rating	Power limited / 24 VDC unfiltered, 1.7 A @ 49°C per circuit
	Max power allowed	10A
Aux Power Supply for remote annunciators	Terminals are labelled "AUX PWR".	
	Rating	Power Limited 24 VDC unfiltered, 1.7 A @ 49°C
Resettable 4-Wire Smoke Supply	Terminals are labelled "4-WIRE".	
	Rating	22 VDC, 400 mA max., 5mV ripple
RS-485 port	For Remote Annunciators or interface to Audio Systems. Terminals are labelled "RS485".	
	Rating	Power limited to 300 mA.
Auxiliary relays (resistive loads)	Terminals are labelled "ALARM, TROUBLE, SUPV".	
	Alarm/Supv/Trouble	Must be connected to a Listed Power Limited Source of Supply. Form C, 1 Amp, 28 VDC
Electrical ratings	AC Line Voltage	120V 60Hz / 240V, 50Hz 4 Amps / 2 Amp (primary)
	Power Supply ratings	12 Amps. Max. (secondary)
Battery	Type	24VDC, Gel-Cell/Sealed Lead-Acid
	Charging capability	17-55 AH batteries
	Charging current	3A maximum
	Current Consumption	standby: 230 mA alarm: 380 mA
Other	Displays (incl LCD) and Controls for all Common Functions, and 16 Zone Displays. Micro-controller based design. Fully Configurable with PC software. Full walk test function.	

12.3 FX-2017-12ADS and FX-2017S-12ADS Specifications

Table 23 FX-2017-12ADS and FX-2017S-12ADS Specifications

FX-2017-12ADS and FX-2017S-12ADS Chassis		
Analog Loop	One Analog Loop capable of monitoring 99 Sensors and 99 Modules or 99 Advanced Protocol (AP) devices and 99 AP Modules.	
	Line voltage	22 VDC, 400 mA max, max loop resistance 40
NAC Circuits	4 Style Y or Z (Class B or A) NAC circuits, configured as strobes or audibles. Terminals are labelled "IND".	
	Rating	Power limited / 24 VDC unfiltered, 1.7 A @ 49°C per circuit
	Max power allowed	10A
Aux Power Supply for remote annunciators	Terminals are labelled "AUX PWR".	
	Rating	Power Limited 24 VDC unfiltered, 1.7 A @ 49°C
Resettable 4-Wire Smoke Supply	Terminals are labelled "4-WIRE".	
	Rating	22 VDC, 400 mA max., 5mV ripple
RS-485 port	For Remote Annunciators or interface to Audio Systems. Terminals are labelled "RS485".	
	Rating	Power limited to 300 mA.
Auxiliary relays (resistive loads)	Terminals are labelled "ALARM, TROUBLE, SUPV".	
	Alarm/Supv/Trouble	Must be connected to a Listed Power Limited Source of Supply. Form C, 1 Amp, 28 VDC
Electrical ratings	AC Line Voltage	120V 60Hz / 240V, 50Hz 4 Amps / 2 Amp (primary)
	Power Supply ratings	12 Amps. Max. (secondary)
Battery	Type	24VDC, Gel-Cell/Sealed Lead-Acid
	Charging capability	17-55 AH batteries
	Charging current	3A maximum
	Current Consumption	standby: 230 mA alarm: 380 mA
Other	<p>Displays (incl LCD) and Controls for all Common Functions, with capacity for 48 zone displays, and 48 configurable displays and controls.</p> <p>Micro-controller based design.</p> <p>Fully Configurable with PC software.</p> <p>Full walk test function.</p>	

12.4 FX-2000 Specifications

Table 24 FX-2000 System Modules and Annunciator Specifications

FX-2000 System Modules and Annunciators		
ALC-198S	Single Intelligent Analog Loop Module	One Analog Loop capable of monitoring 99 Sensors and 99 Modules or 99 Advanced Protocol (AP) devices and 99 AP Modules. Power limited 22 VDC, 400 mA max max loop resistance 40 Current Consumption Standby: 50 mA / Alarm: 60 mA
ALC-396S	Dual Intelligent Analog Loop Module	Two Analog Loops capable of monitoring 198 Sensors and 198 Modules or 198 Advanced Protocol (AP) devices and 198 AP Modules. Power limited: 22 VDC, 400 mA max, max loop resistance 40 Current Consumption standby: 50 mA / alarm: 60 mA
ALC-H16	Loop Controller Module	Provides connection for adding up to 16 FA-1000 style adders DM-1008A, SGM-1004A and RM-1008A. Current Consumption standby: 35 mA / alarm: 50 mA
SGM-1004A	NAC Signal Adder Module	Four Class B or A (Style Y or Z) NAC circuits; configurable as strobes or audibles. Terminals are labelled "IND". Power Limited: 24 VDC unfiltered max. 1.7 amps @ 49C per circuit Current Consumption standby: 60 mA / alarm: 258 mA
RM-1008A (resistive loads)	Relay Adder Module	Must be connected to a listed power limited source of supply. Terminals are labelled "RLY". Eight fully configurable Form C NAC. Form C, 1 amp., 28 VDC (resistive loads) Current Consumption standby: 25 mA / alarm: 150 mA
PR-300	Polarity Reversal and City Tie Module	Supervised city tie--not power limited 24VDC unfiltered, 210 mA max., Trip coil: 14 ohms. Terminals are labelled "City Tie". Polarity reversal power limited Terminals are labelled "Polarity Reversal". 24VDC open 12VDC @ 3.5 mA, 8 mA max. (shorted) Current Consumption standby: 35 mA / alarm: 300 mA

Table 24 FX-2000 System Modules and Annunciator Specifications (Continued)

FX-2000 System Modules and Annunciators		
DM-1008A	Detection Adder Module	<p>Eight supervised Class B (Style B) or four Class A (Style D) NAC circuits; fully configurable. Terminals are labelled "INI". NAC circuits are Compatibility ID "A".</p> <p>Current Consumption</p> <p>standby: 80 mA</p> <p>alarm: 1 zone active: 125 mA</p> <p>2 zone active: 170 mA</p> <p>4 zone active: 275 mA</p> <p>6 zone active: 370 mA</p> <p>8 zone active: 465 mA</p>
FDX-008	Fan Damper Display Module	<p>24V DC nominal, range of 20 to 39V DC.</p> <p>Interconnects via one ribbon cable to P2 of previous display module. Provides eight configurable output circuits or fan damper controls.</p> <p>Current Consumption</p> <p>standby: 15mA Max.</p> <p>alarm (all LEDs ON): 35mA Max.</p>
FDX-008KI	Fan Damper Display Module with Keyswitch	<p>24V DC nominal, range of 20 to 39V DC.</p> <p>Interconnects via one ribbon cable to P2 of previous display module. Provides eight configurable output circuits or fan damper controls, 1 output controlled via keyswitch.</p> <p>Current Consumption</p> <p>standby: 15mA Max.</p> <p>alarm (all LEDs ON): 35mA Max.</p>
RAX-1048TZDS	Adder Annunciator Chassis	<p>48 Display Points and 48 trouble points. Interconnect via one ribbon cable to RAM-1032(TZ) or to previous RAX-1048(TZ). Annunciation of up to 48 additional points (with trouble annunciation on the TZ version).</p> <p>Current Consumption</p> <p>standby: 22 mA</p> <p>alarm: 1 zone LED active: 26 mA</p> <p>2 zone LED active: 30 mA</p> <p>3 zone LED active: 35 mA</p> <p>4 zone LED active: 39 mA</p> <p>48 zone LED active: 262 mA</p>
IPS-2424DS	Programmable Input Switches Module	<p>Current Consumption</p> <p>standby: 5 mA</p> <p>alarm: 22 mA maximum</p>

Table 24 FX-2000 System Modules and Annunciator Specifications (Continued)

FX-2000 System Modules and Annunciators		
UDACT-300A	Digital Communicator Module	Transmit alarm, supervisory, and trouble to a central monitoring station.
	Current Consumption	standby: 45 mA / alarm: 120 mA

12.5 Compliance

System Model	FX-2000 Series Fire Alarm Control Panel
System Type	Local, auxiliary (using PR-300), remote protected premise station (using PR-300 or UDACT-300A), central station protected premises (using UDACT-300A).
Type of Service	A, M, WF, SS (with PR-300 or UDACT-300A)
Type of Signalling	Coded and Non-coded
Applicable Standards	NFPA 70 and 72, UL-864 Rev.9, ULC S-524, ULC S-527-99
Installation	Intended for indoor use, dry locations

13.0 Appendix B: Compatible Devices

13.1 FX-2000 Series Compatible Addressable Loop Devices (UL)

Table 25 UL Compatible FX-2000 Series Addressable Loop Devices

Make Model / Base	Description
Mircom	
MIX-1251	Low-Profile Analog Ionization Smoke Sensor
MIX-1251AP	Advanced Protocol Ionization Smoke Sensor
MIX-2251(B)/T(B)	Low-Profile Analog Photoelectric Smoke Sensor/plus Thermal
MIX-2251AP/TAP	Advanced Protocol Photoelectric Smoke Sensor/plus Thermal
MIX-2251TM(B)	Low-Profile Acclimate™ Intelligent Photoelectric Thermal Sensor
MIX-2251TMAP	Advanced Protocol Photoelectric Thermal Sensor
MIX-7251(B)	Pinnacle™ Intelligent Laser Smoke Sensor
MIX-5251P/RP	Low-Profile Analog Thermal Sensor/Rate of Rise
MIX-5251(B)/R(B)	Low Profile Intelligent Thermal Sensor/Rate of Rise
MIX-M500MB	Monitor Module (Universal)
MIX-M500MAP	Advanced Protocol Monitor Module
MIX-5251H	Low Profile Intelligent Thermal Sensor
MIX-M500CH	Addressable Control Module
MIX-M501M	Addressable Mini-Monitor Module
MIX-M501MAP	Advanced Protocol Mini-Monitor Module
MIX-M502M	Universal Monitor Module
MIX-M502MAP	Advanced Protocol Universal Mini-Monitor Module
MIX-M500R	Addressable Relay Output Module
MIX-M500RAP	Advanced Protocol Relay Output Module
MIX-M500S	Addressable Supervised Output Module
MIX-M500SAP	Advanced Protocol Supervised Output Module
MIX-M500DM	Addressable Dual Input Monitor Module
MIX-DH200PL	Intelligent Smoke Detector
MIX-DH200RPL	Intelligent Smoke Detector (with relay)
MIX-210LP	200 Series Low Profile Intelligent Base
MIX-B501BH	200 Series Low Profile Intelligent Base with Horn
MIX-B501BHT	200 Series Low Profile Intelligent Base with Horn (Temporal Code)
System Sensor	
FTX-P1	Filtrex™ Intelligent Photoelectric Smoke Sensor
M500X	Fault Isolator Module
IM-10	Ten Input Monitor Addressable Module
CR-6	Six Relay Control Module
SC-6	Six Supervised Control Module
B254BI	Analog Base with Isolator
B501B	Analog Base
B210LP	200 Series Low Profile Intelligent Base
B501B-FTX	Filtrex Base

Table 25 UL Compatible FX-2000 Series Addressable Loop Devices

Make Model / Base	Description
System Sensor continued	
B501BH	200 Series Low Profile Intelligent Base with Horn
B501BHT	200 Series Low Profile Intelligent Base with Horn (Temporal Code)
CZ-6	Six Addressable Universal Zone Module
BEAM200	Intelligent Addressable Beam Detector
BEAM200S	Intelligent Addressable Beam Detector (with Sens Test)

13.2 FX-2000 Series Compatible Two-Wire Smoke Detectors (UL)



Notes: Whether mixing different models of compatible smoke detectors or using the same model on the same circuit, total standby current of all detectors must not exceed 3 mA.

The below listed smoke detectors are compatible with initiating circuits having Compatibility Identifier "A".

Table 26 FX-2000 Series Compatible Two-Wire Smoke Detectors (UL Listed)

Smoke Detector Make Model / Base	Compatibility Identifier Head / Base	Rated Standby Current	Smoke Detector Make Model / Base	Compatibility Identifier Head / Base	Rated Standby Current
Apollo			Sentrol - ESL		
55000-225 / 45681-251, -255, -256, -258	225 / 251, 255, 256, 258	0.045 mA	429C	S10A - N/A	0.10 mA
55000-325 / 45681-251, -255, -256, -258	325 / 251, 255, 256, 258	0.045 mA	429CT	S10A - N/A	0.10 mA
Detection Systems Inc.			429CST	S11A - N/A	0.10 mA
DS250	B - N/A	0.10 mA	429CRT	S11A - N/A	0.10 mA
DS250TH	B - N/A	0.10 mA	711U/701E, 701U, 702E, 702U	S10A - S00	0.10 mA
DS282	B - N/A	0.10 mA	712U / 701E, 701U, 702E, 702U	S10A - S00	0.10 mA
DS282TH	B - N/A	0.10 mA	713-5U / 701E, 701U, 702E, 702U	S10A - S00	0.10 mA
Hochiki			721U / 702E, 702U	S10A - S00	0.10 mA
DCD-135/NS6-220	HD-3/HB-72	0.035mA	732U / 702E, 702U, 702RE, 702RU	S11A - S00	0.10 mA
DCD-135/NS4-220	HD-3/HB-3	0.035mA	721UT / 702E, 702U	S10A - S00	0.10 mA
DCD-135/HSC-220R	HD-3/HB-3	0.035mA	722U / 702E, 702U	S10A - S00	0.10 mA
DCD-190/NS6-220	HD-3/HB-3	0.035mA	731U / 702E, 702U, 702RE, 702RU	S11A - S00	0.10 mA
DCD-190/NS4-220	HD-3/HB-3	0.035mA	721UT / 702E, 702U	S10A - S00	0.10 mA
DCD-190/HSC-220R	HD-3/HB-3	0.035mA	721UT / 702E, 702U	S10A - S00	0.10 mA

Table 26 FX-2000 Series Compatible Two-Wire Smoke Detectors (UL Listed)

Smoke Detector Make Model / Base	Compatibility Identifier Head / Base	Rated Standby Current	Smoke Detector Make Model / Base	Compatibility Identifier Head / Base	Rated Standby Current
Hochiki continued			System Sensor		
SIJ-24/NS6-220	HD-3/HB-72	0.040mA			
SIJ-24/NS4-220	HD-3/HB-3	0.040mA	4451HT / B401***	A - A	0.12 mA
SIJ-24/HSC-220R	HD-3/HB-3	0.040mA	5451 / B401B***	A - A	0.12 mA
SLR-24/NS6-220	HD-3/HB-72	0.045mA	5451 / B401***	A - A	0.12 mA
SLR-24/NS4-220	HD-3/HB-3	0.045mA	2451 / B401B***	A - A	0.12 mA
SLR-24/HSC-220R	HD-3/HB-3	0.045mA	2451 / B406B***	A - A	0.12 mA
SLR-24H/NS6-220	HD-3/HB-3	0.045mA	2451 / DH400***	A - N/A	0.12 mA
SLR-24H/NS4-220	HD-3/HB-3	0.045mA	2451TH / B406B***	A - A	0.12 mA
SLR-24H/HSC-220R	HD-3/HB-72	0.045mA	2451 / B401***	A - A	0.12 mA
SLR-835/NS6-220	HD-3/HB-3	0.045mA	2451TH / B401***	A - A	0.12 mA
SLR-835/NS4-220	HD-3/HB-3	0.045mA	4451HT / B401B***	A - A	0.12 mA
SLR-835/HSC-220R	HD-3/HB-72	0.045mA	4451HT / B406B***	A - A	0.12 mA
SLR-835B-2	HD-6	55µa @ 24VDC	1100***	A - N/A	0.12 mA
NAPCO			1151/ B110LP***	A - A	0.12 mA
FW-2	HD-6	55µa @ 24VDC	1151/ B116LP***	A - A	0.12 mA
Mircom			1400***	A - N/A	0.10 mA
MIR-525U	FDT-1	0.10 mA	1451/B401***	A - A	0.12 mA
MIR-525TU	FDT-1	0.10 mA	1451/ B401B***	A - A	0.12 mA
MIR-752L / MIR-B6**	WHC60 / WB02	0.2 mA	1451/ B406B***	A - A	0.12 mA
MIR-752L / MIR-B44**	WHC60 / WB04	0.2 mA	1451DH/ DH400***	A - A	0.12 mA
MIR-752HL / MIR-B6**	WHC60 / WB02/	0.2 mA	2100***	A - N/A	0.12 mA
MIR-752HL / MIR-B44**	WHC60 / WB04	0.2 mA	2100T***	A - N/A	0.12 mA
			2151/ B110LP***	A - A	0.12 mA
			5451 / B406B***	A - A	0.12 mA
			2151/ B116LP***	A - A	0.12 mA
			2400***	A - N/A	0.12 mA
			2400TH***	A - N/A	0.12 mA
			2WTA-B*	A - N/A	0.1 mA
			2WTR-B*	A - N/A	0.1 mA
			2W-B, 2WT-B	A - N/A	0.1 mA



Notes: Maximum number of devices per circuit is 30 unless otherwise noted. If item is identified by a single asterisk (*) the maximum number of devices is 1. If item is identified by a double asterisk (**) the maximum number of devices is 21. If item is identified by a triple asterisk (***) the maximum number of devices is 25.

13.3 FX-2000 Series Compatible Four-Wire Smoke Detectors (UL Listed)

Table 27 FX-2000 Series Compatible Four-Wire Smoke Detectors (UL Listed)

Make & Model	# of Devices /Circuit	Make & Model	# of Devices/ Circuit
Mircom		System Sensor	
MIR-545U	30	1424	25
MIR-545TU	30	6424	30
Sentrol-ESL		6424A	30
541C	N/A	A77-716B	
541CXT	N/A	DH400ACDCI	8
709-MV-21	N/A	DH400ACDCP	8
709-24V-21	N/A	DH400ACDCIHT	8
741U WITH 702U or 702E Base	N/A		
449AT, 449C, 449CT, 449CRT, 449CST, 449CSTE, 449CSRT, 449CSRH, 449CSST, 449CSSTE, 449CTE, 449CSLT	N/A		

13.4 FX-2000 Series Compatible Signalling Devices (UL Listed)

Table 28 FX-2000 Series Compatible Signalling Devices (UL Listed)

Make & Model	Make & Model	
System Sensor - SpectrAlert	Wheelock	
P2415	AS-2415W-24-FR	RS-2415W-FR
P2415W	AS-241575W-FR	RSS-241575W-FR
P241575	AS-2430W-FR	RSS-2415W-FR
P241575W	AS-2475W-FR	RSS-241575W-FR
P2475	AS-24110W-FR	RSS-2430W-FR
P2475W	AS-2415C-FW	RSS-2475W-FR
P24110	AS-2430C-FW	RSS-24110W-FR
P24110W	AS-2475C-FW	RSS-2415C-FW
S2415	AS-24100C-FW	RSS-2430C-FW
S2415W	AH-24-R	RSS-2475C-FW
S241575	AH-24-WP-R	RSS-24100C-FW
S241575W	NS-2415W-FR	MT-12/24-ULC
S2475	NS-241575W-FR	MT-24-LS-VFR-ULC
S2475W	NS-2430W-FR	MT-24-WS-VFR-ULC
S24110	NS-2475W-FR	AMT-12/24-R-ULC
S24110W	NS-24110W-FR	AMT-24-LS-VFR-ULC
H12/24	NS4-2415W-FR	MB-G6-24-R
H12/24W	NS4-241575W-FR	MB-G10-24-R
MDL	NS4-2430W-FR	SM-12/24-R
MDLW	NS4-2475W-FR	DSM-12/24-R
	NS4-24110W-FR	

13.5 FX-2000 Series Compatible Addressable Loop Devices (ULC)

Table 29 FX-2000 Series Compatible Addressable Loop Devices (ULC)

Make & Model	Description	Make & Model	Description
Mircom		System Sensor	
MIX-1551A	Analog Ionization Smoke Sensor	5551A	Analog Thermal Sensor
MIX-1251A	Low-Profile Analog Ionization Smoke Sensor	5551RA	Analog Rate of Rise Thermal Sensor
MIX-1251APA	Advanced Protocol Ionization Smoke Sensor	5251PA	Low-Profile Analog Thermal Sensor
MIX-2551A	Analog Photoelectronic Smoke Sensor	5251RPA	Low-Profile Analog Rate of Rise Thermal Sensor
MIX-2251A/2551TA	Low-Profile Analog Photoelectronic Smoke Sensor / Plus Thermal	5251APA/HAPA/RAPA	Advanced Protocol Thermal Detector/Rate of Rise
MIX-2251APA/TAPA	Advanced Protocol Photoelectronic Smoke Sensor / Plus Thermal	FTX-P1A	Filtrex™ Intelligent Photoelectric Smoke Sensor
MIX-2251TMA	Low-Profile Acclimate™ Intelligent Photoelectric Thermal Sensor	M500X	Fault Isolator Module
MIX-2251TMAPA	Advanced Protocol Photoelectric Thermal Sensor	B254BIA	Analog Base with Isolator
MIX-7251A	Pinnacle™ Intelligent Laser Smoke Sensor	B501B	Analog Base
MIX-M500MA	Monitor Module (Universal)	IM-10A	Ten Input Monitor Addressable Module
MIX-M500MAPA	Advanced Protocol Monitor Module	CR-6A	Six Relay Control Module
MIX-M500CHA	Addressable Control Module	SC-6A	Six Supervised Control Module
MIX-M501MA	Addressable Mini-Monitor Module		
MIX-M501MAPA	Advanced Protocol Mini-Monitor Module		
MIX-DH200PLA	Intelligent Smoke Detector		
MIX-DH200RPLA	Intelligent Smoke Detector (with relay)		
MIX-210LPA	200 Series Low Profile Intelligent Base		
MIX-B501BHA	200 Series Low Profile Intelligent Base with Horn		
MIX-B501BHTA	200 Series Low Profile Intelligent Base with Horn (Temporal Code)		

13.6 FX-2000 Series Compatible Hardwire Smoke Detectors (ULC)



Note: Whether mixing different models of compatible smoke detectors or using the same model on the same circuit, the total standby current of all detectors must not exceed 3 mA.

Table 30 FX-2000 Series Compatible Hardwire Smoke Detectors (ULC Listed)

Make & Model	# of Devices /Circuit	Make & Model	# of Devices /Circuit
Hochiki		Simplex	
DCD-135/NS6-220	30	2098-9110	base
DCD-135/NS4-220	30	Mirtone	
DCD-135/HSC-220R	30	73471	base
DCD-190/NS6-220	30	73494	base
DCD-190/NS4-220	30	73575	base
DCD-190/HSC-220R	30	73495/73486	base
SIJ-24/NS6-220	30	73495/73487	base
SIJ-24/NS4-220	30	73595/73486	
SIJ-24/HSC-220R	30	73595/73497	
SLR-24/NS6-220	30	73594/73400	
SLR-24/NS4-220	30	73405/73400	
SLR-24/HSC-220R	30	73594/73401	
SLR-24H/NS6-220	30	73405/73401	
SLR-24H/NS4-220	30	System Sensor	
SLR-24H/HSC-220R	30	1400-A	30
SLR-835/NS6-220	30	2400-A	25
SLR-835/NS4-220	30	1451-A/B401B	25
SLR-835/HSC-220R	30	1451-A/B406B	25
SLR-835B-2	30	2451-A/B401B	25
Cerberus Pyrotronics		2451-A/B406B	25
D1-2		1451DH/DH400A	30
D1-3/DB-3S	30	2451-A/DH400A	25
Mircom		1151A	30
MIR-525	30	2151A	30
MIR-525T	30	C2W-BA/C2WT-BA	30
MIR-1400A	30	C2WTR-B	1
MIR-2400A	25	C2WTA-BA	1
MIR-752L	21	NAPCO	
MIR-752HL	21	FW-2	30

Table 30 FX-2000 Series Compatible Hardwire Smoke Detectors (ULC Listed)

Make & Model	# of Devices /Circuit	Make & Model	# of Devices /Circuit
Edwards		Fenwal	
6249C		PSD-7131/70-201000-001	
6250C		PSD-7131/70-201000-002	
6264C		PSD-7131/70-201000-003	
6266C		PSD-7131/70-201000-005	
6269C		PSD-7130/70-201000-001	
6270C		PSD-7130/70-201000-002	
6269C-003		PSD-7130/70-201000-003	
6270C-003		PSD-7130/70-201000-005	
Apollo		PSD-7128/70-201000-001	
55000-325	30	PSD-7126/70-201000-002	
55000-325 / 45681-251, -255, -256, -258	30	PSD-7126/70-201000-003	
		PSD-7126/70-201000-005	base
		PSD-7129/70-201000-000	base
		PSD-7125/70-201000-001	base
		PSD-7126/70-201000-002	base
		PSD-7125/70-201000-003	base
		PSD-7125/70-201000-005	base
		CPD-7021/70-201000-001	base
		CPD-7021/70-201000-002	base
		CPD-7021/70-201000-003	base
		CPD-7021/70-201000-005	base

13.7 FX-2000 Series Compatible Synchronized Modules and Strobes

Synchronization for strobes can be accomplished by using Sync Modules.

Manufacturer	Brand	Sync. Module	Strobe Models	Max. Strobe / NAC
Amseco / Potter	Mircom	SDM 240	FHS-340R/W, FHS-240-110	15
Gentex Corp.	Secutron	AVS44 R	MRA-HS3-24ww	20
SpectrAlert	System Sensor	MDL	P1224 MC	25
Wheelock	Wheelock	DSM 12/24	NS-24 MCW -FW	25
Faraday	Faraday	5406	6234B-14-24	26*



Notes: * Strobes and horns must be connected to separate circuits since the horn is a non-synchronized audible appliance.

Do not mix and match sync module with strobes from different manufacturers because each manufacturer uses different synchronization protocols.

14.0 Appendix C: Power Supply and Battery Calculations

IMPORTANT NOTICE

The main AC branch circuit connection for Fire Alarm Control Unit must provide a dedicated continuous power without provision of any disconnect devices. Use #12 AWG wire with 600-volt insulation and proper over-current circuit protection that complies with the local codes. Refer to *Appendix A: Specifications on page 79* for specifications.

Power Requirements (All currents are in amperes)

Model Number	Description	Qty		Standby	Total Standby	Alarm	Total Alarm
FX-2003-6DS/-12DS/-12XTDS/-16LED	Main Chassis (6A/12A)		X	0.230	=	0.380	=
FX-2017(S)-12ADS	Main Chassis (12 Amps)		X	0.230	=	0.380	=
FX-2009(S)-12DS	Large Main Chassis (12A)		X	0.230	=	0.380	=
ALC-198S	Single Analog Loop		X	0.050	=	0.060	=
ALC-396S	Double Analog Loop		X	0.050	=	0.060	=
ALC-H16	Adder Controller		X	0.035	=	0.050	=
DM-1008A	8 initiating circuit Module		X	0.080	=	1 zone active: 0.125 2 zone active: 0.170 4 zone active: 0.275 6 zone active: 0.370 8 zone active: 0.465	=
SGM-1004A	4 NAC circuit Module		X	0.060	=	0.258	=
RM-1008A	8 Relay circuit Module		X	0.025	=	0.150	=
FDX-008/KI	Fan Damper Control Module		X	0.015	=	0.035	=
UDACT-300A	Dialer Module		X	0.045	=	0.120	=
PR-300	City Tie Module		X	0.035	=	0.300	=
IPS-2424DS	Programmable Input Switches Module		X	0.005	=	0.022 maximum	=
RAX-1048TZDS	Adder Annunciator Chassis		X	0.022	=	1 zone active: 0.026 2 zone active: 0.030 3 zone active: 0.035 4 zone active: 0.039 48 zone active: 0.262	=
RAM-1032TZDS	Main Remote Annunciator		X	0.050	=	32 zone active: 0.300	=
MGD-32	Master Graphic Drive Module		X	0.035	=	__ (# of LEDs) x 4mA (Refer to LT-847 if using lamps)	

AGD-048	Adder Graphic Driver Module		X	0.035	=	__ (# of LEDs) x 4mA (Refer to LT-847 if using lamps)	=
Two-Wire Smoke Detectors			X	♦ 0.0001	=	* 0.090	= 0.090
MIX-1251/A Analog Ion Smoke Detector			X	200µA	=	0.0065	=
MIX-2251B/A Analog Photo Smoke Detector			X	230µA	=	0.0065	=
5551A/RA Analog Thermal Sensor			X	200µA	=	0.007	=
MIX-M500MA/MB, MIX-M501MA/MB Monitor			X	400µA	=	0.0051/0.0055	=
MIX-M500S/R Monitor Module			X	300µA	=	0.0051	=
M500X Fault Isolator Module			X	450µA	=	450µA	=
B254BI/A Analog Base with Isolator			X	450µA	=	0.005	=
Four-Wire Smoke Detectors			X		=		=
Signal Load (bells, horns, strobes, and etc.)			X				=
Auxiliary Power Supply for Remote Annunciators					=	Alarm	=
Total currents (Add above currents) STANDBY					(A)		(B)

Total Current Requirement: ALARM (B) _____ Amps.

Battery Capacity Requirement:

[(STANDBY (A) _____] X [(24 or 60 Hours) ____]] + [(ALARM (B) _____] X [*Alarm in Hr.] _____] = (C) _____ AH

Main Chassis Selection: Select FX-2003-6DS or FX-2003-6DS-16LED or FX-2009(S)-12DS or FX-2017(S)-12DS if (B) value is less than 12 Amps.

Battery Selection: Multiply (C) by 1.20 to derate battery.

Batteries: BA-110(10AH), BA-117(17AH) will fit in the UB-1024DS
BA-124 (24AH) will fit in the BBX-1072ADS/ARDS, BB-5008, or the BB-5014
BA-140(40AH) will fit in the BC-160 battery cabinet

* Assuming three initiating circuits in alarm.

* Use 0.084 for five minutes of alarm or 0.5 for thirty minutes of alarm as a multiplier figure.

♦ Using the System Sensor 2W-B (or C2W-BA) 2-wire smoke detector. See *Appendix B: Compatible Devices on page 85* for other available smoke detectors.

15.0 Appendix D: Remote Annunciator Panels

15.1 RA-1000 & RAM-200 Series

The RA-1000 Series of remote annunciators are units with electrical modules and enclosures matching the configurations of the FX-2000 Series Fire Alarm Control Panels. For detailed information see Mircom Documents RA-1000 Manual LT-617, RAM-208 Manual LT-648, RAM-216 Manual LT-658 and MGD-32 Manual LT-847.

15.1.1 RA-1000 & RAM-200 Models

RAM-1032TZDS	Main Annunciator Chassis with common indicators and controls, and 32-circuit capacity.
RAX-1048TZDS	Adder Annunciator Chassis with 48 circuit capacity.
RAM-1016	Non-Expandable Annunciator Chassis with common indicators and controls, and 16-circuit capacity.
RAM-208/R	Non-Expandable Annunciator Chassis with limited common indicators and controls, and eight-circuit capacity. Standard beige colour RAM-208, RAM-208R is red.
RAM-216/R	Non-Expandable Annunciator Chassis with limited common indicators and controls, and 16-circuit capacity. Standard beige colour RAM-216, RAM-216R is red.

15.1.2 Graphic Annunciators

MGD-32	Main Graphic Annunciator Chassis with common indicators and controls, and 32-circuit capacity.
AGD-048	Adder Graphic Annunciator Chassis with 48-circuit capacity.

15.1.3 Enclosures

BB-1001/R	Capacity for one annunciator chassis.
BB-1002/R	Capacity for two annunciator chassis.
BB-1003/R	Capacity for three annunciator chassis.
BB-1008/R	Capacity for eight annunciator chassis.
BB-1012/R	Capacity for twelve annunciator chassis.

15.2 RAX-LCD

The RAX-LCD Remote Shared Display is a remote annunciator that provides the same functions as the main display on the fire alarm control panel, less 16 zone LEDs. It is equipped with a large 4 line x 20 character backlit alphanumeric LCD display which uses a simple menu system complete with a directional key pad and switches for Enter, Menu, Cancel and Info. For more information see Mircom document LT-856.

15.2.1 Models

RAX-LCD	Main Annunciator Chassis with Common Indicators and Controls.
RAX-1048TZDS	Adder Annunciator Chassis with 48 Circuit Capacity.
IPS-2424	Programmable Input Switches module with 48 display points and 24 buttons.

15.2.2 Enclosures

Enclosures are:

- Finish painted, textured, off-white (standard), suffix R for red (for other paint available colours and finishes, please contact factory).
- Material 8 G.A. cold roll steel (CRS).

BB-1001/R	Capacity for one annunciator chassis.
BB-1002/R	Capacity for two annunciator chassis.
BB-1003/R	Capacity for three annunciator chassis.

16.0 Appendix E: DIP Switch Settings Summary

RA-1000	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
	33	ON	OFF	OFF	OFF	OFF	N/A	N/A	ON when used with FX-2000 version 2.X.X or higher(16 bit checksum). OFF when used with FX-2000 version 0.X.X(8 bit checksum). RAM-1000 must be at firmware revision 1.0.6 or higher to accommodate 16 bit checksum operation.
	34	OFF	ON	OFF	OFF	OFF			
	35	ON	ON	OFF	OFF	OFF			
	36	OFF	OFF	ON	OFF	OFF			
	37	ON	OFF	ON	OFF	OFF			
	38	OFF	ON	ON	OFF	OFF			
	39	ON	ON	ON	OFF	OFF			
	40	OFF	OFF	OFF	ON	OFF			
	41	ON	OFF	OFF	ON	OFF			
	42	OFF	ON	OFF	ON	OFF			
	43	ON	ON	OFF	ON	OFF			
	44	OFF	OFF	ON	ON	OFF			
	45	ON	OFF	ON	ON	OFF			
	46	OFF	ON	ON	ON	OFF			
	47	ON	ON	ON	ON	OFF			
	48	OFF	OFF	OFF	OFF	ON			
	49	ON	OFF	OFF	OFF	ON			
	50	OFF	ON	OFF	OFF	ON			
	51	ON	ON	OFF	OFF	ON			
	52	OFF	OFF	ON	OFF	ON			
	53	ON	OFF	ON	OFF	ON			
	54	OFF	ON	ON	OFF	ON			
	55	ON	ON	ON	OFF	ON			
	56	OFF	OFF	OFF	ON	ON			
	57	ON	OFF	OFF	ON	ON			
	58	OFF	ON	OFF	ON	ON			
	59	ON	ON	OFF	ON	ON			
	60	OFF	OFF	ON	ON	ON			
	61	ON	OFF	ON	ON	ON			
	62	OFF	ON	ON	ON	ON			
	63	ON	ON	ON	ON	ON			

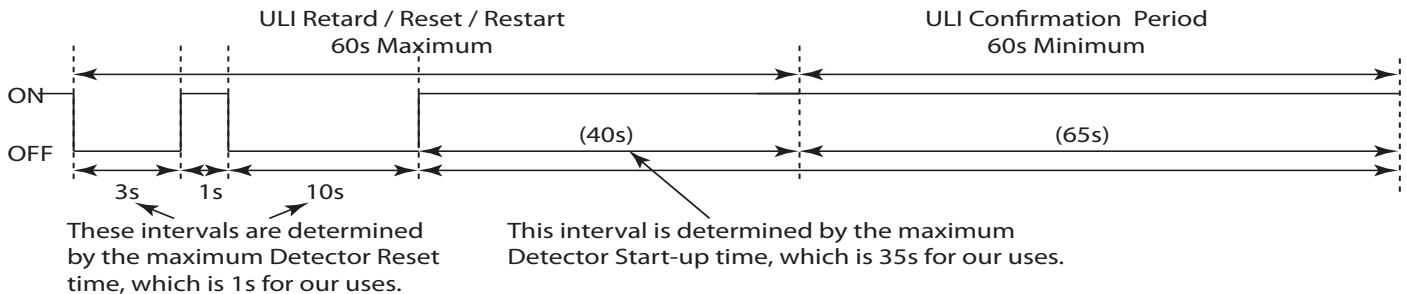
MGD-32	ADDR	SW1-1	SW1-2	SW1-3	SW1-4
	33	ON	OFF	OFF	ON when used with FX-2000 version 2.X.X or higher(16 bit checksum). OFF when used with FX-2000 version 0.X.X(8 bit checksum). MGD must be 1.05 or higher to accept 16 bit checksum.
	34	OFF	ON	OFF	
	35	ON	ON	OFF	
	36	OFF	OFF	ON	
	37	ON	OFF	ON	
	38	OFF	ON	ON	
	39	ON	ON	ON	

RAX-LCD	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
	33	OFF	ON	ON	ON	ON	OFF	ON	Put in "OFF" position for firmware restore to defaults during power up. At all other times put in "ON" state.
	34	ON	OFF	ON	ON	ON	OFF	ON	
	35	OFF	OFF	ON	ON	ON	OFF	ON	
	36	ON	ON	OFF	ON	ON	OFF	ON	
	37	OFF	ON	OFF	ON	ON	OFF	ON	
	38	ON	OFF	OFF	ON	ON	OFF	ON	
	39	OFF	OFF	OFF	ON	ON	OFF	ON	
	40	ON	ON	ON	OFF	ON	OFF	ON	
	41	OFF	ON	ON	OFF	ON	OFF	ON	
	42	ON	OFF	ON	OFF	ON	OFF	ON	
	43	OFF	OFF	ON	OFF	ON	OFF	ON	
	44	ON	ON	OFF	OFF	ON	OFF	ON	
	45	OFF	ON	OFF	OFF	ON	OFF	ON	
	46	ON	OFF	OFF	OFF	ON	OFF	ON	
	47	OFF	OFF	OFF	OFF	ON	OFF	ON	
	48	ON	ON	ON	ON	OFF	OFF	ON	
	49	OFF	ON	ON	ON	OFF	OFF	ON	
	50	ON	OFF	ON	ON	OFF	OFF	ON	
	51	OFF	OFF	ON	ON	OFF	OFF	ON	
	52	ON	ON	OFF	ON	OFF	OFF	ON	
	53	OFF	ON	OFF	ON	OFF	OFF	ON	
	54	ON	OFF	OFF	ON	OFF	OFF	ON	
	55	OFF	OFF	OFF	ON	OFF	OFF	ON	
	56	ON	ON	ON	OFF	OFF	OFF	ON	
	57	OFF	ON	ON	OFF	OFF	OFF	ON	
	58	ON	OFF	ON	OFF	OFF	OFF	ON	
	59	OFF	OFF	ON	OFF	OFF	OFF	ON	
	60	ON	ON	OFF	OFF	OFF	OFF	ON	
	61	OFF	ON	OFF	OFF	OFF	OFF	ON	
	62	ON	OFF	OFF	OFF	OFF	OFF	ON	
	63	OFF	OFF	OFF	OFF	OFF	OFF	ON	

RAM-208 or RAM-216	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	JP-1
	33	ON	OFF	OFF	OFF	JUMPER ON Pins 2&3 when used with FX-2000 version 2.X.X or higher(16 bit checksum). JUMPER ON Pins 1&2 when used with FX-2000 version 0.X.X(8 bit checksum). Firmware of 208/216 must be 1.0.6 or higher to accommodate 16 bit
	34	OFF	ON	OFF	OFF	
	35	ON	ON	OFF	OFF	
	36	OFF	OFF	ON	OFF	
	37	ON	OFF	ON	OFF	
	38	OFF	ON	ON	OFF	
	39	ON	ON	ON	OFF	
	40	OFF	OFF	OFF	ON	

ALC-396S	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
	1	OFF	ON	ON	ON	ON	ON	ON	Put in "OFF" position for firmware restore to defaults during power up. At all other times put in "ON" state.
	2	ON	OFF	ON	ON	ON	ON	ON	
	3	OFF	OFF	ON	ON	ON	ON	ON	
	4	ON	ON	OFF	ON	ON	ON	ON	
	5	OFF	ON	OFF	ON	ON	ON	ON	
	6	ON	OFF	OFF	ON	ON	ON	ON	
	7	OFF	OFF	OFF	ON	ON	ON	ON	
	8	ON	ON	ON	OFF	ON	ON	ON	
	9	OFF	ON	ON	OFF	ON	ON	ON	
	10	ON	OFF	ON	OFF	ON	ON	ON	
	11	OFF	OFF	ON	OFF	ON	ON	ON	
	12	ON	ON	OFF	OFF	ON	ON	ON	
	13	OFF	ON	OFF	OFF	ON	ON	ON	
	14	ON	OFF	OFF	OFF	ON	ON	ON	
	15	OFF	OFF	OFF	OFF	ON	ON	ON	
	16	ON	ON	ON	ON	OFF	ON	ON	
	17	OFF	ON	ON	ON	OFF	ON	ON	
	18	ON	OFF	ON	ON	OFF	ON	ON	
	19	OFF	OFF	ON	ON	OFF	ON	ON	
	20	ON	ON	OFF	ON	OFF	ON	ON	
	21	OFF	ON	OFF	ON	OFF	ON	ON	
	22	ON	OFF	OFF	ON	OFF	ON	ON	
	23	OFF	OFF	OFF	ON	OFF	ON	ON	
	24	ON	ON	ON	OFF	OFF	ON	ON	
	25	OFF	ON	ON	OFF	OFF	ON	ON	
	26	ON	OFF	ON	OFF	OFF	ON	ON	
	27	OFF	OFF	ON	OFF	OFF	ON	ON	
	28	ON	ON	OFF	OFF	OFF	ON	ON	
	29	OFF	ON	OFF	OFF	OFF	ON	ON	
	30	ON	OFF	OFF	OFF	OFF	ON	ON	

17.0 Appendix F: Alarm Verification Timing



A Manual Station, or other contact-closure device, would remain shorted and be detected during the very short Zone Power burst within the first three seconds. A Smoke Detector will have been reset, and will require some minimum time to power-up, thus the Verification cycle will be entered.

18.0 Appendix G: Wiring For Supervised Output Module

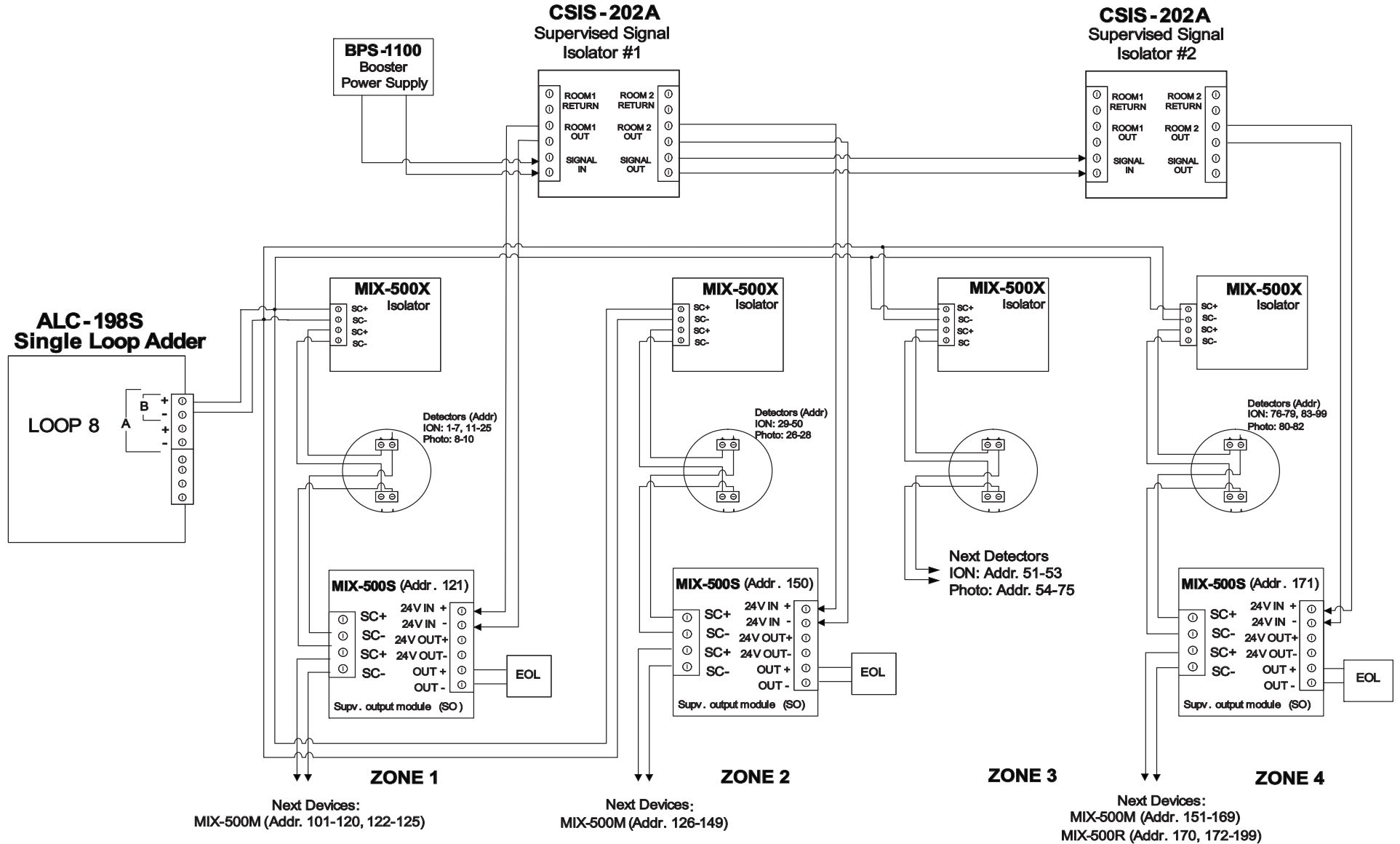


Figure 48 UL 864 Wiring for Addressable Supervised Output Module

19.0 Warranty & Warning Information

19.1 Warning Please Read Carefully

Note to End Users: This equipment is subject to terms and conditions of sale as follows:

19.1.1 Note to Installers

This warning contains vital information. As the only individual in contact with system users, it is your responsibility to bring each item in this warning to the attention of the users of this system. Failure to properly inform system end-users of the circumstances in which the system might fail may result in over-reliance upon the system. As a result, it is imperative that you properly inform each customer for whom you install the system of the possible forms of failure.

19.1.2 System Failures

This system has been carefully designed to be as effective as possible. There are circumstances, such as fire or other types of emergencies where it may not provide protection. Alarm systems of any type may be compromised deliberately or may fail to operate as expected for a variety of reasons. Some reasons for system failure include:

- *Inadequate Installation*

A Fire Alarm system must be installed in accordance with all the applicable codes and standards in order to provide adequate protection. An inspection and approval of the initial installation, or, after any changes to the system, must be conducted by the Local Authority Having Jurisdiction. Such inspections ensure installation has been carried out properly.

- *Power Failure*

Control units, smoke detectors and many other connected devices require an adequate power supply for proper operation. If the system or any device connected to the system operates from batteries, it is possible for the batteries to fail. Even if the batteries have not failed, they must be fully charged, in good condition and installed correctly. If a device operates only by AC power, any interruption, however brief, will render that device inoperative while it does not have power. Power interruptions of any length are often accompanied by voltage fluctuations which may damage electronic equipment such as a fire alarm system. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.

- *Failure of Replaceable Batteries*

Systems with wireless transmitters have been designed to provide several years of battery life under normal conditions. The expected battery life is a function of the device environment, usage and type. Ambient conditions such as high humidity, high or low temperatures, or large temperature fluctuations may reduce the expected battery life. While each transmitting device has a low battery monitor which identifies when the batteries need to be replaced, this monitor may fail to operate as expected. Regular testing and maintenance will keep the system in good operating condition.

- *Compromise of Radio Frequency (Wireless) Devices*

Signals may not reach the receiver under all circumstances which could include metal objects placed on or near the radio path or deliberate jamming or other inadvertent radio signal interference.

- *System Users*

A user may not be able to operate a panic or emergency switch possibly due to permanent or temporary physical disability, inability to reach the device in time, or unfamiliarity with the correct operation. It is important that all system users be trained in the correct operation of the alarm system and that they know how to respond when the system indicates an alarm.

- *Automatic Alarm Initiating Devices*

Smoke detectors, heat detectors and other alarm initiating devices that are a part of this system may not properly detect a fire condition or signal the control panel to alert occupants of a fire condition for a number of reasons, such as: the smoke detectors or heat detector may have been improperly installed or

positioned; smoke or heat may not be able to reach the alarm initiating device, such as when the fire is in a chimney, walls or roofs, or on the other side of closed doors; and, smoke and heat detectors may not detect smoke or heat from fires on another level of the residence or building.

- **Software**

Most Mircom products contain software. With respect to those products, Mircom does not warranty that the operation of the software will be uninterrupted or error-free or that the software will meet any other standard of performance, or that the functions or performance of the software will meet the user's requirements. Mircom shall not be liable for any delays, breakdowns, interruptions, loss, destruction, alteration or other problems in the use of a product arising out of, or caused by, the software.

Every fire is different in the amount and rate at which smoke and heat are generated. Smoke detectors cannot sense all types of fires equally well. Smoke detectors may not provide timely warning of fires caused by carelessness or safety hazards such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches or arson.

Even if the smoke detector or heat detector operates as intended, there may be circumstances when there is insufficient warning to allow all occupants to escape in time to avoid injury or death.

- ***Alarm Notification Appliances***

Alarm Notification Appliances such as sirens, bells, horns, or strobes may not warn people or waken someone sleeping if there is an intervening wall or door. If notification appliances are located on a different level of the residence or premise, then it is less likely that the occupants will be alerted or awakened. Audible notification appliances may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners or other appliances, or passing traffic. Audible notification appliances, however loud, may not be heard by a hearing-impaired person.

- ***Telephone Lines***

If telephone lines are used to transmit alarms, they may be out of service or busy for certain periods of time. Also the telephone lines may be compromised by such things as criminal tampering, local construction, storms or earthquakes.

- ***Insufficient Time***

There may be circumstances when the system will operate as intended, yet the occupants will not be protected from the emergency due to their inability to respond to the warnings in a timely manner. If the system is monitored, the response may not occur in time enough to protect the occupants or their belongings.

- ***Component Failure***

Although every effort has been made to make this system as reliable as possible, the system may fail to function as intended due to the failure of a component.

- ***Inadequate Testing***

Most problems that would prevent an alarm system from operating as intended can be discovered by regular testing and maintenance. The complete system should be tested as required by national standards and the Local Authority Having Jurisdiction and immediately after a fire, storm, earthquake, accident, or any kind of construction activity inside or outside the premises. The testing should include all sensing devices, keypads, consoles, alarm indicating devices and any other operational devices that are part of the system.

- ***Security and Insurance***

Regardless of its capabilities, an alarm system is not a substitute for property or life insurance. An alarm system also is not a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation.

IMPORTANT NOTE: End-users of the system must take care to ensure that the system, batteries, telephone lines, etc. are tested and examined on a regular basis to ensure the minimization of system failure.

19.2 Limited Warranty

Mircom Technologies Ltd. together with its subsidiaries and affiliates (collectively, the “Mircom Group of Companies”) warrants the original purchaser that for a period of three years from the date of shipment, the product shall be free of defects in materials and workmanship under normal use. During the warranty period, Mircom shall, at its option, repair or replace any defective product upon return of the product to its factory, at no charge for labor and materials. Any replacement and/or repaired parts are warranted for the remainder of the original warranty or ninety (90) days, whichever is longer. The original owner must promptly notify Mircom in writing that there is defect in material or workmanship, such written notice to be received in all events prior to expiration of the warranty period.

19.2.1 International Warranty

The warranty for international customers is the same as for any customer within Canada and the United States, with the exception that Mircom shall not be responsible for any customs fees, taxes, or VAT that may be due.

19.2.2 Conditions to Void Warranty

This warranty applies only to defects in parts and workmanship relating to normal use. It does not cover:

- damage incurred in shipping or handling;
- damage caused by disaster such as fire, flood, wind, earthquake or lightning;
- damage due to causes beyond the control of Mircom such as excessive voltage, mechanical shock or
- water damage;
- damage caused by unauthorized attachment, alterations, modifications or foreign objects;
- damage caused by peripherals (unless such peripherals were supplied by Mircom);
- defects caused by failure to provide a suitable installation environment for the products;
- damage caused by use of the products for purposes other than those for which it was designed;
- damage from improper maintenance;
- damage arising out of any other abuse, mishandling or improper application of the products.

19.3 Warranty Procedure

To obtain service under this warranty, please return the item(s) in question to the point of purchase. All authorized distributors and dealers have a warranty program. Anyone returning goods to Mircom must first obtain an authorization number. Mircom will not accept any shipment whatsoever for which prior authorization has not been obtained. **NOTE:** Unless specific pre-authorization in writing is obtained from Mircom management, no credits will be issued for custom fabricated products or parts or for complete fire alarm system. Mircom will at its sole option, repair or replace parts under warranty. Advance replacements for such items must be purchased.

Note: Mircom’s liability for failure to repair the product under this warranty after a reasonable number of attempts will be limited to a replacement of the product, as the exclusive remedy for breach of warranty.

19.4 Disclaimer of Warranties

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or implied (including all implied warranties of merchantability or fitness for a particular purpose) And of all other obligations or liabilities on the part of Mircom neither assumes nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

This disclaimer of warranties and limited warranty are governed by the laws of the province of Ontario, Canada.

19.5 Out of Warranty Repairs

Mircom will at its option repair or replace out-of-warranty products which are returned to its factory according to the following conditions. Anyone returning goods to Mircom must first obtain an authorization number. Mircom will not accept any shipment whatsoever for which prior authorization has not been obtained.

Products which Mircom determines to be repairable will be repaired and returned. A set fee which Mircom has predetermined and which may be revised from time to time, will be charged for each unit repaired.

Products which Mircom determines not to be repairable will be replaced by the nearest equivalent product available at that time. The current market price of the replacement product will be charged for each replacement unit.

The foregoing information is accurate as of the date of publishing and is subject to change or revision without prior notice at the sole discretion of the Company

WARNING: Mircom recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

NOTE: Under no circumstances shall Mircom be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, but are not limited to, loss of profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property.

MIRCOM MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS GOODS DELIVERED, NOR IS THERE ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, EXCEPT FOR THE WARRANTY CONTAINED HEREIN.



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