MAINTENANCE & OPERATION MANUAL

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FleXNet™

Network Intelligent Analog Fire Alarm and Audio System

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Introduction

About the FleX-Net^{TM} Network Fire and Emergency Communication System

Mircom's FleX-Net^{TM} Intelligent Fire Alarm and Audio Network offers modular components for network systems providing a wide variety of applications. Designed for peer to peer network communications, using industrial standard ARCnet protocol. FleX-Net^{TM} allows for a maximum of 63 nodes (where a node can be a control center or a floor panel) while providing reliability and flexibility.

FleX-Net^{TM} is based on the proven and reliable FX-2000 Fire Alarm Control Panel platform. Each base panel consists of one intelligent analog loop controller capable of supporting 99 analog sensors and 99 addressable modules. In addition, the base panel also consists of 4 Class A/B (Style Z/Y) Indicating Circuits (NACs) rated at 1.7 amperes each and a large 4 x 20 back-lit alphanumeric LCD display.

The FleX-Net^{TM} configuration allows the FleX-Net^{TM} Fire Alarm Control Panels to be connected to a Mircom network which provides additional input circuits, visual zones, programmable notification appliance circuits and relays. In addition, a FleX-Net^{TM} Integrated Fire and Audio panel can be used to provide a fully distributed audio and/or integrated telephone system.

Mircom's FleX-Net^{TM} Network system also provides zoned emergency multi-channel audio providing emergency paging and fire evacuation, and an optional firefighters' telephone communication to and from CACF (Central Alarm and Control Facilities) location to all remote telephone handsets. The system consists of Integrated Fire and Audio Network Panel or FX-MNS nodes. Each Integrated Fire and Audio Network Panel or FX-MNS contains an audio portion which consists of a QMB-5000N motherboard and card cage which holds an ANC-5000 Audio Network Card, a TNC-5000 Telephone Network Card and up to 4 amplifiers, a fire alarm portion FX-2000ND Main Chassis, a PS-2040 power supply and batteries. The QBB-5001/R expansion audio cabinet (connected to a Integrated Fire and Audio Network Panel or FX-MNS node) contains a card cage motherboard which holds up to 7 amplifiers, has an audio power supply, battery charger and batteries all housed in an audio backbox enclosure.

For communication and annunciation there is a microphone for paging, a paging selector panel, firefighters' telephone and associated selector panels all housed in a central enclosure (CACF). The master paging and telephone modules are intended for installation in a CACF.

Note that the paging microphone and firefighters' telephone may be used together or independently, connected to a FleX-Net^{TM} Network Central Alarm and Control Facility (CACF).

Overall Features
- Large System Capacity and Modular Design.
- Provides peer-to-peer network communications
- Supports up to 63 nodes (including lobby panel).
- Supports copper and/or fiber optic network cable.
- Each Analog Loop is capable of supporting 99 Digital or Analog Sensors and 99 Addressable Modules which can be wired as Class A (Style 6 or 7) or Class B (Style 4).
- 12 Ampere Power Supply.
- Four Class A/B (Style Z/Y) NACs 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.
- Indicating circuits (NACs) may be configured to provide additional auxiliary power or resettable auxiliary power. NAC expansion using the INX-10A, INX-10ADS or INX-10AC.
- 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-1 Remote Trouble Indicator.

Introduction

- RS-485 Interface for Remote Annunciators. Remote Annunciators do not occupy a node on the network. Up to seven annunciators can be connected per node.
- Three Level Password Protection with field settable definition which enables the installer to determine what functions are accessible for each level of password
- 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.
- Large 4 line by 20 character alphanumeric, back-lit LCD Display with user-friendly menu system.
- Common Controls and Indicators for System Reset, Lamp Test, Fire Drill, Signal Silence, General Alarm, Acknowledge, AC On, Pre-Alarm, and Ground Fault.
- Two Spare configurable switches and LED Indicators.
- 16 Zone configurable LED (bi-coloured) Annunciator with slide-in labels for Zone Description.
- Provides drift compensation for ionization and 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.
- Quad Loop Adder module ALCN-792M for expanding addressable loops by 2; with daughter board ALCN-792D expanding addressable loops by a total of 4.

Overall Audio Features:

- Supervises signal circuits while in use.
- Control of fire management operations (e.g. all-call paging and total evacuation signalling).
- Indication of all required fault conditions.
- Microprocessor-based operations with hardware and software watchdog timer to ensure reliable system operation.
- Supervised tone generators.
- Up to 100 audio zones per node, 1575 audio amplifiers per Network system.
- Up to 5 (analog) firefighters' telephone zones per node and 315 (analog) telephone zones per Network system.
- 99 addressable telephone zones per loop, maximum of 29 addressable telephone loops per node, maximum of 144 addressable telephone zones per system.
- Easy configuration process.
- Operates from 24 VDC backup batteries in the event of a power failure.
- Removable terminal blocks for ease of installation and maintenance.
- Speaker circuits integrated with amplifier circuits.
- Maximum of 180 Watts per Integrated Fire and Audio Cabinet (BBX-2000) and FX-MNS.
- Maximum of 360 Watts per QBB-5001/R expansion cabinet and 1260 Watts of total power per Integrated Fire and Audio Panel (BBX-2000) or FX-MNS node with maximum expansion [180W +360W(3)=1260W].
- Optional redundant backup amplifier per node.

Additional Features

Blackfin based Quad Loop Adder module ALCN-792M. The ALCN-792M is a 2 loop addressable adder module with provision to connect a daughter board ALCN-792D which contains an additional 2 addressable loops for a total of four addressable loops.

There are two additional main fire alarm panel displays:

DSPL-420 8 line LCD display narrow board

DSPL-2440 9 event, 24 line graphical display narrow board

The BBX-FXMNS enclosure is for the Integrated Fire and Audio consisting of a backbox, door and middle chassis. Part of this enclosure is the vertical mount telephone QMT-5302NV and the vertical mount paging microphone QMP-5101NV.

The ANC-5000 Audio Network Controller module includes ARCnet and an ethernet port. ARCnet reduces the wiring for audio and telephone to the ARCnet only or fiber optics (if used).

The QBC-5000N charger provides a dual voltage transformer for audio.

The RAXN-LCDG is a graphical display remote annunciator.

The FleXNet[TM] is compatible with Coptir, Pinnacle, Acclimate and 4-20mA devices.

Configuration options are provided for grouping inputs.

Panel supports previous, current and next configuration. Configuration automatically reverts back to previous or moves to future configuration through front-panel menu.

OPEN Graphic Navigator Software Package allows 3D graphic display of premises and devices. Use the ethernet port on the main board to connect to OPEN graphics software.

Boolean logic functions are now available within the configuration software.

uBoot Based BootLoader program (inherent in the configuration) provides leading technology that allows a choice of multiple configuration files or firmware revisions to support site-specific requirements.

The FleXBoot[TM] shell offers UNIX style commands for directory listing, log download, diagnostic probing and system tuning and optimization.

Document Conventions

Circuits and Zones

The term **circuits** refers to an actual electrical interface, initiating (detection), indicating (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 FleX-Net[TM], 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.

Wiring Styles

Initiating circuits are configured by default as Class B (Style B). They may be configured as Class A (Style D) as described in System *Configuration*. 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.

Indicating circuits (NACs) 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).

Typical FleX-Net™ Wiring Without Audio

Node 1
FX-2017-12N in a BBX-1072RA

Node 2
FX-2003-12N in a BBX-1024R

Node 3
FX-2017-12N in a BBX-1072RA

RAXN-LCD in a BB-1001R

RS-485

Class A wiring

Twisted Pair Wiring

Node 5
FX-2003-12N in a BBX-1024R

Node 4
FX-2009-12N in a BB-5008R
CACF

RAXN-LCD in a BB-1001R

RS-485

RAXN-LCD in a BB-1001R

RS-485

Typical FleX-Net ™ Wiring With Audio

Node 3 - Floor Panel

Five Telephone Audio Channels

Audio Channels for Paging, prerecorded messages and tones

Addressable Loop

RAXN-LCD in BB-1001R

Node 2 - Floor Panel

Five Telephone Audio Channels

Audio Channels for Paging, prerecorded messages and tones

Addressable Loop

RAXN-LCD in BB-1001R

1 twisted pair or 2 fibre optic cables for ARCnet Network, Fire Control, Paging Audio and Telephone

NOTES:
(1) The main board has two conventional loops, one SLC loop and 4 Class B (Style Y) NAC circuits.
(2) The main FX-2000N supports a maximum of 12 frames (a frame is a measure of display capacity).
(3) Each FX-2000N supports a maximum of seven ALCN-792M Quad Addressable Loop Adder Module plus ALCN-792D for a total of 29 loops per FX-2000N.
(4) The system supports a maximum of 7 annunciators per node.
(5) Annunciators RAXN-LCD and RAXN-LCDG can support a maximum of 41 frames each, which include IPS-2424, FDX-008, AGD-048, RAX-1048TZ and QAZT-5302.
(6) If high speed digitized audio is used only the ARCnet or Fiber Optic wiring is required between nodes.

Node1

Firefighter's Handsets

Speakers

Five Telephone Circuits per TNC-5000

Amplifier - 4
Amplifier - 3
Amplifier - 2
Amplifier - 1

Paging Audio
Stored audio temporal tone etc.
Alert 1
Alert 2
Phone Line 1
Phone Line 2

Addressable Devices

ANC-5000 & TNC-5000 in Audio Card Cage

UDACT-300A Digital Communicator Module

ALCN-792D Analog Loop Network Module

FNC-2000 Network Controller Module

FOM-2000-SP Fibre Optic Network Module

and/or

Addressable Devices Loop 2

FX-2000N Main Board

DM-1008A Inputs
SGM-1004A Signal
RM-1008A Relays

PTR-2000-1 Line Printer

Conventional Devices

FDX-008 Fan Damper Controller

RAX-1048TZ Display Adder

IPS-2424 Zone Bypass

AGD-048 Graphic Driver

IPS-2424 Zone Bypass switch

RAXN-LCD Annunciator

MAIN display

FX-2000N Control Panel Node 4

FDX-008 Fan Damper Controller

RAX-1048TZ Display adder

AGD-048 Graphic driver

Internal RS-485

External RS-485

ARCnet

Paging Audio

Telephone Audio

5

Chassis Types

	Model	Description
	FX-2003-12N	**12 Amp Compact Main Chassis.** This compact main chassis comes complete with one Analog Loop Controller (99 Analog Sensors and 99 Addressable Modules), 4 Class A/B (Style Z/Y) NACs (1.7 Amp each), a 4 line by 20 character back-lit LCD display, 16 zone LED annunciator and a 12 ampere power supply which charges 17-65 AH batteries. The FX-2003-12N supports the FNC-2000 Network Controller Module and 2 other adder modules. This unit mounts in the BBX-1024 black backbox/white door or BBX-1024R black backbox/red door. This model does not support any network audio.
	FX-2017-12NDS	**12 Amp Mid-Size Main Chassis.** This mid-size main chassis comes complete with one Analog Loop Controller (99 Analog Sensors and 99 Addressable Modules), 4 Class A/B (Style Z/Y) NACs (1.7 Amp each), a DSPL-420 4 line by 20 character LCD display and a 12 ampere power supply which charges 17-65 AH batteries. The FX-2017-12N supports the FNC-2000 Network Controller Module and two adder modules over the main board plus additional space in the chassis for 14 adder boards. This chassis mounts in the BBX-1072A/DS black backbox/white door or BBX-1072RA/ARDS black backbox/ red door. This model does not support any network audio.
	FX-2017-12N FX-2017-12NDS	**12 Amp Mid-Size Main Chassis.** This mid-size main chassis comes complete with one Analog Loop Controller (99 Analog Sensors and 99 Addressable Modules), 4 Class A/B (Style Z/Y) NACs (1.7 Amp each), a 4 line by 20 character back-lit LCD display, 16 zone LED annunciator and a 12 ampere power supply which charges 17-65 AH batteries. The FX-2017-12N supports the FNC-2000 Network Controller Module and two adder modules over the main board plus additional space in the chassis for 14 adder boards. This chassis mounts in the BBX-1072A black backbox/white door or BBX-1072RA black backbox/ red door. This model does not support any network audio.
	FX-2017-12NDS	**12 Amp Mid-Size Main Chassis.** This mid-size main chassis comes complete with one Analog Loop Controller (99 Analog Sensors and 99 Addressable Modules), 4 Class A/B (Style Z/Y) NACs (1.7 Amp each), a DSPL-420 4 line by 20 character LCD display, and a 12 ampere power supply which charges 17-65 AH batteries. The FX-2017-12NDS supports the FNC-2000 Network Controller Module and two adder modules over the main board plus additional space in the chassis for 14 adder boards. This chassis mounts in the BBX-1072A/DS black backbox/white door or BBX-1072RA/ARDS black backbox/ red door. This model does not support any network audio.
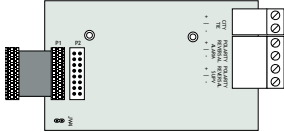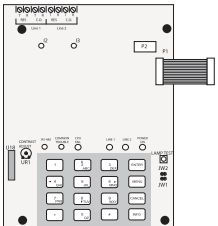
	FX-2009-12N	**12 Amp Large Main Chassis.** This large main chassis comes complete with one Analog Loop Controller (99 Analog Sensors and 99 Addressable Modules), 4 Class A/B (Style Z/Y) NACs (1.7 Amp each), a 4 line by 20 character back-lit LCD display, 16 zone LED annunciator and a 12 ampere power supply which charges 17-65 AH batteries. The FX-2009-12N supports the FNC-2000 Network Controller Module over the main board plus additional space in the chassis for 8 adder boards. This chassis mounts in the BB-5008 or BB-5014 black backbox/black door or BB-5008R black backbox/red door. This is model does not support any network audio.
	FX-2009-12NDS	**12 Amp Large Main Chassis.** This large main chassis comes complete with one Analog Loop Controller (99 Analog Sensors and 99 Addressable Modules), 4 Class A/B (Style Z/Y) NACs (1.7 Amp each), a DSPL-420 4 line by 20 character back-lit LCD display, and a 12 ampere power supply which charges 17-65 AH batteries. The FX-2009-12NDS supports the FNC-2000 Network Controller Module over the main board plus additional space in the chassis for 8 adder boards. This chassis mounts in the BB-5008 or BB-5014 black backbox/black door or BB-5008R black backbox/red door. This is model does not support any network audio.
	FX-2000MNS	Consists of a backplate which is mounted into the BBX-FXMNS backbox and a FX-2000N Fire Alarm Control board and a battery disconnect board.
	ECX-0012	Expander Chassis to use with the FX-2009-12N. It provides space for 12 adder modules and two display modules. This chassis mounts into the BB-5008(R) or BB-5014 backbox.

Network Controller Modules
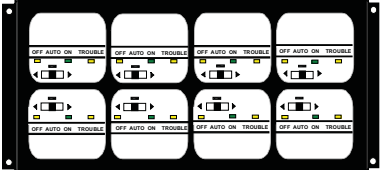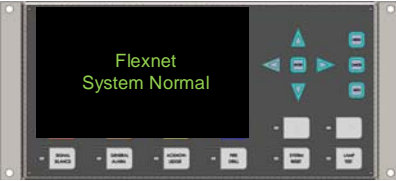
	Model	Description
	FNC-2000	Provides network capability for the FX-2000N Fire Alarm panel. One module is required per one network node panel. The FNC-2000 Fire Network Controller module is mounted in position 2 over the FX-2000N main board.
	ANC-5000	Audio Network Controller module. The ANC-5000 Audio Network Controller module is mounted over a metal plate (which is packaged with the FX-2009-12N) and then the plate is mounted in a BB-5008 or BB-5014 backbox in positions marked 4 to 9 inclusive. The recommended plate mounting is sideways with LEDs across the top.
	TNC-5000	Telephone Network Controller module. The TNC-5000 Telephone Network Controller module is mounted over the ANC-5000 Audio Network Controller module and both are mounted on a metal plate and then the plate is mounted in a BB-5008 or BB-5014 backbox in positions marked 4 to 9 inclusive. The recommended plate mounting is sideways with LEDs across the top.
	FOM-2000-SP	**Fiber Optics Module** (Optional) Connects to the FNC-2000 Fire Alarm Network Controller Module and allows fiber optics cabling.
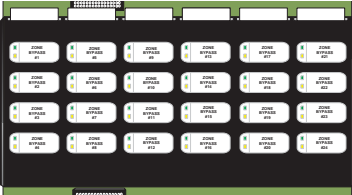
Adder Modules

	Model	Description
	ALCN-792M	Quad Loop Adder board.
	ALCN-792D	Daughter board for ALCN-792M Quad Loop Adder

	Model	Description
	DM-1008A	Eight Initiating Circuit Module
	SGM-1004A	Four NAC circuit Module
	RM-1008A	Eight Relay Circuit Module
	PR-300	Polarity Reversal and City Tie Module
	UDACT-300A	Digital Communicator/Dialer Module
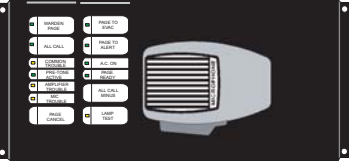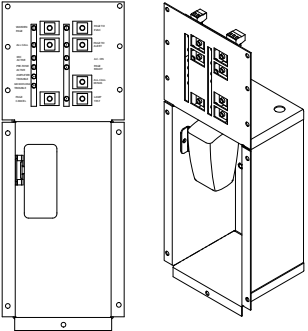
Display Modules
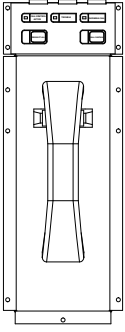
	Model	Description
	FDX-008	Fan Damper Module
	DSPL-420	4 line by 20 charactor display which can be mounted into backboxes BBX-1072A(RA), BBX-1072ADS(ARDS), BB-5008(R), BB-5014 and the BBX-FXMNS Backbox.
	DSPL-2440	Graphic display which can be mounted in backboxes BBX-1072A(RA), BBX-1072ADS(ARDS), BB-5008(R), BB-5014 and the BBX-FXMNS Backbox

System Components
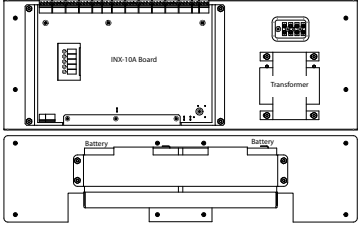
	Model	Description
	IPS-2424/DS	Programmable Input Switches Module (mounts with the FX-2009-12N and can also be part of the RAXN-LCD)
	RAM-1032 RAM-1032TZ RAM-1032TZDS	Model RAM-1032 Main Chassis Remote Annunciator with 32 Bi-coloured LEDs. Model RAM-1032TZ/DS Main Chassis Remote Annunciator with 16 Bi-coloured LEDs and 32 trouble LEDs.
	RAX-1048TZ RAX-1048TZDS	Model RAX-1048TZ/DS Adder Annunciator Chassis with 48 Bi-coloured LEDs and 48 trouble LEDs.

Audio and Telephone Modules
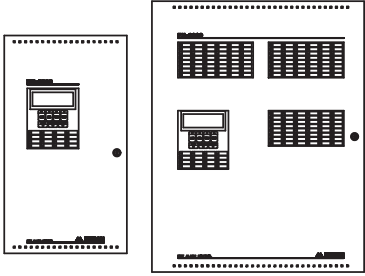
	Model	Description
	QMP-5101N	Network Master Paging Control Panel
	QMP-5101NV	Network Master Paging Control Panel (Vertical Mount) mounts within the BBX-FXMNS enclosure.
	QMT-5302N	Network Master Telephone Control Panel

	Model	Description
	QMT-5302NV	Network Master Telephone Control Panel (Vertical Mount) mounts within the BBX-FXMNS enclosure.
	QAZT-5302/DS	Zoned Paging and Telephone Selector Panel

Booster Power Supply
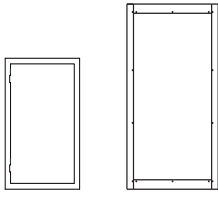
	Model	Description
	INX-10AC	Addressable Booster Power Supply mounts to backboxes BB-5014 and BBX-FXMNS. Same unit as the INX-10A and INX-10ADS, except this model comes with a chassis for mounting. Refer to LT-899 manual for more detailed instructions.

Enclosures
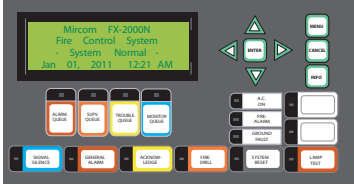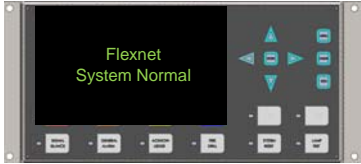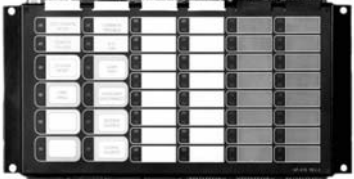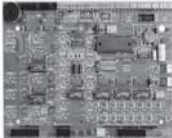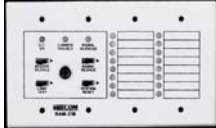
	Model	Description
	BBX-1024 white door black backbox (add suffix "R" for red door/black backbox)	Enclosure 26"H x 14.5"W x 4.5"D
	BBX-1024DS white door black backox (add suffix "R" for red door/black backbox)	Enclosure 27.5"H x 16.5"W x 5.5"D
	BBX-1072A white door black backbox (or BBX-1072RA for door/black backbox)	Enclosure 32.5"H x 25"W x 6.5"D
	BBX-1072ADS white door black backbox (or BBX-1072RADS for door/black backbox)	Enclosure 34"H x 26.5"W x 7.7"D
	BB-5008 black door and backbox (add suffix "R" for red door/black backbox)	Backbox 36"H x 30"W x 7"D
	BB-5014 black door and backbox	Backbox 60"H x 30"W x 7"D
	BBX-FXMNS Enclosure with Door Assembly (add suffix "R" for red door/black backbox)	Backbox 61.5"H x 22"W x 9"D

System Components
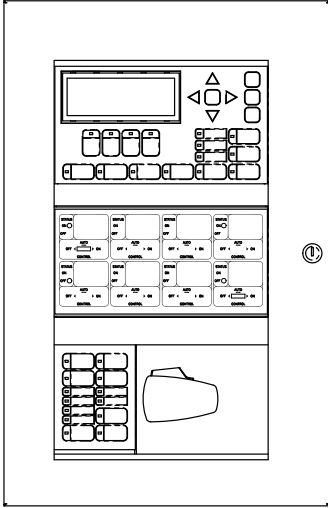
Flush Trim Rings

	Model	Description
	FA-UNIV-TRB FA-1072TR	Black flush trim ring for BBX-1024(R) Black flush trim ring for BBX-1072A/RA/DS/RDS.

Remote Annunciators
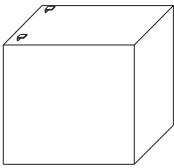
	Model	Description
	RAXN-LCD	Remote Shared Display Annunciator. Please refer to LT-895 RAXN-LCD manual for further information.
	RAXN-LCDG	Remote Shared Graphical Display Annunciator. Please refer to LT-6033 RAXN-LCDG manual for further information.
	RAM-1016 RAM-1016TZ RAM-1016TZDS (RA-1000 Series)	Model RAM-1016 Main Chassis Remote Annunciator with 16 Bi-coloured LEDs. Model RAM-1016TZ/DS Main Chassis Remote Annunciator with 16 Bi-coloured LEDs and 16 trouble LEDs. Please refer to LT-617 RA-1000 Series Annunciator manual for further information.
	MGD-32	Master Graphic Driver Annunciator Board
	AGD-048	Adder Graphic Driver Board
	RAM-216	Annunciator with 16 Bi-coloured LEDs.

	RAM-208	Annunciator with 8 Bi-coloured LEDs.
	RTI-1	Remote Trouble Indicator (single LED and trouble buzzer).

FX-LOC(R) Local Operating Console

	Model	Description
	FX-LOC(R) consists of: FX-LOC Enclosure includes backbox, inner door and outer white door. FX-LOCR, the R suffix represents a red door. Main Display RAXN-LCD. Selection control panel FDS-008 plus IM-10A Ten Input Monitor module. Master paging microphone, model QMP-5101N.	The FX-LOC(R) Local Operating Console along with the Mircom FleX-Net™ Network Fire Alarm system facilitates a Mass Notification System. The FX-LOC(R) provides critical emergency (as well as fire) information to be communicated within buildings. Refer to LT-6039 FX-LOC(R) Installation Instruction Manual for further details and the LT-6042 Application Guide for Mass Notification information.

Batteries

	Model	Description
	Batteries	17 to 65 AH

FleX-Net™ Accessories

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

Mechanical Installation and Dimensions

Install the enclosure as shown for the BBX-1024 in Figure 1 below. The BBX-1024DS install information is in Figure 2. For the BBX-1072A and BBX-1072ADS see Figure 3 and 4, on the following pages. Figure 5 demonstrate the BB-5508 backbox installaltion.

Figure 1: BBX-1024 Flush or Surface Enclosure Installation and Dimensions
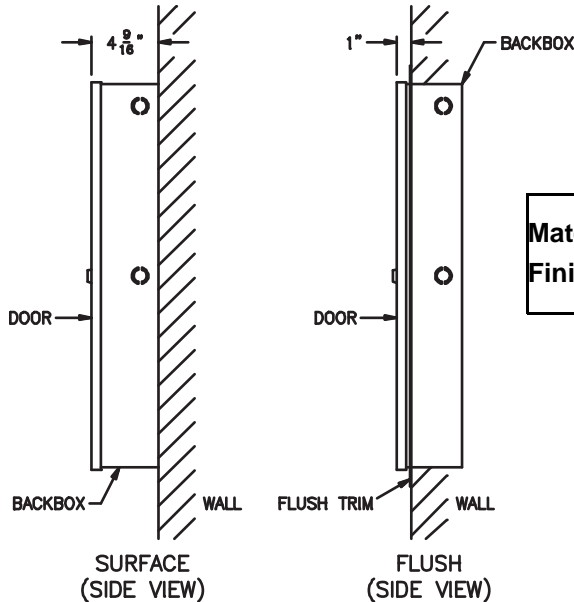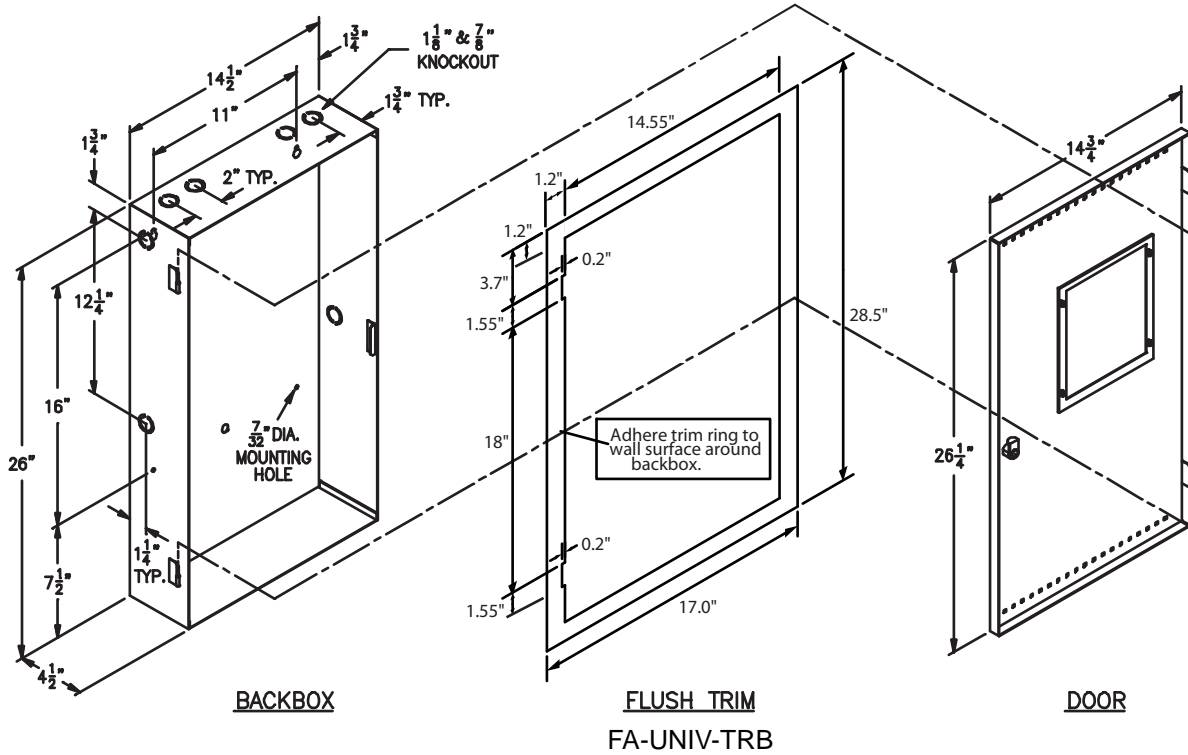
Material: 18GA (0.048") thick cold rolled steel
Finish: Painted except for hinges

Note: Leave bottom of box conduit free for batteries.

Figure 2: BBX-1024DS Flush and Surface Enclosure Installation and Dimensions

BBX-1024DS BACKBOX AND DOOR

12"

23 1/2"

BACKBOX FRONT VIEW

5 3/4"

4 1/4"   1 1/2"

LEFT SIDE VIEW

14 1/2"

26 "

BACKBOX

17"

28 "

DOOR

KNOCKOUT LOCATIONS

1 3/4"

2"

6"

9 1/2"

RIGHT SIDE VIEW

1 3/4" 2"   2" 1 3/4"

1 3/4"

TOP VIEW
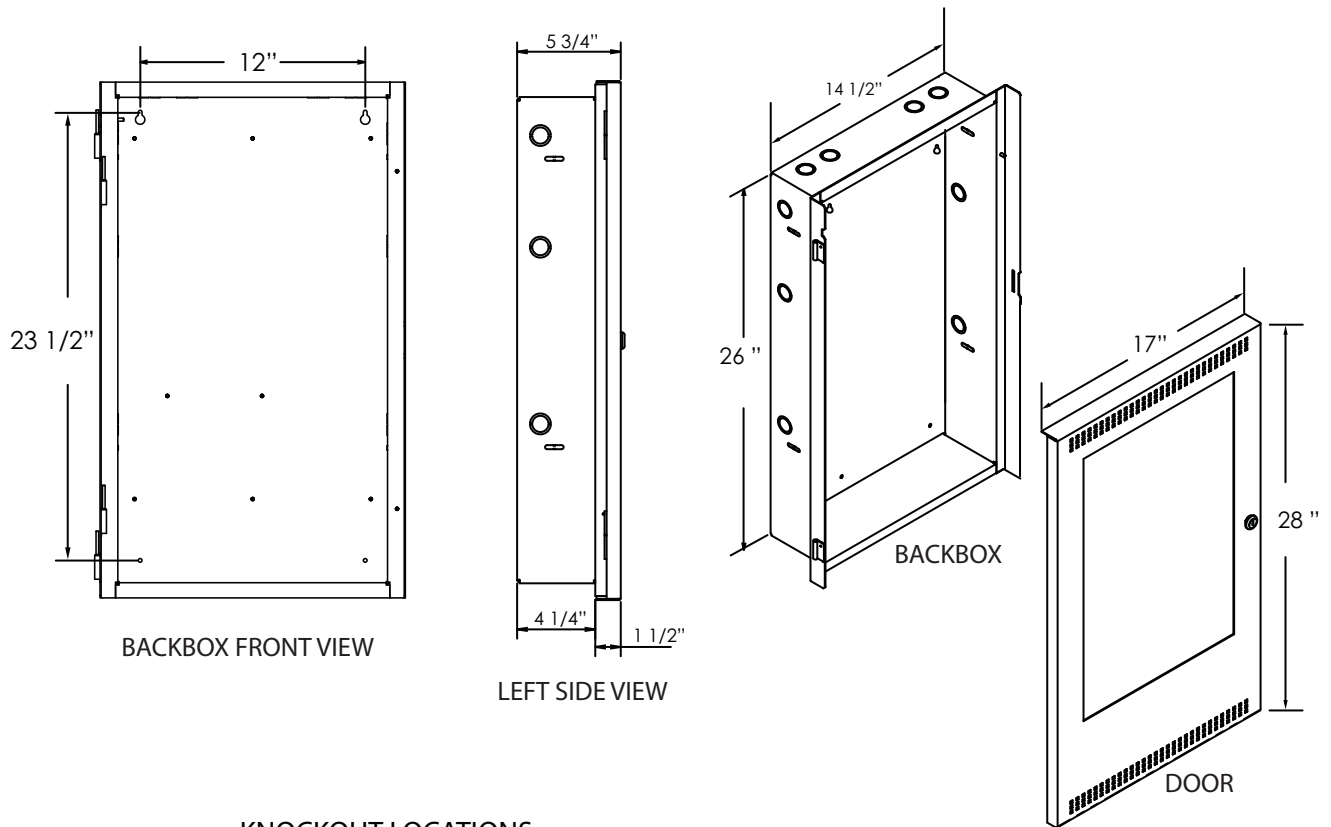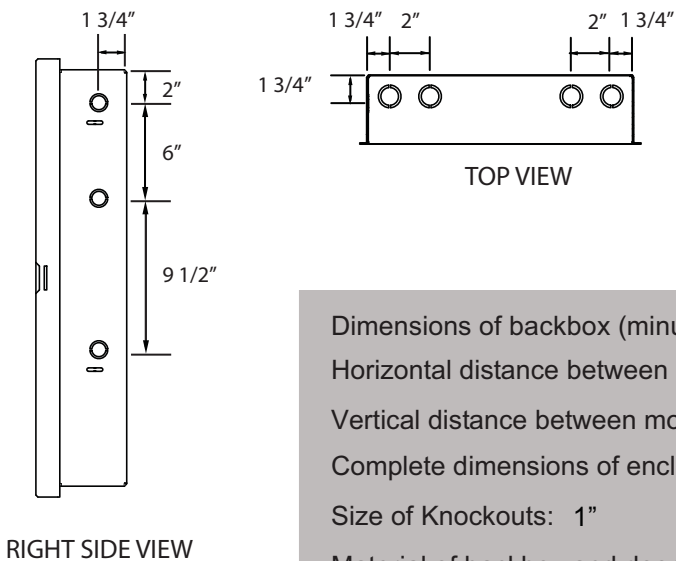
Dimensions of backbox (minus built-in trim ring)	26"H x 14 1/2"W x 4 1/4" D
Horizontal distance between mounting screws	12"
Vertical distance between mounting screws	23 1/2"
Complete dimensions of enclosure with door	28"H x 17"W x 5 3/4"D
Size of Knockouts: 1"	
Material of backbox and door: 16 GA (0.059") thick cold rolled steel	
Finish of backbox and door: Painted	

Figure 3: BBX-1072A Flush or Surface Enclosure Installation and Dimensions

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

SURFACE
(SIDE VIEW)

FLUSH
(SIDE VIEW)

DOOR

BACKBOX

Note: Leave bottom of box conduit free for batteries.

16
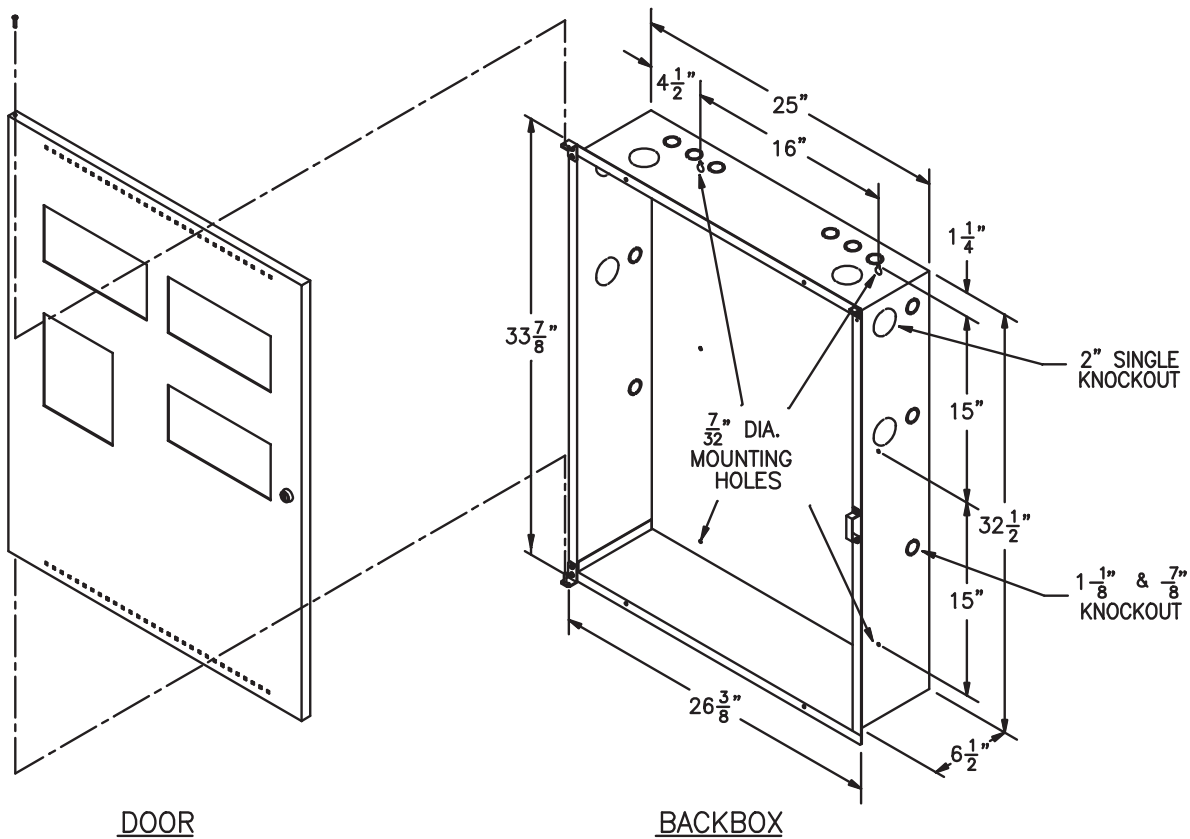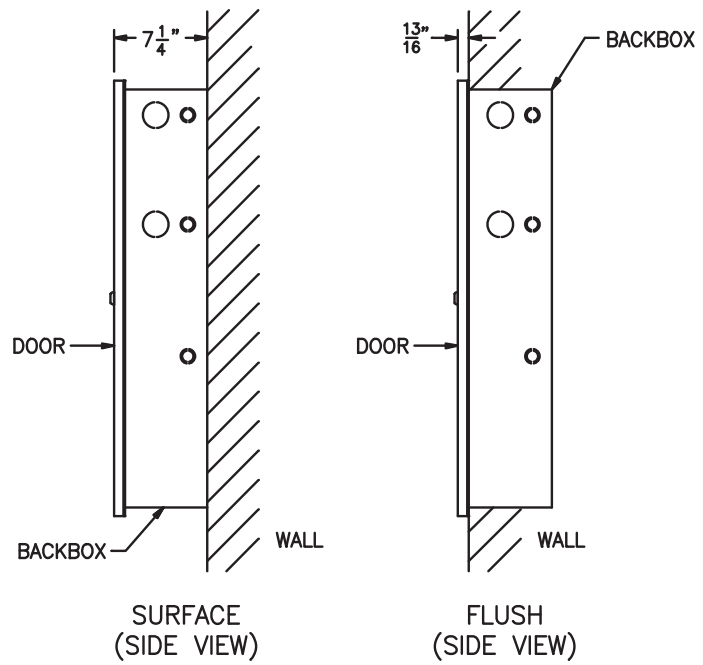
Figure 4:   BBX-1072ADS Flush and Surface Installation and Dimensions

Material: Cold rolled steel
   16GA (0.059") thick for backbox
   14GA (0.075") thick for door
Finish: Painted except for hinges
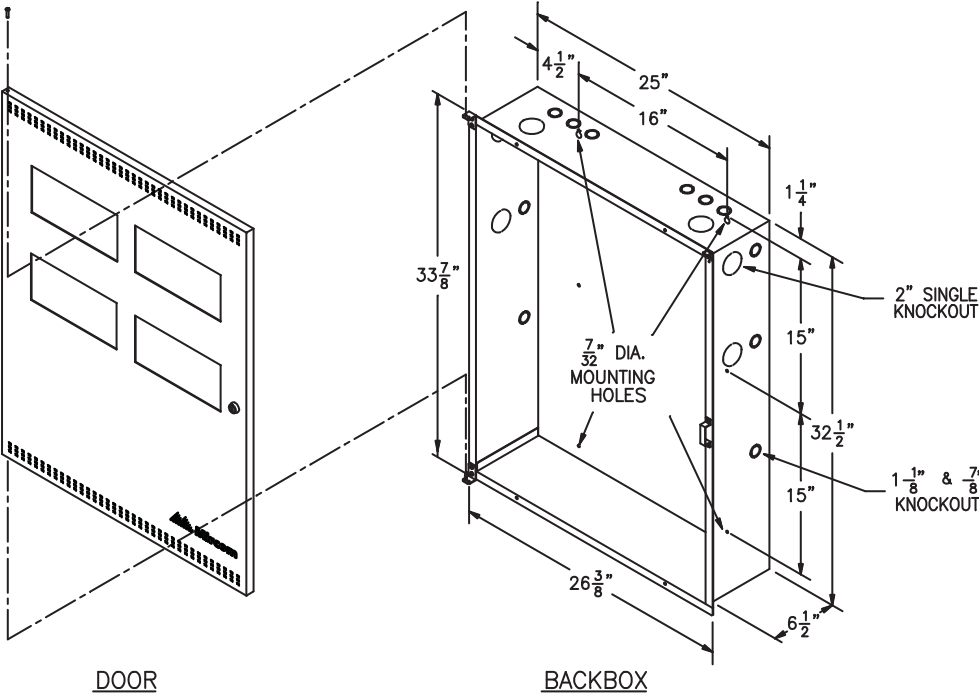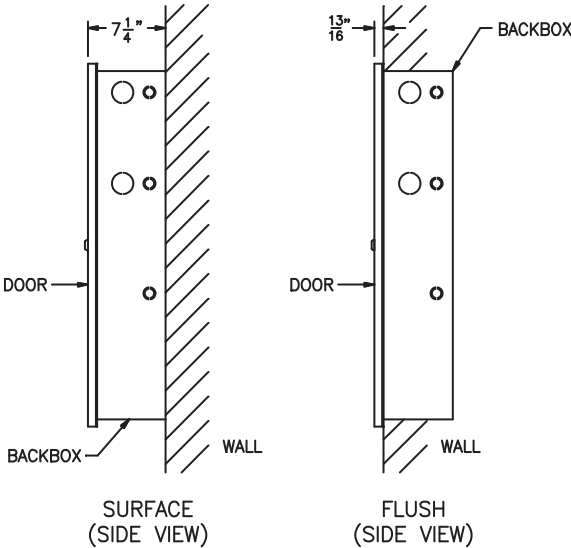
Figure 5: BB-5008 Enclosure Installation Instructions and Dimensions

BB-5008 Backbox

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

Backbox

$2\frac{13}{16}$"

$30\frac{1}{16}$"

$24\frac{7}{16}$"

$3\frac{3}{8}$"

$37\frac{1}{2}$"

$\frac{7}{32}$" DIA. MOUNTING HOLE

2" SINGLE KNOCKOUT

$30\frac{11}{16}$"

$36\frac{1}{8}$"

$1\frac{1}{8}$" & $\frac{7}{8}$" KNOCKOUT

$31\frac{5}{16}$"

7"

7"

WALL

WALL

SURFACE (SIDE VIEW)

FLUSH (SIDE VIEW)

Backbox with DOX-5008M Door

$7\frac{3}{4}$"

$\frac{13}{16}$"

BACKBOX

DOOR

DOOR

BACKBOX

WALL

WALL

SURFACE (SIDE VIEW)

FLUSH (SIDE VIEW)

DOX-5008M Metal Door

⑤
#8-32 x 3/4" FLAT/TORX MACHINE SCREW

TOP HINGE

②
#6 x 5/16" PAN/PHILLIPS TYPE-B SCREW (7 PLACES)

③
DOOR STOP

#8-32 x 3/4" FLAT/TORX MACHINE SCREW

⑥
DOOR LOCK BRACKET

①
BOTTOM HINGE

④
GUIDE BOTTOM HOLE TO TORX SCREW ON BOTTOM HINGE

DOOR

BACKBOX

Note: Leave bottom of box conduit free for batteries. Mount the power supply in the same manner as shown in *Figure 4*.

Chassis Installation

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 FX-2003-12N into backbox BBX-1024 using the supplied hexnuts as shown in *Figure 6* below.

Figure 6:   Chassis Installation into BBX-1024

BACKBOX

14 1/2″

26″

4 1/2″

Mircom FX-2000N
Fire Alarm Control Panel
Normal Condition
December 31, 2009

MAIN CHASSIS
FX-2003-12N

#8-32 HEXNUTS (4)

EARTH GROUND LUG

#8 X 1/4″ TYPE 'B' SCREW
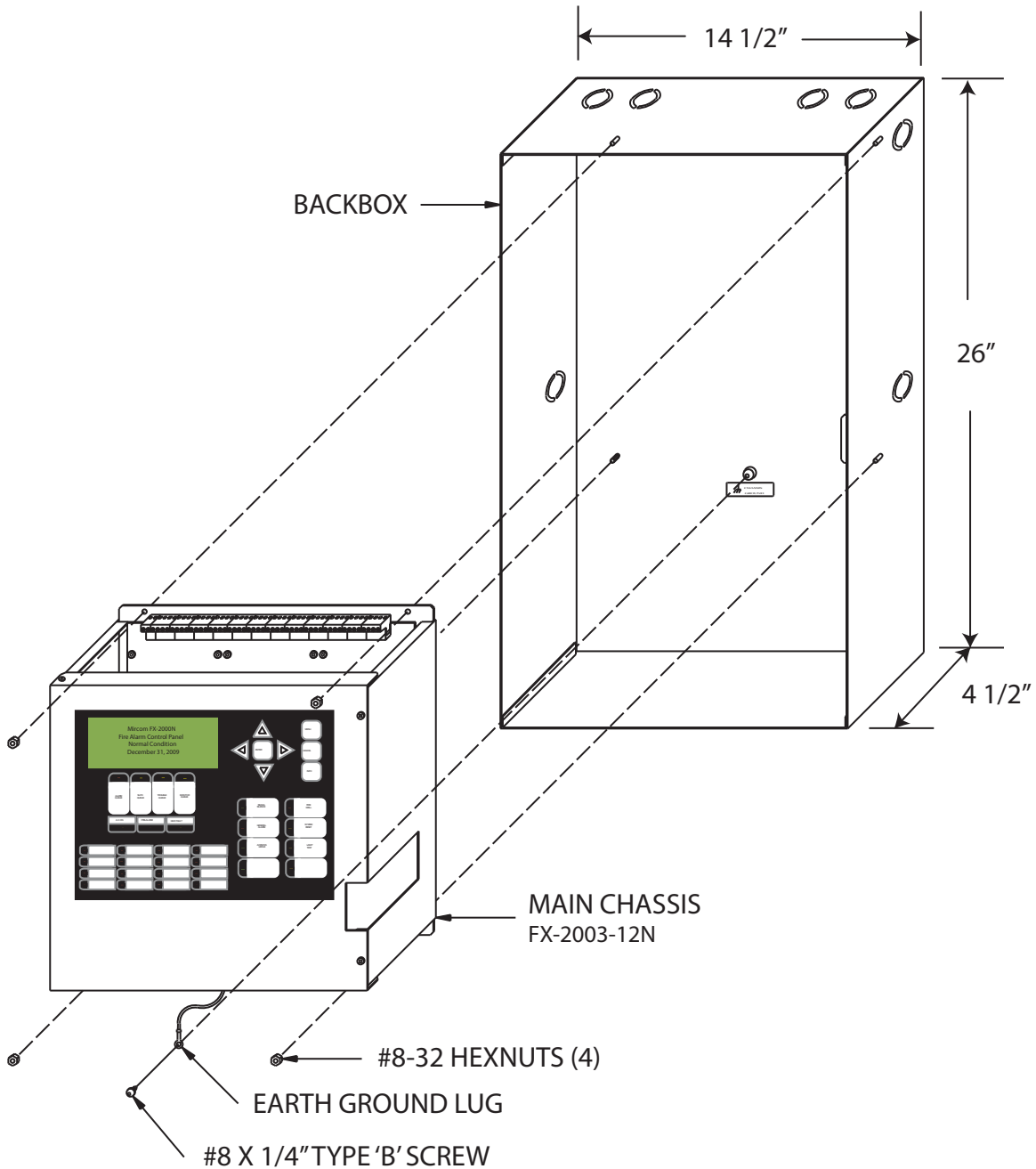
Note: Leave bottom of box conduit free for batteries.

Figure 7: Chassis Installation into BBX-1072A

Mount chassis FX-2017-12N into backbox BBX-1072A using the supplied hexnuts as shown below.

POWER SUPPLY ASSY.
PS−2012

EARTH GROUND LUG

#8 x 1/4"
TYPE 'B' SCREW

#8−32 HEXNUTS (6X)

#6−32 HEXNUTS
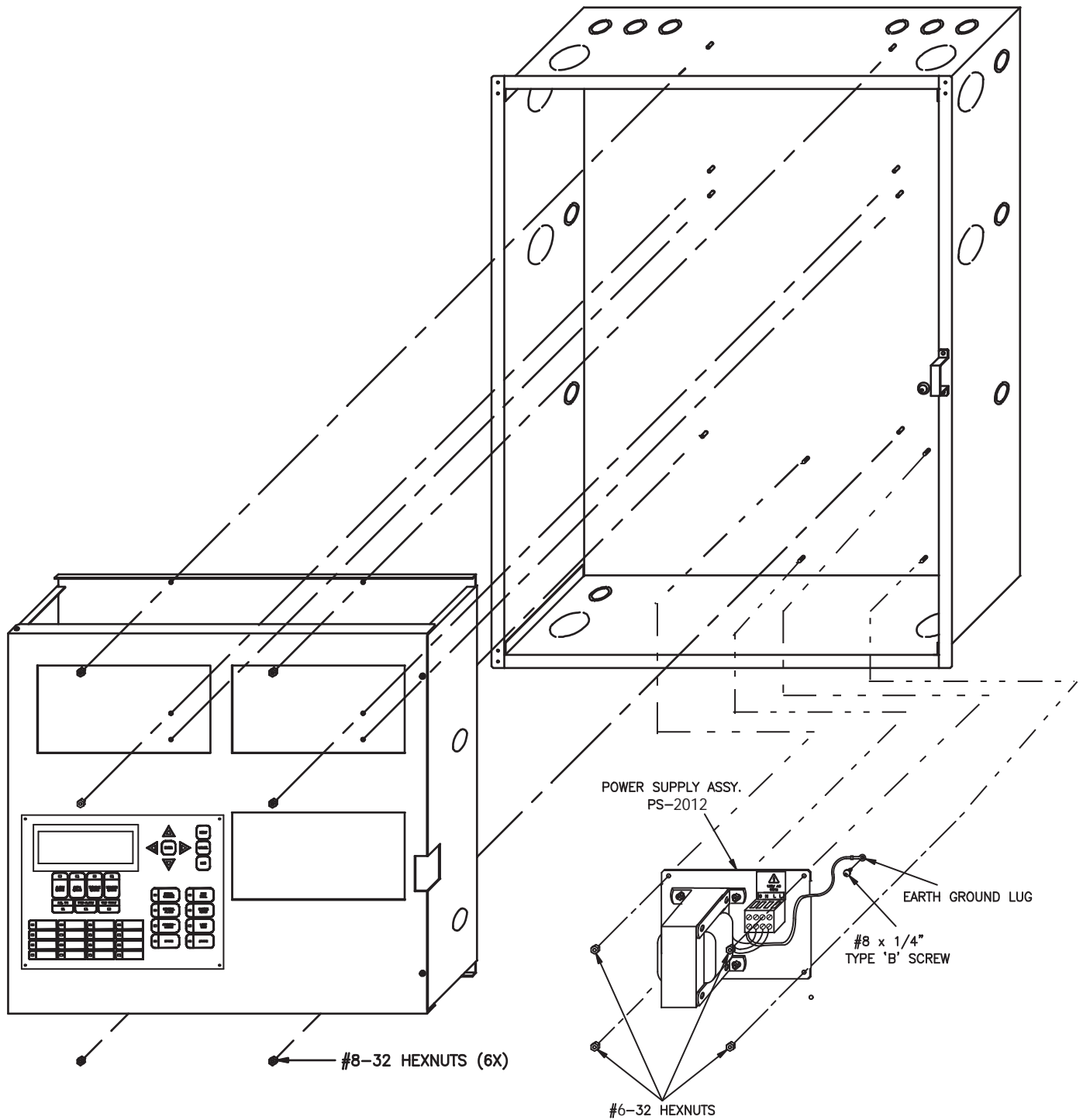
Figure 8: Installation Instructions and Dimensions for BB-5014

BB-5014 Backbox

Material:
 Cold rolled steel
 16GA (0.059") thick
 for backbox
 14GA (0.075") thick
 for door

Finish: Painted except for
 hinges

Backbox

SURFACE
(SIDE VIEW)

FLUSH
(SIDE VIEW)
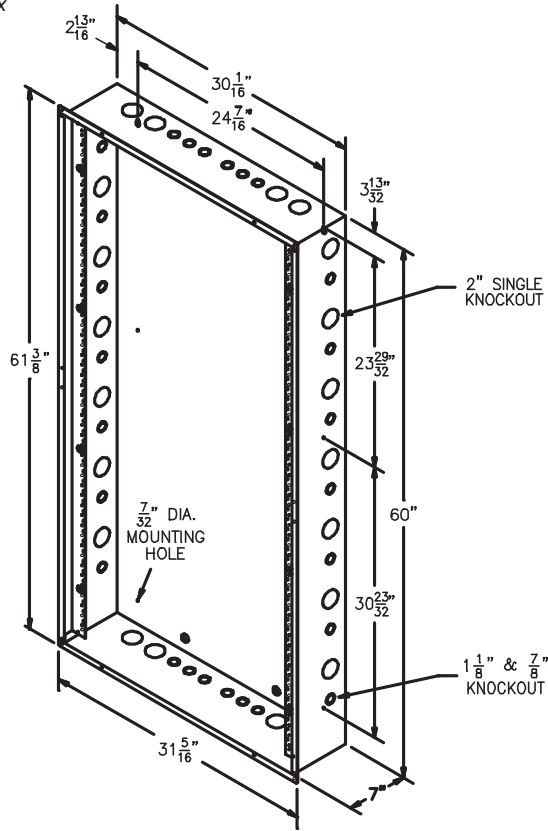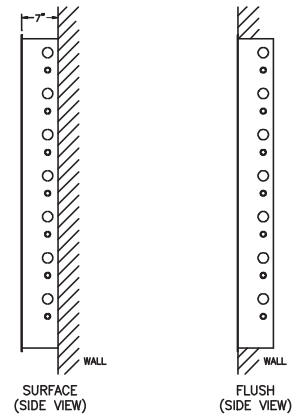
Backbox with DOX-5014M Door

SURFACE
(SIDE VIEW)

FLUSH
(SIDE VIEW)
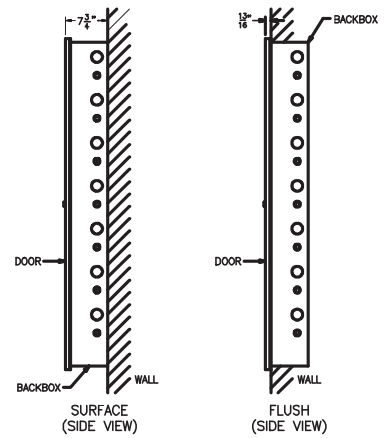
DOX-5014M Metal Door
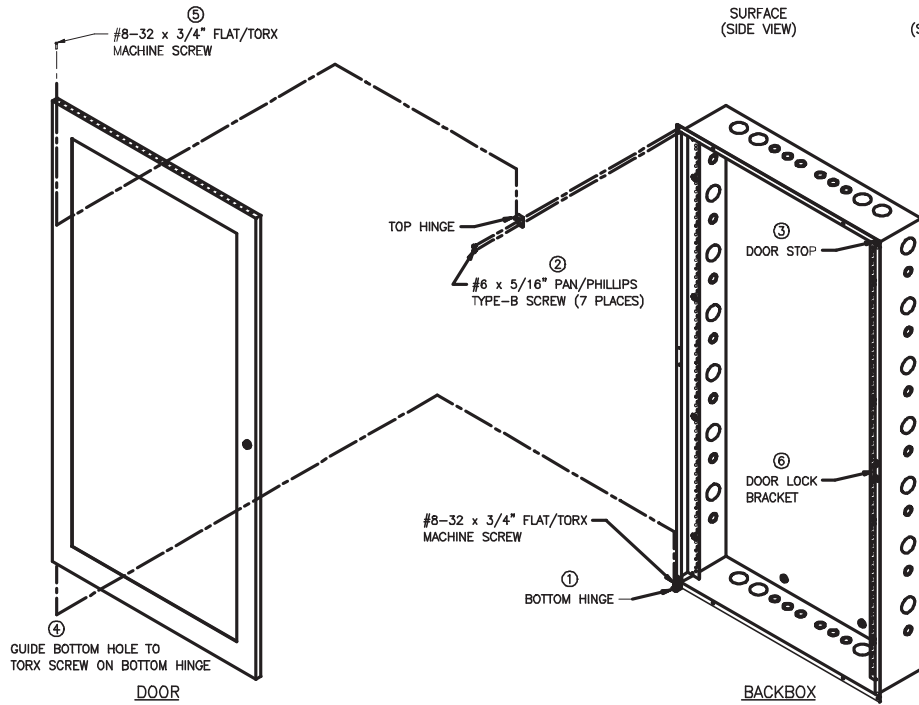
Note: Mount the power supply in the same manner as shown in *Figure 5*.

Module Mounting Locations

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

> ℹ️ **Notes:** For many adder modules 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.

Figure 9: Module Mounting Locations View #1

PR-300 CITY TIE MODULE
(SEE NOTE 2)

#6-32 x 1 1/4" SCREW

UDACT-300A DIALER MODULE
(SEE NOTE 2)

FNC-2000 or OTHER CIRCUIT ADDER
(SEE NOTE 3)

MAIN CHASSIS MODEL: FX-20XX-12N/DS
(SEE NOTE 1)

OTHER CIRCUIT ADDER MODULE
(SEE NOTE 3)

#6-32 x 1 1/2" M/F HEX SPACER
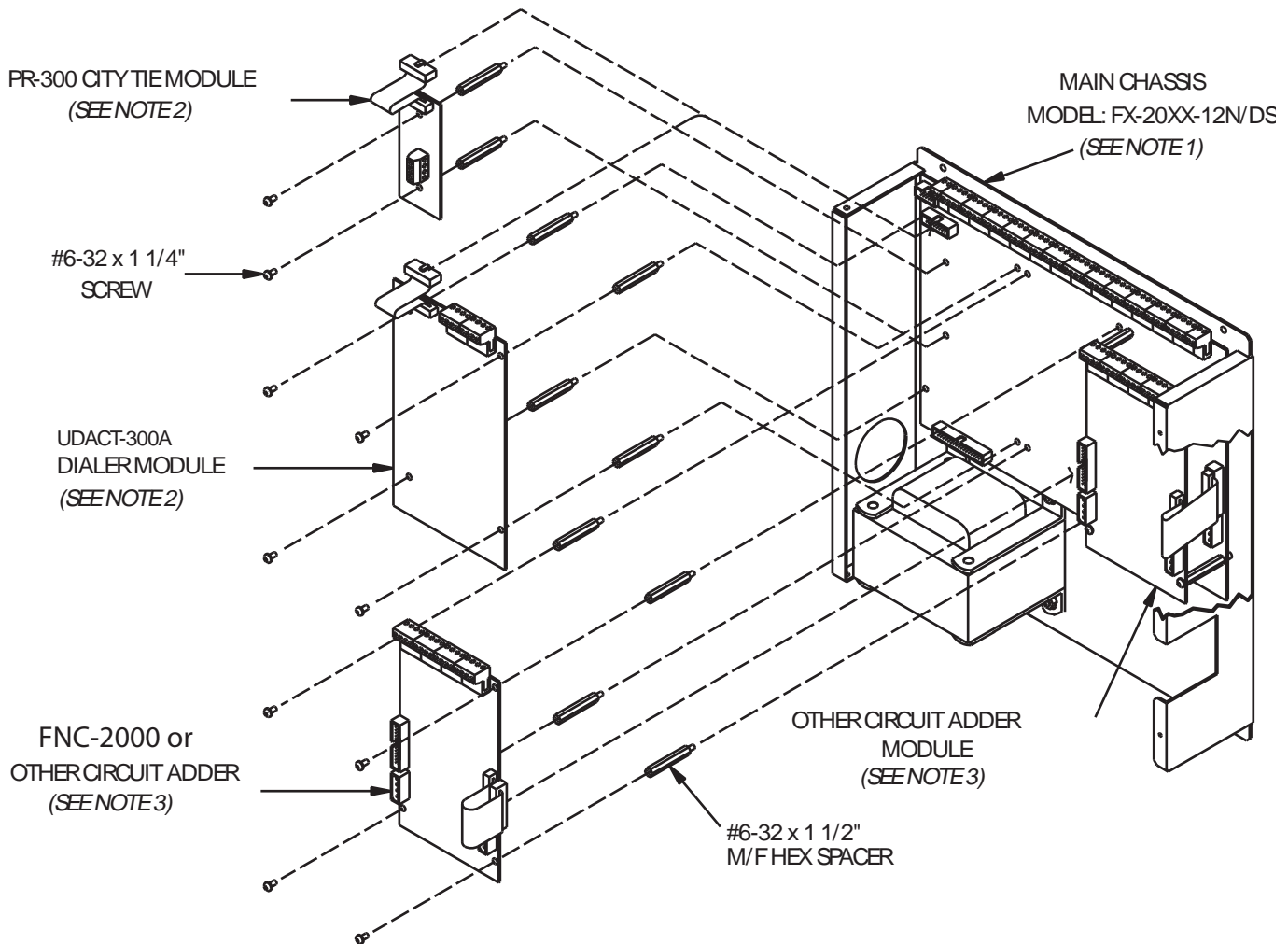
> ℹ️ **Notes:**
> 1. Front plate is not shown.
> 2. Position reserved for PR-300 or UDACT-300A.
> 3. Other circuit adder modules may include:
>
>   • FNC-2000
>   • DM-1008A Detection Circuit Adder Module
>   • SGM-1004A Signal Circuit Adder Module
>   • RM-1008A Relay Circuit Adder Module
>   • ALCN-792M and ALCN-792D Loop Adder Modules

Figure 10:   Module Mounting Locations View #2

Main Chassis
FX-20XX-12N/DS

Provision for PR-300 or
UDACT-300A

FNC-2000 in position 2
and other Adder Module
in position 1

2

1

MD-575 Long Ribbon Cable
MD-579 Short Power Cable
MD-580 Long Power Cable

MD-579

FNC-2000 Fire Network Controller Module

This module is required in the main lobby and one per node. It mounts over the main fire alarm board, preferably in position 2. Use the four 2" spacers and four screws to secure the FNC-2000 to the main fire alarm board.

Display and Adder Modules Mounting Locations

FX-2003-12N Compact Main Chassis

Mounts in the BBX-1024 Enclosure and supports three adder modules.

Exterior View
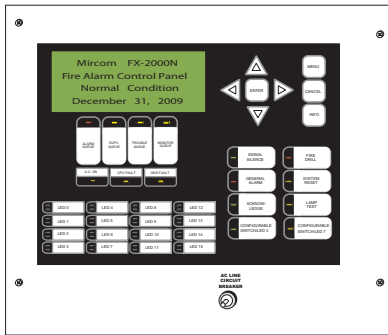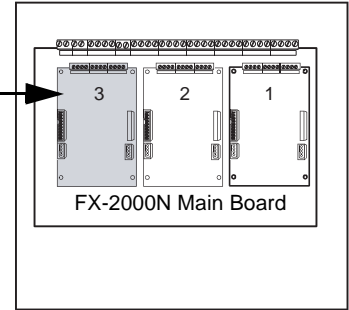
Interior View

Slot 3 is reserved for PR-300 or UDACT-300A. If not required, this slot can be used to mount any of the adder modules.

The recommended mounting position is 2 for the FNC-2000. The FOM-2000-SP board, if used, is mounted over the FNC-2000 board.

FX-2000N Main Board

FX-2017-12N Mid-size Main Chassis

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

Exterior View
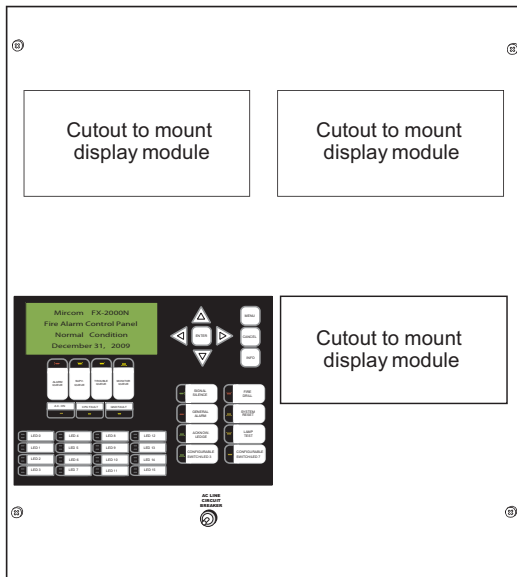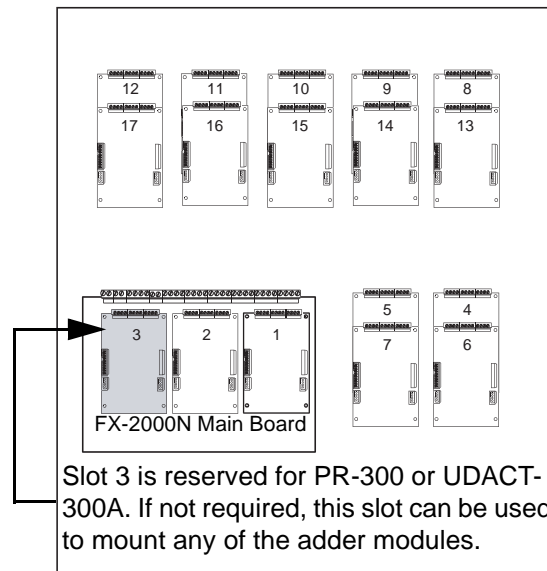
Cutout to mount display module

Cutout to mount display module

Cutout to mount display module

Interior View

FX-2000N Main Board

Slot 3 is reserved for PR-300 or UDACT-300A. If not required, this slot can be used to mount any of the adder modules.

The recommended mounting position is 2 for the FNC-2000. The FOM-2000-SP board, if used, is mounted over the FNC-2000 board.

FX-2009-12N 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. This large chassis size can hold the integrated audio and/or telephone modules.

Exterior View

Interior View

Cutout to mount display module

Cutout to mount display module

FX-2000N Main Board

Slot 3 is reserved for PR-300 or UDACT-300A. If not required, this slot can be used to mount any of the adder modules.

The recommended mounting position is 2 for the FNC-2000. The FOM-2000-SP board, if used, is mounted over the FNC-2000 board. Positions 4 to 9 are replaced with the audio and telephone boards if used.
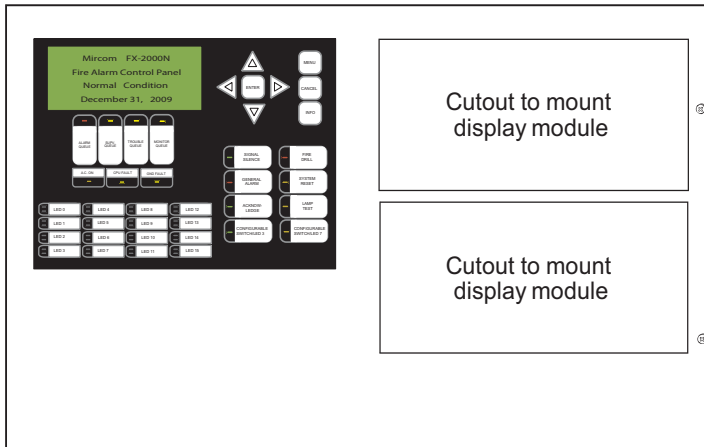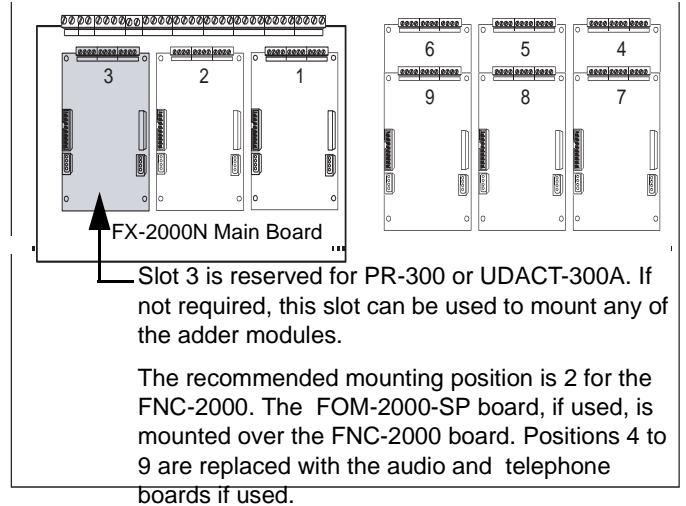
ECX-0012 Expander Chassis for FX-2009-12N

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

Exterior View

Interior View

Cutout to mount display module

Cutout to mount display module
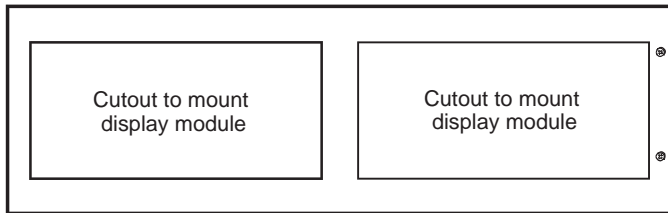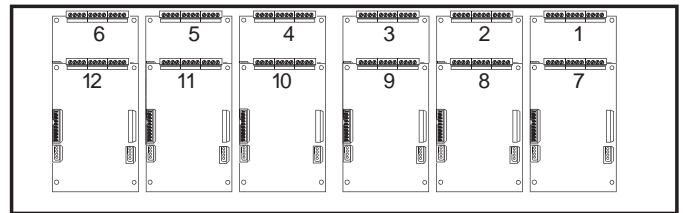
NETWORK CONTROLLER MODULES

The FNC-2000 Fire Network Controller module is mounted in position 2 over the FX-2000N main board. The TNC-5000 Telephone Network Controller module is mounted over the ANC-5000 Audio Network Controller module and both are mounted on a metal plate and that plate is mounted in a BB-5008 or BB-5014 backbox in positions marked 4 to 9 inclusive, refer to previous drawing of large chassis.
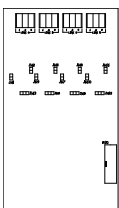
FNC-2000

Fire Network Controller Module

ANC-5000

Audio Network Controller Module
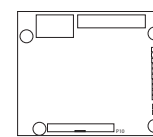
TNC-5000

Telephone Network Controller Module
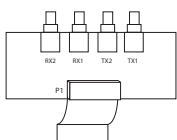
FOM-2000-SP

Fiber Optics Module

Mounts over the FNC-2000 Fire Network Controller Module

Display and Adder Modules Mounting Locations

Adder Modules

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

- FX-2003-12N Compact Main Chassis
- FX-2017-12N Mid-size Main Chassis
- FX-2009-12N Large Main Chassis
- ECX-0012 Expander Chassis for FX-2009-12N
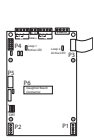
ALCN-792M
Quad Intelligent Analog Loop Adder Module.

DM-1008A
Eight Initiating Circuit Module
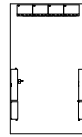
SGM-1004A
Four NAC circuit Module

RM-1008A
Eight Relay Circuit Module
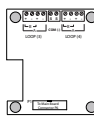
ALCN-792D
Daughter Board Analog 2 Loop Adder Module. Mounts over ALCN-792M

UDACT-300A
DIgital Alarm Communicator Module
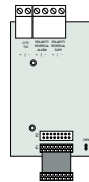
PR-300
Polarity Reversal/ City Tie Module

Display Modules

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

- FX-2003-12N Compact Main Chassis
- FX-2017-12N Mid-size Main Chassis
- FX-2009-12N Large Main Chassis
- ECX-0012 Expander Chassis for FX-2009-12N

These modules can also be mounted in the standard BB-5000 Series enclosures which have cutouts (with brackets), and the BBX-1000 Series enclosures (requires RAXN-LCD as a driver). "Frame" is a measure of display capacity, used in the programming of the system.

DSPL-420
Narrow Display Control(3 Frames)

RAM-1032/TZ/TZDS
Programmable Zone LED Annunciator Module (3 Frames)
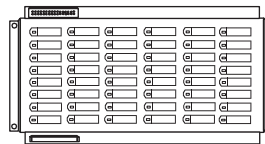
IPS-2424/DS
Programmable Input Switches Module (2 Frames)
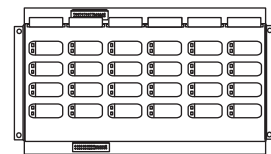
DSPL-2440
Graphic Display Control(3 Frames)
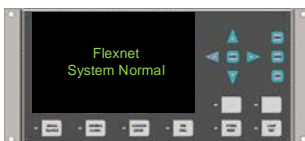
RAX-1048TZ/DS
Programmable Zone/Trouble LED Annunciator Module (3 Frames)
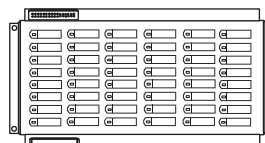
FDX-008/KI
Fan Damper Module (1 Frame)
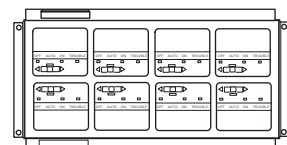
Module Settings

Main Fire Alarm Module (MD-871A "N" Version Main Chassis)

This main board has one addressable loop and network capability.

JW1	Jumper is removed if a PR-300 or UDACT-300A is installed.
JW2,JW4	Jumpers are Factory Set and should not be changed.
JW5	Normally un-installed, add jumper to silence on-board buzzer.
JW6	Normally installed, remove jumper to enable external power supply supervision.
P1,2	Factory connection to Bridge Rectifier.
P3	Black RS-485 Connector connects to the Adder Loop ALCN-792M if used (Address Loops 3 and 4)
P4	Connector for PR-300 Module or UDACT-300A.
P5	Connector for next 8 Conventional Hardwire Circuit Adder Modules (Loop 1).
P6	Connector for first 8 Conventional Hardwire Circuit Adder Modules (Loop 0).
P7	Ethernet jack.
P8	Power Connector for Adder Modules.
P9	RS-232C for Printer or "CRT" Monitor.
P10,11	Connection to 24 VDC Battery. Observe Polarity.
P14	Connector for Display Module.
P15, P18, J1	Connectors for Factory Use.
P16	High speed RS-485 audio link to ANC-5000 Audio Network Controller Module.
	When connected provides ARCnet or Fibre Optic audio and telephone communication
P19	Connector for FNC-2000 Fire Network Controller Module.
SW2	DIP Switch for node address.
NAC PWR	**24V FWR** input terminals for additional power for signal adder modules.
F1	20 Amp slow blow non-replaceable fuse.

> ⓘ **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.
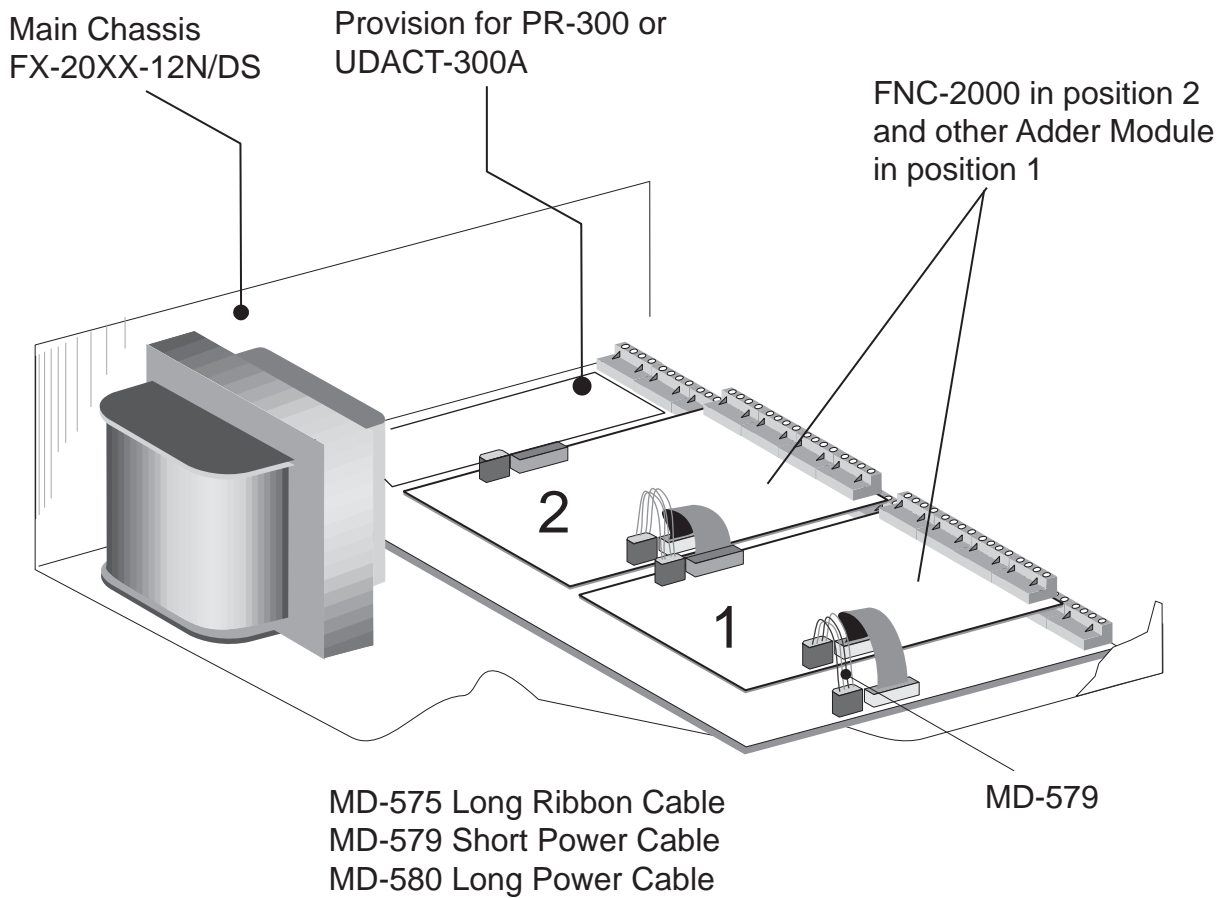
TO CONFIGURE THE FIRE ALARM PANEL USE THE RS-485 CONNECTOR P4 OF THE LAST ADDER LOOP CONTROLLER MODULE INSTALLED OR IF NOT PRESENT, P3 ON THE FleX-Net™ MAIN FIRE ALARM MODULE.

Figure 11: Main Fire Alarm Module (MD-871A "N" Version Main Chassis)
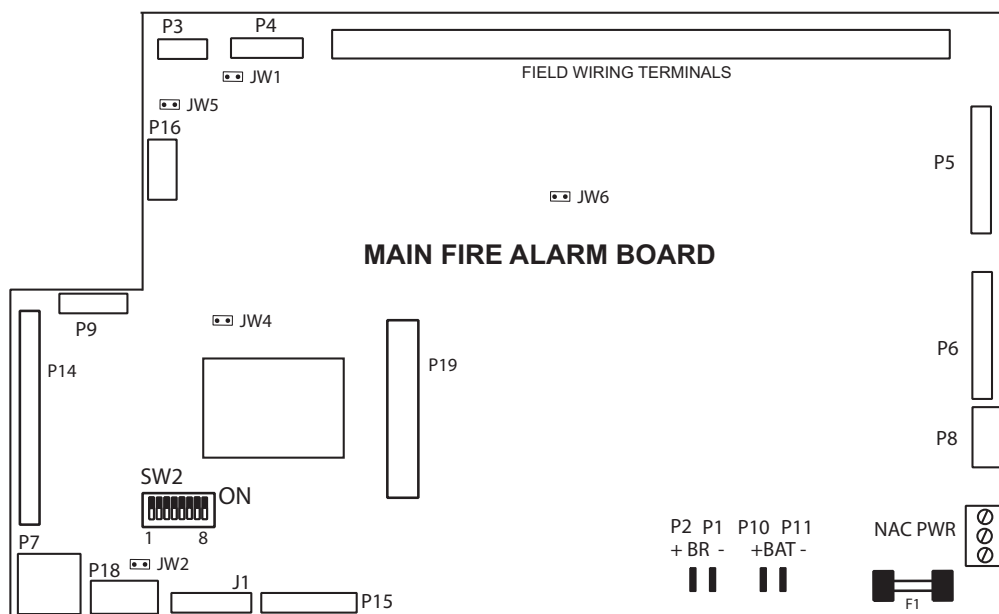
SW2 DIP Switch Node Address Setting on Main Fire Alarm Module

Refer to table in Appendix for Node Address Setting. Available addresses are 1 to 63. DIP Switch SW2-1 is the least significant digit.

DSPL-420 Main Display Module

The DSPL-420 mounts into backboxes BB-5008(R), BB-5014(R) and BBX-FXMNS. This display is part of the following main fire alarm chassis: FX-2003-12NDS, FX-2003-12XTDS, FX-2009-12NDS, FX-2017-NDS, and FX-2000NDS.

Figure 12: DSPL-420 Main Display Module (Part of Main Chassis c/w Main Fire Alarm Module)
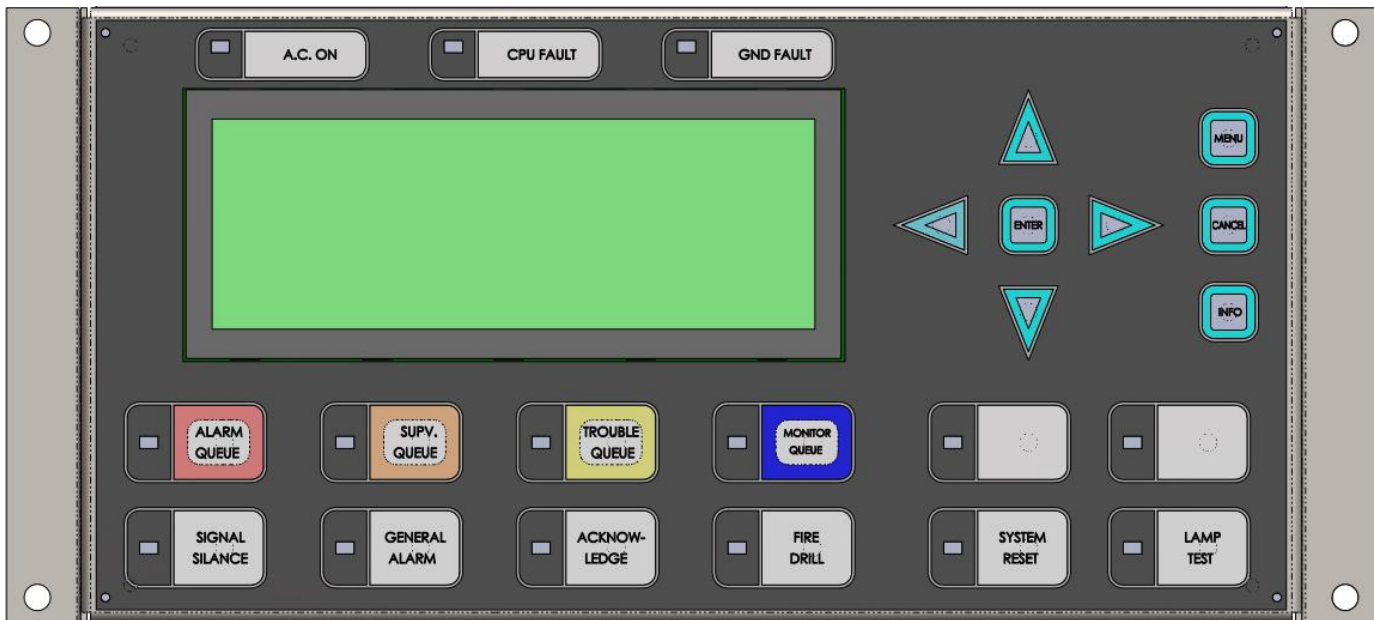
P1: Cable connects to P14 of the FX-2000N main fire alarm board (Figure 11).

P2: Connection to P1 of any adder display module if used.

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.

DSPL-2440 Graphical Main Display Module

The DSPL-2440 is a separate item. It can be mounted into backboxes BB-5008(R), BB-5014(R) and BBX-FXMNS. It can replace the DSPL-420 found with the following models: FX-2003-12NDS, FX-2003-12XTDS, FX-2009-12NDS, FX-2017-NDS, and FX-2000NDS.

Figure 13: DSPL-2440 Graphical Main Display Module
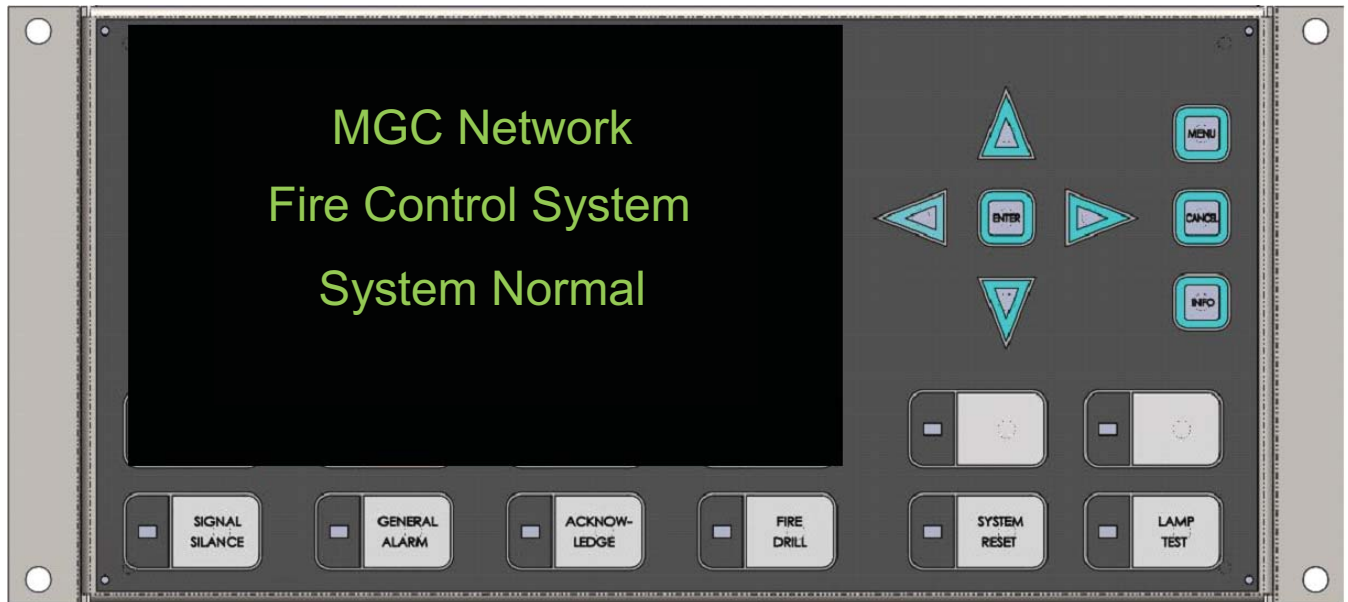
P1: Cable connects to P14 of the FX-2000N main fire alarm board (Figure 11).

P2: Connection to P1 of any adder display module if used.

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.

Main Display Module

The display module shown in Figure 14 is part of the following chassis: FX-2003-12N, FX-2009-12N, FX-2017-12N and FX-2000ND.

Figure 14:   Main Display Module (Part of Main Chassis)
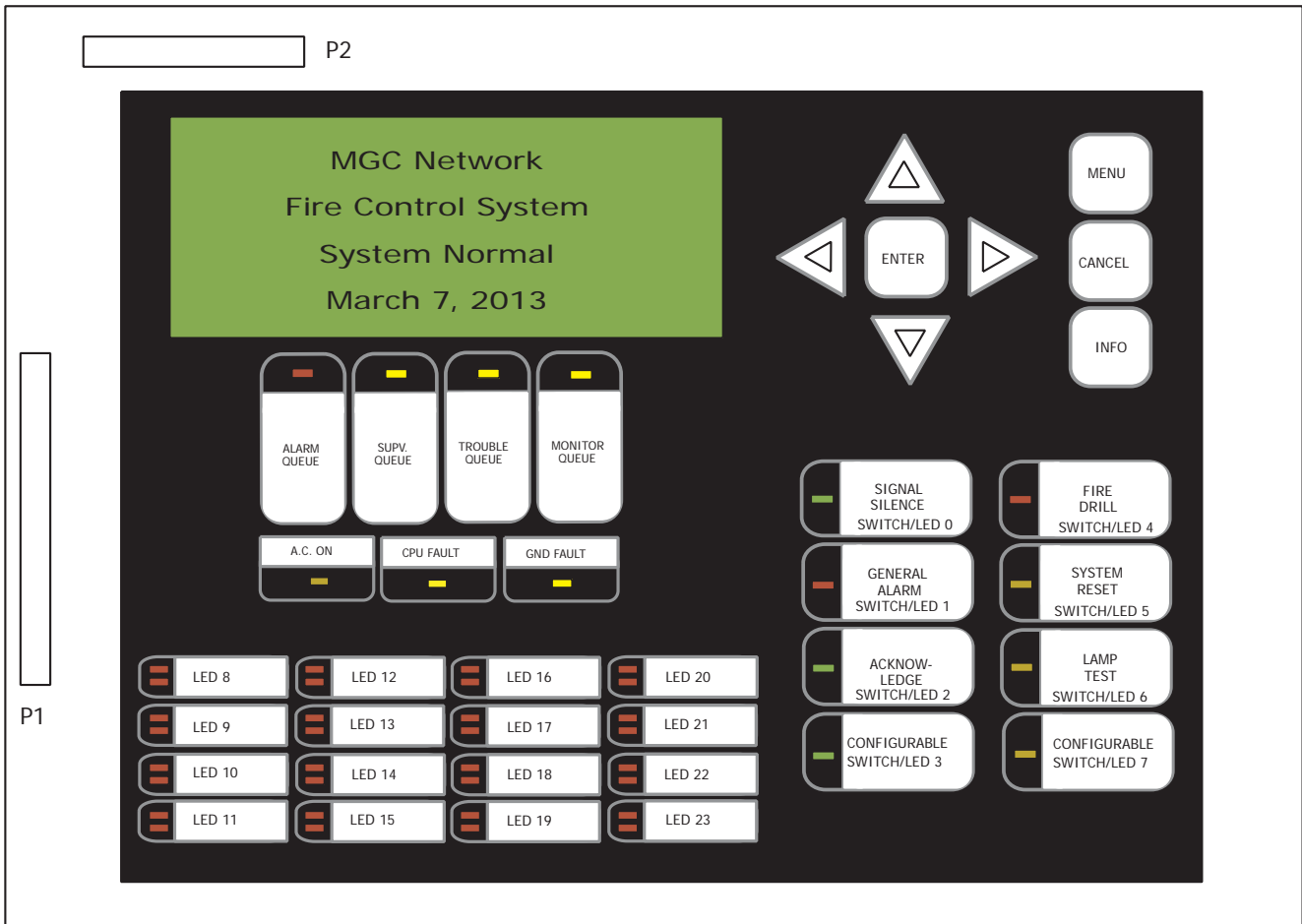
P1: Cable connects to P14 of the FX-2000N main fire alarm board (Figure 11).

P2: Connection to P1 of any adder display module if used.

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.

FNC-2000 Fire Network Controller Module

An FNC-2000 Fire Network Controller module is required in each fire alarm node in the system. The FNC-2000 also provides a connection for an optional FOM-2000-SP Fiber Optics Module.

Figure 15:   FNC-2000 Fire Network Controller Module
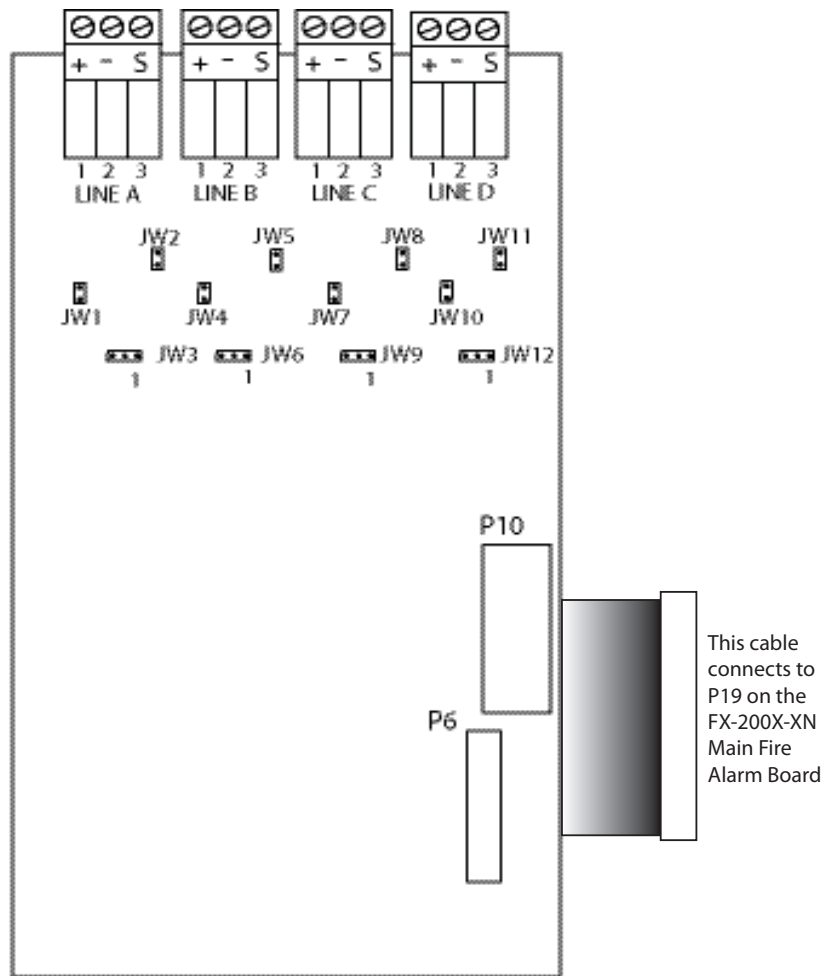
Table 1: FNC-2000 Module List of Connectors and Jumpers and Functions

CONNECTOR OR JUMPERS	Function
P6	**P6** is for Factory Use Only.
P10	**P10** connects to **P1** of the FOM-2000-SP Fiber Optic Network Adder Module if used.
JW1, JW2, JW4, JW7, JW8, JW11	Jumpers for **JW1**, **JW4**, **JW7**, and **JW10** equal Line Termination (always short). Jumpers for **JW2** and **JW8** equal Ground Fault (always short).
JW5 and JW11	Leave both un-installed. Do not connect JW5 or JW11 (open)
JW3, JW6, JW9, JW12	Jumpers for **JW3**, **JW6**, **JW9**, **JW12** shall be present between pins 1 and 2 (far right) and remain as is.

i **Note:** Network connection is through twisted cable from Line A, B, C and D. Refer to Figure 35 for specific wiring and cable information.

Figure 16:   FOM-2000-SP Fiber Optic Network Module
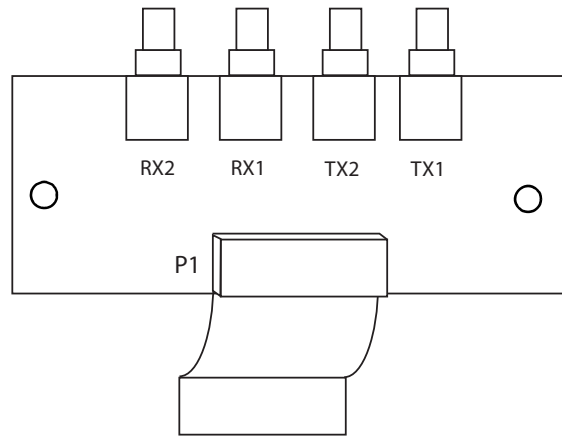
One of these modules is required at each panel where fiber optics will be used between them. The FOM-2000-SP will be mounted over the FNC-2000 Network board (over the field wiring terminals) with two #6 Phillips screws and two Hex spacers.

Table 2: FOM-2000-SP Fiber Optic Network Module Cable Connection

Connector	Function
P1	**P1** cable attaches to **P10** of the FNC-2000 Fire Network Controller Module.

RAX-1048/TZ/TZDS Zone Display Module

Figure 17:   Zone Display Module (RAX-1048 or RAX-1048TZ/DS)
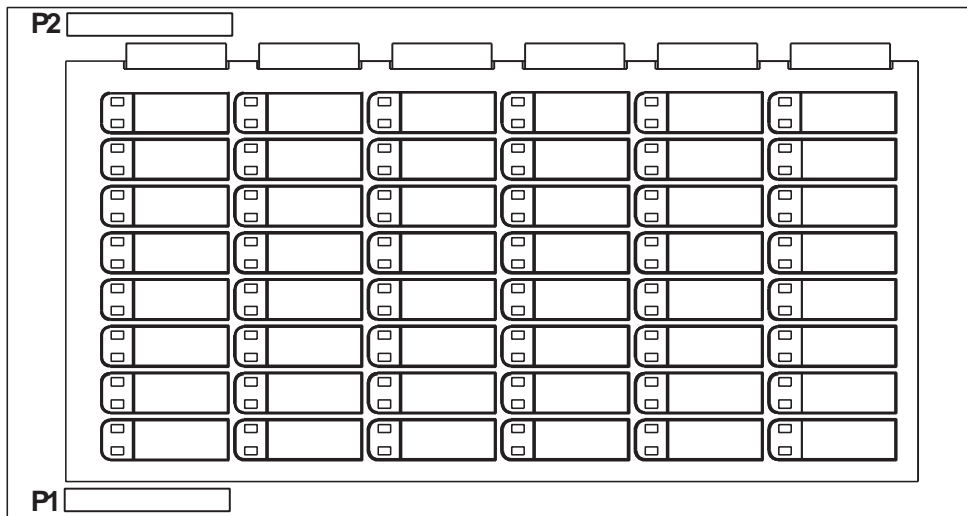
Table 3: RAX-1048/TZ/TZDS Zone Display Module Cable Function

Connector	Function
P1	**P1** Cable connects to P2 of previous display module.
P2	**P2** Cable connects to P1 of next display module

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

Figure 18: IPS-2424/DS Programmable Input Switches Module
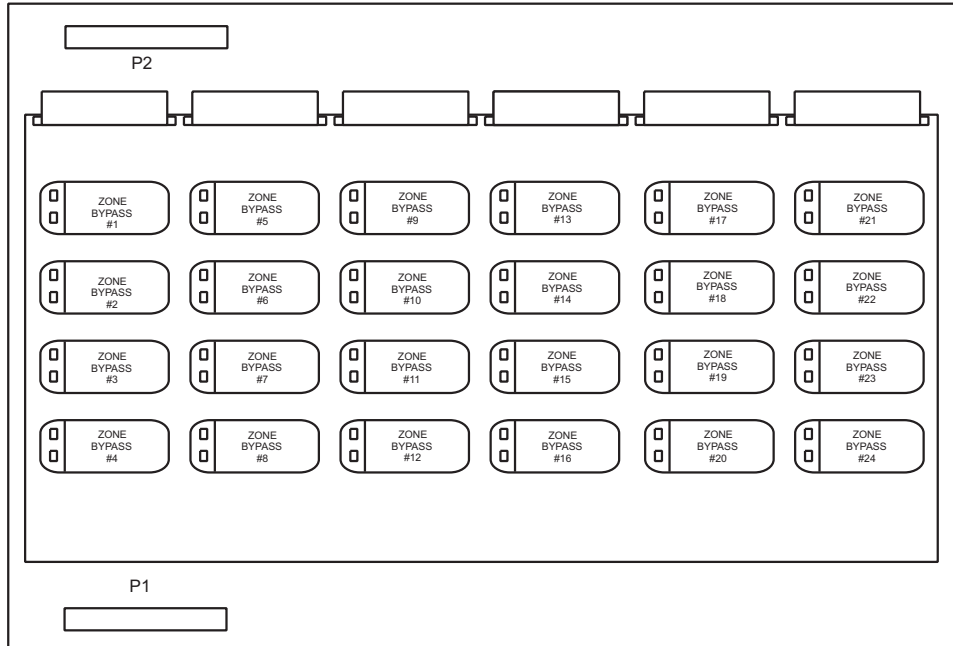
Table 4: IPS-2424/DS Programmable Input Switches Module Cable Function

Connector	Function
P1	**P1** Cable connects to P2 of previous display module.
P2	**P2** Cable connects to P1 of next display module

Note: The IPS-2424/DS module comes with laser printer-compatible slide-in paper labels for zone labelling.

Figure 19:   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 an FX-2000N Fire Alarm Control Panel.
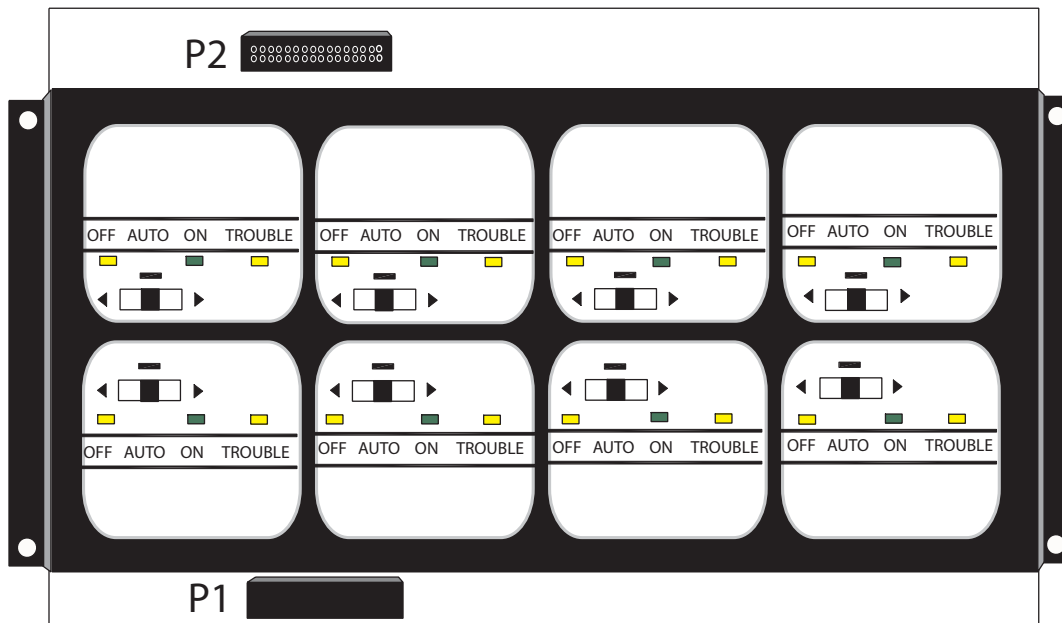
Fan Damper Operation

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.

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), both the ON and OFF LEDs will flash at the slow trouble rate. 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.
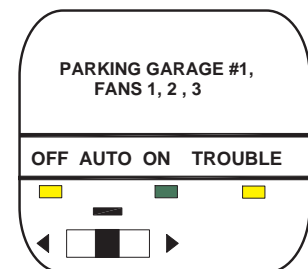
ON LED shows steady for all outputs operating and confirmed.

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

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

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

Figure 20: FDX-008 Block Diagram of Fan and Monitor Set-up
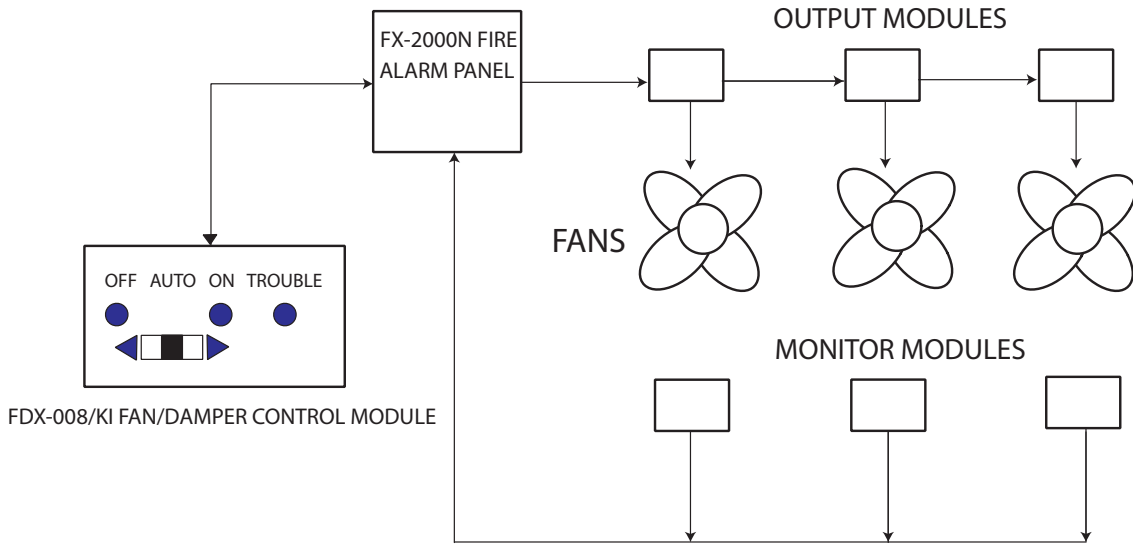
Before mounting the FDX-008KI module, if a keyswitch is to be connected, wire the keyswitch to terminals at TS1 as shown in Figure 19 below. Mount the FDX-008 and FDX-008KI Fan Damper Control Display modules in any position on the front part of the FX-2000N chassis and backbox.

Figure 21: FDX-008KI Fan Damper Control Display Module
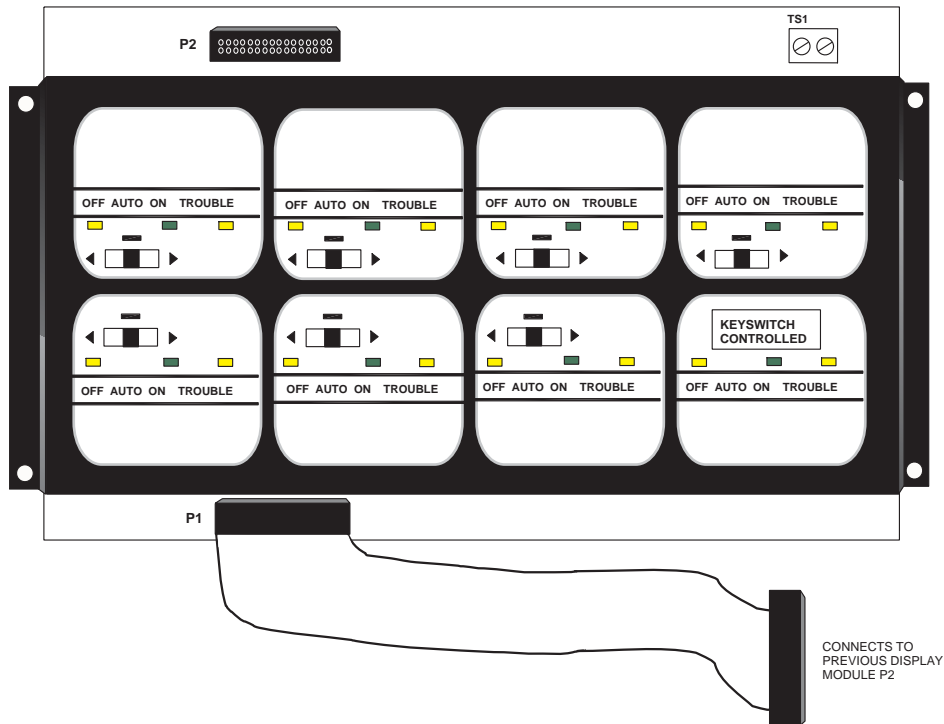
i **Note:** There are also terminals located behind TS1 on the other side of the board for the convenience of wiring the keyswitch. The last fan damper zone in the bottom right position of the FDX-008KI is controlled by the keyswitch.

UUKL with FDX-008 and FDX-008KI

The models FDX-008 and FDX-00KI can be effectively use to provide an automatic and manual control system for smoke. Refer to document number LT-966 for extensive instructions regarding UUKL applications.

Figure 22: Hardwire Detection Adder Module (DM-1008A)
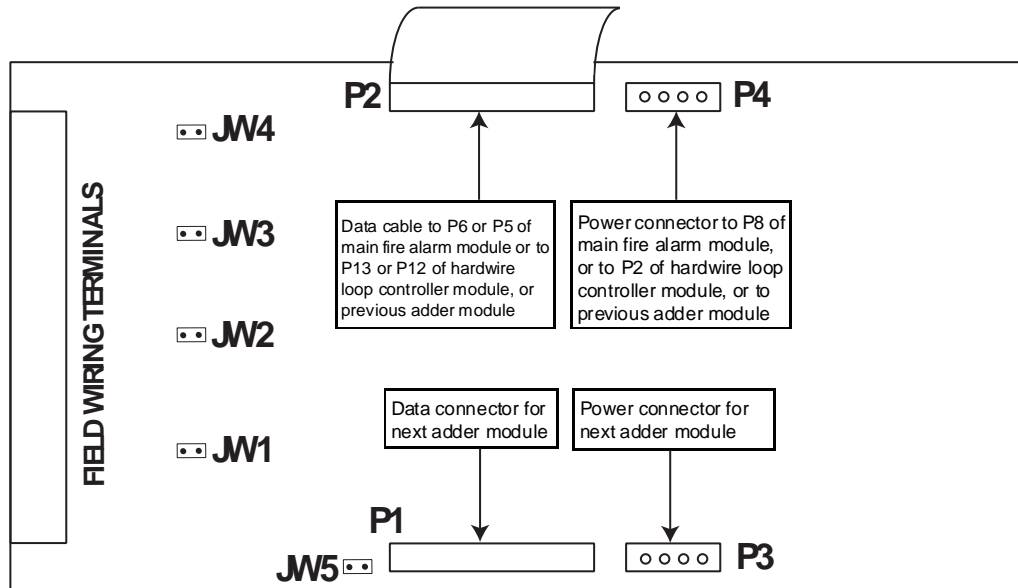
JW1: Install jumper for Class A (Style D) operation of initiating circuits 1 and 2.

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.

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

Figure 23:   Hardwire Signal Adder Module (SGM-1004A)

GREEN SIGNAL LEDs
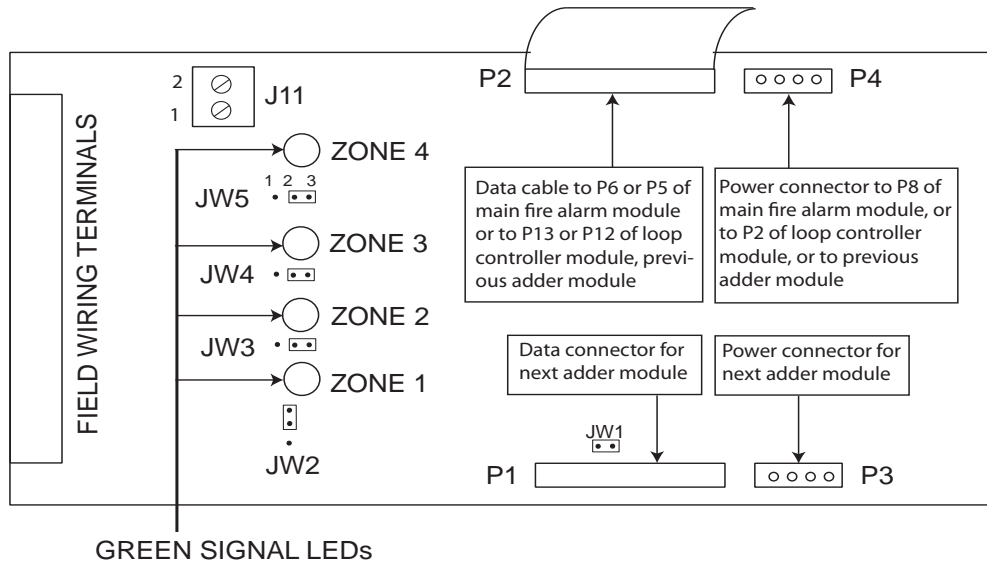
Basic Mode

Jumpers on the SGM-1004A Signal Adder Module and their functions:

JW1: Remove continuity jumper if this is not the last adder module installed.

JW2, JW3, JW4, and JW5: Leave these jumpers open, on positions 2 and 3.

J11 Terminals: Not connected.

Components

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

Operation

There are two modes of operation for this module. The basic mode of operation does not involve any 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 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.

Isolator Mode
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.

> **ATTENTION:** Discard jumpers on zones that are not configured for isolators.

J11: Wire these terminals to an alarm relay. These may be tapped if more signal modules are used in this manner.

Figure 24:   Hardwire Relay Adder Module (RM-1008A)
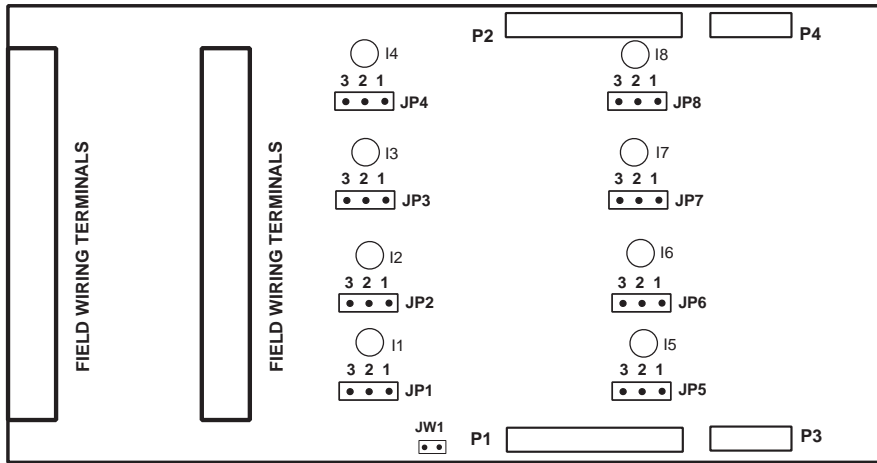
P2: Data cable to P6 or P5 of main fire alarm module, or to previous adder module.

P1: Data connector for next adder module.

P4: Power connector to P8 of main fire alarm module, or to 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.

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

Figure 25:   Polarity reversal and city tie module
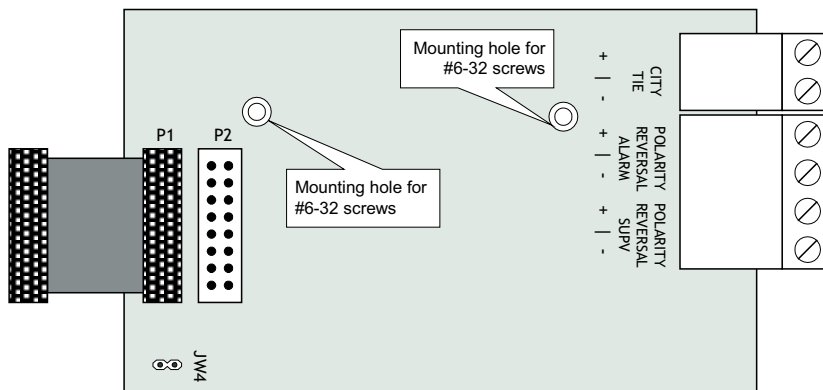
The following hardware configuration must be performed before installing the PR-300.

Table 5: PR-300 jumper settings

P1	Cable connects to **P4** on the **FX-2000N Main Fire Alarm Board**
P2	Not used. If a UDACT-300A is used in conjunction with a PR-300, then the UDACT-300A ribbon cable P1 is connected to header P2 of the PR-300.
JW4	Jumper JW4 is always left intact.

The Alarm Transmit signal to the PR-300 can be programmed to turn OFF when signal silence is active (Not allowed by UL 864 refer to Configuration section). 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.

ℹ️ **Note:** Jumper JW4 on the FX-2000N main fire alarm board must be removed if a city tie module is installed.

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 (which can be done using the FX-2000N Configurator Software) the UDACT-300A. Refer to Figure 26 below for location of jumpers, cable connections, pushbutton and LEDs. Table 6 following, provides a description of the user items on the UDACT-300A.

Figure 26:   UDACT-300A Board Layout
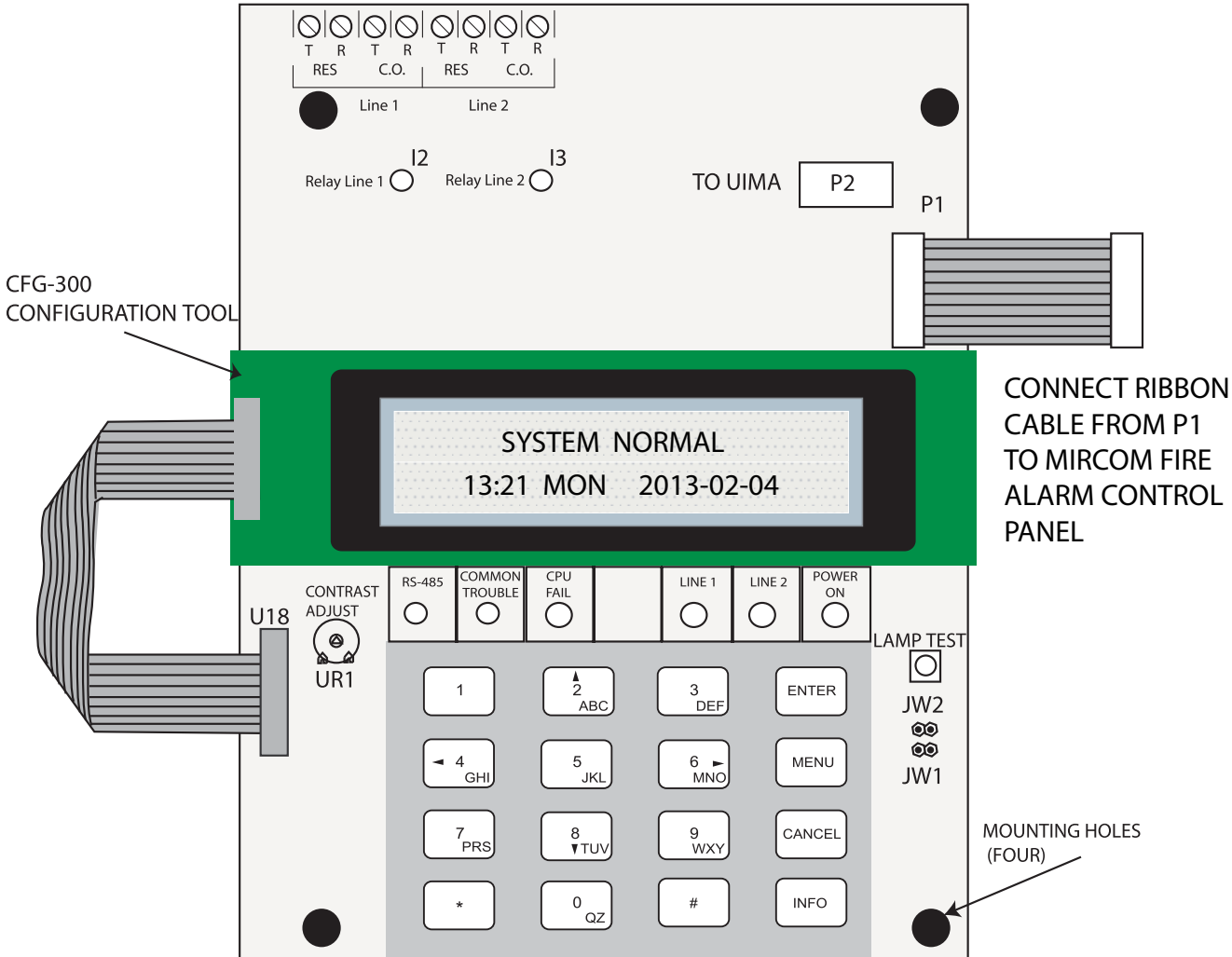
Module Settings

Table 6: UDACT-300A Cable Connectors and Miscellaneous

Cable Connector	Function
P1	Ribbon Cable for connecting to P4 of FX-2000N main fire alarm module or to P2 header on the PR-300 if used.
P2	RS-232C/RS-485 Connection for computer configuration.
U18	Connector for CFG-300 Configuration Tool
Lamp Test button	Press and hold this button to test all the UDACT-300A LEDs
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 7: UDACT-300A List of LEDs and their Functions.

LEDs	LED 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.

Table 8: UDACT-300A List of Jumpers for Operation and Configuration

Jumper Number	Jumper 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.

i **Note:** This module cannot be installed if a city tie module is used.

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

ALCN-792M Quad Loop Adder Module with ALCN-792D Daughter Board

The new Quad Loop Adder module provides two addressable loops plus an additional two loops as part of the daughter board ALCN-792D which is mounted over the ALCN-792M. The Quad Loop Adder module may be mounted over the main chassis of the FX-2000N Fire Alarm Panel or on any chassis that supports adder boards. Refer to the Display and Adder Modules section for mounting applications. This 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 fire alarm 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. One power cable is supplied with this module.
RS-485:	The RS-485 cable comes attached at P3 and is either connected to P3 of the main fire alarm controller module 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. SW1-1 is the lowest significant digit and ON is active. For example, an address of two would be created by turning SW1-1 OFF, SW1-2 ON and DIP switches SW1-3 to SW1-8 OFF. Refer to Appendix C for DIP switch settings.
Loop 1:	This is the addressable loop for all initiating devices. Wire the loop as shown in Figures 34, 35 and 36.
Loop 2:	This is the addressable loop for all initiating devices. Wire the loop as shown in Figures 34, 35 and 36.
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.
RS-232 Debug Interface:	This connection if for factory use only.
JTAG Port:	This connection is for factory use only.

The ALCN-792D Daughter Board provides another two addressable loops when connected to the ALCN-792M Quad Loop Adder Board. This daughter board is mounted over the ALCN-792M. Wire the two addressable loops on the ALCN-792D Daughter Board in the same manner the ALCN-792M addressable loops are wired.

Figure 27: ALCN-792D Daughter Board
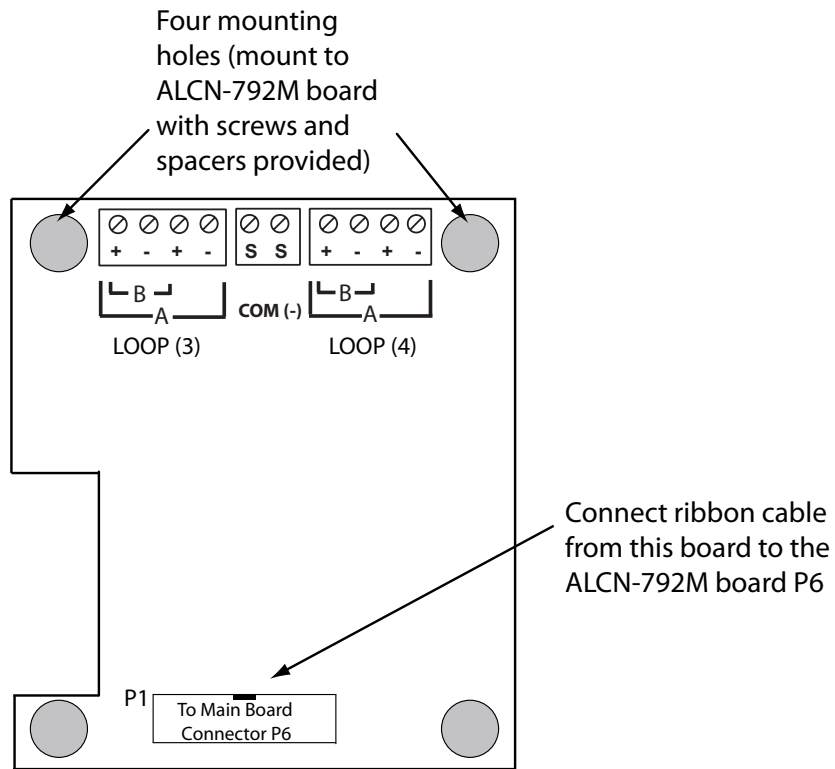
Notes for ALCN-792D:
- All circuits are power limited and must use type FPL, FPLR, or FPLP power limited cable.
- Loop wiring: maximum loop resistance is 40 ohms total. These lines power-limited and fully supervised.

Wire the ALCN-792M Quad Loop Adder module as shown in Figure 28 below.

Figure 28:   ALCN-792M Quad Loop Adder Module

> **ⓘ** **Wiring The Addressable Loops**
> There are two addressable loops present on this board that are wired in the same manner as shown in the wiring diagrams beginning with Figure 34. Although these drawings show only Loop 1;Loop 2 is wired in the same way as Loop 1 is.

> **ⓘ** **Notes for ALCN-792M:**
> • All circuits are power limited and must use type FPL, FPLR, or FPLP power limited cable.
> • Loop wiring: maximum loop resistance is 40 ohms total. These lines power-limited and fully supervised.

Field Wiring

Main Fire Alarm Module Terminal Connections

Wire devices to terminals as shown in below. Refer to Appendix A for specifications and to LT-1023 for compatible devices.

> **ATTENTION:** Do not exceed power supply ratings:
>
> Main Chassis FX-2003-12N/DS or FX-2017-12N/DS: total current for NACs is 10A max.
>
> Main Chassis FX-2009-12N/DS total current for NACs is 10A max.

> **Notes:**
>
> The terminal blocks are removable for ease of wiring.
>
> All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.

Figure 29: Main Fire Alarm Controller Board Field Terminal Connections

FX-2000N Main Fire
Alarm Controller board

P3

P4

Shield one end of the
RS-485 LOOP ONLY

RS-485 INTERFACE TO
ANNUNCIATORS AND
OTHER DEVICES
(POWER LIMITED)

RS485

+

-

S

USE TWISTED SHIELDED PAIR
22 AWG UP TO 2000 FT.
20 AWG UP TO 4000 FT.

S

COM

TROUBLE   NO

NC

COMMON TROUBLE
CONTACTS
24 VDC, 1 AMP
RESISTIVE LOAD

COM

ALARM   NO

NC

AUXILIARY COMMON
ALARM CONTACTS
24 VDC, 1 AMP
RESISTIVE LOAD

MUST BE
CONNECTED TO A
LISTED POWER
LIMITED SOURCE
OF SUPPLY

COM

SUPV.   NO

NC

AUXILIARY COMMON
SUPERVISORY
CONTACTS
24 VDC, 1 AMP
RESISTIVE LOAD

SIG GND
or COM(-)

NOT USED

Figure 30: Main Fire Alarm Control board Field Terminal Connections (continued)

ANALOG LOOP 2 CONNECTIONS (LOOP 0 AND LOOP1 ARE INTERNAL ADDRESSES FOR FIRST 8 CARDS AND SECOND 8 CARDS RESPECTIVELY

LOOP 2
B +
B -
A +
A -

ANALOG LOOP FIELD WIRING (CLASS A OR B) SEE ANALOG LOOP WIRING SECTION POWER-LIMITED, 22V DC, 400 mA MAX Maximum Loop Resistance 40 ohms

CONNECTION TO MIRCOM RTI REMOTE TROUBLE INDICATOR (SEE RTI INSTALLATION INSTRUCTION) BLK TO TRB+ BLU TO TRL-RED & WHT TO AUX. POWER COM+

4-WIRE POWER SUPPLY
+
-

POWER-LIMITED, REGULATED 22V DC, 400 mA MAX 5 mV Ripple

AUX. POWER (POWER-LIMITED)
+
-

RED & WHT
AUXILIARY POWER FOR REMOTE ANNUNCIATORS 24 VDC SPECIAL APPLICATION 1.7 AMPS MAXIMUM

END OF LINE RELAY LISTED S3403 MODEL A77-716B MANUFACTURED BY SYSTEM SENSOR

4-WIRE DETECTION DEVICE

RTI INTERFACE
TRB
TRL

BLK
POWER-LIMITED   RTI
BLU

TO INITIATING CIRCUIT
DETECTION
POWER

NAC 0 INDICATION CIRCUIT 1 (POWER-LIMITED)
+
+
-
-

SUPERVISED NAC # 0

STYLE Y (CLASS B) WIRING

NAC 1 INDICATION CIRCUIT 2 (POWER-LIMITED)
+
+
-
-

SUPERVISED NAC # 1

STYLE Z (CLASS A) WIRING

NAC 2 INDICATION CIRCUIT 1 (POWER-LIMITED)
+
+
-
-

SUPERVISED NAC # 2

STYLE Y (CLASS B) WIRING

NAC 3 INDICATION CIRCUIT 2 (POWER-LIMITED)
+
+
-
-

SUPERVISED NAC # 3

STYLE Z (CLASS A) WIRING

TS2

NAC External Power Connection
E+
I+
−

TS2 Terminal Block is located on the bottom right corner of the main fire alarm board

+ NOT
_ USED

Legend:

| | BELL, HORN, OR STROBE | | 3.9K 1/2W ELR LISTED S5434 MODEL MP-300 MANUFACTURED BY MIRCOM |

Notes:

- All circuits are power limited (unless marked otherwise) and must use type FPL, FPLR, or FPLP power limited cable.
- NACs are fully supervised and rated for 24 VDC special application, 1.7A max. They must be wired as shown in the *Wiring Tables and Information* section.

Analog Loop Wiring

Figure 31: Loop Terminal Connections - Class B
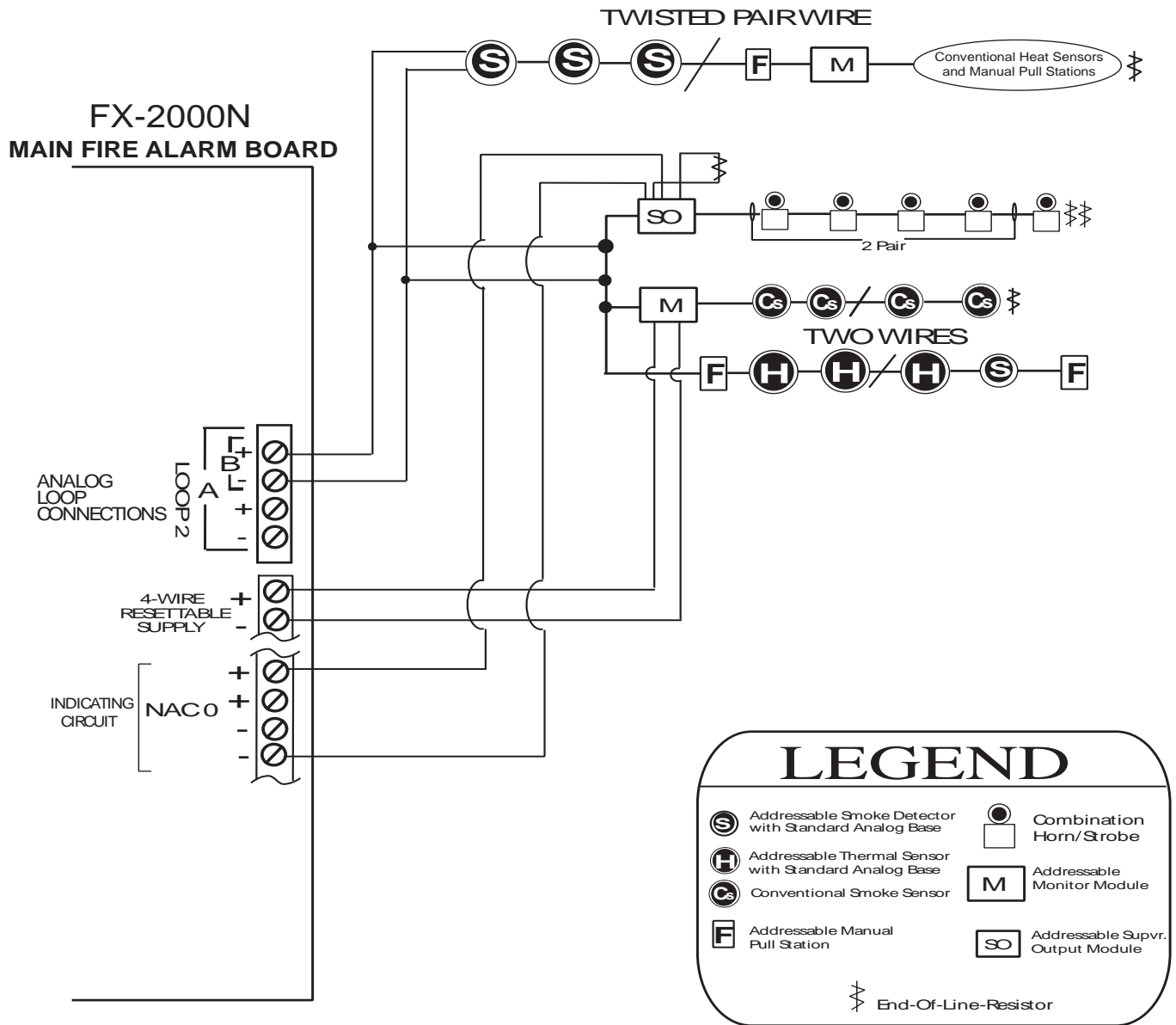
Notes:

- 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 power limited and fully supervised.
- Observe in and out polarity when using module and base isolators.

Figure 32: Loop Terminal Connections - Style 7

FX-2000N
MAIN FIRE ALARM BOARD

ADDRESSABLE
SMOKE DETECTOR
WITH ISOLATOR BASE

TWISTED PAIR WIRE

TWISTED PAIR WIRE

TWISTED PAIR WIRE

ADDRESSABLE
THERMAL
SENSOR
WITH
ISOLATOR
BASE

Conventional Heat Sensors
and Manual Pull Stations

ANALOG
LOOP
CONNECTIONS

LOOP 2

B

A

+

−

+

−

4-WIRE
RESETTABLE
SUPPLY

+

−

**STYLE 7: For Style 7 operation use isolator
bases for the detectors and use isolator modules
(front and back as shown in this diagram) for the
addressable pull stations, monitor modules, and
control modules**

LEGEND

(S)	Addressable Smoke Detector with Isolator Base
(H)	Addressable Thermal Sensor with Isolator Base
(Cs)	Conventional Smoke Sensor
F	Addressable Manual Pull Station
I	Fault Isolator Module
M	Addressable Monitor Module

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 power- limited and fully supervised.

Figure 33: Loop Terminal Connections - Style 6 (Formerly Class A)
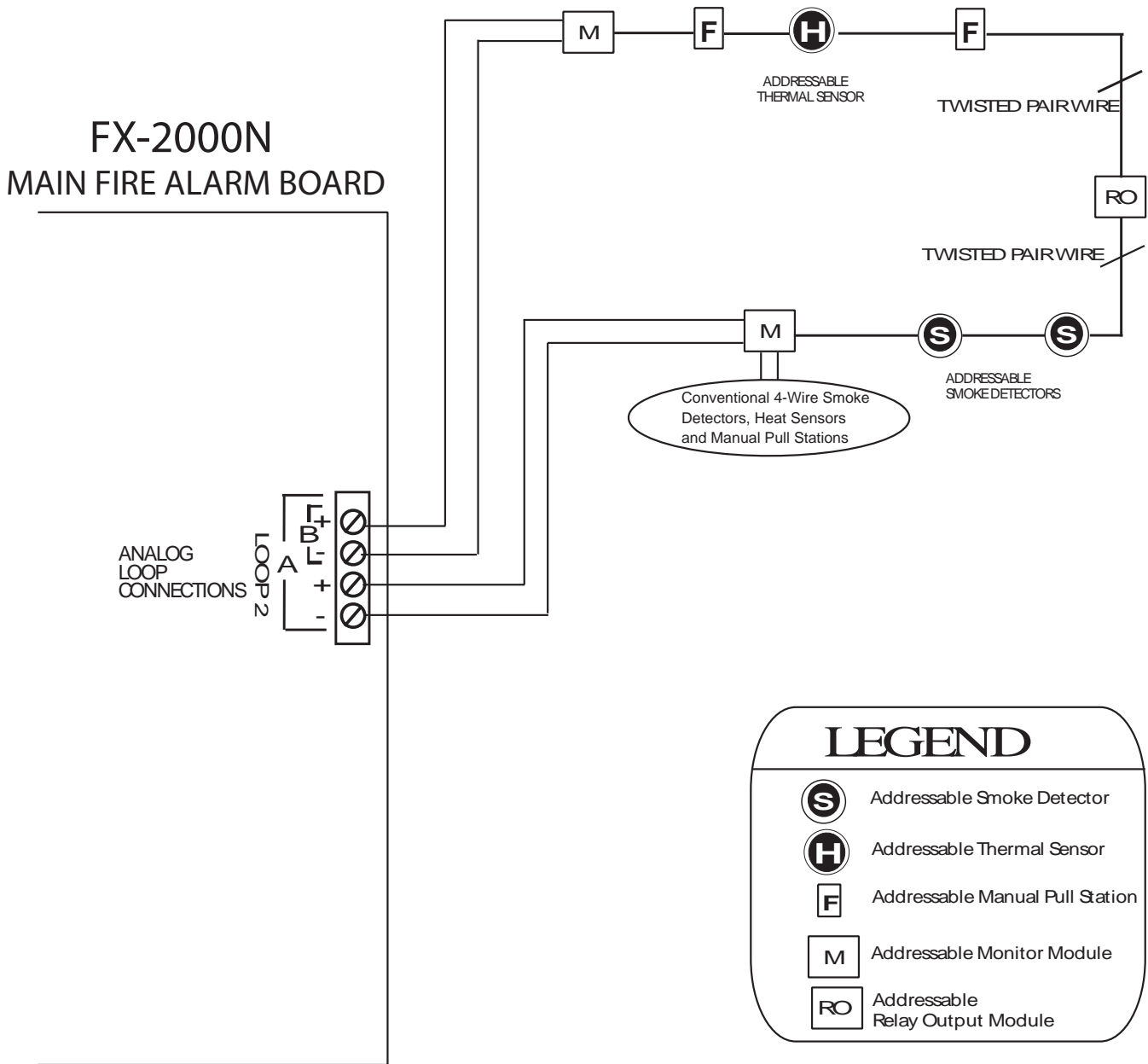
Notes:

- 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 power-limited and fully supervised.

Figure 34: Quad Loop Terminal Connections - Class B
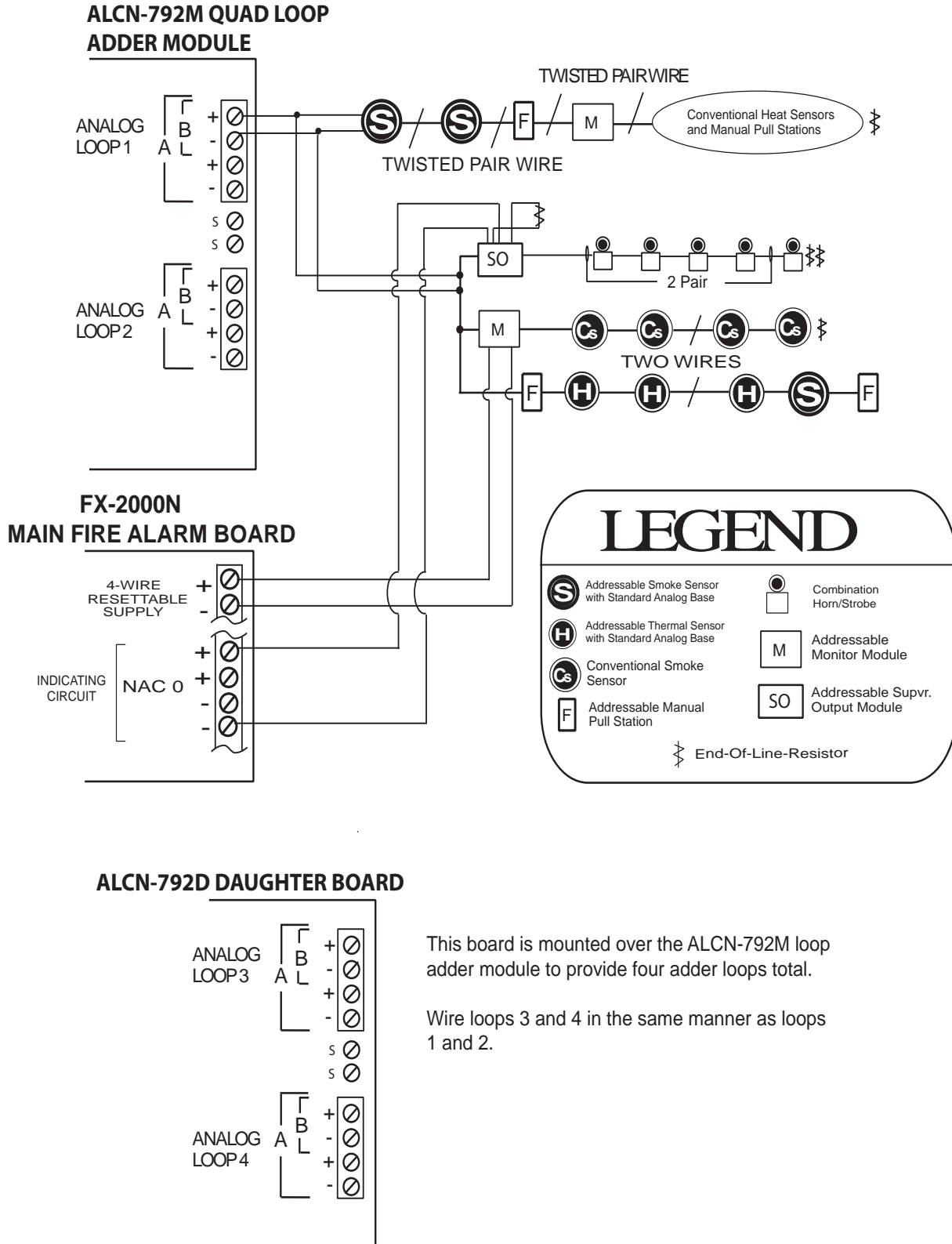
**ALCN-792M QUAD LOOP
ADDER MODULE**

**FX-2000N
MAIN FIRE ALARM BOARD**

LEGEND

(S)	Addressable Smoke Sensor with Standard Analog Base	●	Combination Horn/Strobe
(H)	Addressable Thermal Sensor with Standard Analog Base	M	Addressable Monitor Module
(Cs)	Conventional Smoke Sensor	SO	Addressable Supvr. Output Module
F	Addressable Manual Pull Station		

⌇ End-Of-Line-Resistor

ALCN-792D DAUGHTER BOARD

This board is mounted over the ALCN-792M loop adder module to provide four adder loops total.

Wire loops 3 and 4 in the same manner as loops 1 and 2.
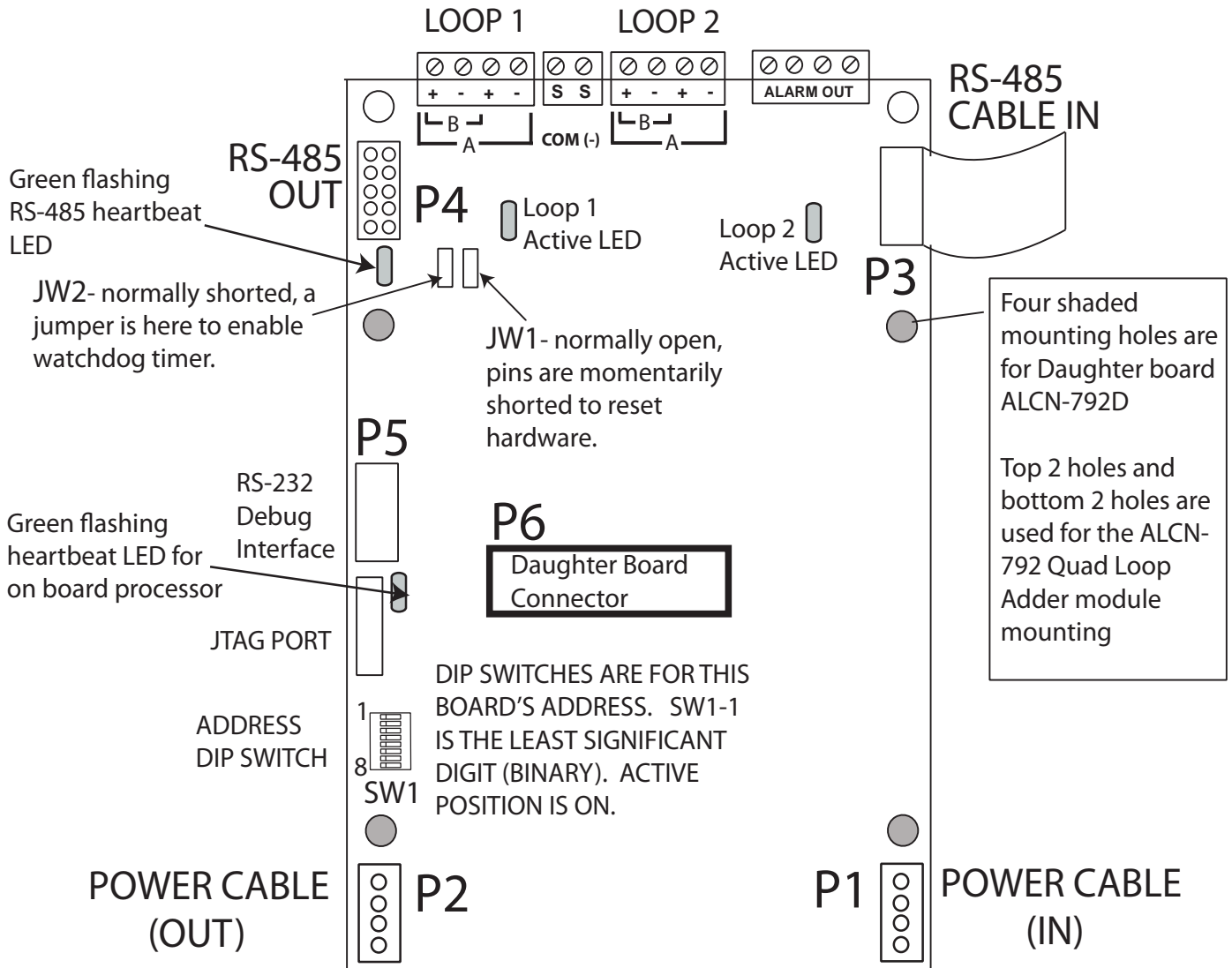
Notes:

- 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 power-limited and fully supervised.

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Figure 35: Quad Loop Adder Module Terminal Connections - Style 7

ALCN-792M QUAD LOOP ADDER MODULE
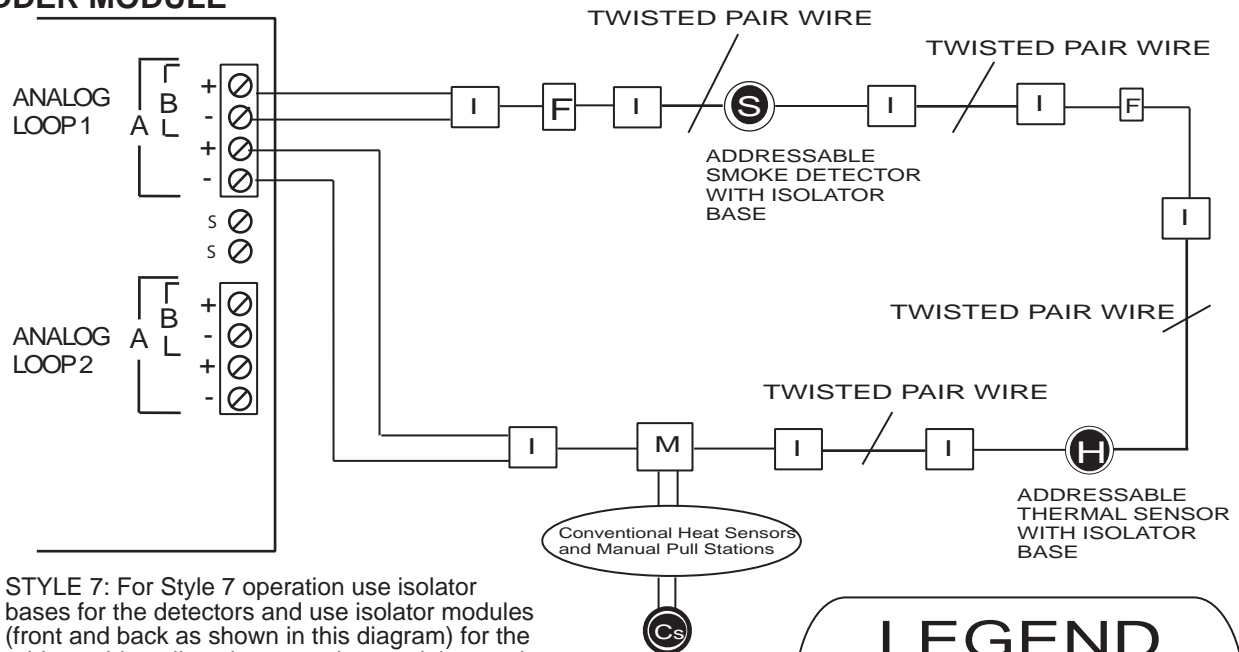
ANALOG LOOP 1
BAL + - + -

TWISTED PAIR WIRE

TWISTED PAIR WIRE

ADDRESSABLE SMOKE DETECTOR WITH ISOLATOR BASE

ANALOG LOOP 2
BAL + - + -

TWISTED PAIR WIRE

TWISTED PAIR WIRE

TWISTED PAIR WIRE

Conventional Heat Sensors and Manual Pull Stations

ADDRESSABLE THERMAL SENSOR WITH ISOLATOR BASE

STYLE 7: For Style 7 operation use isolator bases for the detectors and use isolator modules (front and back as shown in this diagram) for the addressable pull stations, monitor modules, and control modules

TWISTED SHIELDED PAIR WIRE IS NOT RECOMMENDED. IF USED THE SHIELD SHOULD BE TERMINATED AT THE TERMINALS MARKED SHIELD

LEGEND

S	Addressable Smoke Sensor with Isolator Base
H	Addressable Thermal Sensor with Isolator Base
Cs	Conventional Smoke Sensor
F	Addressable Manual Pull Station
M	Addressable Monitor Module
I	Fault Isolator Module

ALCN-792D DAUGHTER BOARD

ANALOG LOOP 3
BAL + - + -

ANALOG LOOP 4
BAL + - + -
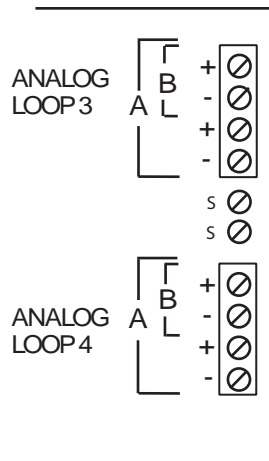
This board is mounted over the ALCN-792M to provide and additional two loops, for a total of four loops.

Wire loops 3 and 4 in the same manner as loops 1 and 2.

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 power-limited and fully supervised.

Figure 36: Quad Loop Adder Module Terminal Connections - Style 6
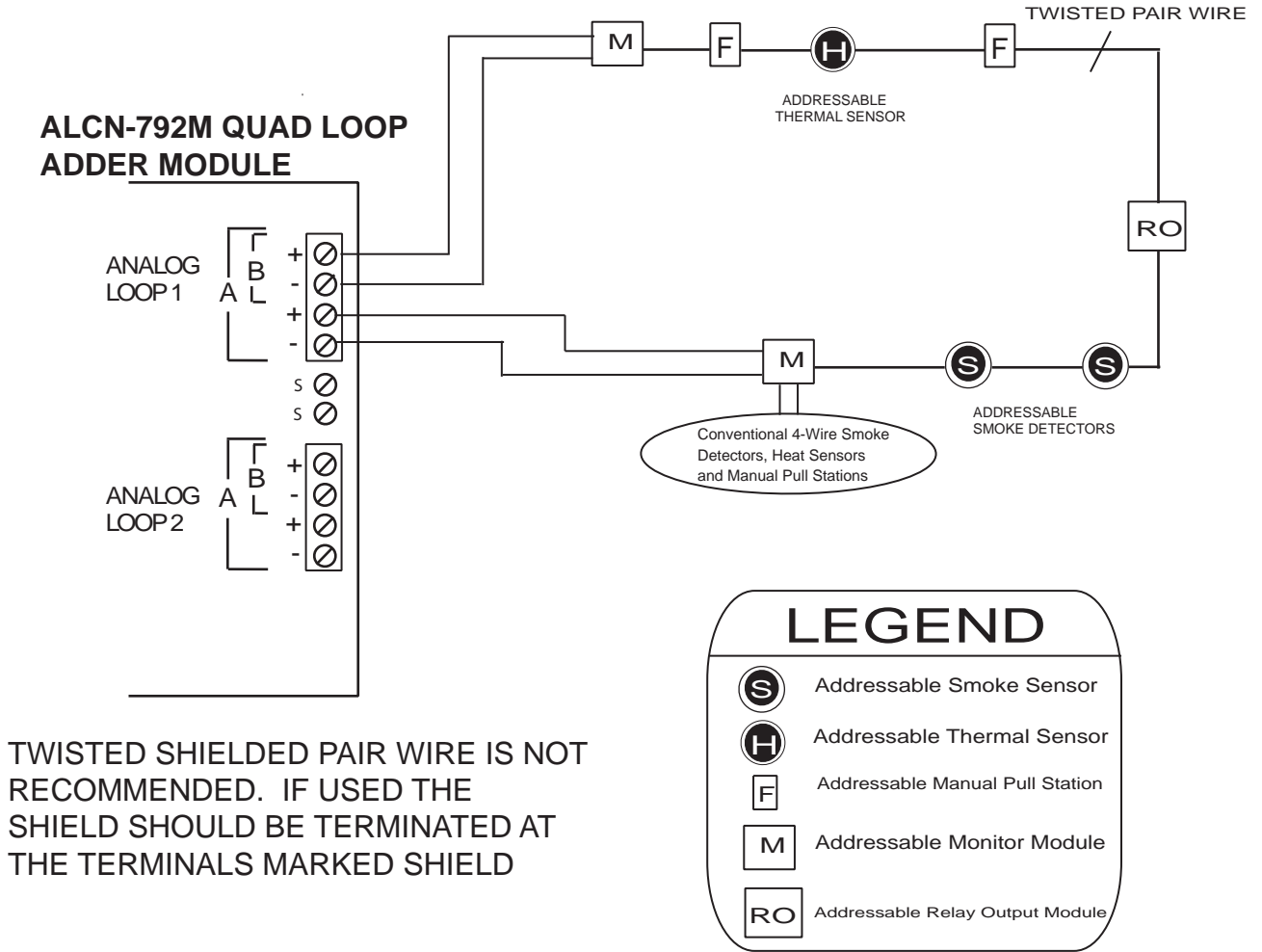
ALCN-792M QUAD LOOP ADDER MODULE

ANALOG LOOP 1

ANALOG LOOP 2

ADDRESSABLE THERMAL SENSOR

TWISTED PAIR WIRE

RO

Conventional 4-Wire Smoke Detectors, Heat Sensors and Manual Pull Stations

ADDRESSABLE SMOKE DETECTORS

TWISTED SHIELDED PAIR WIRE IS NOT RECOMMENDED. IF USED THE SHIELD SHOULD BE TERMINATED AT THE TERMINALS MARKED SHIELD

LEGEND

S	Addressable Smoke Sensor
H	Addressable Thermal Sensor
F	Addressable Manual Pull Station
M	Addressable Monitor Module
RO	Addressable Relay Output Module

ALCN-792D DAUGHTER BOARD

ANALOG LOOP 3

ANALOG LOOP 4
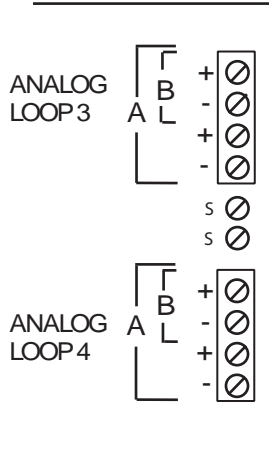
This board is mounted over the ALCN-792M loop adder module to provide an addition two loops, for a total of four loops.

Wire loops 3 and 4 in the same manner as loops 1 and 2.

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 power-limited and fully supervised.

FNC-2000 Fire Network Controller Module

The FNC-2000 Fire Network Controller modules are wired from terminals marked Line A, positive and negative (see specific cable recommended in Figure 37) to the Line B terminals of the next FNC-2000 module. **Use of shielded cable is not recommended**. Wire from Line B terminals to Line A of the next FNC-2000 module. Start from the lobby panel and wire to all the FNC-2000, wiring the last FNC-2000 back to Line B of the first FNC-2000 at the lobby panel for Class A.

Figure 37: Style 7 Wiring for the FNC-2000 Module

STYLE 7 WIRING

Line B **FNC-2000** Line A	Line A **FNC-2000** Line B
Line B **FNC-2000** Line A	Line A **FNC-2000** Line B
Line B **FNC-2000** Line A	Line A **FNC-2000** Line B

Network Wiring Specifications

Power-Limited and Supervised

Voltage: 9V Max

Current: 800mA

Frequency: 625K Hz

Line Loss: 25 ohms

4000 feet MAX wiring distance with twisted pair 18 gauge wire.

Line B   Line A

FNC-2000 Lobby Panel

RECOMMENDED CABLE:
BELDEN 5320 UJ or 5320UM
Tyco Pyro CIC
Draka Lifeline
All above cables are 2x18AWG unshielded, low capacitance

Figure 38:   Redundant Wiring for the FNC-2000 Module

REDUNDANT WIRING

RECOMMENDED CABLE:
BELDEN 5320 UJ or 5320UM
Tyco Pyro CIC
Draka Lifeline
All above cables are 2x18AWG unshielded,
low capacitance

Line A   Line C
FNC-2000
Line B   Line D

Line D   Line B
FNC-2000
Line C   Line A

Line A   Line C
FNC-2000
Line B   Line D

Line D   Line B
FNC-2000
Line C   Line A

Line A   Line C
FNC-2000
Line B   Line D

Line D   Line B
FNC-2000
Line C   Line A

Line A Line C   Line D   Line B
FNC-2000
Lobby Panel

Network Wiring Specifications

Power-Limited and Supervised

Voltage: 9V Max

Current: 800mA

Frequency: 625K Hz

Line Loss: 25 ohms

4000 feet MAX wiring distance with twisted pair 18 gauge wiring

FOM-2000-SP Fiber Optic Network Adder Module

The FOM-2000-SP Fiber Optic Network Adder Module is wired with fiber optic cable. It is wired OUT through the transmit connectors marked TX and IN through the receive connectors marked RX.

Figure 39:   FOM-2000-SP Fiber Optic Network Adder Module Wiring

STYLE 7 WIRING
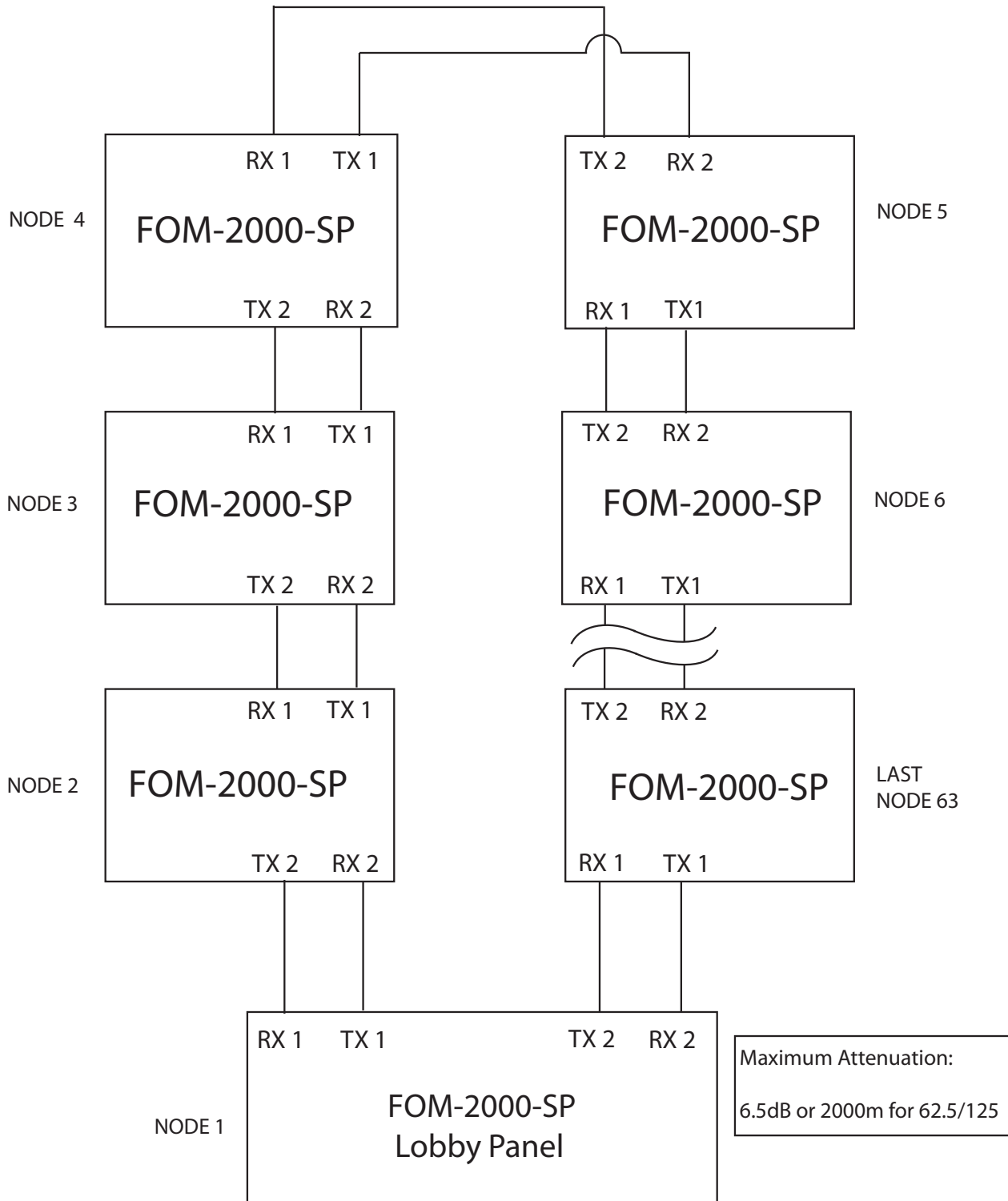
Detection Module (DM-1008A) Terminal Connections

Wire devices to terminals as shown below. See wiring tables, and Appendix A for electrical specifications and document LT-1023 for compatible devices.

Figure 40: Hardwire Detection Module (DM-1008A) Terminal Connections

Style D Note: Initiating circuits of the DM-1008A must be either all Style B (Class B) or all Style D (Class A). If Style D is selected, the number of circuits is cut in half.

Legend:

SMOKE DETECTOR	SUPERVISORY OR WATERFLOW SWITCH (NO)
HEAT DETECTOR	3.9K 1/2W ELR LISTED S5434 MODEL MP-300 MANUFACTURED BY MIRCOM
PULL STATION	
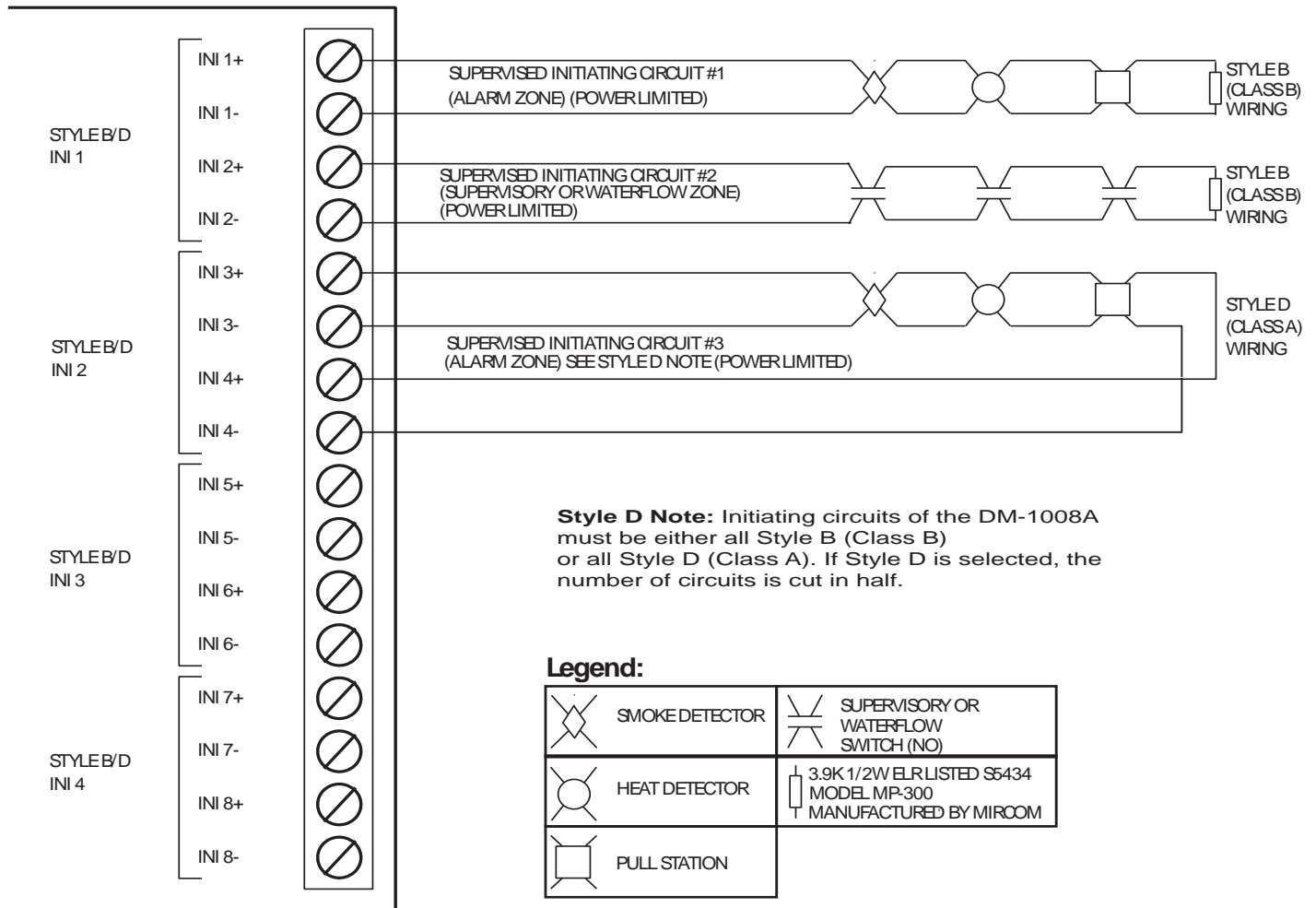
Note:

- 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".

Signal Module (SGM-1004A) Terminal Connections

Wire devices to terminals as shown in Figure 39 below. See Appendix A for signal module specifications, and LT-1023 for compatible devices.

Figure 41: Hardwire Signal Module Terminal Connections
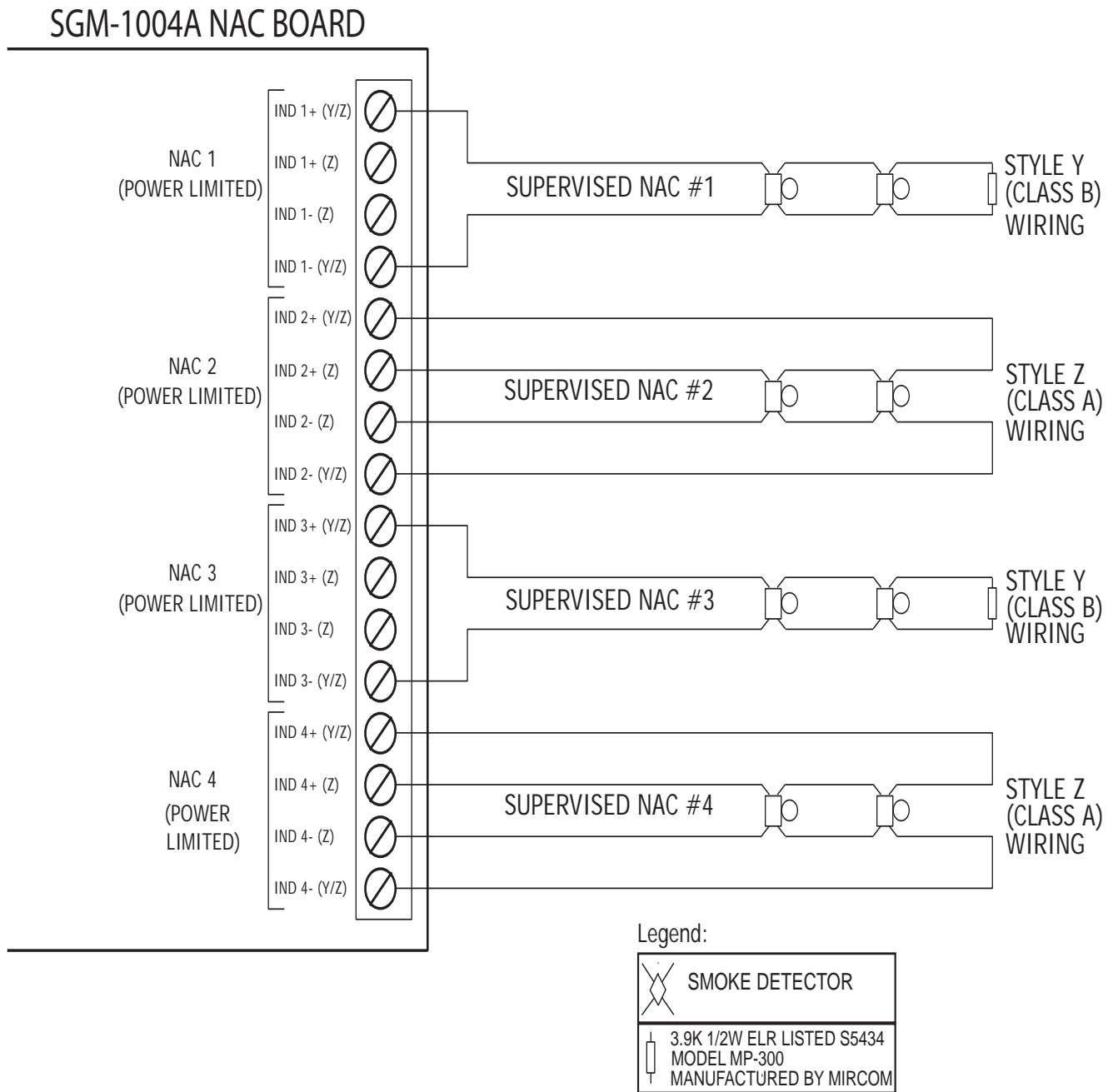
SGM-1004A NAC BOARD

NAC 1 (POWER LIMITED)
IND 1+ (Y/Z)
IND 1+ (Z)
IND 1- (Z)
IND 1- (Y/Z)
SUPERVISED NAC #1
STYLE Y (CLASS B) WIRING

NAC 2 (POWER LIMITED)
IND 2+ (Y/Z)
IND 2+ (Z)
IND 2- (Z)
IND 2- (Y/Z)
SUPERVISED NAC #2
STYLE Z (CLASS A) WIRING

NAC 3 (POWER LIMITED)
IND 3+ (Y/Z)
IND 3+ (Z)
IND 3- (Z)
IND 3- (Y/Z)
SUPERVISED NAC #3
STYLE Y (CLASS B) WIRING

NAC 4 (POWER LIMITED)
IND 4+ (Y/Z)
IND 4+ (Z)
IND 4- (Z)
IND 4- (Y/Z)
SUPERVISED NAC #4
STYLE Z (CLASS A) WIRING

Legend:

SMOKE DETECTOR

3.9K 1/2W ELR LISTED S5434 MODEL MP-300 MANUFACTURED BY MIRCOM

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 NACs are fully supervised and rated for 24 VDC special application, 1.7A max. They must be wired as shown in the Wiring Tables on page 62.

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

Relays are available as shown below.

Figure 42:   Hardwire Relay Module Terminal Connections

RM-1008A Relay Module
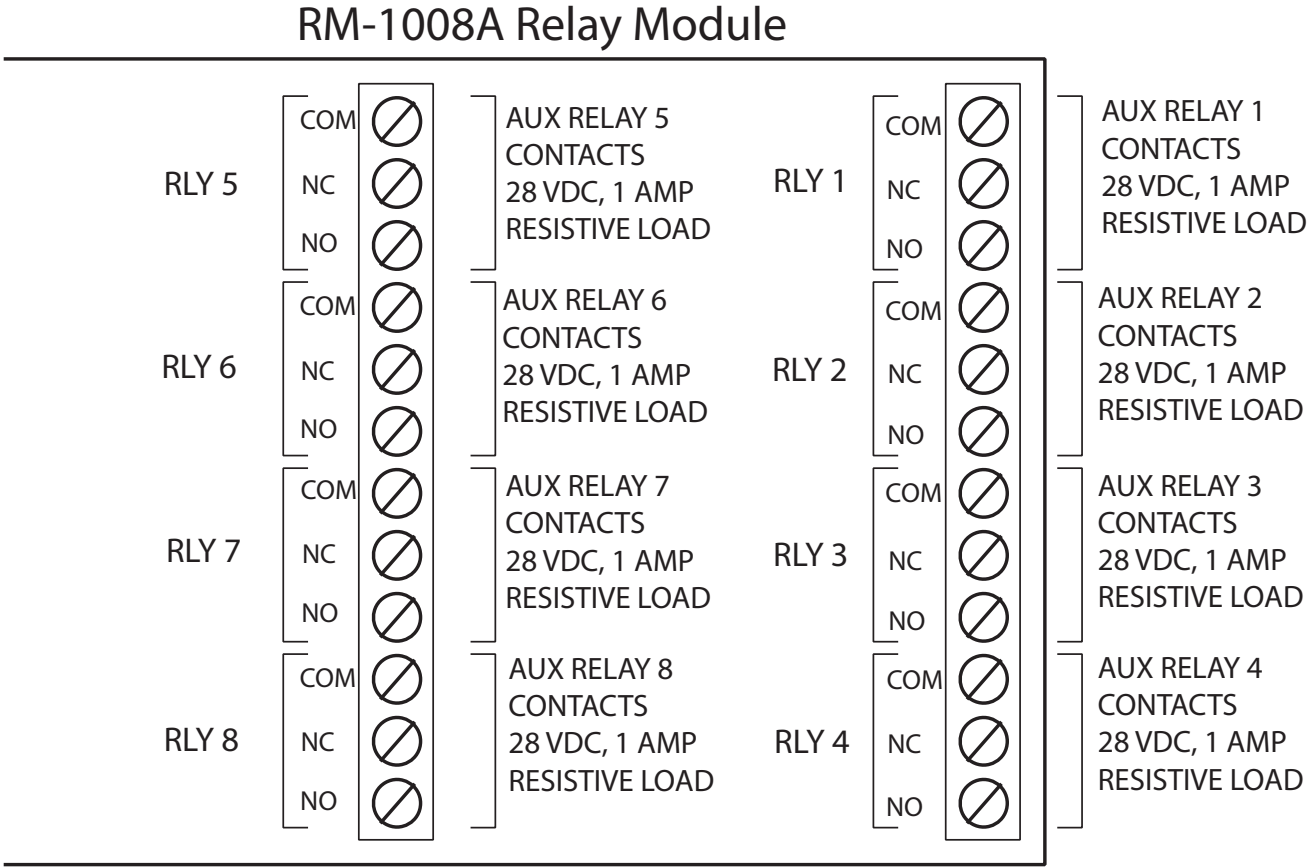
Notes:
- All relay circuits are power limited and must use type FPL, FPLR, or FPLP power limited cable.
- All relay circuits must be connected to a listed power limited source of supply.

ATTENTION:
- Do not connect 120 VAC directly to these relays.

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

Wire PR-300 Polarity Reversal and City Tie Module (if used) as shown in Figure 43 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 43: Polarity reversal and city tie module terminal connection

PR-300

CITY TIE LOCAL ENERGY
RATED - 24VDC FILTERED
TRIP COIL - 14 Ohms, 250mA
5mV RIPPLE

POLARITY REVERSAL ALARM
24VDC OPEN
12VDC AT 3.5mA
8mA MAX. SHORT
POWER LIMITED

POLARITY REVERSAL SUPV.
24VDC OPEN
12VDC AT 3.5mA
8mA MAX. SHORT
POWER LIMITED

PROTECTOR

UNPROTECTED

PROTECTED

USE A SHORTING WIRE WHEN THE CITY TIE IS NOT USED

CONFORMS TO NEMA STANDARD 2011 INTENDED FOR CONNECTION TO POLARITY REVERSAL CIRCUIT OF A REMOTE STATION RECEIVING UNIT HAVING COMPATIBLE RATINGS

DIN RAIL CONNECTION TO EARTH GROUND

POWER LIMITED CABLE TYPE **FPL**, **FPLR** or **FPLP** MUST BE USED FROM PR-300 TO PROTECTORS.

DIN RAIL CONNECTION TO EARTH GROUND

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-2000N 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.

UDACT-300A Main Board Terminal Connections

Wire the two telephone lines to RJ31X Connector terminals as shown in Figure 44 below. 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.

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

Figure 44: Telephone Line Wiring Diagram
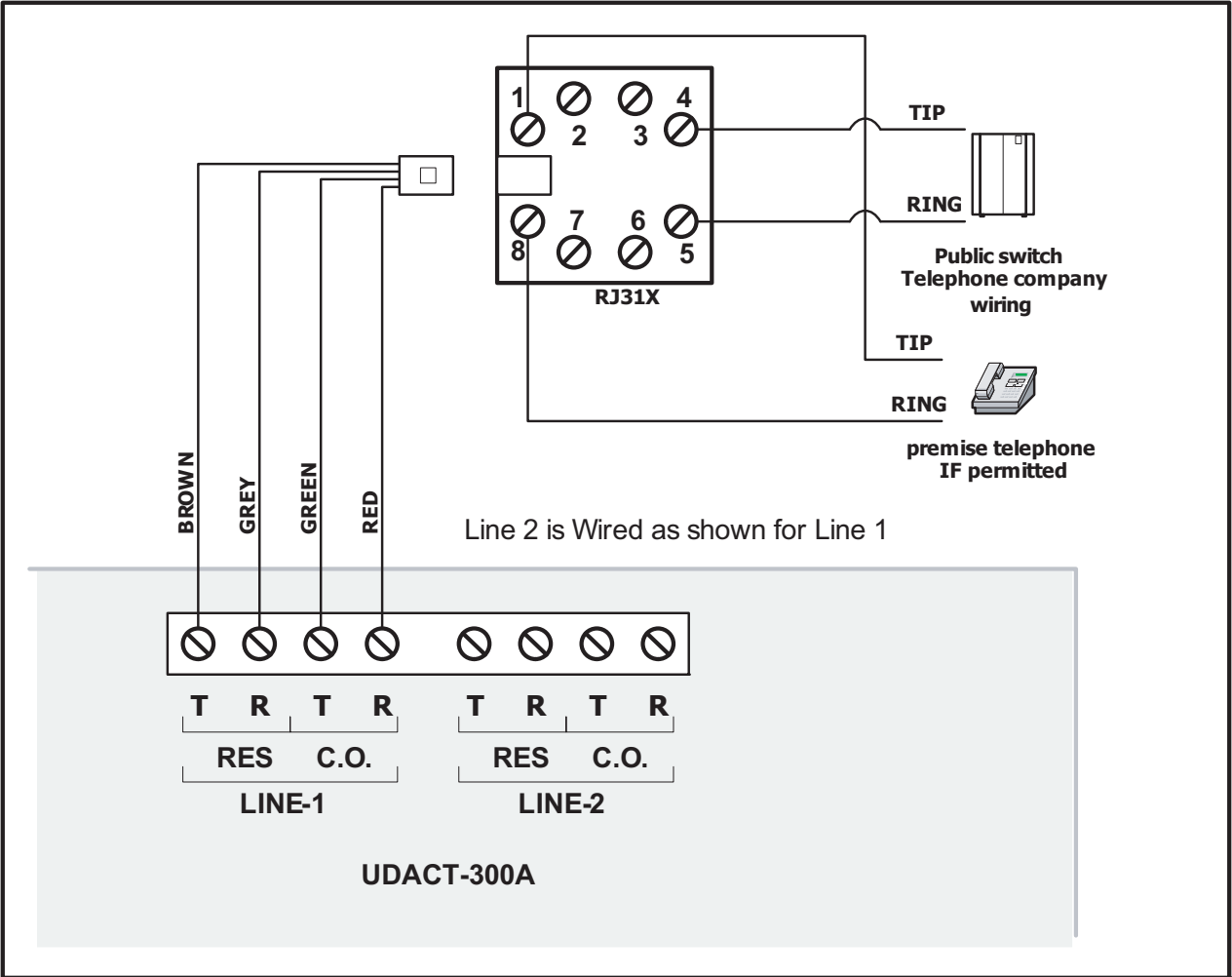
Power Supply Connections

The power supply is part of the main chassis. The ratings are outlined in the table below.

Model	Electrical Input Ratings	Power Supply Total Current	Battery Fuse on Main Module
FX-2003-12N/DS & FX-2017-12N/DS Main Chassis	120 VAC, 60 Hz, 2A / 240VAC, 50hz, 1A	12 amps maximum	20 Amp, 1-1/4" Slow Blow Non-replaceable Fuse
FX-2009-12N/DS Main Chassis	120 VAC, 60 Hz, 2A / 240VAC, 50hz, 1A	12 amps maximum	20 Amp, 1-1/4" Slow Blow Non-replaceable Fuse
All Chassis'	IN-LINE 20 Amp, 1 1/4" Fast Acting Fuse, positive side of Battery Connection		

See Appendix A for more power supply specifications. Wire as shown below with proper gauge wire.

Figure 45:   Power Supply Connections
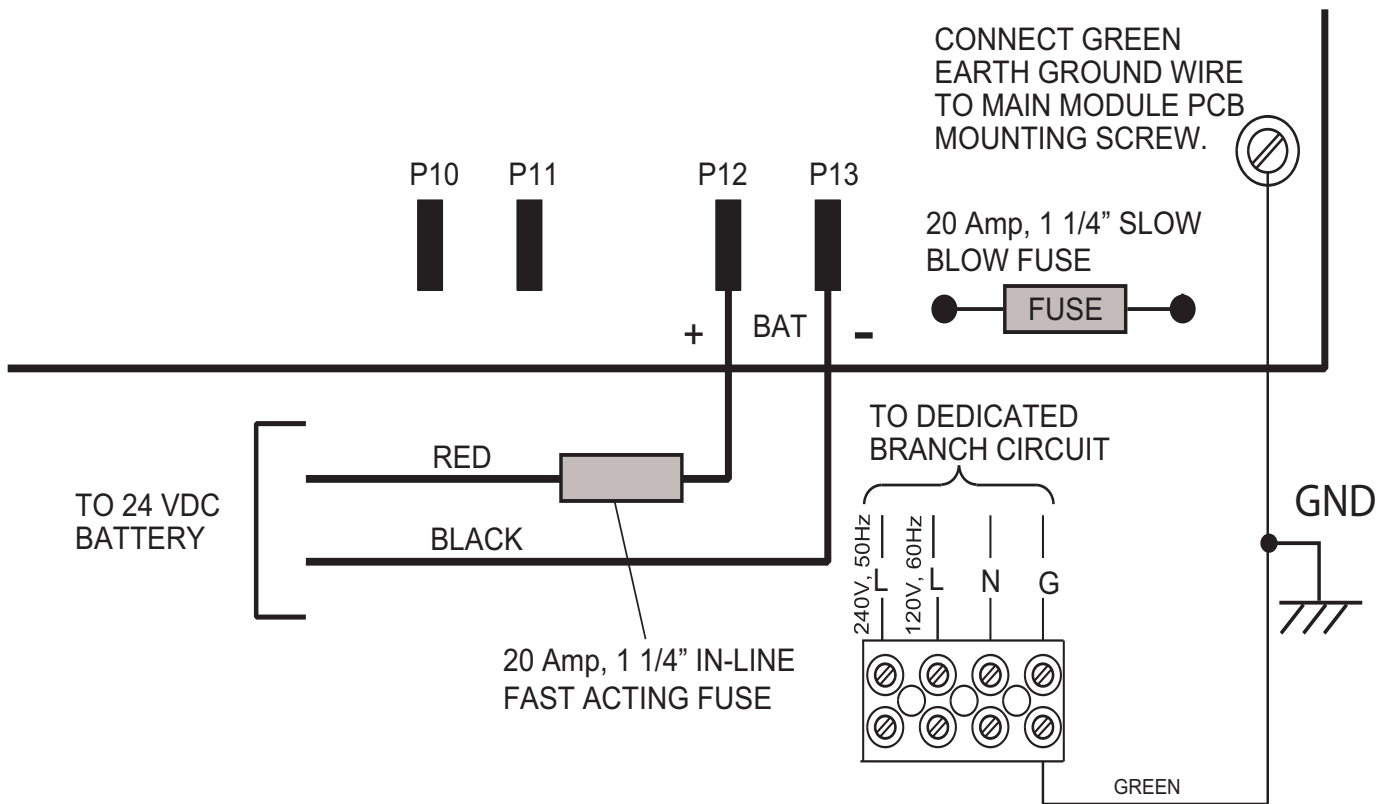
CAUTION:

- To prevent sparking, connect batteries after the system's main A.C. power is turned ON.
- *Do not exceed power supply ratings.*
- **Adhere to voltage markings as specified on labels.**

Wiring Tables and Information

Table 9: Wiring Table for Initiating Circuits.

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

i **Note:** Maximum loop resistance should not exceed 100 Ohms.

Table 10: Wiring Table for NACs

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

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
1.7	78	24	125	38	200	61	285	87	1.0

i **Note:** Maximum voltage drop should not exceed 1.8 volts.

Table 11: Analog Loop Wiring

Wire Gauge (use twisted pair)	Loop Total (Out and In) Maximum Twisted Pair Wire Run	
(AWG)	ft.	m
12	10,000	3049
14	7971	2429
16	4980	1518
18	3132	955

Note:
- Line capacitance shall not exceed 0.5 mF.
- Inductance shall not exceed 1 mH.
- Resistance shall not exceed 40 ohms.

Power Wiring: Use Table 10: Wiring Table for NACs 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 10: WIring for NACs 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.

System Checkout

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). Refer to NFPA 70.
8. Make sure to *close the front cover plate* before powering the system from main AC supply.

> ℹ️ **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.

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 Guide.

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. *Note: disconnecting a circuit will cause a system trouble (off-normal position).*
Ground Fault	The FX-2000N panel has a Common 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.

Indicators, Controls, and Operation

Refer to Figure 46 below for LED indicators, control buttons, and switches locations.

Figure 46: Indicators and Control Location
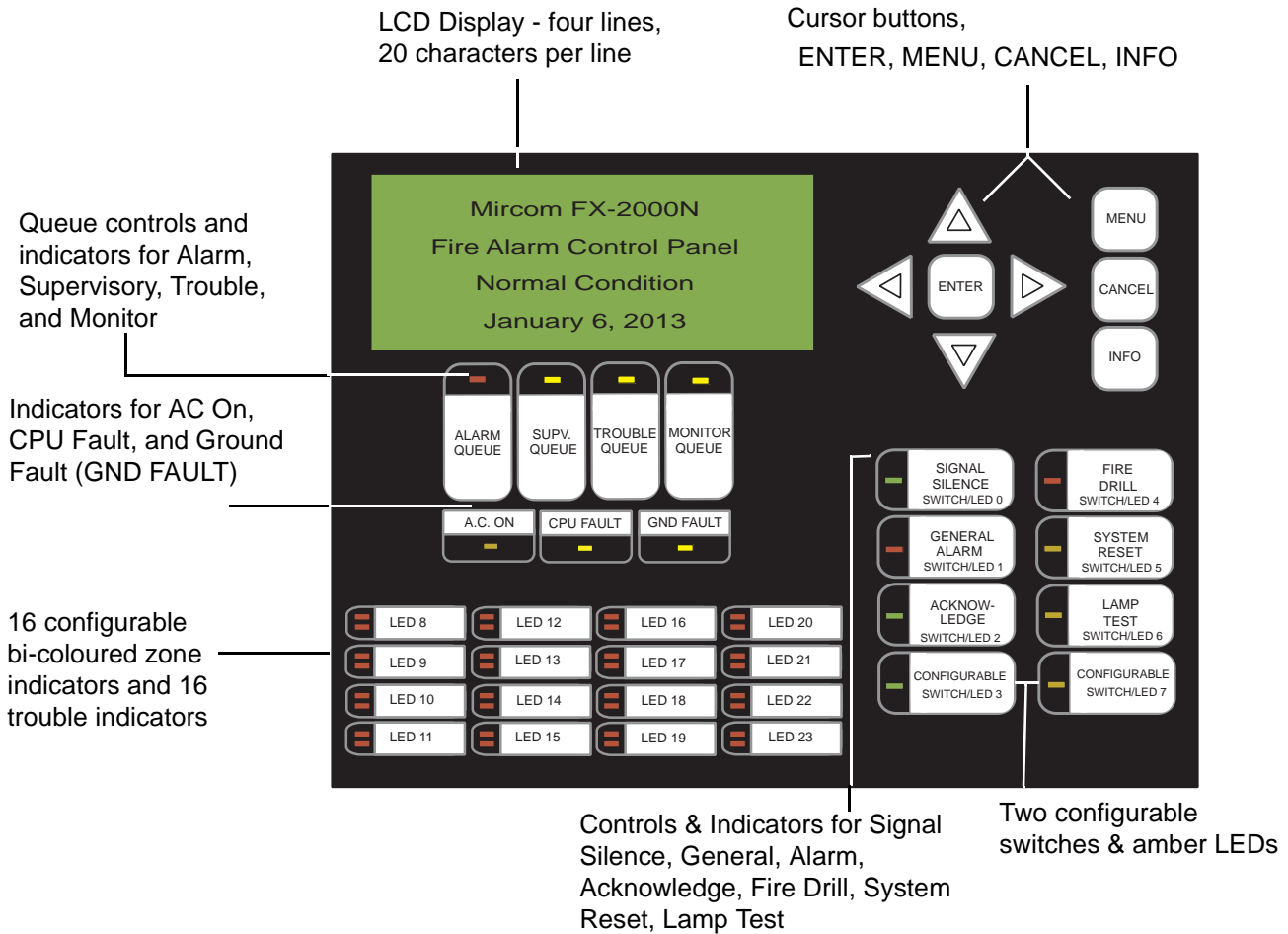
LED indicators are amber (trouble or supervisory), red (alarm), or green (AC On), and may illuminate continuously (steady) or at one of two flash rates:

- **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."

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.

Common Indicators

Indicators	Description
Buzzer	The Buzzer is activated by any of the following Fire Alarm - Steady Supervisory Alarm - Fast Rate Trouble - Trouble Rate Monitor - Configurable to sound at Trouble Rate 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.
AC On LED	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.
Alarm Queue LED	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.
Supervisory Queue LED	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.
Trouble Queue LED	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.
Monitor Queue LED	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.
CPU Fault LED	The CPU Fault Indicator is flashed yellow at the Trouble Flash Rate if the CPU is faulty.
Fire Drill LED	The Fire Drill Indicator turns on steady amber while Fire Drill is active.
Acknowledge LED	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.

Common Controls

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.

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.

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.
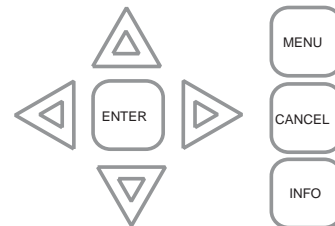
Enter Button

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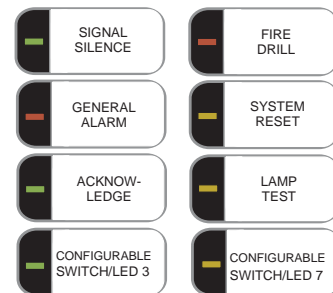
Cancel Button

This button is used to cancel an operation.

Menu Button

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

Info Button

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

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 NACs
- 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.

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 NACs. 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 NACs 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.

Fire Drill Button

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

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 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 Indicator is on steady amber.

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.

Lamp Test Button

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

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 NACs 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

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 indicating 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 (s*ee Indicating (Signal) Circuit Types section*).
- If the panel is not already in General Alarm and if the Acknowledge LED is on steady indicating 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.

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

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-2000N 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.

> ℹ **Note: Pre-Signal is not permitted to be used in Canada, unless approved by the AHJ.**

Circuit Types

The term **circuits** refers to an actual electrical interface, either initiating (detection) or indicating (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.

Initiating (Detection) Circuit Type

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 start-up 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 Appendix D Alarm Verification for details.
Water-Flow Alarm	An alarm for water-flow sensors. These alarms are identical to normal non-verified alarms except that any NACs 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.**
Sprinkler Alarm	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. **Note: Do not use the retard operation with any external retarding device; maximum retard may not exceed 120 seconds.**
General Alarm	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 *all* NACs.
Non-Latching Supervisory	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.
Latching Supervisory	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 *not* clear.

Initiating (Detection) Circuit Type	Description
Monitor	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).
Trouble-Only	This circuit is used for monitoring a trouble condition from an external device such as a Mircom Series 500 Audio System. Both open and short circuits generate a non-latching trouble condition.

Indicating (Signal) Circuits Types

| Indicating (Signal) 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	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. **Note: The NFPA-72 and ULC-S527 specify temporal tone. However, for retrofits of systems that were previously approved, coded signalling is allowed.**
Strobe	For visual devices such as strobes that use no code patterns (they are continuous).

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
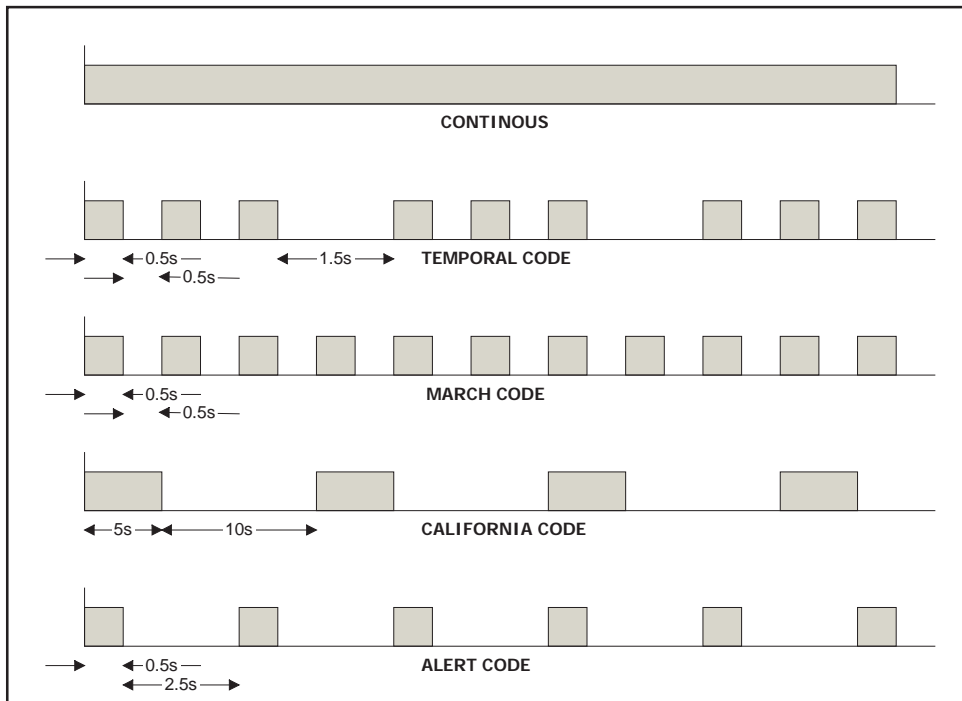
Configuration

The FleX-Net^{TM} network system which includes FX-2003-12N/DS, FX-2009-12N/DS, FX-2017-12N/DS, FX-2000ND/S and FX-2000MNS is configured using Mircom software MSW-025.

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
Alarm Transmit Silence	No	Enabled or Disabled	Disabled or unchecked

Configuration Backup, Query and Fast-Forward

The panel supports previous, current and next configuration. The panel can be load configured without taking the panel off-line. Configuration reverts back to previous or moves to future configuration through front-panel menu.

OPEN Graphic Navigator Software Package

This software package (OPEN GN) allows 3D graphic display of premises and devices. It provides unlimited floor plans and events, node and job support. It supports input file formats for floors such as .svg, .dxf, .pdf, .png, .wmf, .jpeg. Device icons and state animations can be customized.

Ethernet Port

Integrated TCP/IP Stack, Hardware based MAC address. Provides a fully configurable IP address. Use this ethernet port to connect to OPEN graphics software. This port also provides web server for diagnostic and system report via LAN or WAN connection on-site or remotely.

Boolean Logic Engine

Boolean logic functions are now available within the configuration software. Sophisticated logic functions such as:

AND, OR, NOT, ANY n of m, >, <, >=, <>

Built-in timers or user configurable timers and intervals and schedules available to support UUKL operations.

uBoot Based BootLoader

This program (inherent in the configuration) provides leading technology that allows a choice of multiple configuration files or firmware revisions to support site-specific requirements.

The FleXBoot^{TM} shell offers UNIX style commands for directory listing, log download, diagnostic probing and system tuning and optimization.

Typical FleX-Net^{TM} System Layouts with Audio

The following figures show two typical applications for the FleX-Net^{TM} system with audio.

Figure 48 below shows a typical FleX-Net^{TM} system layout with the main lobby control panel as Node 1 and the combination Fire Alarm and Audio Network systems as Node 2 and 3. The diagram also shows addressable fire alarm loops, paging and telephone connections and audio cabinets.
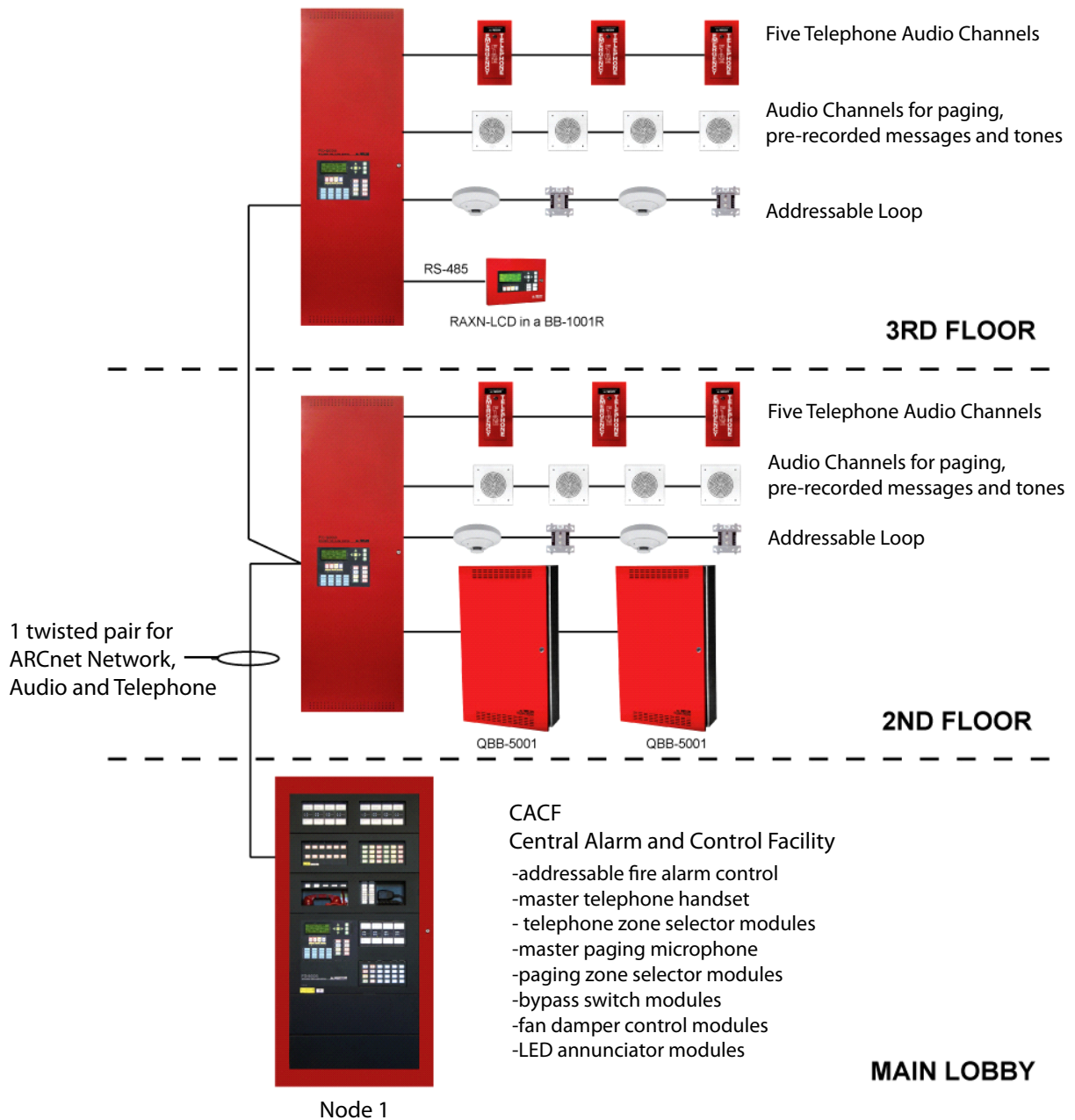
Figure 48: Typical FleX-Net^{TM} System with Audio Nodes

Five Telephone Audio Channels

Audio Channels for paging, pre-recorded messages and tones

Addressable Loop

RS-485

RAXN-LCD in a BB-1001R

3RD FLOOR

Five Telephone Audio Channels

Audio Channels for paging, pre-recorded messages and tones

Addressable Loop

1 twisted pair for ARCnet Network, Audio and Telephone

QBB-5001   QBB-5001

2ND FLOOR

CACF
Central Alarm and Control Facility

-addressable fire alarm control
-master telephone handset
- telephone zone selector modules
-master paging microphone
-paging zone selector modules
-bypass switch modules
-fan damper control modules
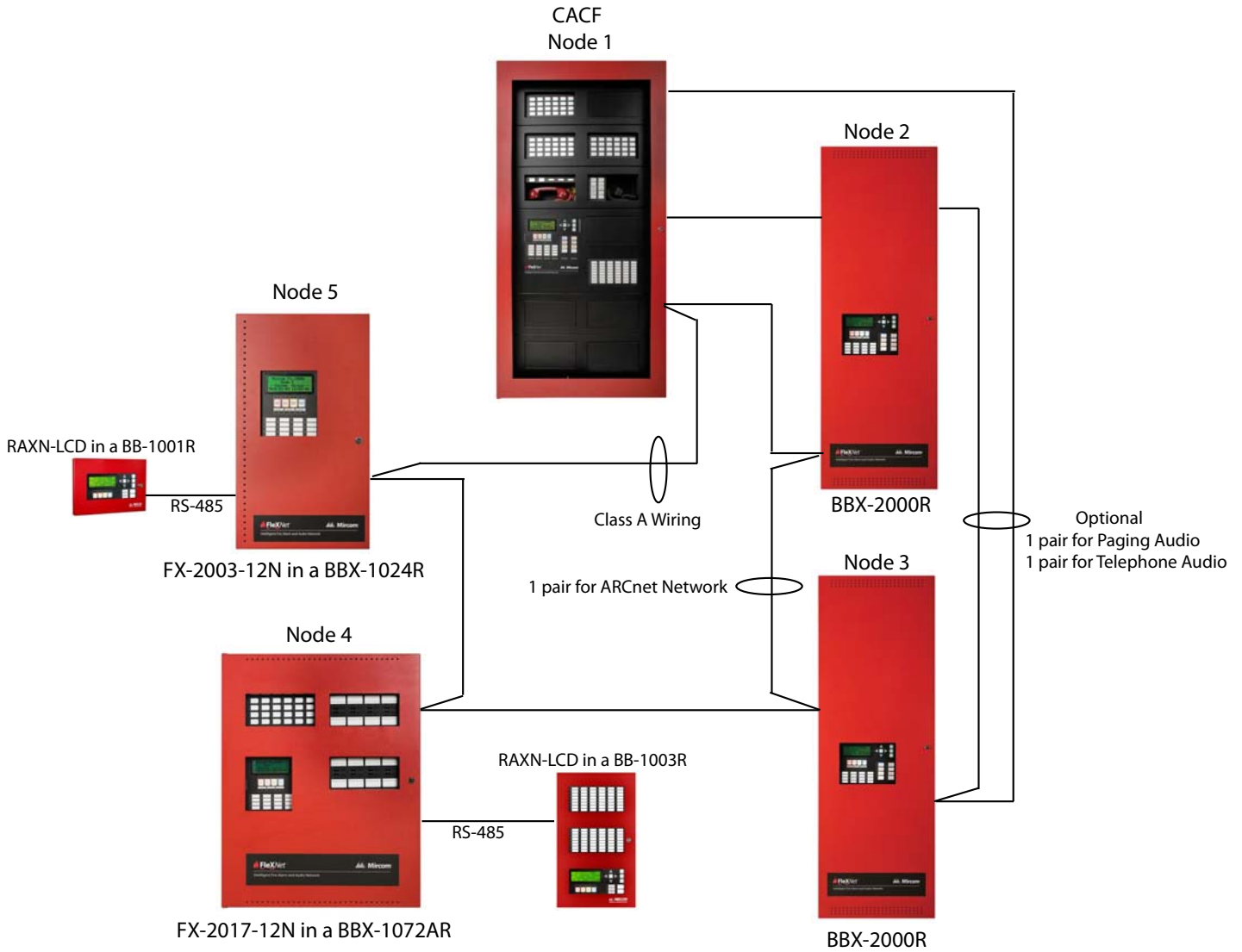-LED annunciator modules

MAIN LOBBY

Node 1

Figure 49 below shows the FleX-Net™ fire alarm and audio shown within the Integrated Network Fire/Audio cabinet as Node 2 and 3. Paging and telephone devices are hooked up to Nodes 2 and 3.

Figure 49:   Typical FX-2000N Network System with Audio and Non-Audio Nodes

NOTE: Wiring for ARCnet Network, Audio and Telephone can be as shown (3 pairs) or 1 pair as shown in Figure 46

System Components for the Integrated Fire/Audio Cabinet

Network Fire Alarm

	Model	Description
	FX-2000ND	**12 Amp Large Main Chassis.** This large main chassis comes complete with one Analog Loop Controller (99 Analog Sensors and 99 Addressable Modules), 4 Class A/B (Style Z/Y) Indicating Circuits (1.7 Amp each), a 4 line by 20 character back-lit LCD display, 16 zone LED annunciator and a 12 ampere power supply which charges 17-65 AH batteries. The Integrated Fire and Audio system supports the FNC-2000 Network Controller Module, the ANC-5000 Audio Network Controller Module and the TNC-5000 Telephone Network Controller Module. This chassis mounts in the BBX-2000 backbox.
	FX-2000NDS	Same as above. Different front panel appearance.

Network Controller Modules

	Model	Description
	FNC-2000	Provides network capability for the FX-2000N Fire Alarm panel. One module is required per one network node panel. The FNC-2000 Fire Network Controller module is mounted in position 2 over the FX-2000ND main board.
	ANC-5000	Audio Network Controller module. The ANC-5000 Audio Network Controller module is mounted on a metal plate (which is packaged with the FX-2000ND) and then the plate is mounted into BBX-2000 backbox in position 1 of the QMB-5000N Card Cage.
	TNC-5000	Telephone Network Controller module. The TNC-5000 Telephone Network Controller module is mounted below the ANC-5000 Audio Network Controller module and both are mounted on a metal plate and then the plate is mounted into the BBX-2000 backbox in position 1 of the QMB-5000N Card Cage.

Fiber Optics Module

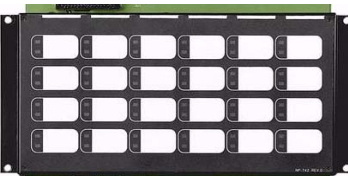| Model	Description
FOM-2000-SP	Connects to the FNC-2000 Fire Alarm Network Controller Module and allows fiber optics cabling.

Adder Modules

Model	Description
DM-1008A, SGM-1004A, RM-1008A	Loop and Circuit Adder Modules

Auxiliary Modules

Model	Description
PR-300	Polarity Reversal and City Tie Module
UDACT-300A	Digital Communicator/Dialer Module

Programmable Modules

Model	Description
FDX-008	Fan Damper Module
IPS-2424/DS	Programmable Input Switches Module (mounts with the FX-2009-12N/DS and can also be part of the RAXN-LCD)

FleXNet^TM Mass Notification System (BBX-FXMNS) Enclosure

This enclosure can accommodate all existing modules, except the QMP-5101N Network Master Paging Control module and the QMT-5302N Master Firefighters' Telephone. New models, QMP-5101NV vertical mounting master paging microphone and QMT-5302NV Master Telephone panels are used instead to mount within the BBX-FXMNS Enclosure. The BBX-FXMNS enclosure includes a backbox and a two part door and display deadfront chassis.
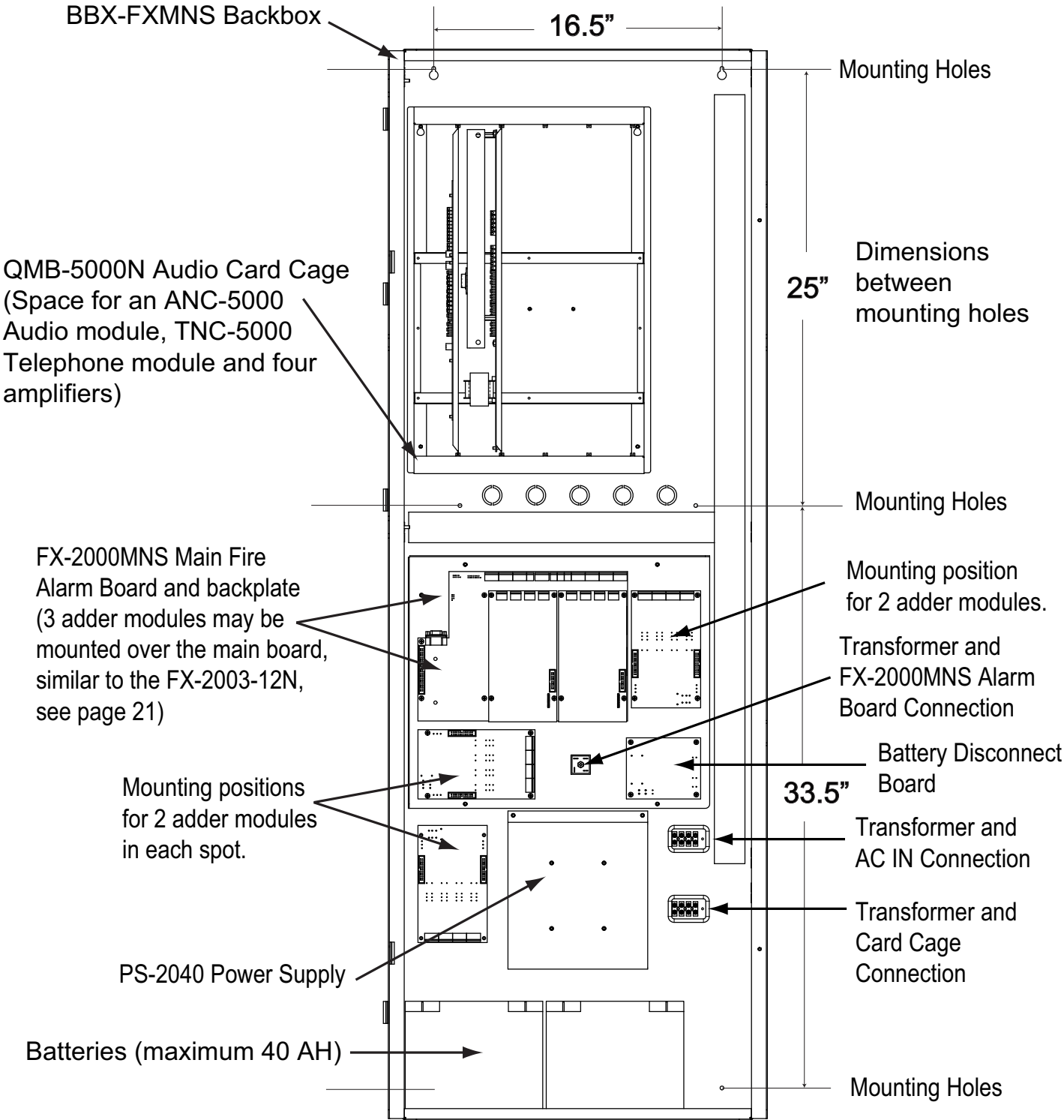
Figure 50: BBX-FXMNS Enclosure
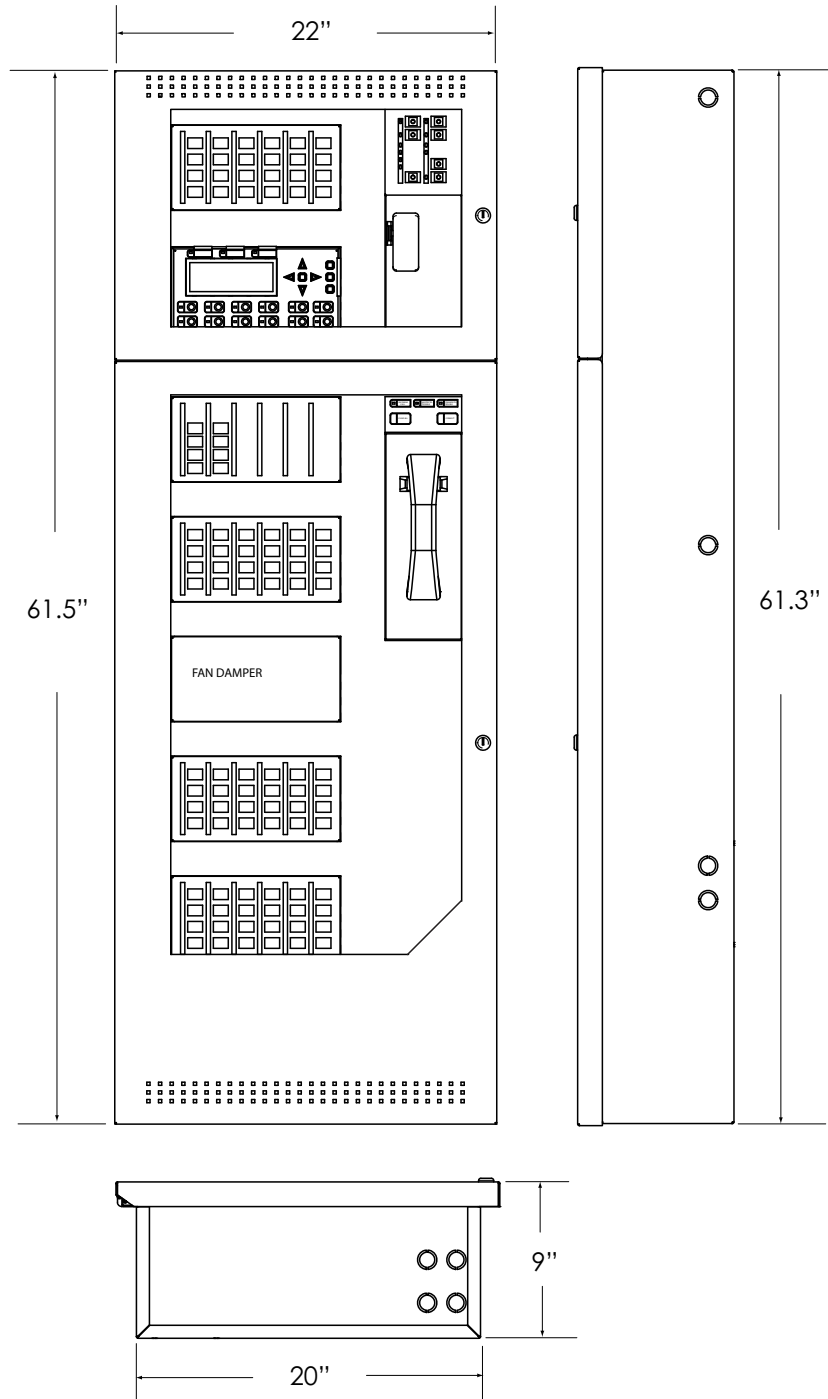
Notes: When using the BBX-FMNS as a Mass Notification System (ACU) refer to Appendix J.

The BBX-FXMNS backbox supports the QMB-5000N amplifier backplane and card cage which holds up to four amplifiers, the FX-2000MNS Fire Alarm main board chassis and PS-2040 Power Supply.

Figure 51:   BBX-FXMNS Backbox Dimensions and Contents

BBX-FXMNS Backbox

16.5"

Mounting Holes

QMB-5000N Audio Card Cage (Space for an ANC-5000 Audio module, TNC-5000 Telephone module and four amplifiers)

25"

Dimensions between mounting holes

Mounting Holes

FX-2000MNS Main Fire Alarm Board and backplate (3 adder modules may be mounted over the main board, similar to the FX-2003-12N, see page 21)

Mounting position for 2 adder modules.

Transformer and FX-2000MNS Alarm Board Connection

Battery Disconnect Board

Mounting positions for 2 adder modules in each spot.

33.5"

Transformer and AC IN Connection

PS-2040 Power Supply

Transformer and Card Cage Connection

Batteries (maximum 40 AH)

Mounting Holes

Figure 52: BBX-FXMNS Enclosure Complete View

BBX-FXMNS FRONT DOORS
AND DEADFRONT CHASSIS

BBX-FXMNS BACKBOX
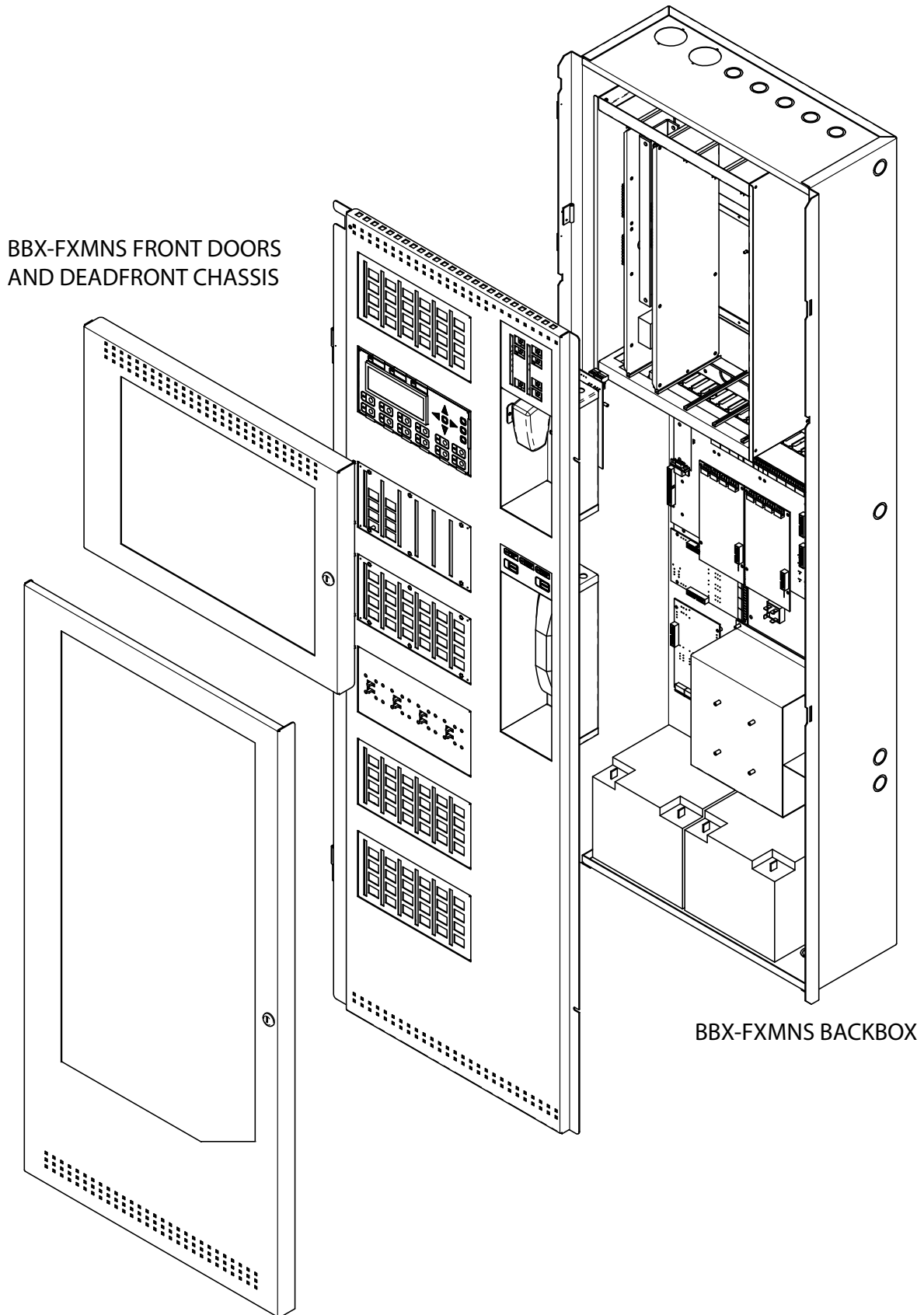
Figure 53: Mounting Vertical Microphone and Telephone Modules in the BBX-FXMNS

Back side of BBX-FXMNS inner door

Door Hinge

Modules are mounted from the backside of the middle door using the screws provided

Door Hinges

Door Hinge
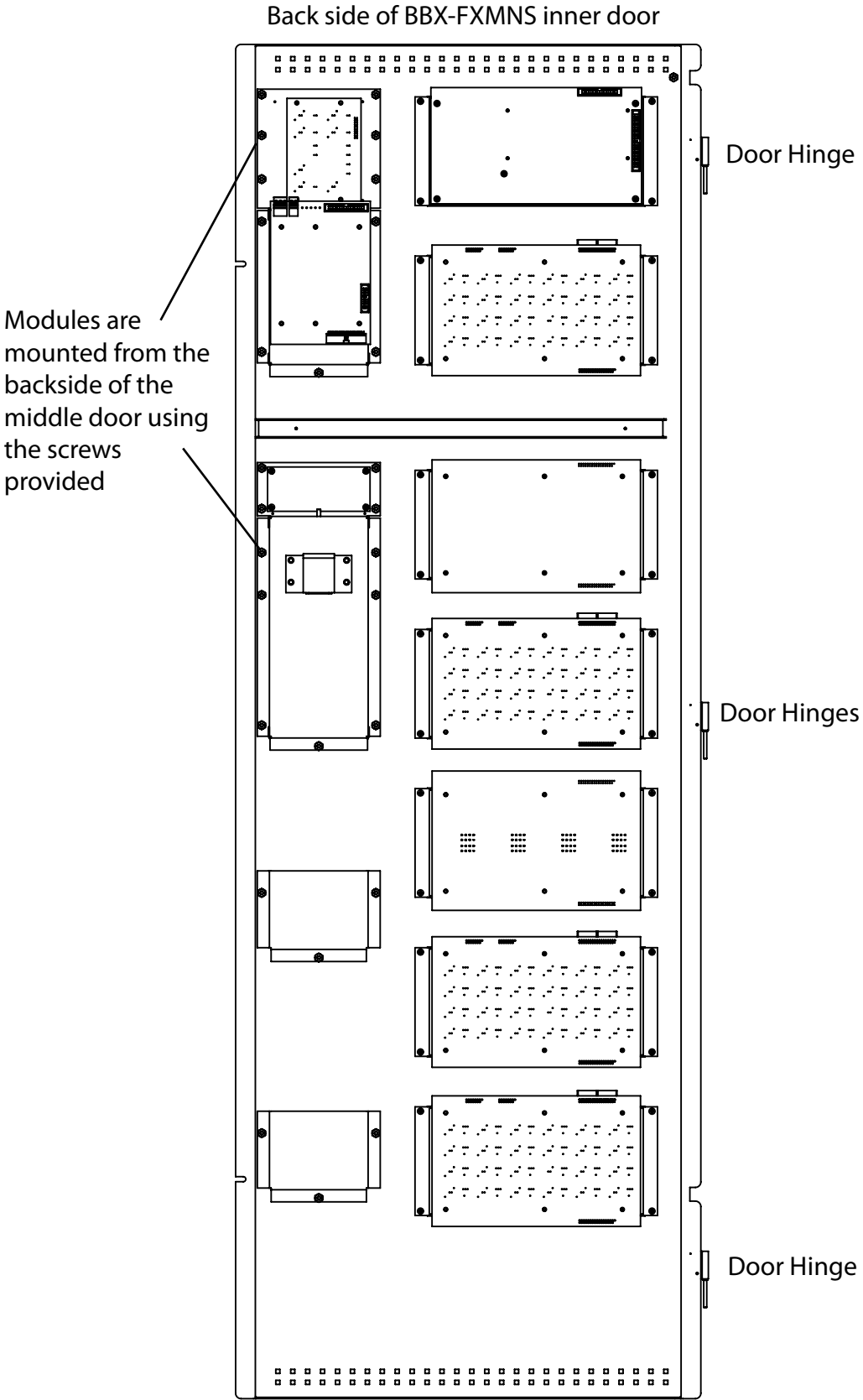
# Integrated Fire/Audio Cabinet Mechanical Installation

The Integrated Fire/Audio Cabinet is the network fire alarm and audio floor or node panel. It is mounted into the BBX-2000 backbox and door. Mount the backbox onto the wall using six #8 screws to secure the backbox to the wall. The backbox is surface mounted only; the dimensions for the mounting holes are shown in Figure 54 below. The Integrated Fire/Audio Cabinet consists of the Audio Card Cage, FX-2000ND Deep Chassis with FX-2000N Main Control board/2 Amp Battery Charger, and PS-2040 10 Amp Fire Alarm/30 Amp Audio Power Supply. Batteries are mounted in the tray located at the bottom of the enclosure.

Figure 54: BBX-2000 Enclosure with the Integrated Fire and Audio System

BBX-2000 Enclosure

16.5"

Metal plate with ANC-5000 and TNC-5000 modules aboard fit into position 1 of the QMB-5000N Audio Card Cage

QAA Amplifiers fit into slot positions 2, 3, 4 and 5.

QMB-5000N Audio Card Cage

25"

FX-2000ND Main Chassis with provision to mount FNC-2000 Network Controller Module and 2 adder modules/loop controllers

PS-2040 Power Supply and space to mount 6 adder modules/ loop controllers

33.5"

Batteries (maximum 40 AH)

Each part has to be mounted into the backbox by the user. The QMB-5000N Audio Card Cage is mounted in the top left side of the backbox over the four studs with the #8 Hex nuts provided. The FX-2000ND Main Chassis is mounted below the audio card cage over the four studs provided using four #8 Hex nuts. The PS-2040 power supply is mounted under the main chassis with #10 Hex nuts, the power supply cover is mounted over the transformer and over the two studs using the #6 hex nuts and the batteries are placed on the battery tray which comes mounted at the bottom of the backbox.

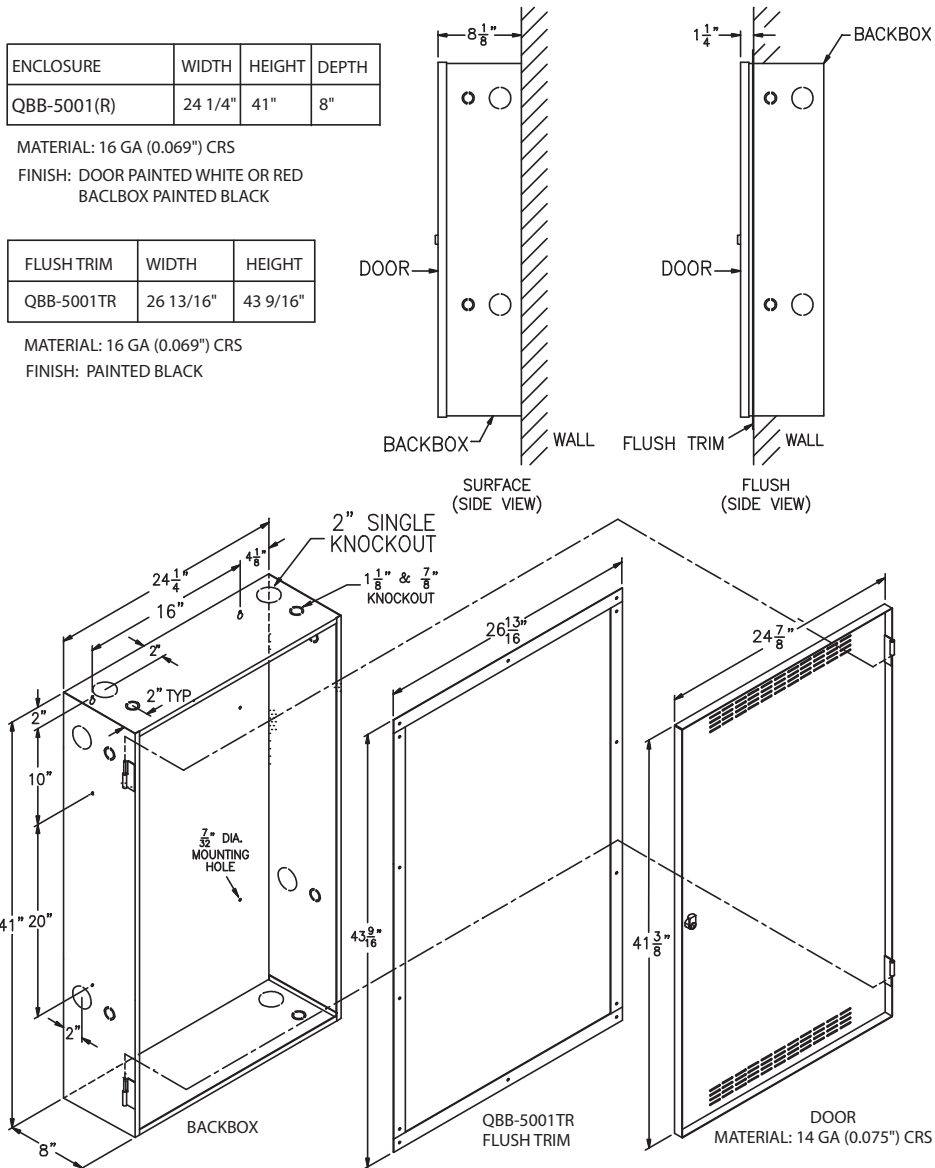## Figure 55: Perspective View of BBX-2000 Enclosure with Integrated Fire and Audio System
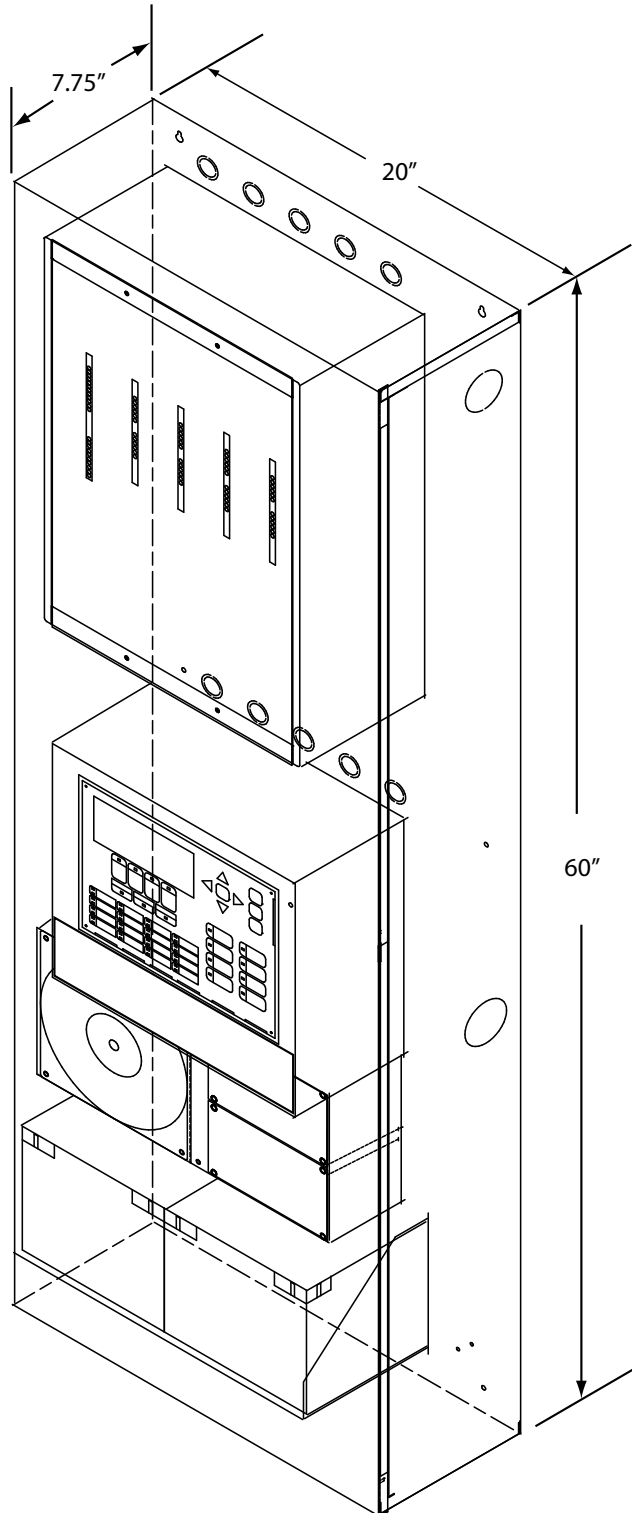
Mechanical Installation for the Expansion Audio Cabinet

QBB-5001/R Expansion Audio Cabinet Installation

Expansion audio cabinets are mounted as shown in Figure 56 below. The QBB-5001/R is the backbox and door. The QBB-5001/R backbox may be flush or surface mounted. The QBB-5001TR is the metal flush trim. Install all cabinets and enclosures empty. Pull all required wiring in through the conduit holes provided (must be punched out). Do not mount the modules until mechanical installation is complete and all wires have been fed into the cabinets and enclosures.

Figure 56: **Expansion Audio Cabinet Mechanical Installation**

ENCLOSURE	WIDTH	HEIGHT	DEPTH
QBB-5001(R)	24 1/4"	41"	8"

MATERIAL: 16 GA (0.069") CRS

FINISH: DOOR PAINTED WHITE OR RED
BACLBOX PAINTED BLACK

FLUSH TRIM	WIDTH	HEIGHT
QBB-5001TR	26 13/16"	43 9/16"

MATERIAL: 16 GA (0.069") CRS
FINISH: PAINTED BLACK

Notes:

• It is extremely important to connect the audio cabinets earth-ground point (chassis ground) to the earth ground.

• The power supply mounts on the bottom left-hand corner of the backbox and the batteries are placed on the bottom to the right of the power supply. Conduits should be brought in only through the conduits provided at the bottom right hand corner of the cabinet.

FX-2000ND Fire Alarm Chassis Layout
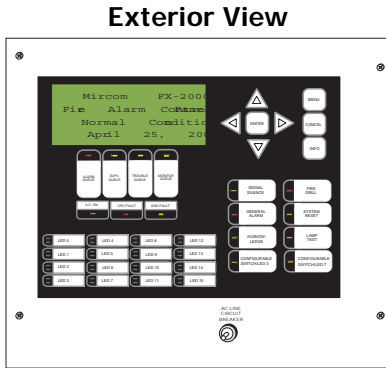
Exterior View

Interior View

Slot 3 is reserved for PR-300 or UDACT-300A only. If not required, this slot can be used to mount (3) any of the adder modules.
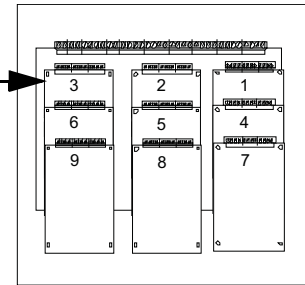
The recommended mounting position is 2 for the FNC-2000. The FOM-2000-SP board if used, is mounted over the FNC-2000 board.
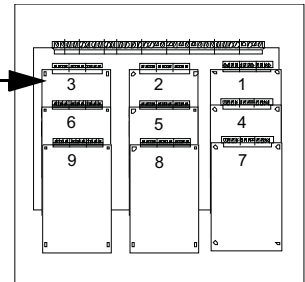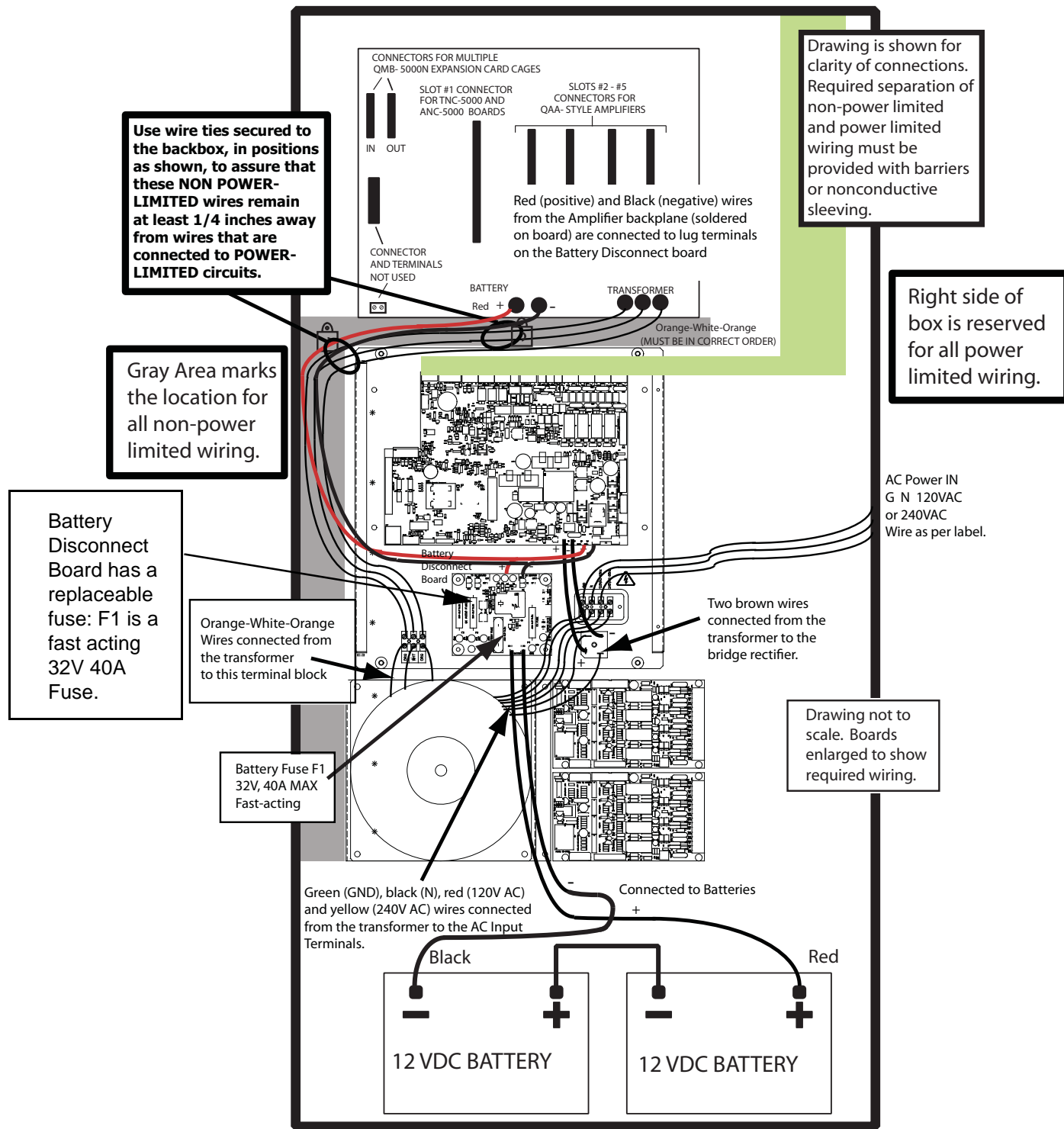

FX-2000ND FIRE ALARM MAIN BOARD

The FX-2000ND mounts into the BBX-2000 below the QMB-5000N Audio Card Cage and above the PS-2040 Power Supply (view Figure 54).

FX-2000NDS Fire Alarm Chassis Layout

Exterior View

Interior View

Slot 3 is reserved for PR-300 or UDACT-300A only. If not required, this slot can be used to mount (3) any of the adder modules.

The recommended mounting position is 2 for the FNC-2000. The FOM-2000-SP board if used, is mounted over the FNC-2000 board.

FX-2000NDS FIRE ALARM MAIN BOARD

The FX-2000NDS mounts into the BBX-2000 below the QMB-5000N Audio Card Cage and above the PS-2040 Power Supply (view Figure 54).

Integrated Fire/Audio Cabinet - Audio Module Placement and Internal Wiring

The modules that mount into the Integrated Fire/Audio Cabinet audio card cage are the amplifier modules. Up to four amplifiers may be installed in each Integrated Fire/Audio Cabinet with one of the four as a backup. Slot #1 is used for the ANC-5000 and/or TNC-5000 modules.

Figure 57: **Integrated Fire/Audio Cabinet Internal Power Wiring.**

CONNECTORS FOR MULTIPLE
QMB- 5000N EXPANSION CARD CAGES

SLOT #1 CONNECTOR
FOR TNC-5000 AND
ANC-5000 BOARDS

SLOTS #2 - #5
CONNECTORS FOR
QAA- STYLE AMPLIFIERS

IN   OUT

CONNECTOR
AND TERMINALS
NOT USED

Drawing is shown for clarity of connections. Required separation of non-power limited and power limited wiring must be provided with barriers or nonconductive sleeving.

Use wire ties secured to the backbox, in positions as shown, to assure that these NON POWER-LIMITED wires remain at least 1/4 inches away from wires that are connected to POWER-LIMITED circuits.

Red (positive) and Black (negative) wires from the Amplifier backplane (soldered on board) are connected to lug terminals on the Battery Disconnect board

BATTERY

Red +   –

TRANSFORMER

Orange-White-Orange
(MUST BE IN CORRECT ORDER)

Right side of box is reserved for all power limited wiring.

Gray Area marks the location for all non-power limited wiring.

Battery Disconnect Board has a replaceable fuse: F1 is a fast acting 32V 40A Fuse.

Orange-White-Orange Wires connected from the transformer to this terminal block

Battery Disconnect Board

AC Power IN
G N 120VAC
or 240VAC
Wire as per label.

Two brown wires connected from the transformer to the bridge rectifier.

Battery Fuse F1 32V, 40A MAX Fast-acting

Drawing not to scale. Boards enlarged to show required wiring.

Green (GND), black (N), red (120V AC) and yellow (240V AC) wires connected from the transformer to the AC Input Terminals.

–
Connected to Batteries
+

Black   Red

12 VDC BATTERY   12 VDC BATTERY

Integrated Fire Alarm Connection

The FX-2000ND/S Chassis consists of the Network Fire Alarm main board and chassis.

Battery Power

The power cable is used to provide power from the batteries to the FX-2000ND/S Fire Alarm main board and the audio card cage motherboard. Power from the batteries is first directed to the Battery Disconnect Board, from this board the power is connected to the main fire alarm board and the audio card cage. The red and black wires are soldered on the audio card cage and the spade ends are connected to the red (+) and black (-) connectors on the Battery Disconnect Board. The extra positive and negative wires (from the Y power cable) are connected to the spades on the main fire alarm board and the spade connectors from the bottom of the Battery Disconnect Board are hooked up to the batteries, red (+) and black (-). Refer to Figure 57.

Transformer Power

The orange, white, orange wires are soldered on the audio card cage motherboard. They are connected to the terminal block located on the power supply cover (which covers the transformer) in the order left to right, orange-white- orange. The orange-white-orange wires from the transformer are connected to the top terminals located on the power supply cover in the same order (orange-white-orange). The yellow wire is connected to the 240V terminal, the red wire from the transformer (120V) is connected to the 120V terminal on the fire alarm chassis, the black wire (from the transformer) connects to the N terminal and the green wire (from the transformer) to the G (Ground) terminal all located on the fire alarm chassis. If using 240V supply connect the yellow wire to the 240V terminal, but do not connect the 120V red wire. The brown wires are connected to the bridge located on the fire alarm chassis. Refer to Figure 57.

QBB-5001/R Expansion Audio Cabinet Module Placement

The modules that mount into the QBB-5001/R expansion audio cabinet include the QPS-5000N Power Supply, the QMB-5000B Motherboard, and the QBC-5000N Battery Charger. Module interconnects are shown in Figure 58. There is no module installed into Slot #1 of the QMB-5000B Motherboard, as shown below.

Up to seven Amplifier Modules (Models QAA-5230-70/25, QAA-5230S-70/25, QAA-5415-70, QAA-5415-25 and/or QAA-5160-70/25) may be installed into Slots #2 to #8 on the QMB-5000B motherboard. The total maximum wattage per expansion audio cabinet is 360 Watts.

Figure 58: QBB-5001/R Expansion Audio Cabinet Module Placement
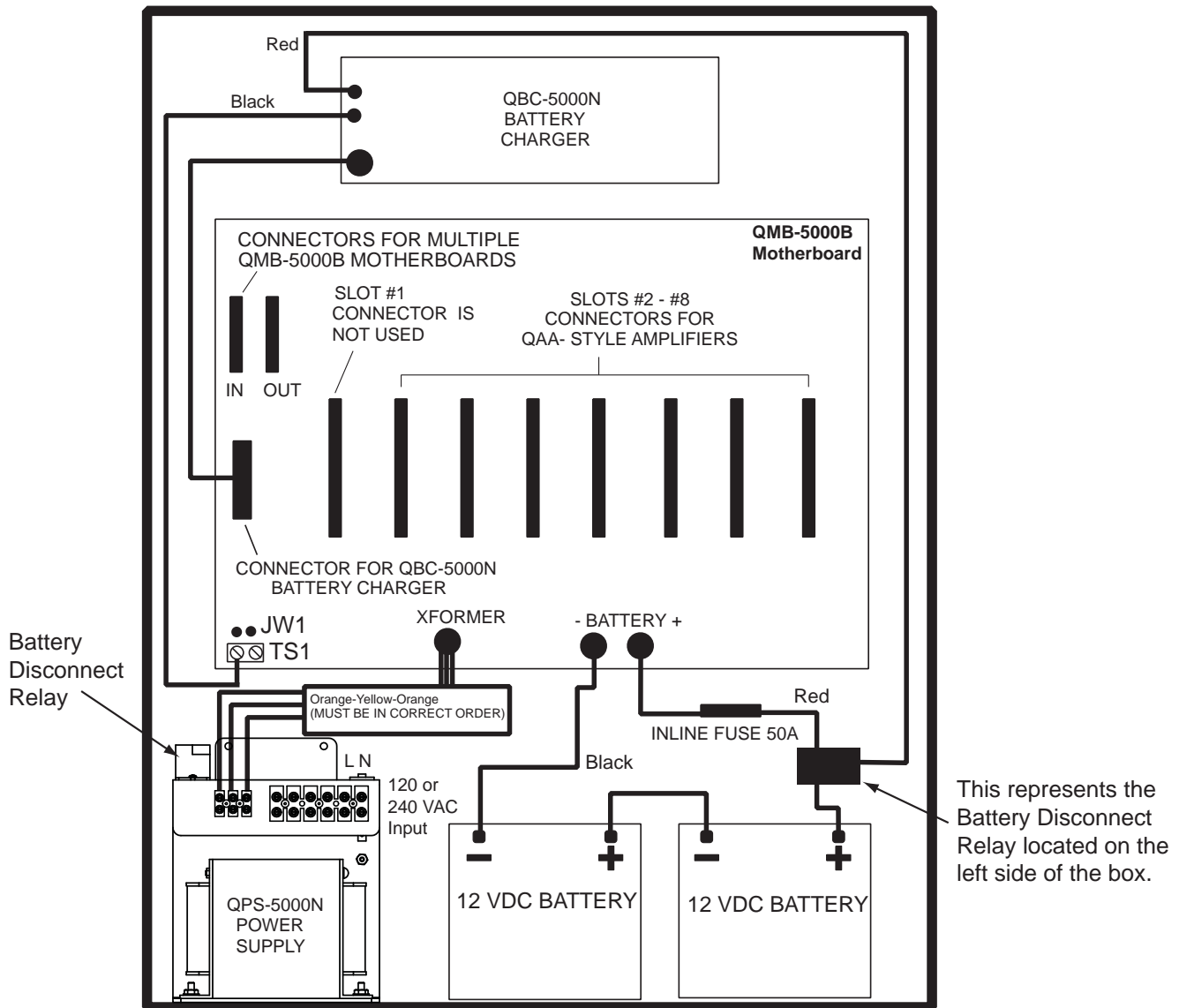
SECURE QPS-5000N POWER SUPPLY TO BACKBOX WITH LUGS AND NUTS PROVIDED

Components on the amplifiers should be facing left when inserted into motherboard. Make sure connections for the power supply and battery charger are as shown above. Place all amplifier modules from left to right in slot positions two to eight. Connect cable MD-525 from the QMB-5000N (inside the BBX-FXMNS or Integrated Fire/Audio Cabinet) to the IN connector at the top left corner of the QMB-5000B Motherboard. Connect cable MD-525 from the QMB-5000B Motherboard (connection marked OUT in the top left corner) to the next expansion audio cabinet QMB-5000B Motherboard (connection marked IN) if another audio cabinet is used. Daisy chain all other expansion audio motherboards used, up to a total of three.

QPS-5000N Power Supply Connection

Two jumpers are provide as shown in figure below for 120 VAC connection. For 240 VAC application, remove both jumpers and replace one jumper between the two middle terminals. The two terminals on the right are N (neutral), L (live) for AC voltage connection. The three terminals on the left are connected from the QMB-5000N motherboard as orange-white-orange (left to right) in that order.
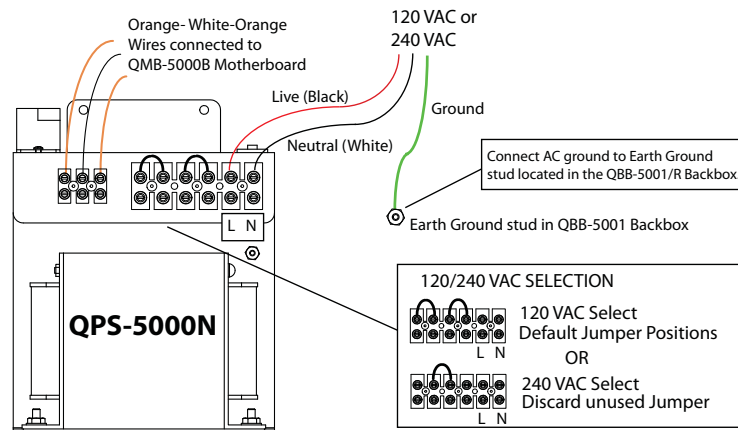
Installing and Removing Amplifiers

ATTENTION: Improper installation or excessive force will damage the motherboard and modules being installed or removed.

Installing QAA Amplifier Modules

1. Hold the amplifier to be installed by the backplate edges. *Do not* handle, push or pull any of the components on the amplifier (especially not the transformer) as this will damage those components.
2. Line up the amplifier being installed with the two plastic runners on the card cage and slide the amplifier back to the point where the amplifier just about touches the pins on the QMB-5000N/B motherboards.
3. Make sure that the amplifier is square with the motherboard.
4. Gently push the amplifier forward to line up the amplifier connector with the motherboard pins. Once you have a sense of feel that the amplifier connector and the motherboard pins are properly lined up, place one thumb on the top edge of the backplate and the other thumb on the bottom of the backplate and carefully push the amplifier in. You should hear a slight thud sound when the amplifier is snapped into place.

Note: If the amplifier connector is not properly lined up with the motherboard pins, or if excessive force is used, the pins on the motherboard can be damaged.

Removing the QAA Amplifier Modules

1. Disconnect all cables connected to the amplifier. *Do not* handle, push or pull any of the components on the amplifier (especially not the transformer) as this will damage those components.
2. Place the forefinger of one hand on the top inside edge of the front heat sink (the heat sinks are the two long silver channel-like metal covers opposite the backplate) and the forefinger of the other hand on the bottom edge of the backplate behind the card cage frame.
3. Carefully pull and rock the amplifier forward until the amplifier connector is disconnected from the motherboard pins.
4. Holding the amplifier firmly by the backplate edges, slide the amplifier forward and completely remove it from the card cage.

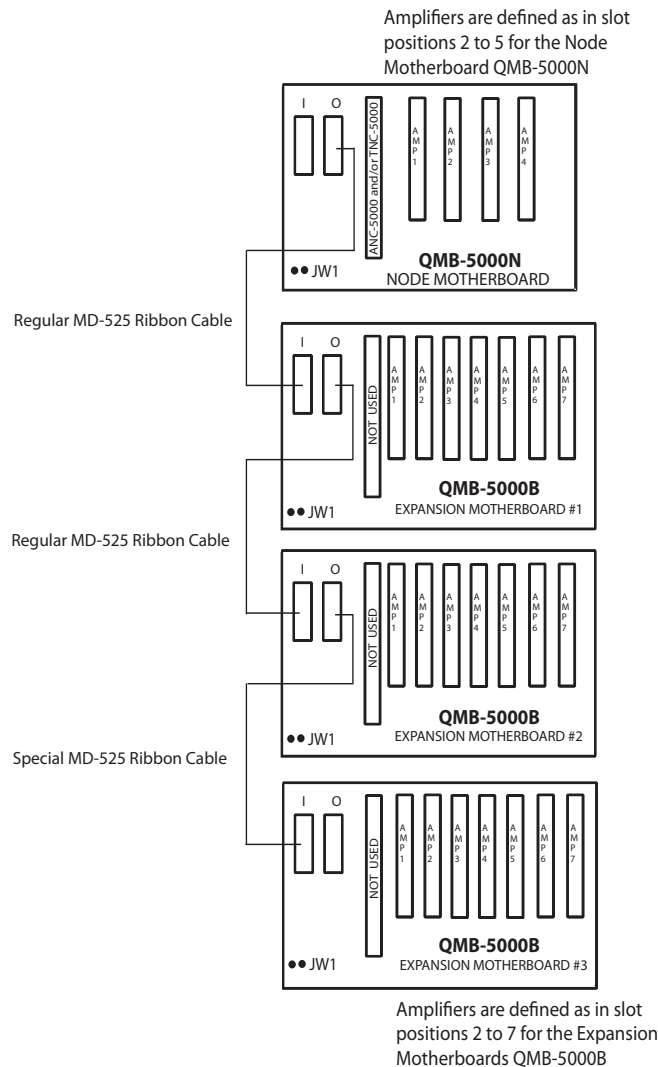**ATTENTION:** Power should be disconnected before removing and inserting modules.

Multiple QBB-5001/R Cabinet Connections

When multiple QBB-5001/R audio cabinets are used in an installation, each has its own QPS-5000N Power Supply, QBC-5000N Battery Charger, and batteries. A total of three audio cabinets may be used by simply interconnecting with Mircom MD-525 Extension Cables from the QMB-5000N "Out" Connector, to the "In" Connector on the next QMB-5000B motherboard.

QMB-5000B Motherboards #1, #2, and #3

Up to a maximum of three QBB-5001/R Audio Cabinets may be connected to a BBX-FXMNS or Integrated Fire/Audio Cabinet. The first QMB-5000N "Node" Motherboard has a connection from the FX-2000ND or FX-2000MNS. The next three QBB-5001/R Audio Cabinets contain QMB-5000B Motherboards #1, #2 and #3 which are connected with the regular ribbon cable MD-525. The MD-525 cable is connected from the output connector on the QMB-5000N "node" motherboard to the input connector on QMB-5000B motherboard #1. Another MD-525 cable is connected from the output connector on motherboard #1 to the input connector on motherboard #2 (see Figure 59 below). Again another MD-525 cable is connected from the output connector on motherboard #2 to the input connector on motherboard #3.

Figure 59: Interconnecting Extra QMB Motherboard

Amplifiers are defined as in slot positions 2 to 5 for the Node Motherboard QMB-5000N

I   O

ANC-5000 and/or TNC-5000

AMP 1 AMP 2 AMP 3 AMP 4

●● JW1   **QMB-5000N**
          NODE MOTHERBOARD

Regular MD-525 Ribbon Cable

I   O

NOT USED

AMP 1 AMP 2 AMP 3 AMP 4 AMP 5 AMP 6 AMP 7

●● JW1   **QMB-5000B**
          EXPANSION MOTHERBOARD #1

Regular MD-525 Ribbon Cable

I   O

NOT USED

AMP 1 AMP 2 AMP 3 AMP 4 AMP 5 AMP 6 AMP 7

●● JW1   **QMB-5000B**
          EXPANSION MOTHERBOARD #2

Special MD-525 Ribbon Cable

I   O

NOT USED

AMP 1 AMP 2 AMP 3 AMP 4 AMP 5 AMP 6 AMP 7

●● JW1   **QMB-5000B**
          EXPANSION MOTHERBOARD #3

Amplifiers are defined as in slot positions 2 to 7 for the Expansion Motherboards QMB-5000B

Note: Jumper JW1 (located in the bottom left-hand corner of the backplane) is installed for expansion cabinets #1 to 3.

Audio Network Card and Telephone Network Card

Each Integrated Fire/Audio Cabinet requires an ANC-5000 Audio Network Controller Card. The TNC-5000 Telephone Controller Network card is necessary only if Telephone circuits are required. Below is a diagram for mounting both audio and telephone cards into the large network fire alarm chassis, FX-2009-12N/DS.

Partial Interior View
(to right of main board)

4 7

5 8

6 9

Metal plate mounts over positions 4 to 9 inclusive

FX-2009-12N Front Door

MGC Network
Fire Alarm Control Panel
Normal Condition
April 20, 2012

TNC-5000

TNC-5000 board mounts over ANC-5000 board

ANC-5000
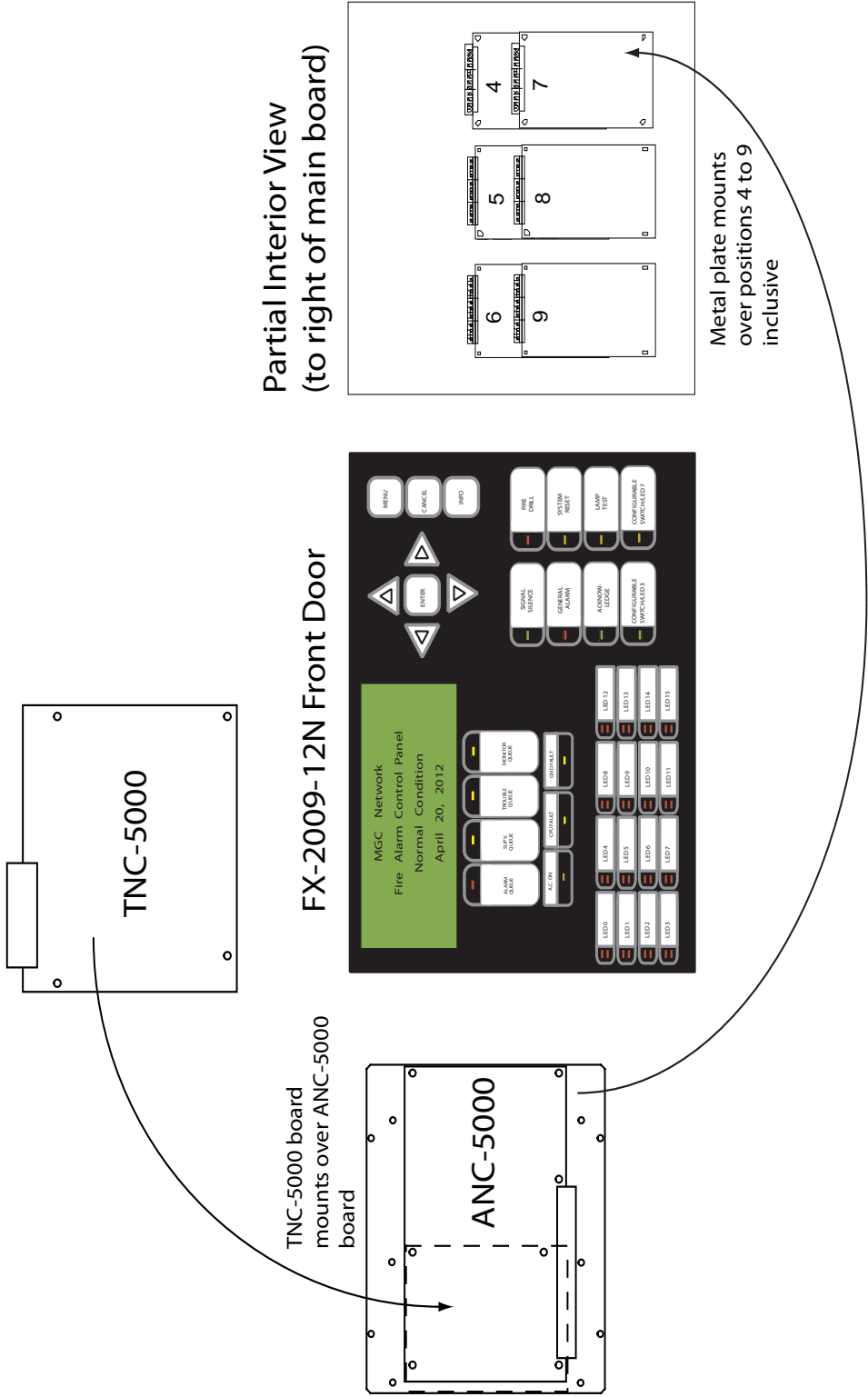
Audio Amplifier Wiring

There are five types of amplifiers available:

Amplifier	Description
QAA-5230-70/25	Two 30 watt individually supervised speaker outputs, 70V or 25V
QAA-5230S-70/25	Two 30 watt split into four 15 watt supervised speaker outputs, 70V or 25V
QAA-5415-70	Four 15 watt individually supervised speaker circuits, 70V
QAA-5415-25	Four 15 watt individually supervised speaker circuits, 25V
QAA-5160-70/25	One 60 watt supervised speaker circuit, 70V or 25V

QAA-5230-70/25 Amplifier Wiring

The QAA-5230-70/25 dual 30 watt amplifier is made up of two 30 watt supervised speaker outputs. Each circuit may be wired as Class A or Class B. Amplifier is set to 70V, if 25V is required, remove orange molex connector cable labelled MD-787 and replace with blue molex connector cable labelled MD-788.

Figure 60:   QAA-5230-70/25 Wiring
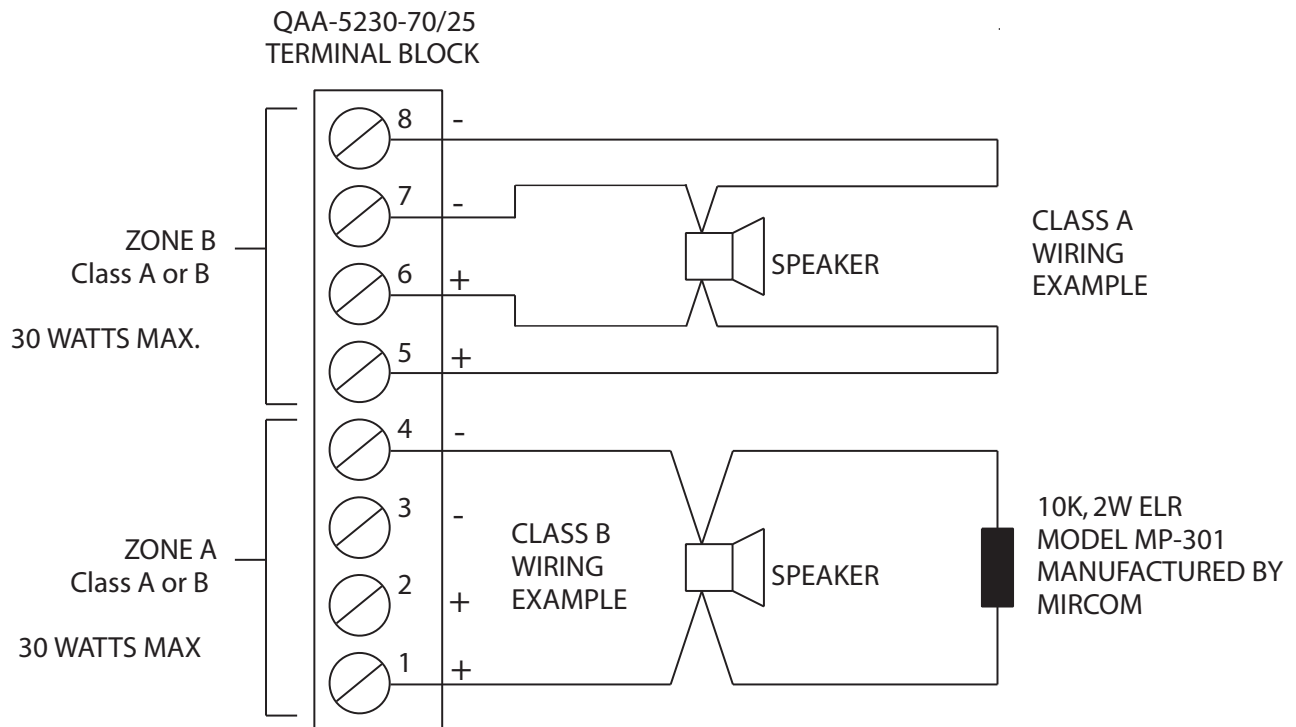
Notes:
- All circuits are power limited and supervised.
- Cut jumper J1 when using an isolator.
- There are two fuses on this board. Both are 4A fast blow.
- See speaker wiring chart for wire gauge selection.

Figure 61:   Using a Speaker Isolator

CUT JUMPER JP1 WHEN USING A SPEAKER ISOLATOR

> **Note:** When using a speaker isolator (SIS-204 or SISA-204 for use in Canada only), jumper JP1 (top left-hand corner, component side) must be cut on the QAA-5230-70/25 and on the QAA-5160-70/25.
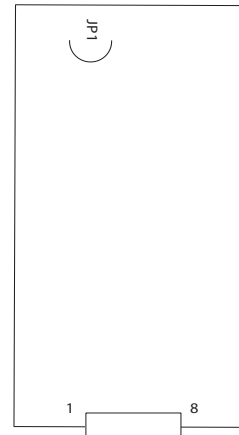
QAA-5230-70/25 AND QAA-5160-70/25 AMPLIFIERS

QAA-5230S-70/25 Amplifier Wiring

QAA-5230S-70/25 dual 30 watt amplifier has two 30 watt amplifiers. Each amplifier has two Class B 15 watt supervised speaker circuits. Each circuit is wired to provide two separate speaker zones on the same floor. Amplifier is set to 70V, if 25V is required, remove orange molex connector cable labelled MD-787 and replace with blue molex connector cable labelled MD-788.

Figure 62:   QAA-5230S-70/25 Wiring
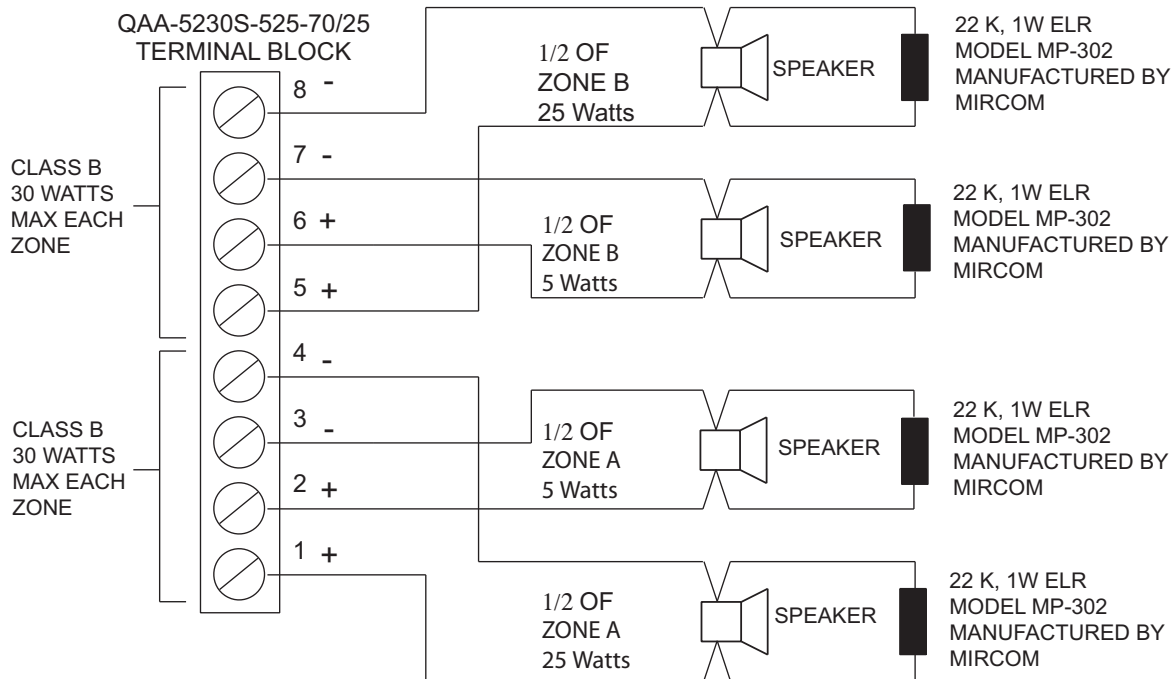
> **Notes:**
> - All circuits are power limited and supervised.
> - There are six fuses on this board. Two are 8A fast blow and four are 1/2A fast blow for the 70V version and two are 8A fast blow and four are 1.25 A fast blow for the 25V
> - See speaker wiring chart for wire gauge selection.

QAA-5415-70 and QAA-5415-25 Amplifier Wiring

QAA-5415-70 quad 15 watt amplifier has four 15 watt amplifiers. Each amplifier has one Class B 15 watt supervised speaker circuit. Each circuit is wired such as to provide one separate speaker zone. The QAA-5415-70 may be wired as Class A by using a QAA-4CLA Class A converter, see Figure 65. The QAA-5415-25 is the same quad amplifier as the QAA-5415 but instead of 70 Volts it is 25 Volts.

Figure 63: QAA-5415-70 or QAA-5415 Wiring
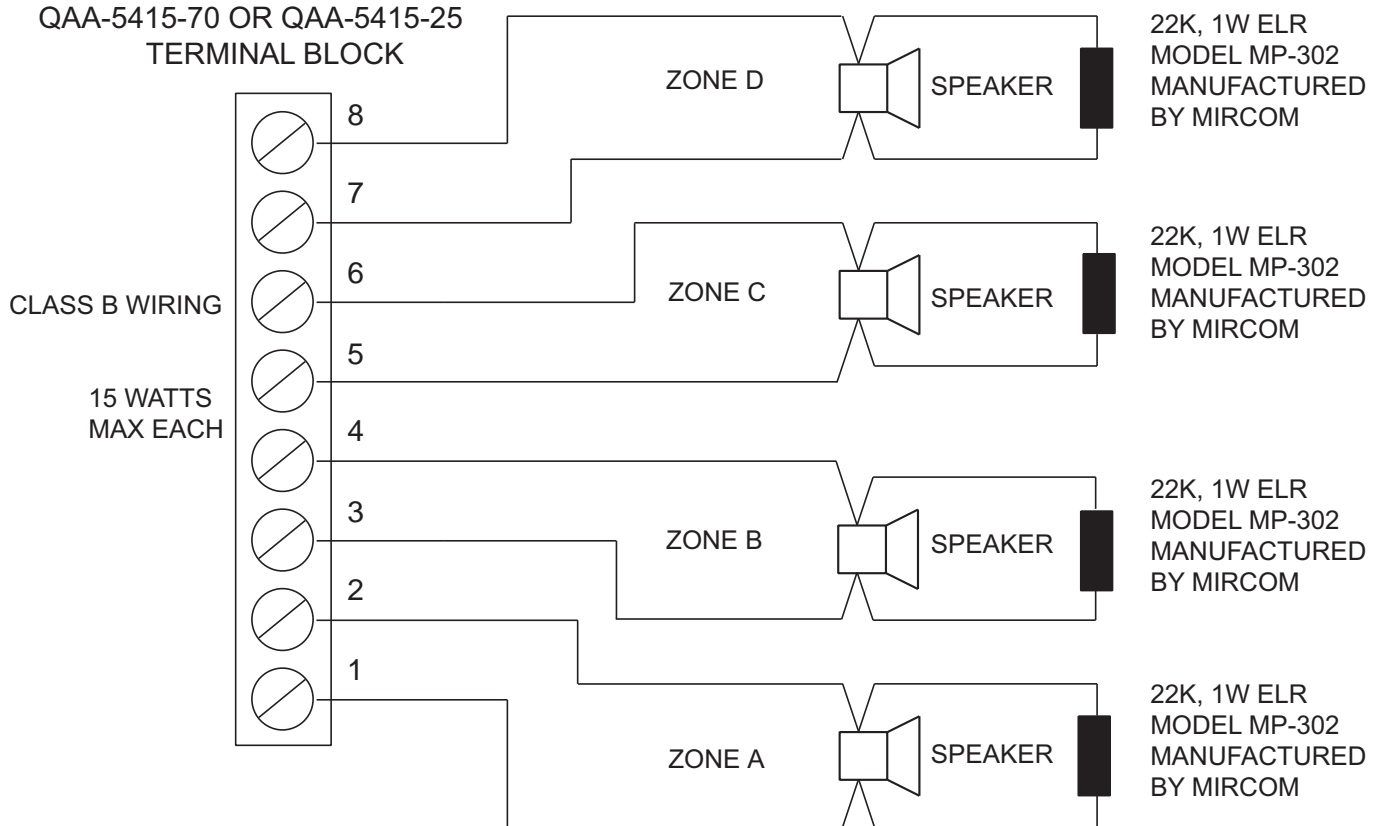
Notes:

- All circuits are power limited and supervised.
- There are four 3A fast blow fuses on this board.
- See speaker wiring chart for wire gauge selection.

Figure 64: Using a Speaker Isolator with the QAA-5415-70 or QAA-5415-25 Amplifiers
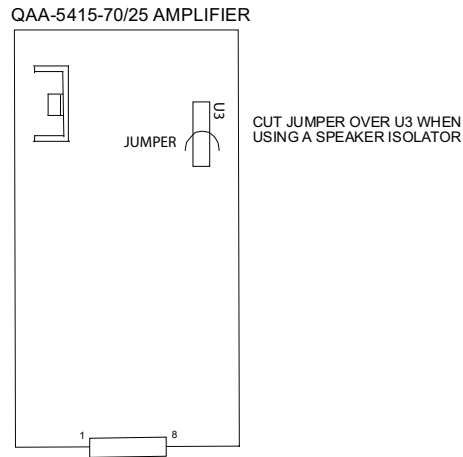
Note: When using a speaker isolator (SISA-204 or SISA-204 for use in Canada only), jumper JP1 (top left-hand corner, component side) must be cut on the QAA-5230-70/25 and on the QAA-5160-70/25.

Figure 65:   QAA-4CLA Class A Converter For QAA-5415-70/25 Amplifier

SPEAKER

O4 +
R4 +
R4 -
O4 -
O3 +
R3 +
R3 -
O3 -
O2 +
R2 +
R2 -
O2 -
O1 +
R1 +
R1 -
O1 -

J1
J2
J3
J4

QAA-4CLA
TERMINAL BLOCK

QAA-5415-70 and QAA-5415-25 AMPLIFIER

REMOVABLE TERMINAL BLOCK

QAA-4CLA

O4 +
O1 -

NOTES:

1. TO WIRE QAA-4CLA, REMOVE TERMINAL FROM QAA-5415-70 or QAA-5415-25 AMPLIFIER, CONNECT TO QAA-4CLA AND SCREW DOWN. WIRE THE FOUR CLASS A CIRCUITS TO THE 16 TERMINALS AS SHOWN IN DIAGRAM AT RIGHT.

2. ALL CIRCUITS ARE POWER LIMITED.

3. 15 WATTS MAX. PER ZONE.

Figure 66: QAA-4CLAS Class A Converter For QAA-5230S-70/25 Amplifier
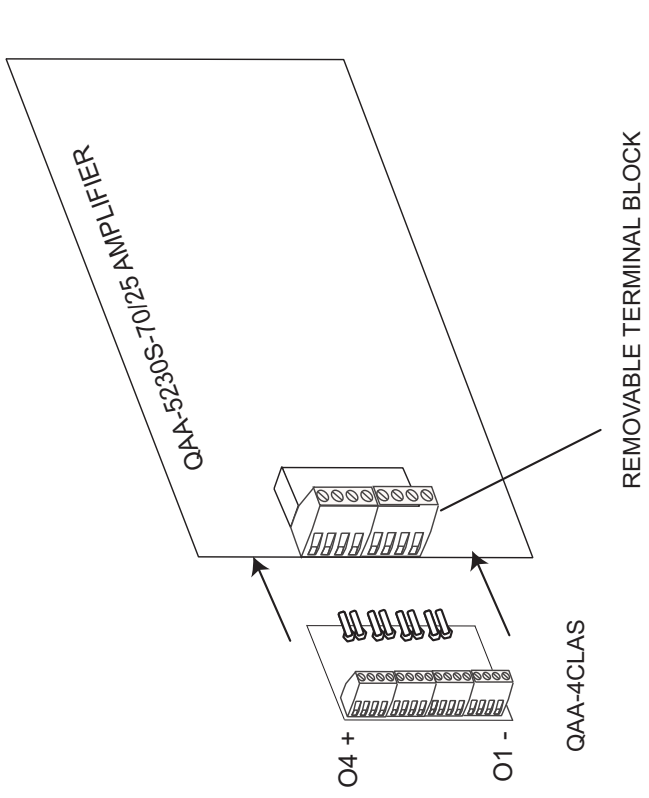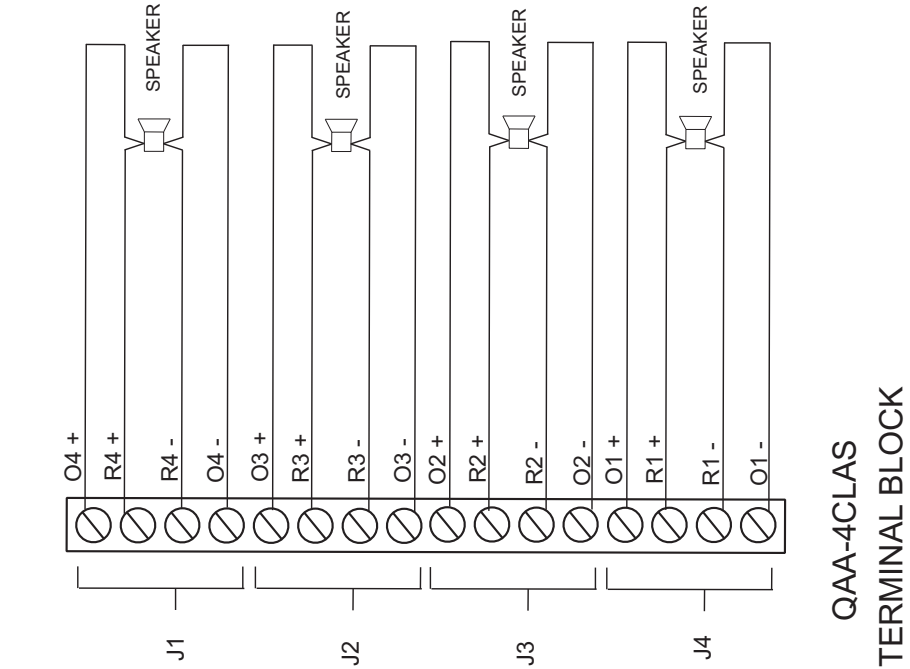
NOTES:

1. TO WIRE QAA-4CLAS, REMOVE TERMINAL FROM QAA-5230S-70/25 AMPLIFIER, CONNECT TO QAA-4CLAS AND SCREW DOWN. WIRE THE FOUR CLASS A CIRCUITS TO THE 16 TERMINALS AS SHOWN IN DIAGRAM AT RIGHT.

2. ALL CIRCUITS ARE POWER LIMITED.

3. 15 WATTS MAX. PER ZONE.

Audio Amplifier Wiring

QAA-5160-70/25

This amplifier provides one 60 Watt supervised speaker circuit either 70 Volts or 25 Volts which may be wired Class A or Class B.

> ⓘ **Note:** When using this amplifier as a backup amplifier, the molex connector MD-789 must be added (see the following section on the backup amplifier for more information). When using a speaker isolator (SIS-204 or SISA-204 for use in Canada only), jumper JP1 (top left-hand corner, component side) must be cut on the QAA-5160-70/25 board (for details, see Figure 61.

Figure 67: QAA-5160-70/25 Wiring
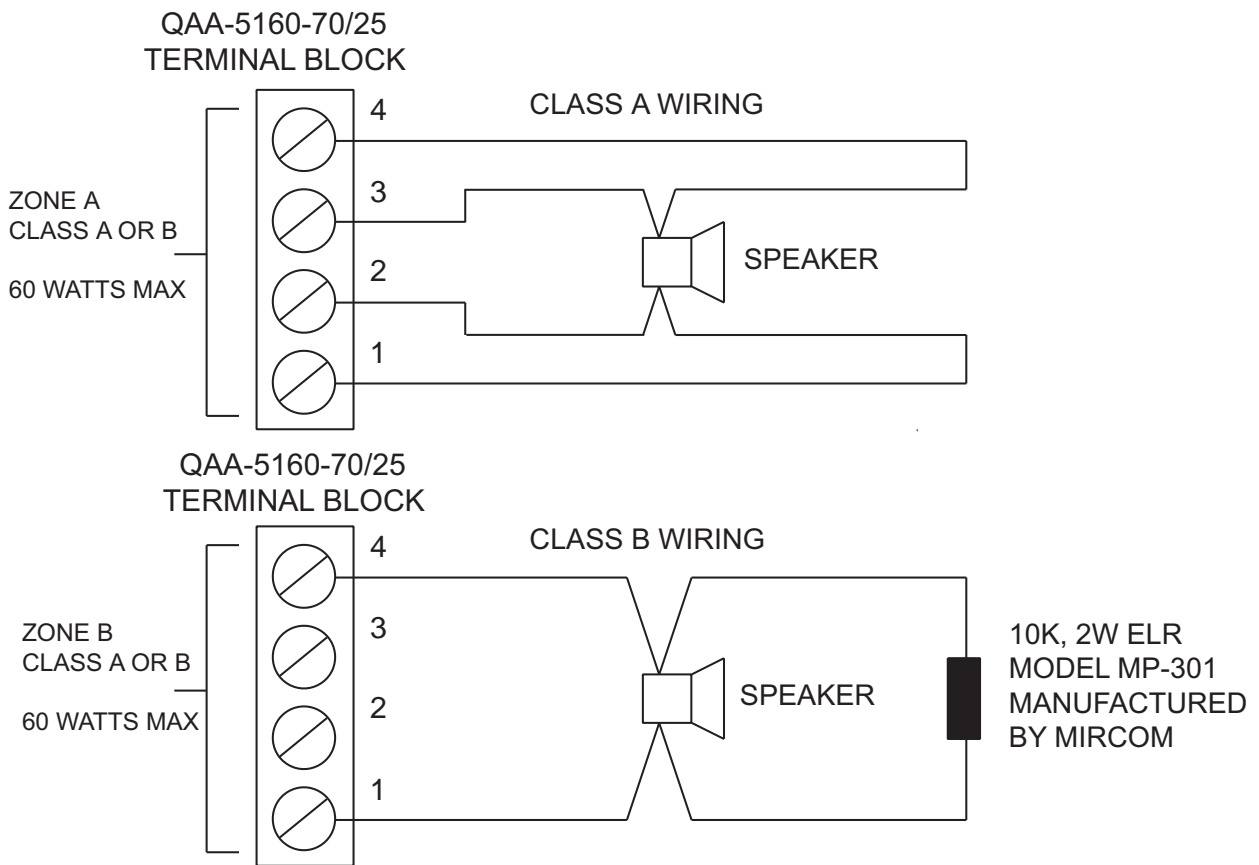
> ⓘ **Notes:**
> - All circuits are power limited and supervised.
> - There are two fuses on this board. Both are 8A fast blow.
> - See speaker wiring chart for wire gauge selection.

Table 12: Wiring Chart for 70V Speakers

Total Power	Maximum Wiring Run To Last Device (ELR)							
	18AWG		16AWG		14AWG		12AWG	
Watts	ft	m	ft	m	ft	m	ft	m
15	2500	762	4000	1219	6000	1828	8000	2438
30	1500	457	2500	762	4000	1219	6000	1828
60	750	228	1200	365	2000	609	3500	1066

Notes for Wiring Charts:

1. For each speaker zone, select the total zone power.
2. Distance shown is calculated to the last speaker, based on the worst case with all speakers lumped at the end.
3. Calculation is based on a 1db power loss (20%) and a source of 70V or 25V.

Table 13: Wiring Chart for 25V Speakers

Total Power	Maximum Wiring Run To Last Device (ELR)							
	18AWG		16AWG		14AWG		12AWG	
Watts	ft	m	ft	m	ft	m	ft	m
15	625	190	1000	305	1500	457	2000	609
30	375	114	625	191	1000	305	1500	457
60	187	57	300	91	500	152	875	267

Backup Amplifier

Any amplifier may be designated as a backup amplifier when backup is required. It should be installed in any audio cabinet and in the right-most slot position of a QMB-5000B backplane.

Figure 68: QAA-5160-70/25 Amplifier (Backup Application)
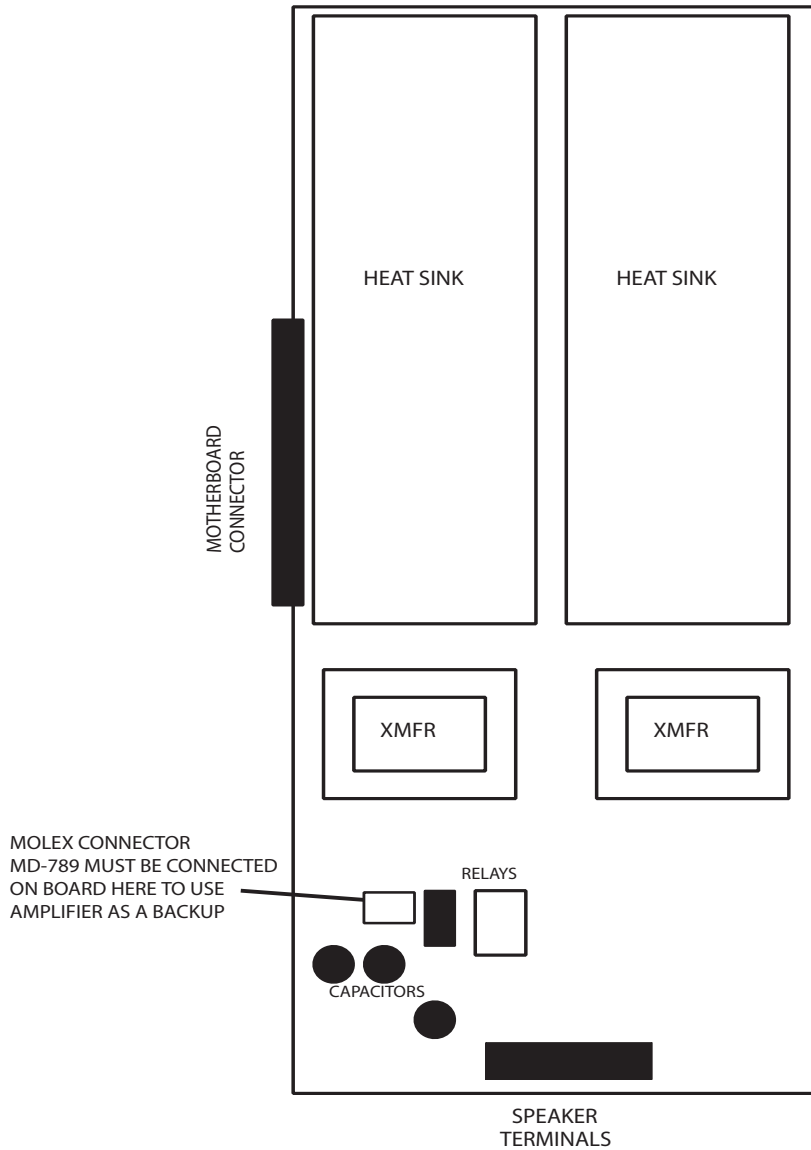
Any amplifier may be designated as the backup amplifier and this backup amplifier must have the MD-789 molex connector placed in the bottom left-hand corner of the board as shown in the adjacent figure. The QAA-5160-70/25 as backup amplifier is inserted into the motherboard. No connections are made to the backup amplifier's terminals except for end-of-line resistors which are to be placed directly on the terminals in the audio cabinet.

Once the Backup Amplifier is installed, it must be properly configured. Refer to the Audio Configuration for details.

The number of backup amplifiers is limited to one per node. Only the first failed amplifier gets the backup. The distance from the farthest audio cabinet to the audio cabinet (which has the backup amplifier) cannot be greater than four cable lengths (approximately 208 inches or 17 feet).

Displays & Controls

Figure 69: Audio Cabinet Displays and Controls

AMP QAA-5160-70/25   AMP QAA-5230-70/25   AMP QAA-5415-70
                        AMP QAA-5203S-70/25   AMP QAA-5415-25
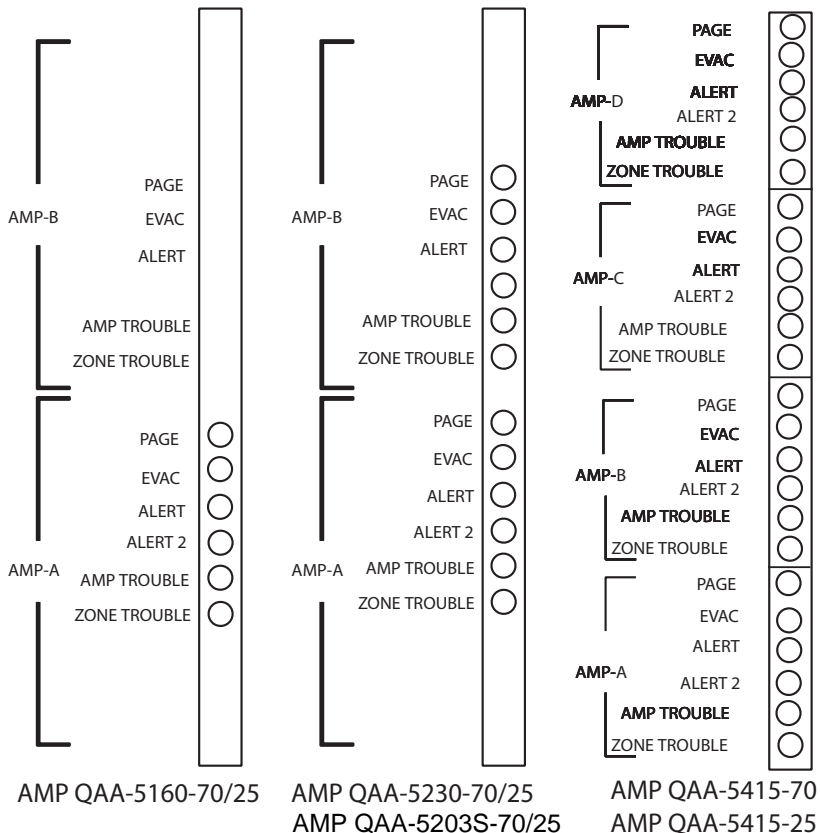
Amplifier Displays

Page

The amplifier is connected to voice paging. Paging occurs on that particular amplifier zone.

Evac

The amplifier is connected to the evacuation tone.

Alert

The amplifier is connected to the alert tone.

Alert 2

The amplifier is connected to the alert tone 2.

Amp Trouble LED

Indicates an amplifier trouble by illuminating steady amber.

Zone Trouble LED

Indicates a zone field wiring trouble, by illuminating steady amber.

> ℹ️ **Notes:**
> - The QAA-5160-70/25 only has displays for "Amp-A", while the QAA-5230-70/25 & QAA-5230S-70/25 has displays for both "Amp-A" & "Amp-B".
> - Each single amplifier comes with a blank black sticker to place over the Amp B information on the amplifier chassis.
> - Each four circuit amplifier comes with its own sticker to place over the Amp A and B information on the amplifier chassis.

Setup

QBB-5001/R Amplifier Installation

The following instructions are based on the assumption that the fire alarm is already installed.

1. Install the QBB-5001/R Audio Backbox and door in the desired location.
2. Install the QMB-5000B Motherboard / Card-Cage into the backbox.
3. Install the QBC-5000N Battery Charger into the backbox. Connect its cable to J1 on the motherboard.
4. Install the QPS-5000N Power Supply into the QBB-5001/R backbox. Be careful: the QPS-5000N is *very heavy*.
5. Connect the heavy orange - yellow - orange wires from the motherboard to the power supply being careful to match the wire colour to the labelling on the power supply.
6. Connect the un-powered 120 VAC line power and chassis ground to the power supply following the labelling. Ground the power supply to the box. *Do not apply AC power at this time.*
7. Install the two 12 VDC batteries into the backbox.
8. Connect the battery cables from the motherboard to the batteries as shown in Figure 58, but do not connect the cable between the batteries at this time.

When plugging in these amplifiers, the components are facing left. Slide the amplifier in place and to avoid damage, making sure that the edge connector is properly mating with the header on the motherboard. Keep the amplifier as straight and level as possible and use even pressure on the top and bottom. The amplifier is connected properly after it snaps into place.

> **ATTENTION:** Powering the system with incorrectly installed amplifiers will cause permanent damage.

9. Connect and check (for opens, shorts, and ground) all the amplifiers' field wiring.

Before Turning the Power "ON"…

The entire system installation should be completed first.

To prevent sparking, *do not* connect the batteries. Connect the batteries after powering the system from the main A.C. supply.

1. Check and secure all interconnection wiring cables.
2. Check and secure all interconnection wiring cables to the Fire Alarm Control Panel.
3. Check the A.C. power wiring for proper connection.
4. Check that the chassis is connected to earth ground.

Audio Configuration

The configuration of the FleX-Net™ is accomplished via the MSW-025 Personal Computer based Configurator Software.

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
Master Telephone Buzzer Disable	No	Enabled or Disabled	Not permitted

Lobby Enclosures

The QMP-5101N paging and QMT-5302N telephone control modules fit into the BB-5008 and BB-5014 lobby backboxes. All selector panels mount into the BB-5008 and BB-5014 backboxes also. Below find the dimensions for both the backboxes.

Figure 70:   BB-5008 and BB-5014 Backboxes

BB-5014 Lobby Backbox
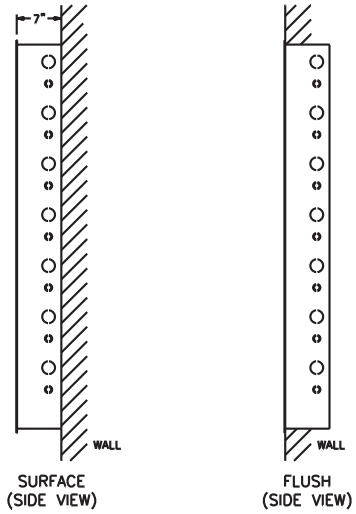
BB-5008 Lobby Backbox
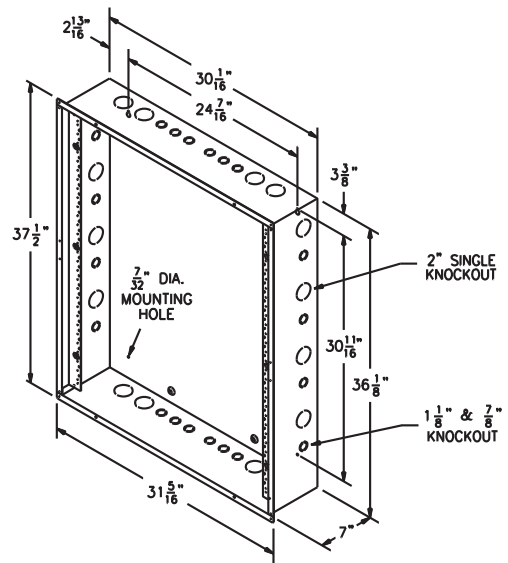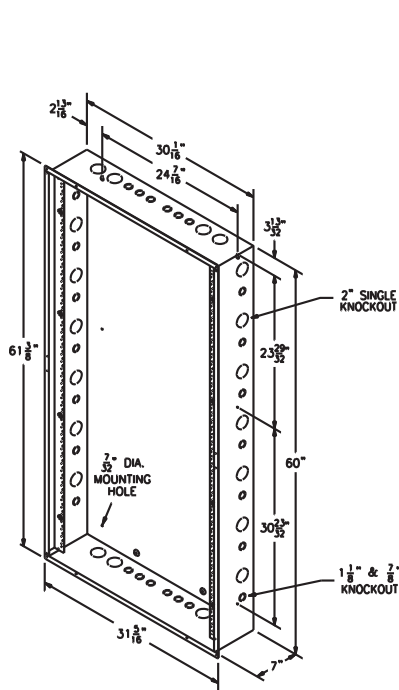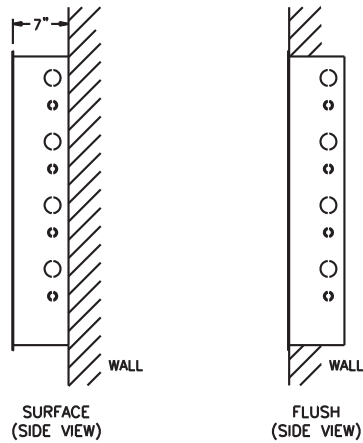
Notes:

- Material: 16GA (0.059") cold rolled steel.
- Finish: painted.
- Allow 4" gap between flanges of the backboxes when installing side by side.
- Door is not shown.
    - For white door order DOX-50014M and DOX-5008M
    - For red door order DOX-5014MR, and DOX-5008MR

ANC-5000 Audio Network Controller Module

Figure 71:   ANC-5000 Audio Network Controller board

Connects to TNC-5000 Telephone
Network Controller Module

P11

P7 AMPS Interface

Heartbeat
RESET/CPU Fail
System OK
COMM RX
COMM TX
Audio/CLASS D TX
Audio/CLASS D RX
Audio RX
Status Page Bus OUT
Status Page Bus IN

LEDs for
Information

Plugs into the
QMB-5000N
Backplane

DIP Switch SW1 is factory set
at address one, SW1-8 ON.
Refer to Appendix C for all
DIP switch address settings.

SW1

JW9

ON

1   8

P13 Ethernet
Port for Future Use

P13

ETHERNET
PORT

JW5
JW4

JW5 Jumper Watch-
dog , Leave Shorted

JW4 Jumper Factory
Use Only, Leave Open

Jumper JW9 is
normally open

P3 Network RS-485

P4 RS-232 Debug

P8 H_Speed Audio

Connect
RS-485 cable
from P3 on the
main fire alarm
board to P6 IN
on this board
(daisy chain
fashion) and
from P10 OUT
to next main
fire alarm
board or to
next ANC-5000

IN
P6 RS-485

OUT
P10 RS-485

P8 Connect to
main fire alarm
board P16 if
using Digital
Audio and/or
Phone

NOTE:
DIP switch SW1 is
set using SW1-8 as
the lowest binary
digit and active
ON for ANC-5000
board with
ethernet port.

SW1-1 is the
lowest binary digit
and active ON for
ANC-5000 board
without an
ethernet port.

JW6

Gain Level
Jumpers JW7 and JW8
are normally shorted

JW7   JW8

PAGING BUS

Jumper JW6 is
normally open

+ -	+ -	+ - S	+ - S	+ - L	+ - S	+ - S

Alternate
Power
IN

G.A.
Input
IN

RS-485

MIC

PTT

IN

OUT

NOTE: All connectors not shown on this drawing are for factory use only.

ANC-5000 Wiring

Figure 72: ANC-5000 Wiring Diagram

Alternate Power IN

G.A. Input IN

RS-485

NOT USED

MIC

PTT

PAGING BUS

IN   OUT

JW7   JW8

Microphone and push to talk (PTT) button is wired to Master Paging module

L terminal NOT USED

Wire the Paging Bus to all other ANC-5000 Audio Network Controller Modules, see Figure 73.

3K9 ohms   3K9 ohms

Connect resistors to + and - of MIC and PTT terminals when master microphone and telephone is not used.

Figure 73:   Audio Paging Bus Wiring

CLASS A WIRING

ANC-5000 Paging Bus Out Paging Bus In Node 4	**ANC-5000** Paging Bus In Paging Bus Out Node 5
ANC-5000 Paging Bus Out Paging Bus In Node 3	**ANC-5000** Paging Bus In Paging Bus Out Node 6
ANC-5000 Paging Bus Out Paging Bus In Node 2	Additional ANC-5000s connected in between **ANC-5000** Paging Bus In Paging Bus Out Last Node

Audio Bus Specifications:

10V, 50 mA Maximum

Total cable resistance is: 90 ohms Max

18 gauge twisted pair wire

Audio Bus is power-limited and fully supervised.

S - +   S - +
Paging   Paging
Bus Out   Bus In

ANC-5000
CACF
Node 1

QMP-5101NV Vertical Paging Control Module

The QMP-5101NV Paging Module fits into the new BBX-FXMNS Enclosure. It mounts on the inside dead chassis (part of the BBX-FXMNS). CONNECTIONS AND TERMINAL WIRING ARE THE SAME AS THE QMP-5101N, WIRE AS SHOWN IN THE FOLLOWING INSTRUCTIONS FOR QMP-5101N PAGING CONTROL MODULE.

Figure 74:   QMP-5101NV Vertical Paging Control Module
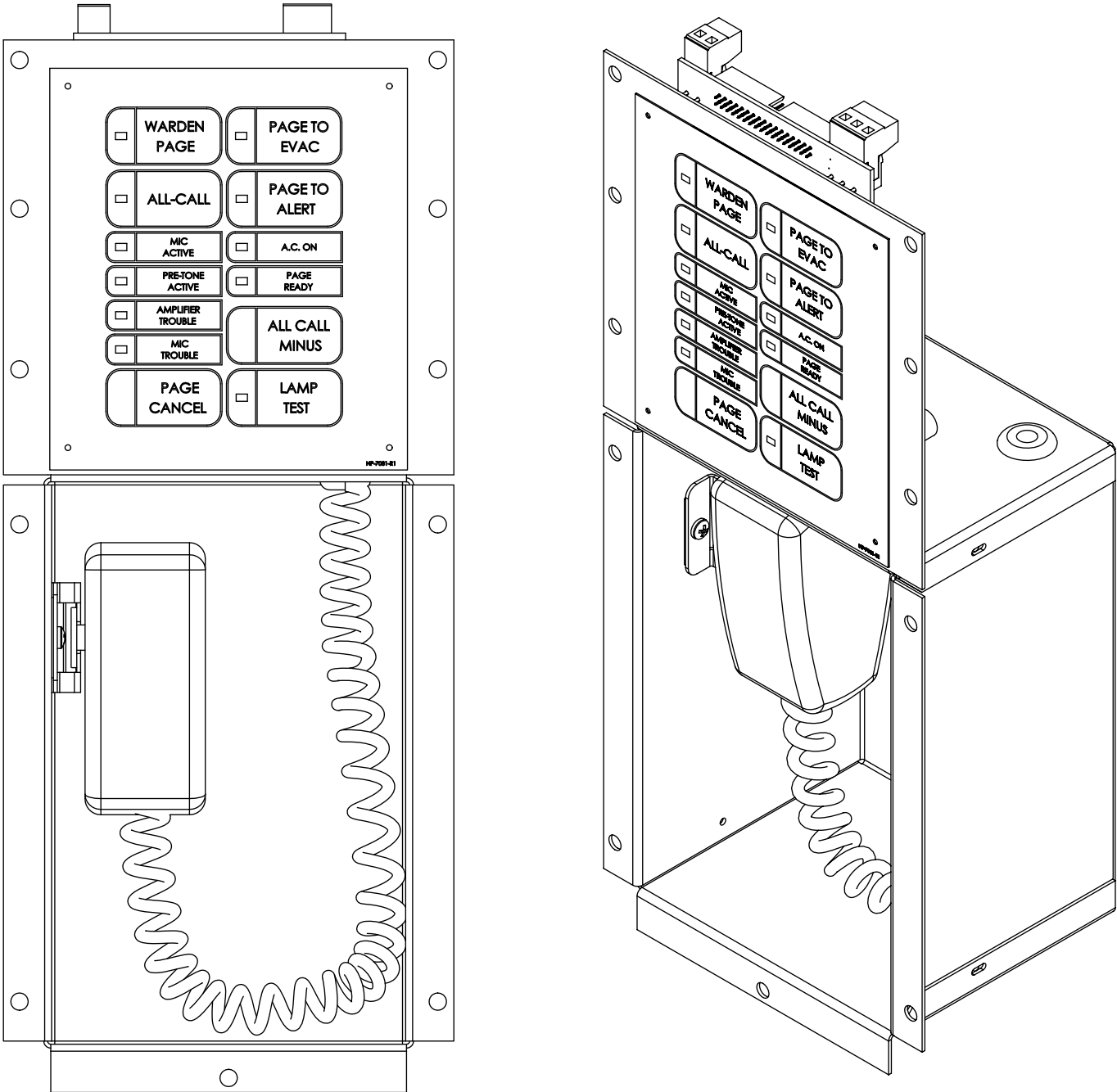
Paging Modules

The QMP-5101N Network Master Paging Control Module mounts into the BB-5008 and BB-5014 backboxes.

QMP-5101N Network Master Paging Control Module

The QMP-5101N Network Master Paging Control Module connects via a ribbon cable to the first QAZT-5302/DS Zoned Selector Panel and to the previous display module. It also has wiring terminals for connection to the ANC-5000 Audio Network Controller Module in the cabinet

Slide-in labels NP-6659 are placed so that push buttons and LEDs are labelled as shown in Figure 75.

Figure 75:   QMP-5101N Network Master Paging Control Module
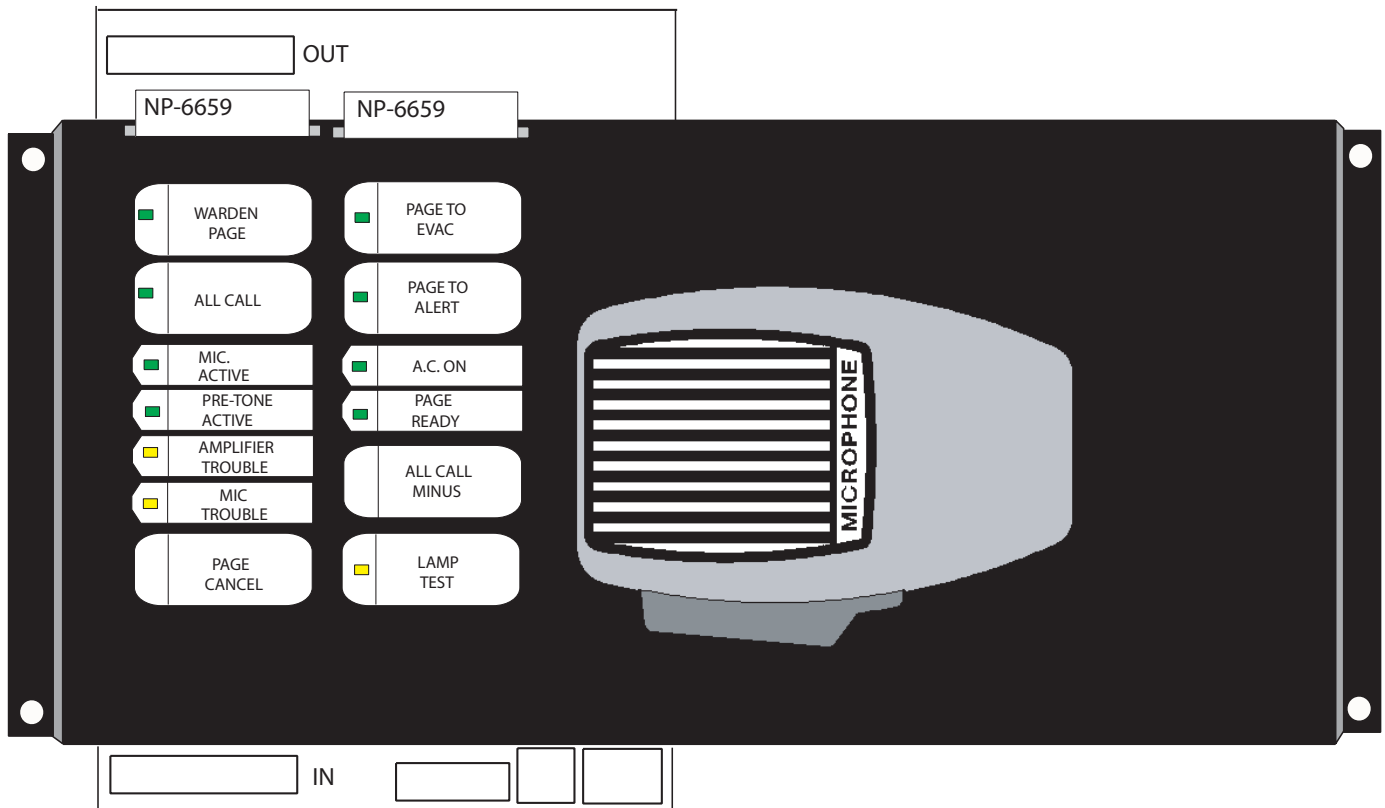
Connect ribbon cable from P1 (IN) to previous display module. Connect P2 (OUT) to the QAZT-5302/DS Zoned Selector Panel or next display module. Wire the positive and negative terminals and the microphone MIC positive, negative and shield to the ANC-5000 Audio Network Controller Module corresponding terminals.

Figure 76:   QMP-5101N/V Network Master Paging Control Module Connections and Terminal Blocks
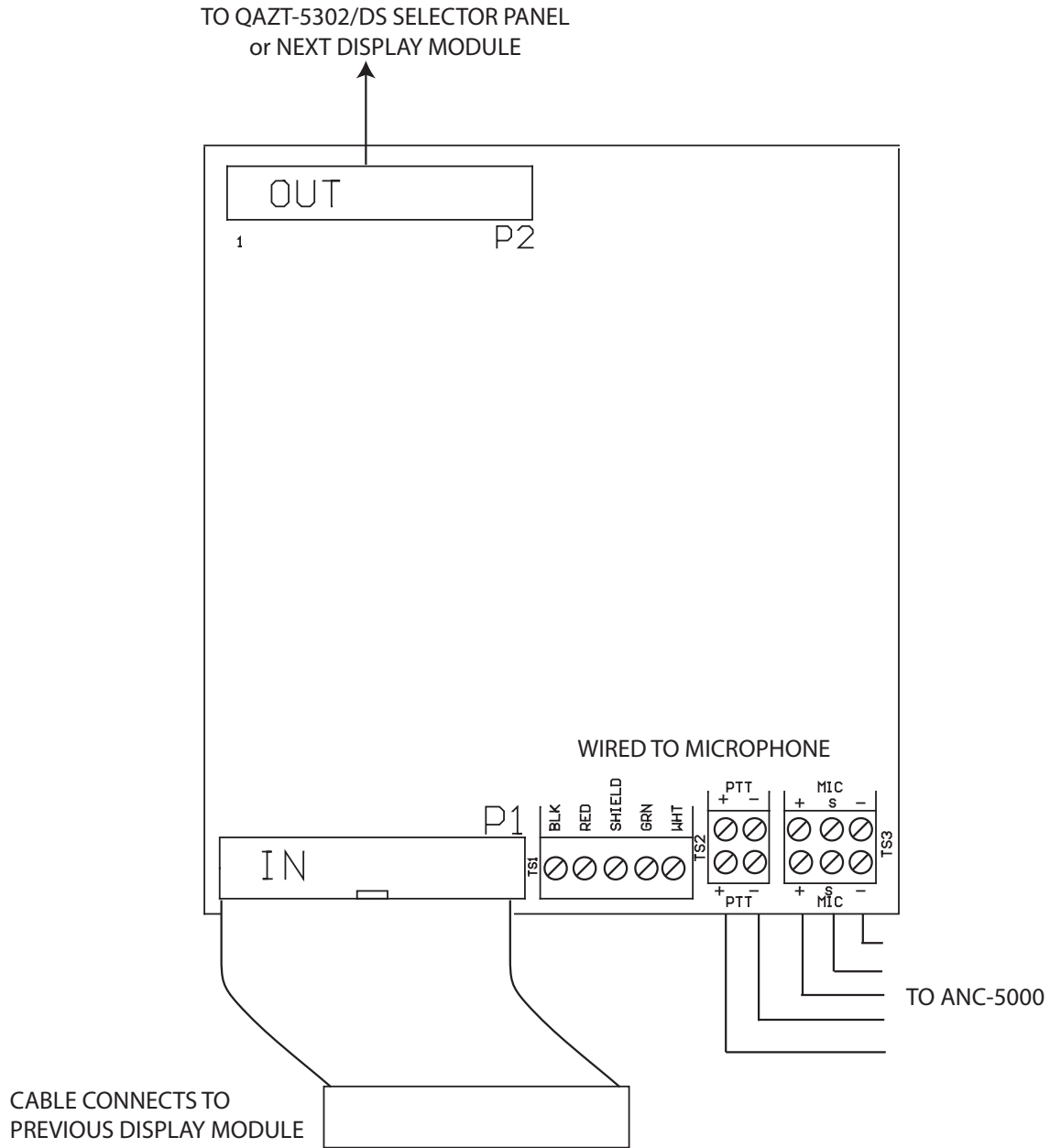
The interface wiring between the QMP-5101N and ANC-5000 is as follows:

MIC+, MIC-, SHLD:	18-22 AWG Twisted Shielded Pair
PTT+, PTT-:	18-22 AWG Twisted Pair

The maximum wiring run from the QMP-5101N and the ANC-5000 is 20 feet or 6 metres.

QMP-5101N/V Network Paging Wiring

Figure 77: QMP-5101N/V Network Master Paging Control Module Wiring to the ANC-5000 Audio Network Controller Module
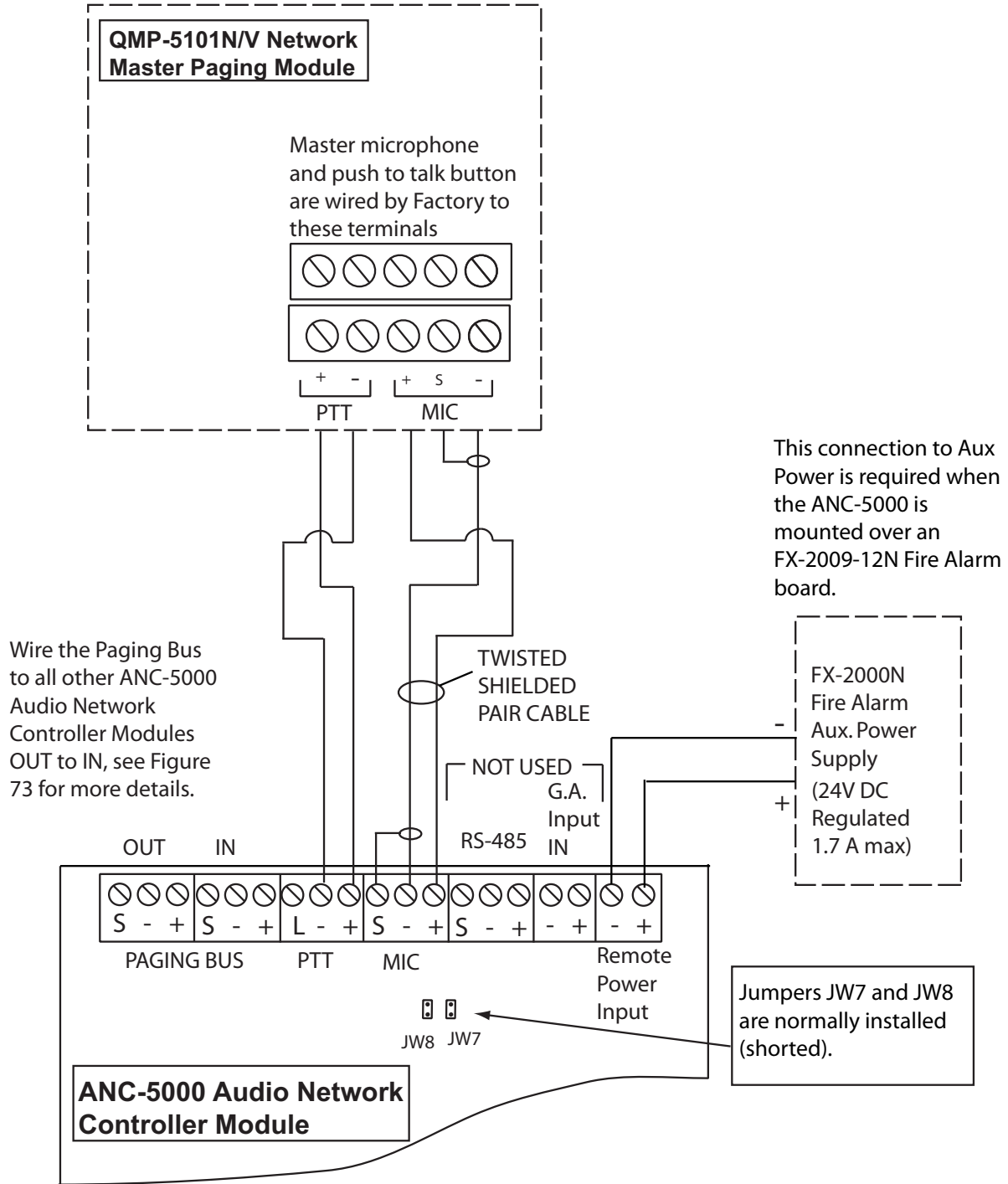
QAZT-5302/DS Zoned Paging Selector Panel

Each QAZT-5302/DS annunciates and controls up to 24 audio zones. There is one button and two LEDs per zone. The lower amber LED indicates Zone trouble. The upper green LED indicates whether that zone is selected for voice paging via the master microphone.

Press the button to turn the selection for voice paging for that zone ON and OFF.

PAGE #1	PAGE #5	PAGE #9	PAGE #13	PAGE #17	PAGE #21
PAGE #2	PAGE #6	PAGE #10	PAGE #14	PAGE #18	PAGE #22
PAGE #3	PAGE #7	PAGE #11	PAGE #15	PAGE #19	PAGE #23
PAGE #4	PAGE #8	PAGE #12	PAGE #16	PAGE #20	PAGE #24
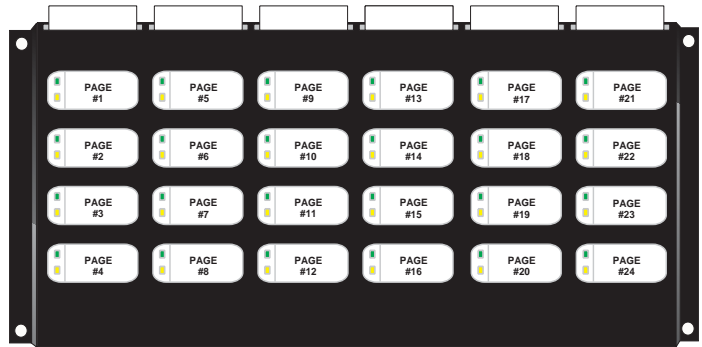
Paging Operation

This section describes the controls and indicators on the QMP-5101N and QMP-5101NV Master Paging and QAZT-5302/DS Paging Selector Modules.

QMP-5101N/QMP-5101NV LEDs

Warden Page
Illuminates steady green to indicate that the Warden Page function is active.

All Call
Illuminates steady green to indicate that the All-Call function is active.

Common Trouble LED
Flashes amber to indicate any QX-5000 trouble.

Pre-Tone Active LED
Steady green when paging and warden paging

Amplifier Trouble LED
Indicates any amplifier internal trouble.

Mic Trouble LED
Flashes amber to indicate a microphone trouble.

Page to Evac LED
Illuminates steady green when the Page to Evac pushbutton is active.

Page to Alert LED
Illuminates steady green when the Page to Alert pushbutton is active.

AC ON LED
This green LED illuminates steadily to Indicate that AC power is present.

Page Ready LED
Illuminates steady green when the push-to-talk (PTT) on the microphone is depressed (active).

Lamp Test LED
This amber LED illuminates steadily to indicate that the Lamp Test has been activated.

QMP-5101N/QMP-5101NV Pushbutton Controls

Warden Page Button

When depressed, the Warden Page button enables voice paging from the firefighters' telephone (if connected) to all zones selected for paging, unless page inhibit is active. Note that pressing PTT will not result in any paging activity unless there are zones selected for paging. Also note that there must be an active firefighters' telephone connection for warden paging to occur.

All-Call Button

Selects all zones for voice paging.

All-Call Minus Button

Inverts the selection of zones for voice paging.

Page to Evac

Pressing this button selects all the audio zones currently in evacuation mode, for paging.

Page to Alert

Pressing this button selects all the audio zones currently in alert mode, for paging.

Page Cancel

Pressing this button de-selects all zones (including those manually selected) from paging.

Lamp Test Button

Momentarily activates all LED indicators.

Microphone PTT Button

The microphone's PTT (push-to-talk) button is located on the microphone itself. When depressed, allows voice paging (from the microphone) to be enabled to all zones selected for paging, unless page cancel is active. Note that pressing PTT will not result in any paging activity unless there are zones selected for paging.

QAZT-5302/DS Paging Selector Panel LEDs

Page LED

Illuminates green if the zone is selected for voice paging.

Trouble LED

Flashes amber to indicate that the zone is in trouble.

QAZT-5302/DS Pushbuttons

Page Button (if enabled)

Selects / deselects that zone for voice paging.

TNC-5000 Telephone Network Controller Module

Module Mounting Locations

The TNC-5000 Telephone Network Controller board can be mounted in two places. The TNC-5000 Telephone Network Controller Board is mounted above (beside) the ANC-5000 Audio Network board, both are mounted on a black plate and the ANC-5000 plugs into slot 1 on the QMB-5000N audio backplane of the BBX-2000 or BBX-FXMNS, see Figure 78. The other position is over the ANC-5000 Audio Network Controller module and both are mounted onto a metal plate and then the plate is mounted into a BB-5008 or BB-5014 backbox in positions marked 4 to 9 inclusive, refer to drawing of large chassis, Figure 79.

Figure 78: Mechanical Installation of the TNC-5000 Telephone Network Controller Board within the BBX-FXMNS or BBX-2000

BBX-FXMNS or BBX-2000 Backboxes

CONNECTORS FOR MULTIPLE
QMB- 5000N EXPANSION CARD CAGES

SLOT #1 CONNECTOR
FOR TNC-5000 AND
ANC-5000 BOARDS

SLOTS #2 - #5
CONNECTORS FOR
QAA- STYLE AMPLIFIERS

IN   OUT

CONNECTOR
AND TERMINALS
NOT USED

BATTERY
Red +   -

TRANSFORMER

QMB-5000N Audio Backplane

TNC-5000

ANC-5000

This connector mounts into connector in slot #1 on the QMB-5000N Audio Backplane

12 VDC BATTERY

12 VDC BATTERY

NOT TO SCALE, REPRESENTATION ONLY

Figure 79: Mechanical Installation of the TNC-5000 within the BB-5008 and BB-5014
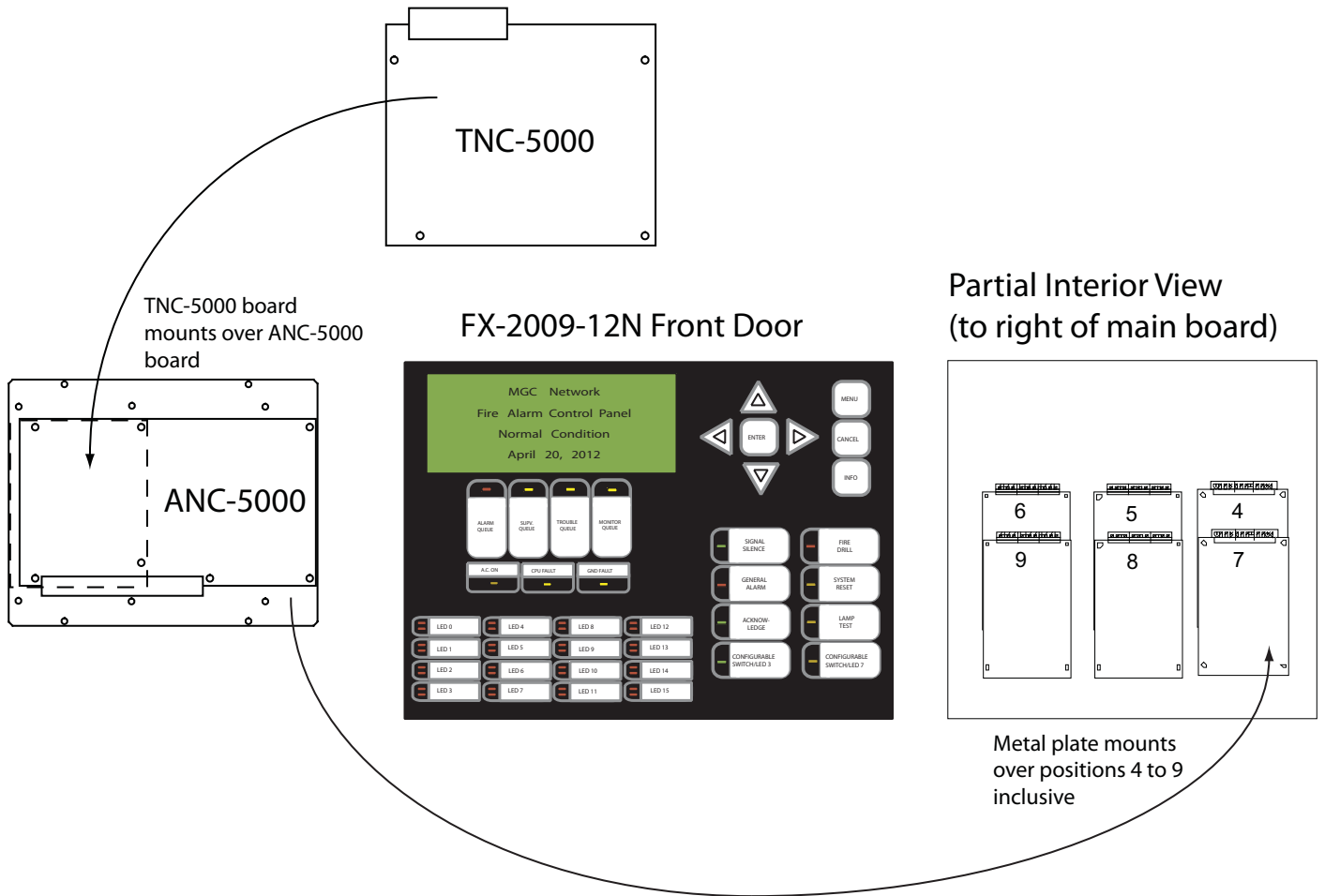
Typical Addressable Telephone Set-up

The typical addressable telephone set-up is with an addressable fire alarm system using the TNC-5000 and from the TNC-5000 to the Master Telephone (QMT-5302N/V). The selector panels (QAZT-5302/DS) are connected to the Master Telephone by cable only. The MIX-M500FP(A) Control Modules are connected to the addressable loop from the FX-2000N and to each other and the Master Telephone. Remote telephones are connected to the control modules.

Figure 80:   Typical Addressable Telephone Set-up
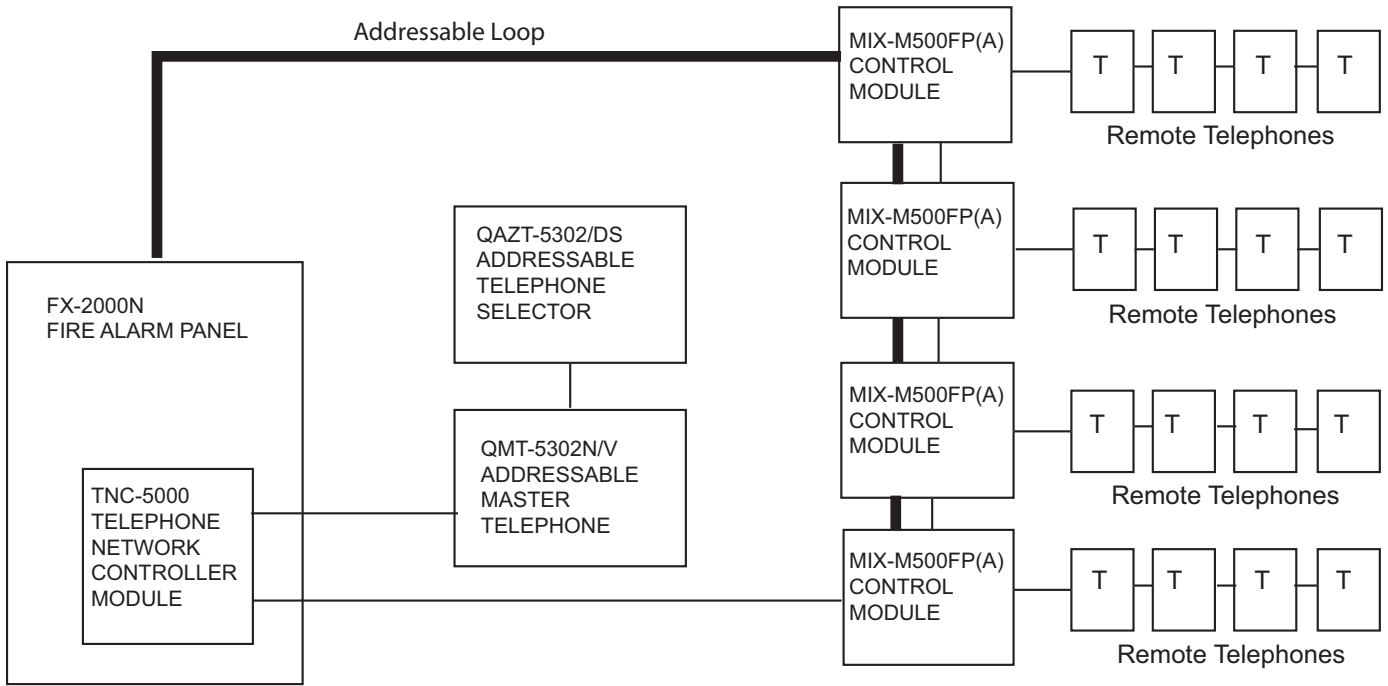
Connectors and Terminal Locations

Refer to Figure 81 for connector and terminal locations. Table 3 below shows the cable connections and jumpers required and additional wiring.

Table 3: TNC-5000 Connectors and Terminals

TNC-5000 Connector and Terminals	Connects to
P10 Cable	P11 on the ANC-5000 Audio Network Controller Module.
Z1 Terminals	These two terminals are wired to the Master Telephone if used, otherwise to any telephone zone.
Z2, Z3, Z4 and Z5 Terminals	These terminals are wired to telephone zones.
Telephone Bus In and Out Terminals	Wire from previous TNC-5000 to next TNC-5000. Total cable resistance is 50 ohms maximum, 18 gauge twisted pair. Telephone Bus is power limited and fully supervised
JW1	Jumper positions 1 and 2 if zone 1 is connected to a Master Telephone.
JW1	Jumper positions 2 and 3 if zone 1 is NOT connected to a Master Telephone.

Figure 81: TNC-5000 Telephone Network Controller Board Layout

Ribbon Cable connects to the ANC-5000 Audio Network Controller Module P11

116
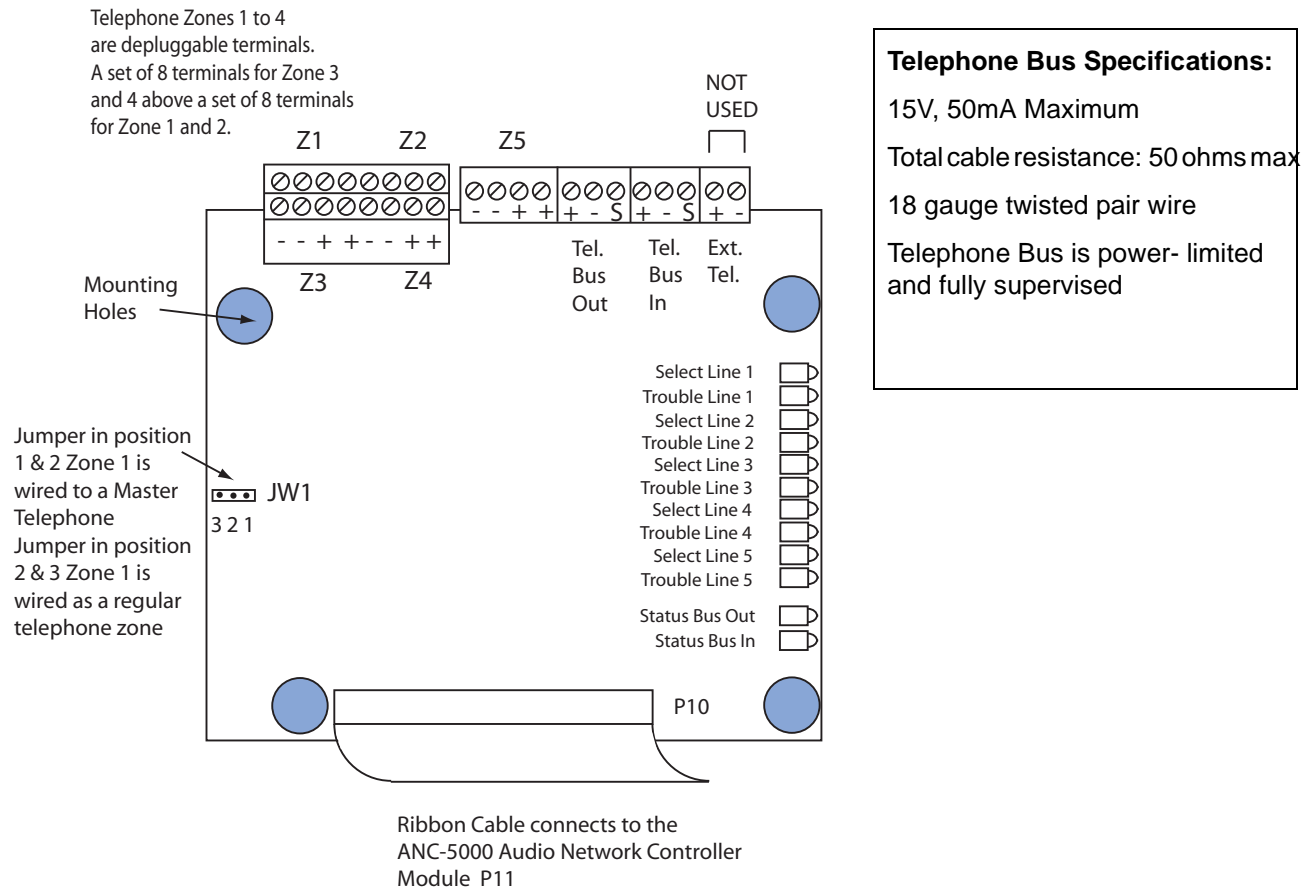
TNC-5000 Telephone Wiring

Figure 82: Telephone Bus Wiring Diagram
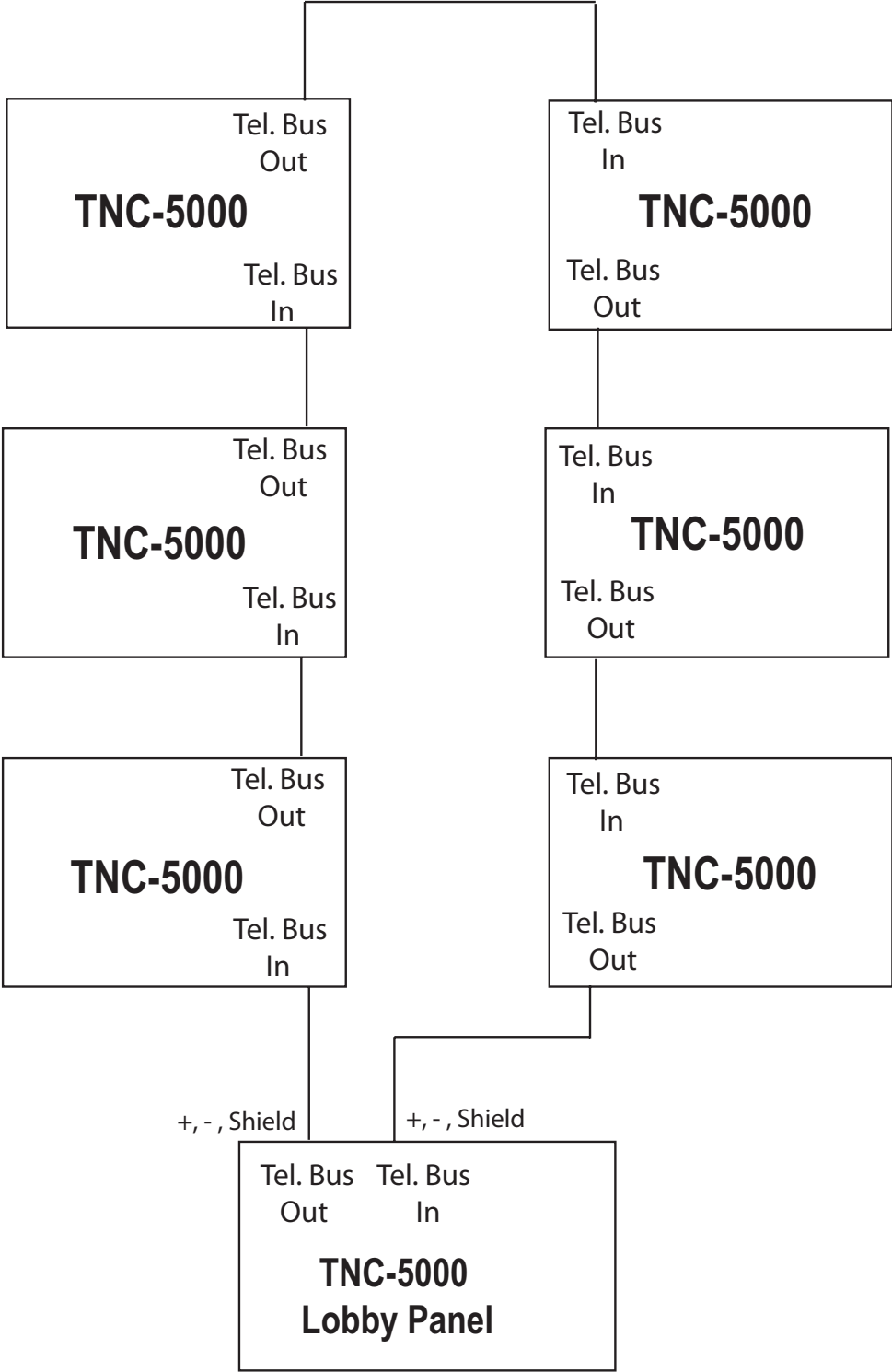
Zones 1 to 5 are wired to telephones via MIX-M500FP(A) addressable control modules. Only Zone 1 is wired to the Master Telephone (if used) at the main fire alarm centre, otherwise Zone 1 is wired as another telephone zone when a master telephone is not required.

Figure 83: TNC-5000 Telephone Zone Wiring
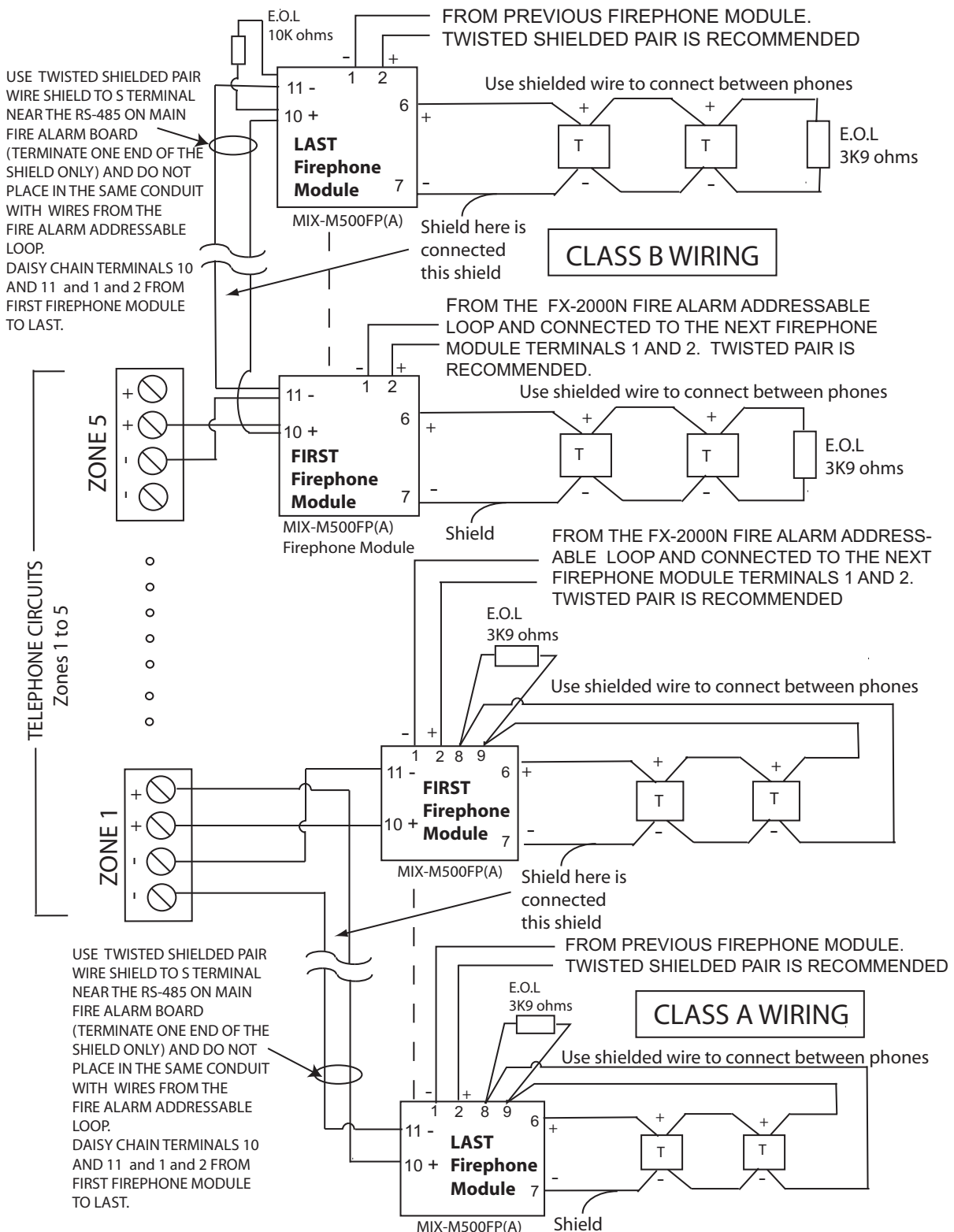
QMT-5302NV Vertical Master Telephone

The QMT-5302NV Vertical Master Telephone Module fits into the new BBX-FXMNS Enclosure. The master telephone is mounted to the inside chassis and field wiring is on the BBX-FXMNS backbox. CONNECTIONS AND TERMINAL WIRING ARE THE SAME AS THE QMT-5302N, WIRE AS SHOWN IN THE FOLLOWING INSTRUCTIONS FOR QMT-5302N MASTER FIREFIGHTERS' TELEPHONE.

Figure 84:   QMT-5302NV Master Firefighters' Telephone
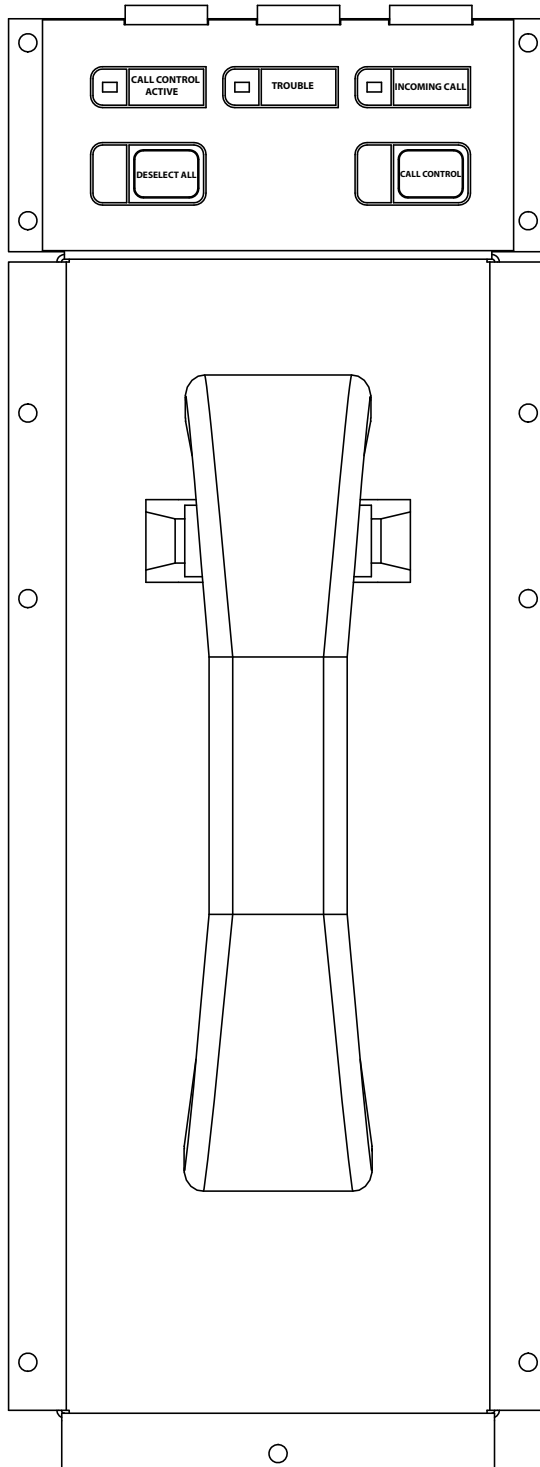
QMT-5302N Master Firefighters' Telephone

The QMT-5302N mounts into the BB-5008 and BB-5014. QMT-5302N Network Master Firefighters' Telephone Control Module is used in conjunction with the FleX-Net™ Fire Alarm system at the CACF Node. Slide-in labels (NP-6657) are supplied with the Master Telephone. Place labels as shown in Figure 85. The QAZT-5302/DS Telephone Selector panels are used for selecting telephone zones (up to 24 zones per selector panel) and include blank labels for labelling the telephone zones.

Figure 85: QMT-5302N Master Firefighters' Telephone
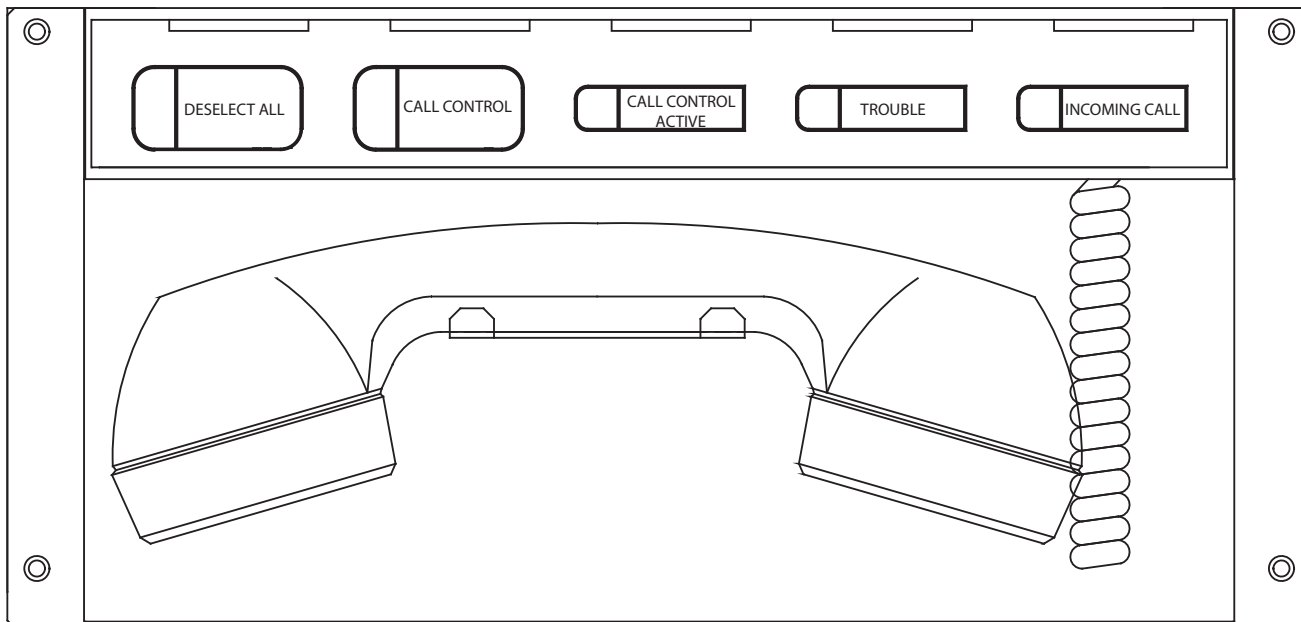
QMT-5302N Connections

The connections required on the QMT-5302N Network Master Firefighters' Telephone Control Module are the cable from the previous display module to P1 or IN connector on the bottom left of the board and the OUT connection goes to the IN connector of the next display board.

The master telephone positive and negative terminals connect to the TNC-5000 Zone 1 positive and negative terminals with twisted shielded pair wires. Refer to Figure 86 below for connector and terminal block locations of the QMT-5302N.

Figure 86: QMT-5302N Cable Connection and Terminal Wiring
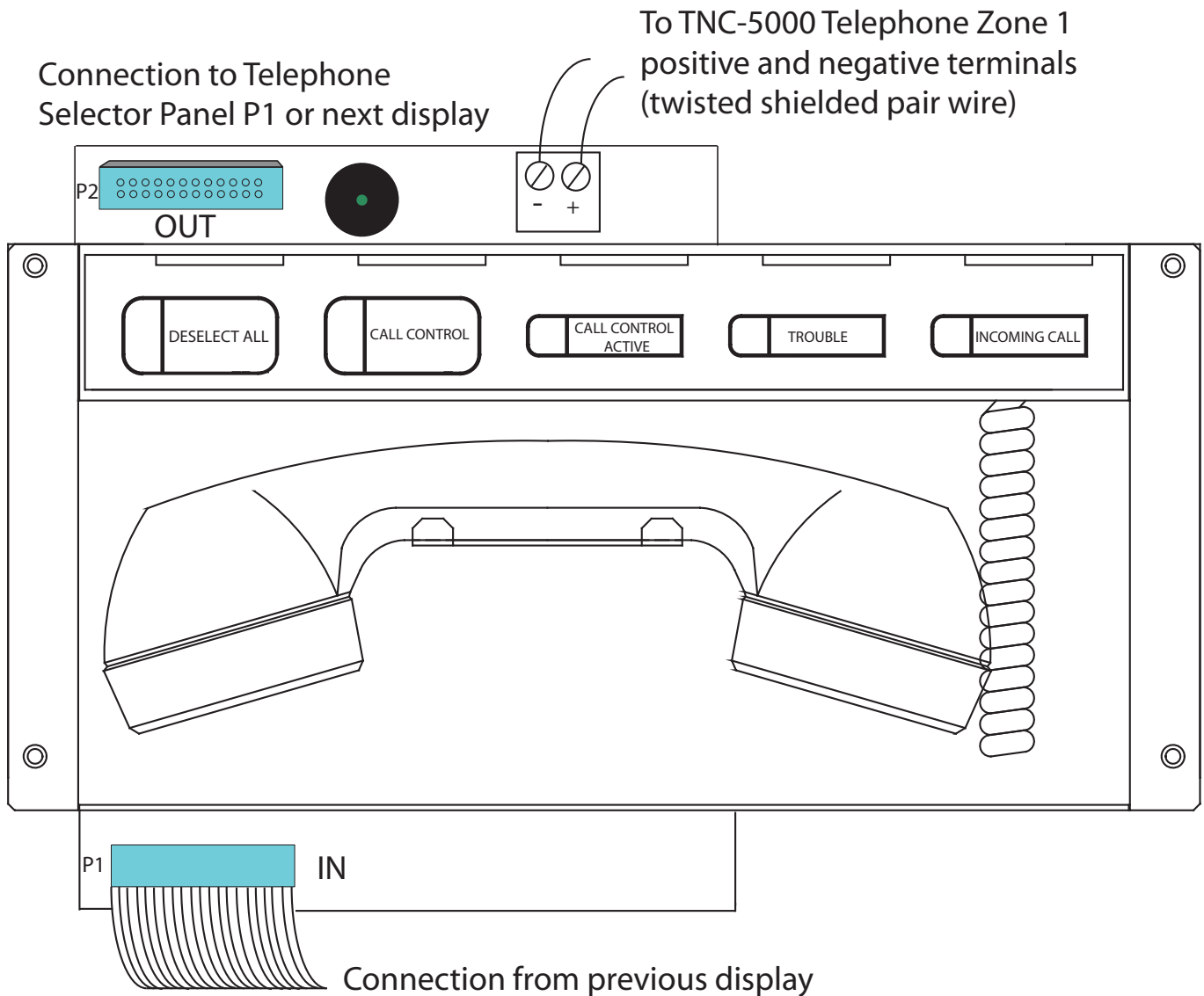
Figure 87:   QAZT-5302/DS Network Firefighters' Telephone Selector Panel

Each QAZT-5302/DS annunciates and controls up to 24 telephone zones. There is one button and two LEDs per zone. The lower amber LED indicates zone trouble. The upper green LED indicates whether that zone is selected for telephone communication.

Press the button to turn the selection for telephone communication for that zone ON and OFF.
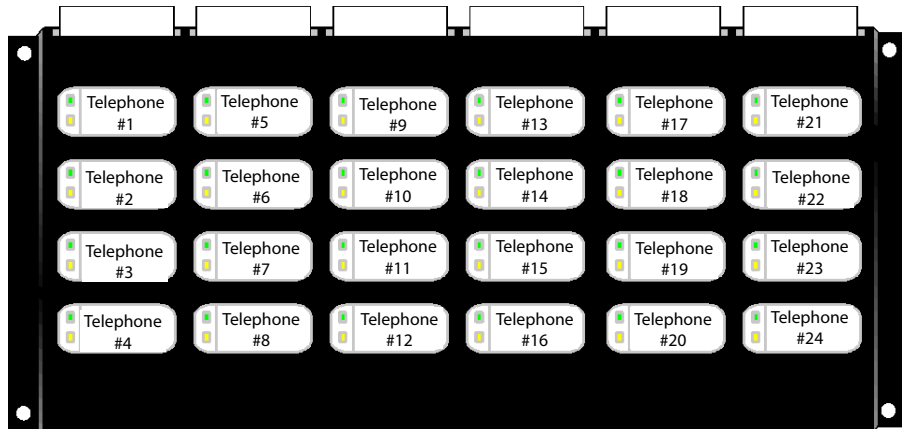
> ⓘ **Note:** Use configurator to set up the QAZT-5302/DS Telephone Zone Selector Panels.

QAZT-5302/DS Network Firefighters' Telephone Selector Panel

Connect the first QAZT-5302 Network Firefighters' Telephone Selector panel to the master telephone by connecting P1 cable into P2 on the QMT-5302N Master Telephone. P2 of the QAZT-5302 is connected to P1 of the next display panel (up to six total).

Figure 88:   QAZT-5302 Telephone Selector Board

CONNECTION TO NEXT DISPLAY PANEL

P1 CONNECTS TO P2 OF THE QMT-5302N NETWORK MASTER TELEPHONE CONTROL MODULE
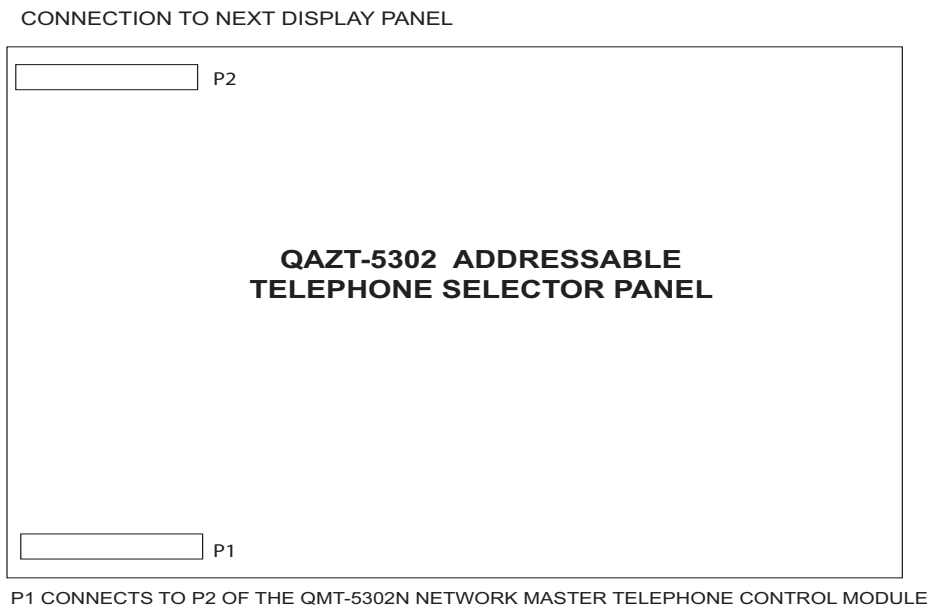
> ⓘ **Note:** All modules such as QMP-5101N/NV Network Master Paging Control Module, the QMT-5302N/NV Network Master Firefighters' Telephone Control Module, the IPS-2424/DS display module and the paging or telephone selector panel QAZT-5302/DS are daisy chained together starting from the FX-2000N LCD display module, DSPL-420, DSPL-2440, RAXN-LCD or RAXN-LCDG. Total number of boards allowed in the daisy chain connection is 6 (12 frames).

Connect the first QAZT-5302DS Network Firefighters' Telephone Selector panel to the master telephone by connecting the Ribbon In cable into P2 on the QMT-5302N/NV Master Telephone. Ribbon Out cable to the Ribbon In of the next QAZT-5302 or P1 of the next display panel (up to six total). See diagram below.

QAZT-5302DS can be used as a telephone or paging selector panel by installing a jumper, see diagram below.

Ribbon Cable connects here on QAZT-5302DS and goes to the next QAZT-5302DS or display module,Ribbon IN.

Install Jumper for QZP

PROG

RIBBON OUT

RIBBON OUT

Ribbon Cable is permanently attached here and connects to Ribbon OUT connector of Master Telephone, Master Paging Microphone or previous QAZT-5302DS.

RIBBON IN

Install jumper here to use QAZT-5302DS as a paging zone selector panel.

RIBBON IN

Telephone Operation

1. When any telephone zone rings (the local buzzer sounds intermittently, and the green zone LED and Incoming Call LED flash) press that zone's button (on the selector panel QAZT-5302/DS) once to answer. Once any one zone has been answered, calls from any other zone will cause that zone's green LED and the Incoming Call LED at the master telephone to flash and the buzzer will sound.

2. Press the answered zone's button once again to hang up. (Note that the telephone zone will hang up automatically if all handsets on the zone are placed back on the hook.)

3. Press DESELECT ALL to disconnect all connected telephones zones.

QMT-5302N and QMT-5302NV Master Telephone LEDs

Trouble LED
This LED will flash amber if there is any zone or other trouble in the firefighters' telephone system.

Incoming Call LED
This LED will flash green if any telephone zone has a handset off-hook and unanswered. It will illuminate steady green if all telephone zones with off-hook handsets have been answered.

Call Control Active LED
This LED will illuminate when there is a connection between the designated Master Telephone (at the CACF) and the present QMT-5302N or QMT-5302NV telephone.

QMT-5302N and QMT-5302NV Master Telephone Pushbutton Controls

Call Control
Pressing this pushbutton will connect this telephone with the designated Master Telephone (possibly at the Central Alarm and Control Facility (CACF).

Deselect All
Pressing this pushbutton will disconnect all selected telephone zones.

QAZT-5302/DS Network Firefighters' Telephone Selector Panel LEDs

Telephone Zone Green LED
This LED will flash green if there is any handset off-hook on that zone, and the zone has not been answered by pressing the zone's button. Once answered, the LED will be steady green.

Telephone Zone Amber LED
This LED will flash amber to indicate trouble on open-circuit zone faults (e.g. missing end-of-line resistor or wire breaks) or short-circuit zone faults.

QAZT-5302/DS Network Firefighters' Telephone Selector Panel Pushbutton Controls

Telephone Selection Pushbutton
Pressing the telephone selector pushbutton will select the associated telephone to be connected to the Master Telephone. Pressing this button a second time will hang up.

Appendix A: Specifications

Main Fire Alarm Chassis (FX-2003-12N/DS and FX-2000ND)

General

One Analog Loop capable of monitoring 99 Sensors and 99 Modules.

Power limited: 22 VDC, 861 mA max, max loop resistance 40ohms

4 Style Y or Z (Class B or A) Indicating Circuits; configurable as strobes or audibles. Terminals are labelled "IND".

Power limited: 24 VDC unfiltered, 1.7 A @ 49°C per circuit

Displays (incl LCD) and Controls for all Common Functions, and 16 Zone Displays.

Optional PR-300 City Tie Module.

Aux. Power Supply (for Remote Annunciators). Terminals are labelled "AUX PWR".

Power limited: 24 VDC unfiltered, 1.7 A @ 49°C

Resettable 4-Wire Smoke Supplies. Terminals are labelled "4-WIRE".

Power limited: 22 VDC, 425 mA max., 5mV ripple

One RS-485 Connection for Remote Annunciators or interface to Audio Systems. Terminals are labelled "RS485".

Power Limited to 300 mA.

Auxiliary relays: (resistive loads)

Must be connected to a Listed Power Limited Source of Supply. Terminals are labelled "ALARM, TROUBLE, SUPV".

    Common Alarm: Form C, 1 Amp, 24 VDC

    Common Supv: Form C, 1 Amp, 24 VDC

    Common Trouble: Form C, 1 Amp, 24 VDC

Micro-controller based design.

Fully Configurable with PC software.

Full walk test function.

Ground Impedance 3k3 ohms

Electrical Ratings

AC Line Voltage:	120V 60Hz / 240V, 50Hz
	4 Amps / 2 Amp (primary)
Power Supply ratings:	*12 Amps. max. (secondary)*
For Indicating Circuits:	24VDC unfiltered
	10 Amps. max.
Battery:	24VDC, Gel-Cell/Sealed Lead-Acid
Charging capability:	17-65 AH batteries
Current Consumption:	standby: 310 mA
	alarm: 733 mA

Main Fire Alarm Chassis (FX-2009-12N/DS)

Same as FX-2003-12N/DS execpt:
Larger Chassis has capacity for 2 display modules and 9 adder modules.

Main Fire Alarm Chassis (FX-2017-12N/DS)

Same as FX-2009-12N/DS except:
Larger Chassis has capacity for 3 display modules and 17 adder modules.

Main Fire Alarm Chassis (FX-2000MNS)

Same as FX-2003-12N/DS except:
Displays (incl LCD) and Controls for all Common Functions, and 16 Zone Displays **are not included**.

Quad Intelligent Analog Loop Module (ALCN-792M/D)

Quad Analog Loops with additional ALCN-792D daughter board capable of monitoring 396 Sensors and 396 Modules.

Power limited: 22 VDC, 400 mA max, 10kHz frequency max loop resistance 40 ohms

Current Consumption: standby: 130 mA

                     alarm: 145 mA

Detection Adder Module (DM-1008A)

Eight supervised Class B (Style B) or four Class A (Style D) initiating circuits; fully configurable. Terminals are labelled "INI".

Initiating circuits are Compatibility ID "A".

Current Consumption:	standby:	80 mA
	alarm: 1 zone active:	125 mA
	2 zone active:	170 mA
	4 zone active:	275 mA
	6 zone active:	370 mA
	8 zone active:	465 mA

Signal Adder Module (SGM-1004A)

Four Class B or A (Style Y or Z) indicating 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

Relay Adder Module (RM-1008A) (resistive loads)

Must be connected to a listed power limited source of supply. Terminals are labelled "RLY".

Eight fully configurable Form C indicating.
    Form C, 1 amp., 28 VDC (resistive loads)

Current Consumption: standby: 25 mA
                             alarm: 150 mA

Polarity Reversal and City Tie Module (PR-300)

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

Appendix A: Specifications

FOM-2000-SP Fiber Optic Module	
Current Consumption:	standby: 15 mA
	alarm: 15 mA

FNC-2000 Network Controller Module	
Current Consumption:	standby: 190 mA
	alarm: 190 mA

ANC-5000 Audio Controller Module	
Current Consumption:	standby: 255 mA
	alarm: 265 mA

RAXN-LCDG Annunciator

24V DC nominal.
Standby: 117 mA Max., All LED's "On": 150 mA Max

TNC-5000 Telephone Controller Module	
Current Consumption:	standby: 195 mA
	alarm: 215 mA

RAXN-LCD Annunciator

24V DC nominal, range of 20 to 39V DC.
Standby: 100 mA Max., All LED's "On": 150 mA Max

Fan Damper Display Module (FDX-008/KI)

24V DC nominal, range of 20 to 39V DC.
Current Consumption: standby: 15mA Max.
                                            alarm (all LEDs ON): 35mA Max.

Selection Control Panel (FDS-008)

24V DC nominal.
Current Consumption: standby: 24mA Max.
                                            alarm (all LEDs ON): 112mA Max.

Adder Annunciator Module RAX-1048/TZ/TZDS

48 Display Points (TZ version has 48 extra trouble display points).
Current Consumption: standby: 139 mA
 alarm: 1 zone LED active: 26 mA
            2 zone LEDs active: 30 mA
            3 zone LEDs active: 35 mA
            4 zone LEDs active: 39 mA
          48 zone LEDs active: 262 mA

Digital Communicator Module (UDACT-300A)

Transmit alarm, supervisory, and trouble to a central monitoring station.
Current Consumption: standby: 45 mA
                                            alarm: 120 mA

Programmable Input Switches Module (IPS-2424/DS)	
Current Consumption:	standby: 10/5 mA
	alarm (one zone active): 15/22 mA

DSPL-420 AND DSPL-2440 Displays

Current Consumption: standby: 25mA and 35mA
                                            alarm: 25mA and 30mA

Compliance

System Model: FleX-Net^{TM} Series Fire Alarm/Alarm Control Panels FX-2003-12N/DS, FX-2009-12N/DS, FX-2017-12N/DS, FX-2000ND and FX-2000MNS.

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: Non-coded

Applicable Standards: NFPA 70 and 72, UL-864 Rev.9, UL 2572, ULC S-524, ULC S-527-99

ULI/ULC Integrated Fire Alarm and Audio Panel Specifications

> ℹ️ **Note:** All circuits are power limited, unless specified otherwise.

Overall

PS-2040 Power Supply

- 0 to 49 degrees Celsius, 0 to 93 + or - 2% RH (non-condensing) operating range
- Power input: 120 VAC, 60Hz, 12A or 240 VAC, 50Hz, 6A (primary), Not Power-limited
- Power supply ratings: 8.5A (x2), 18.85-0-18.85V (secondary)
                            13A, 29V (secondary)

Model QPS-5000N & QBC-5000N Power Supply & Charger

- Primary input 120 VAC, 60Hz, or 240 VAC, 50HZ, 12Amp, Not Power-limited
- Charging for up to 65 AH of 24 VDC batteries
- Float Type Charger

Model FNC-2000 Fire Network Controller Module

- Current consumption: *standby:* 190mA
                           alarm: 190mA

Model ANC-5000 Audio Network Controller Module

- Current consumption: *standby:* 255mA
                           alarm: 265mA

Model TNC-5000 Telephone Network Controller Module

- Current consumption: *standby:*   195mA
                           alarm: 215mA

Model FOM-2000-SP Fiber Optics Module

- Current consumption: *standby:*   15mA
                           alarm: 15mA

Model QAA-5160-70/25 Amplifier with one 70V or 25V, 60 Watt Zone

- 70.7Vrms or 25V constant voltage output
- One fully supervised Class "A" or "B" speaker Zone
- 60 watts per zone
- Freq. Response: ULI bandwidth from 800 to 2800 Hz
- Harmonic distortion less than 2.5% at 1 KHz
- Current consumption: *standby:* 55mA
                           alarm: 350mA, plus 65mA/Watt Speaker Power

Model QAA-5230-70/25 Amplifier with two 70V or 25V, 30 Watt Zones

- 70.7Vrms or 25V constant voltage output
- Two fully supervised Class "A" or "B" speaker zones
- 30 watts per zone
- Freq. Response: ULI bandwidth from 800 to 2800 Hz
- Harmonic Distortion less than 2.5% at 1 KHz
- Current Consumption: *standby:* 55mA
                           alarm: 350mA, plus 65mA/Watt Speaker Power

Appendix A: Specifications

Model QAA-5230S-70/25 Amplifier with 2 split 70V or 25V, 30 Watt Zones

- 70.7Vrms or 25V constant voltage output
- Each 30W output divided into 2 Class "B" 15W lines for split speaker line applications (two lines per zone with staggered speakers); four fully supervised Class "B" speaker zones
- 30 watts per zone, 15 Watts per split
- Freq. response: ULI bandwidth from 800 to 2800 Hz
- Harmonic Distortion less than 2.5% at 1 KHz
- Current Consumption: *standby:* 55mA
                                      alarm: 350mA, plus 65mA/Watt Speaker Power

Model QAA-5415-70 Amplifier with four 70V, 15 Watt Zones

- 70.7Vrms constant voltage output
- Four fully supervised Class "B" speaker zones, 15 watts per zone
- Freq. response: ULI bandwidth from 800 to 2800 Hz
- Harmonic distortion less than 2.5% at 1 KHz
- Current consumption: *standby:* 55mA
                                      alarm: 350mA, plus 75mA/watt speaker power

Model QAA-5415-25 Amplifier with four 25V, 15 Watt Zones

- 25Vrms constant voltage output
- Four fully supervised Class "B" speaker zones
- 15 watts per zone
- Freq. response: ULI bandwidth from 800 to 2800 Hz
- Harmonic distortion less than 2.5% at 1 KHz
- Current consumption: *standby:* 55mA
                                      alarm: 350mA, plus 75mA/watt speaker power

Model QMP-5101N or QMP-5101NV Paging Microphone

- Mounts in Mircom BB-1000, BB-5000, FX-LOC, and BBX-FXMNS (for QMP-5101NV) enclosures
- Current Consumption: *standby:* 3mA
                                      alarm: 7mA

Model QAZT-5302/DS Paging Selector Panel

- Mounts in Mircom BB-1000, BB-5000 and BBX-FXMNS enclosures
- Connects to QMP-5101N to provide 24 zones of paging control
- Up to one per QMP-5101N or QMP-5101NV
- Current Consumption: *standby:* 10mA
                                      alarm: 15mA

Model QMT-5302N or QMT-5302NV Master Telephone

- Mounts in Mircom BB-1000, BB-5000, FX-LOC, and BBX-FXMNS enclosures
- Current Consumption: *standby:* 1mA
                                      alarm: 13mA

Model QAZT-5302/DS Telephone Selector Panel

- Mounts in Mircom BB-1000, BB-5000, FX-LOC, and BBX-FXMNS enclosures
- Connects to QMT-5302N to provide 24 firefighters' telephone zones
- Up to six selector panels per QMT-5302N
- Unlimited handsets allowed per telephone circuit, supports up to 5 handsets active at the same time
- Current Consumption: *standby:* 10mA/5mA
                                      alarm: 15mA/22mA

Appendix B: Power Supply and Battery Calculations

Model Number	Description	Qty		Standby	Total Standby	Alarm	Total Alarm
FX-2003-12N/ND/DS	Main Chassis (12 Amp)		X	0.310	=	0.733	=
FX-2017-12N/DS	Main Chassis (12 Amp)		X	0.310	=	0.733	=
FX-2009-12N/DS	Large Main Chassis (12 Amp)		X	0.310	=	0.733	=
ALCN-792M	Dual Analog Loops		X	0.130	=	0.145	=
ALCN-792M/D	Quad Analog Loops		X	0.130	=	0.145	=
FNC-2000	Fire Network Controller Module		X	0.190	=	0.190	=
ANC-5000	Audio Network Controller Module		X	0.255	=	0.265	=
TNC-5000	Telephone Network Controller Module		X	0.195	=	0.215	=
FOM-2000-SP	Fiber Optics Module		X	0.015	=	0.015	=
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 Indicating 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	=
DSPL-420	Narrow Display		X	0.025	=	0.025	=
DSPL-2440	Graphic Display		X	0.029	=	0.035	=
UDACT-300A	Dialer Module		X	0.045	=	0.120	=
PR-300	City Tie Module		X	0.035	=	0.300	=
FDS-008	Selection Control Panel for MNS		X	0.024	=	0.112	=
RAX-1048/TZ/TZDS	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-1032/TZ/TZDS	Adder Annunciator Chassis		X	0.050	=	32 zone active: 0.300	=
AGD-048	Adder Graphic Driver Board		X	0.035	=	__(#of LEDs) x 4mA (Refer to LT-847 if using lamps)	=
IPS-2424/**DS**	Programmable Input Switches Module		X	0.010/**0.005**	=	0.015/**0.022**	=
Two-Wire Smoke Detectors			X	♦ 0.00005	=	*0.39	= 0.39
MIX-1251B/BA Analog Ion Smoke Detector			X	0.0003	=	0.0065	=
MIX-2251B/BA Analog Photo Smoke Detector			X	0.0003	=	0.0065	=
MIX-2251TMB/TMBA Analog Thermal Sensor			X	0.0003	=	0.0065	=
MIX-M500MB/MA, **MIX-M501MB/MA** Monitor			X	0.0004	=	0.0051/**0.0055**	=
MIX-M500R(A)/MIX-M500S(A) Addressable Control Module			X	0.0003	=	0.0051	=
MIX-M500X(A) Fault Isolator Module			X	0.00045	=	450µA	=
B224BI(A) Analog Base with Isolator			X	0.00045	=	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**)

Battery Calculations continued. . . .

Legend: * Assuming three initiating circuits in alarm.

♦Using the **2W-B or C2W-BA** 2-wire smoke detector. See LT-1023 Compatibility List for other compatible smoke detectors.

To Calculate Chassis and Battery Size:

Add all the alarm currents in column (B), and use this value to determine main chassis selection and the battery capacity requirement.

Total Current Requirement: ALARM (total from column **B**)_____ Amps.

Main Chassis Selection:
Select **FX-2003-12N/DS**, **FX-2017-12N/DS** or **FX-2009-12N/DS** if the total of column **B** is less than 12 Amps.

Use the total from column (A) as the standby current required. Multiple this value by 24 hours or 60 hours depending on AHJ. Add this total to the total of column (B) multiplied by the time in hours to sustain alarm.

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

Battery Capacity Requirement:

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

Battery Selection: Multiply (total from column **C**) by 1.20 to derate battery.

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

RAXN-LCD/RAXN-LCDG:

The RAXN-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. The RAXN-LCDG is similar to the RAXN-LCD except its display is a graphical LCD. It is equipped with expanded memory of more than 18,000 system points, large 4 line x 20 character backlit alphanumeric LCD display (or for the RAXN-LCDG a graphical 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 documents LT-895 and LT-6033.

Models:
- **RAXN-LCD or RAXN-LCDG** Main Annunciator Chassis with Common Indicators and Controls.
- **RAX-1048(TZ):** Adder Annunciator Chassis with 48 Circuit Capacity.
- **IPS-2424/DS:** Programmable Input Switches module with 48 display points and 24 buttons.

ENCLOSURES for RAXN-LCD and RAXN-LCDG:
- **BB-1001** With capacity for one Annunciator Chassis.
- **BB-1002** With capacity for two Annunciator Chassis.
- **BB-1003** With capacity for three Annunciator Chassis.
- **BB-1008** With capacity for eight Annunciator Chassis.
- **BB-1012** With capacity for twelve Annunciator Chassis.

Notes:
- **Finish:** Painted, textured, off-white (standard) (for other paint available colours and finishes, please contact factory)
- **Material:**18 G.A. cold roll steel (CRS)

Appendix C: DIP Switch Settings

FX-200X-XX Network Main Board Address Setting (DIP SWITCH SW2)

Node Address	SW2 DIP SWITCHES							
	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
1	ON	OFF	OFF	OFF	OFF	OFF		
2	OFF	ON	OFF	OFF	OFF	OFF		
3	ON	ON	OFF	OFF	OFF	OFF		
4	OFF	OFF	ON	OFF	OFF	OFF		
5	ON	OFF	ON	OFF	OFF	OFF		
6	OFF	ON	ON	OFF	OFF	OFF		
7	ON	ON	ON	OFF	OFF	OFF		
8	OFF	OFF	OFF	ON	OFF	OFF		
9	ON	OFF	OFF	ON	OFF	OFF		
10	OFF	ON	OFF	ON	OFF	OFF		
11	ON	ON	OFF	ON	OFF	OFF		
12	OFF	OFF	ON	ON	OFF	OFF		
13	ON	OFF	ON	ON	OFF	OFF		
14	OFF	ON	ON	ON	OFF	OFF		
15	ON	ON	ON	ON	OFF	OFF		
16	OFF	OFF	OFF	OFF	ON	OFF		
17	ON	OFF	OFF	OFF	ON	OFF		
18	OFF	ON	OFF	OFF	ON	OFF		
19	ON	ON	OFF	OFF	ON	OFF		
20	OFF	OFF	ON	OFF	ON	OFF		
21	ON	OFF	ON	OFF	ON	OFF		
22	OFF	ON	ON	OFF	ON	OFF		
23	ON	ON	ON	OFF	ON	OFF		
24	OFF	OFF	OFF	ON	ON	OFF		
25	ON	OFF	OFF	ON	ON	OFF		
26	OFF	ON	OFF	ON	ON	OFF		
27	ON	ON	OFF	ON	ON	OFF		
28	OFF	OFF	ON	ON	ON	OFF		
29	ON	OFF	ON	ON	ON	OFF		
30	OFF	ON	ON	ON	ON	OFF		
31	ON	ON	ON	ON	ON	OFF		
32	OFF	OFF	OFF	OFF	OFF	ON		
33	ON	OFF	OFF	OFF	OFF	ON		
34	OFF	ON	OFF	OFF	OFF	ON		
35	ON	ON	OFF	OFF	OFF	ON		
36	OFF	OFF	ON	OFF	OFF	ON		
37	ON	OFF	ON	OFF	OFF	ON		
38	OFF	ON	ON	OFF	OFF	ON		
39	ON	ON	ON	OFF	OFF	ON		
40	OFF	OFF	OFF	ON	OFF	ON		
41	ON	OFF	OFF	ON	OFF	ON		
42	OFF	ON	OFF	ON	OFF	ON		
43	ON	ON	OFF	ON	OFF	ON		
44	OFF	OFF	ON	ON	OFF	ON		
45	ON	OFF	ON	ON	OFF	ON		
46	OFF	ON	ON	ON	OFF	ON		
47	ON	ON	ON	ON	OFF	ON		
48	OFF	OFF	OFF	OFF	ON	ON		
49	ON	OFF	OFF	OFF	ON	ON		
50	OFF	ON	OFF	OFF	ON	ON		
51	ON	ON	OFF	OFF	ON	ON		
52	OFF	OFF	ON	OFF	ON	ON		
53	ON	OFF	ON	OFF	ON	ON		
54	OFF	ON	ON	OFF	ON	ON		
55	ON	ON	ON	OFF	ON	ON		
56	OFF	OFF	OFF	ON	ON	ON		
57	ON	OFF	OFF	ON	ON	ON		
58	OFF	ON	OFF	ON	ON	ON		
59	ON	ON	OFF	ON	ON	ON		
60	OFF	OFF	ON	ON	ON	ON		
61	ON	OFF	ON	ON	ON	ON		
62	OFF	ON	ON	ON	ON	ON		
63	ON	ON	ON	ON	ON	ON		

FX-200X-XX Network Main Board Address Setting

SW2-7: Leave in "OFF" position as Factory Set.

SW2-8: Leave in "OFF" position as Factory Set.

Appendix D: Alarm Verification Timing

ANC-5000 Board with Ethernet Port, Address Setting (DIP SWITCH SW1)

	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
ANC-5000	1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
	2	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
	3	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
	4	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
	5	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
	6	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
	7	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

ANC-5000 Board without Ethernet Port, Address Setting (DIP SWITCH SW1)

	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
ANC-5000	1	ON	OFF	OFF	Leave in "OFF" position as Factory Set.				
	2	OFF	ON	OFF					
	3	ON	ON	OFF					
	4	OFF	OFF	ON					
	5	ON	OFF	ON					
	6	OFF	ON	ON					
	7	ON	ON	ON					

ACN-792M Loop Adder Module (CPU) Address Setting (DIP SWITCH SW1)

	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
ALCN-792M	1	ON	OFF	OFF	OFF	OFF	OFF	OFF	Put in "ON" position for firmware restore to defaults during power up. At all other times put in "OFF" state.
	2	OFF	ON	OFF	OFF	OFF	OFF	OFF	
	3	ON	ON	OFF	OFF	OFF	OFF	OFF	
	4	OFF	OFF	ON	OFF	OFF	OFF	OFF	
	5	ON	OFF	ON	OFF	OFF	OFF	OFF	
	6	OFF	ON	ON	OFF	OFF	OFF	OFF	
	7	ON	ON	ON	OFF	OFF	OFF	OFF	

RAXN-LCD/RAXN-LCDG Remote Annunciator Address Setting (DIP SWITCH SW1)

	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
RAXN-LCD/G	33	ON	OFF	OFF	OFF	OFF	ON	Leave in "OFF" position as Factory Set.	
	34	OFF	ON	OFF	OFF	OFF	ON		
	35	ON	ON	OFF	OFF	OFF	ON		
	36	OFF	OFF	ON	OFF	OFF	ON		
	37	ON	OFF	ON	OFF	OFF	ON		
	38	OFF	ON	ON	OFF	OFF	ON		
	39	ON	ON	ON	OFF	OFF	ON		

Appendix D: Alarm Verification Timing

ULI/ULC Retard / Reset / Restart — 60 seconds Maximum

ULI/ULC Confirmation Period — 60 seconds Minimum

SMOKE DETECTOR IN ALARM

Reset — Restart

3s   1s   10s   (30s)   (65s)

These intervals are determined by the maximum Detector Reset time, which is 1s for our uses.

This interval is determined by the maximum Detector Start-up time. ULC states a maximum hold time of 30 seconds.
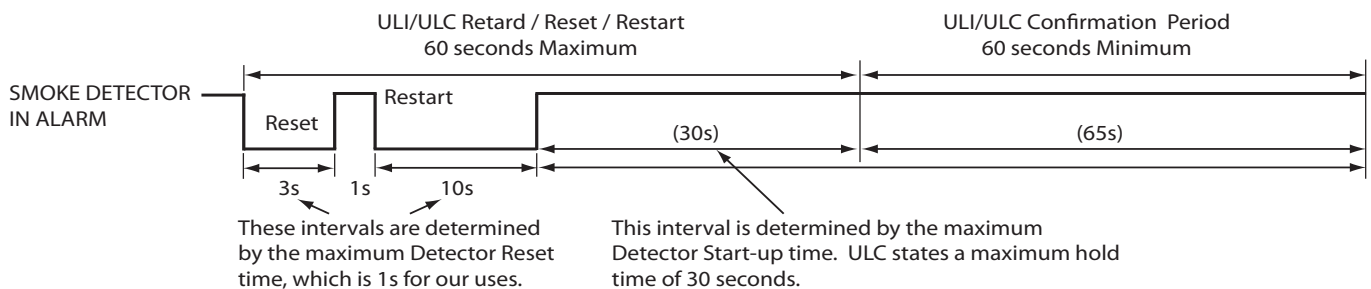
A Manual Station, or other contact-closure device, would remain shorted and be detected during the very short Zone Power burst within the first three seconds. A Smoke Detector will have been reset, and will require some minimum time to power-up, thus the Verification cycle will be entered.

Appendix E: Wiring For Addressable Supervised Output Module
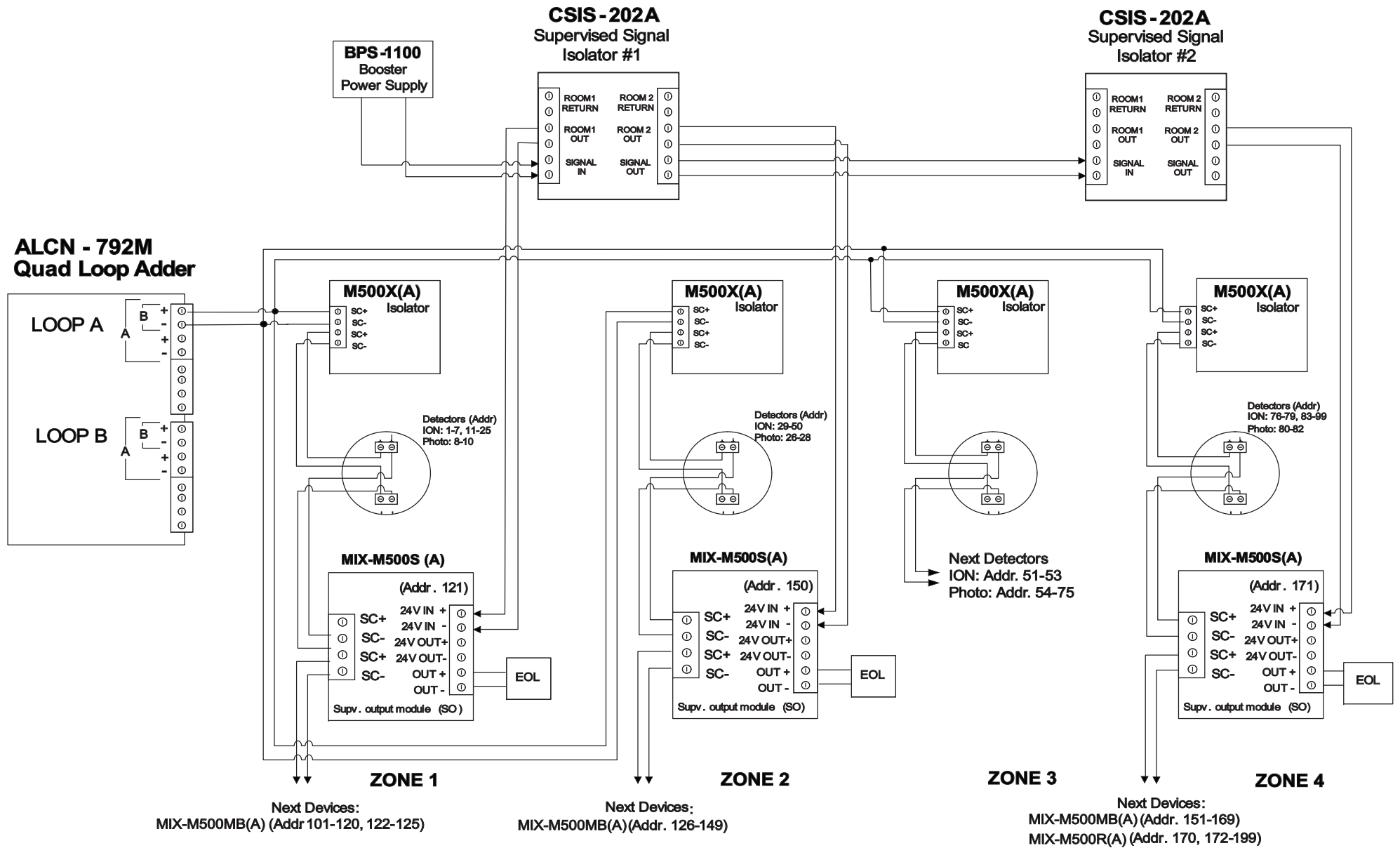
WIRING FOR ADDRESSABLE SUPERVISED OUTPUT MODULE TO COMPLY WITH UL 864 REV. 9

Appendix F: ULC Compatible Speakers

MIRCOM MODEL NUMBER	dbA @ 10 feet		Mounting and Shape	
4" Speakers (70V)				
SP-104A-70 (4"round)	1/4 watt	85 dbA	IB-104 Recessed	Round
SP-204A-70 (4"square)	1/2 watt 1 watt	86 dbA 89 dbA	IB-204 Recessed, IB-404 Surface	Square
SP-304A-70 (retrofit)	2 watts	91 dbA	IB-604 Recessed	Rectangle
Strobe Speakers (70V)				
SPS-104A-70 (4"round)	1/4 watt	85 dbA	IB-104 Recessed	Round
SPS-204A-70 (4"square)	1/2 watt 1 watt 2 watts	86 dbA 89 dbA 91 dbA	IB-204 Recessed, IB-404 Surface	Square
Silenceable Speakers (70V)				
SP-404-70A (4"round)	1/4 watt 1/2 watt 1 watt 2 watts	85 dbA 86 dbA 89 dbA 91 dbA	IB-104 Recessed	Round
SP-504-70A (4"square)			IB-204 Recessed, IB-404 Surface	Square
SP-404SW-70A (4"round)			IB-104 Recessed	Round
SP-504SW-70A (4"square)			IB-204 Recessed, IB-404 Surface	Square
8" Speakers (70V)				
SP-108-70 (8"round)	1/4 watt	83 dbA	IB-108 Recessed	Round
SP-208-70 (8"square)	1/2 watt 1 watt 2 watts	87 dbA 90 dbA 93 dbA	IB-208 Recessed, IB-408 Surface	Square

Appendix G: ULI Compatible Speakers

COOPER-WHEELOCK MODEL NUMBER	dbA @ 10 feet		Mounting and Shape
Square Speakers (25V or 70V)			
E50-R (red) E50-W (white)	1/8 watt 1/4 watt 1/2 watt 1 watt 2 watts	77 dBA 81 dbA 83 dbA 86 dbA 89dbA	Standard Electrical Box, 5" square speaker
Rectangular Speaker/Strobe (25V or 70V)			
E50-241575W-FR (red) E50-241575W-FW (white) E50-24MCW-FR (red) E50-24MCW-FW (white) E50-24MCW-MW (white) E50-24MCWH-FR (red) E50-24MCWH-FW (white)	1/8 watts 1/4 watts 1/2 watts 1 watts 2 watts	76 dBA 80 dbA 82 dbA 85 dbA 88 dbA	Standard Electrical Box with extension ring, 5"W x 6.74" rectangular speaker/strobe
Round Speaker (25V or 70V)			
E60-R (red) E60-W (white)	1/8 watt 1/4 watt 1/2 watt 1 watt 2 watt	77 dBA 81 dbA 83 dbA 86 dbA 89dbA	Standard Electrical Box, 7.385" round speaker
Round Speaker/Strobe (25V or 70V)			
E60-24MCC-FR (red) E60-24MCC-FW (white) E60-24MCCH-FR (red) E60-24MCCH-FW (white)	1/8 watt 1/4 watt 1/2 watt 1 watt 2 watts	76 dBA 80 dbA 82 dbA 85 dbA 88 dbA	Standard Electrical Box with extension ring 7.385" round

Appendix H: Power Supply & Batteries for Audio

Use the form below to determine the required main chassis and secondary power supply (batteries).

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* on page 126 for specifications.

Model Number	Description	Qty		Standby (Amps)	Total Standby (Amps)	Alarm (Amps)	Total Alarm (Amps)
FX-2000MNS	Main Fire Alarm Board		X	0.310	=	0.733	=
ANC-5000	Audio Network Controller Module		X	0.255	=	0.265	=
TNC-5000	Telephone Network Controller Module		X	0.195	=	0.215	=
QAA-5160-70/25	1 Zone 60W Amplifier		X	0.055	=	0.350	=
QAA-5230-70/25	2 Zone 30W Amplifier		X	0.055	=	0.350	=
QAA-5230S-70/25	2 Zone 30W Amplifier (split)		X	0.055	=	0.350	=
QAA-5415-70	4 Zone 15W Amplifier, 70V		X	0.055	=	0.350	=
QAA-5415-25	4 Zone 15W Amplifier, 25V		X	0.055	=	0.350	=
QMP-5101N	Master Paging Module		X	0.003	=	0.007	=
QMP-5101NV	Vertical Master Paging Module		X	0.003	=	0.007	=
QMT-5302N	Master Telephone Module		X	0.001	=	0.013	=
QMT-5302NV	Vertical Master Telephone Module		X	0.001	=	0.013	=
QAZT-5302/**DS**	Paging/Telephone Zone Module		X	0.010/**0.005**	=	0.015/**0.022**	=
Total audio power in watts						0.065/watt	=
Total audio power in watts for QAA-5415-70 or -25						0.075/watt	=
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

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

Batteries: BA-124 (24AH), BA-140 (40AH), and BA-165(65AH).
Above 40AH, batteries require a separate box (model BC-160).

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

i **Note:** Separate calculations must be completed for each QBB-5001(R).

Appendix I - POWER-LIMITED WIRING SCHEME

BBX-2000 Enclosure

QMB-5000N Audio Card Cage

Make sure wires that are connected to NON POWER-LIMITED circuits are at least 1/4 inches away from wires that are connected to POWER-LIMITED circuits

Use wire ties secured to the backbox, in positions as shown, to assure that these NON POWER-LIMITED wires remain at least 1/4 inches away from wires that are connected to POWER-LIMITED circuits.

All circuits on the main fire alarm board are POWER-LIMITED circuits.

FX-2000ND FIRE ALARM

PS-2040 Power Supply

Wires connected to AC power and Batteries are NOT POWER-LIMITED.

Batteries

Appendix J FXMNS Used as a Mass Notification System (ACU)

The MNS portion of a complete Mircom FleX-Net^{TM} Network Fire Alarm system consists of a BBX-FXMNS Enclosure (see Node 2 in figure below). The BBX-FXMNS includes a RAXN-LCD Annunciator which is designated an ACU (Autonomous Control Unit) and a Master Microphone to provide emergency audio. Below the ACU is another RAXN-LCD which annunciates the fire alarm system along with a Master Telephone for emergency use. Below this is a display LCD such as the DSPL-420 or DSPL-2440 which may be used for service; this display will show all messages. Up to seven FX-LOC(R)s can be connected to any MNS node.

The FX-LOC(R) Local Operating Console along with the FleX-Net^{TM} Network Fire Alarm provides compliance with the Mass Notification System (MNS) UL 2572 requirements.

Applicable Standards: UL 2572, UL 864, NFPA 72, ULC

In-Building Mass Notification Sample System

MMX-LOC (R) (#7)

MMX-LOC(R)s (Local Operating Control) can be located on each floor

IN-BUILDING MASS NOTIFICATION SYSTEM

MMX
Intelligent Fire Alarm Network

Node 1

Node 2

RAXN-LCD used as part of ACU (Autonomus Control Unit)

RAXN-LCD used as Fire Alarm Display

SLC

RS-485

24V DC

MIC & PTT

DSPL-2440 Graphic Display used for service

MMX-LOC(R) (#1)

Up to 7 LOCs are allowed per node

CACF
Central Alarm and Control Facility

MMX-FXMNS
Mass Notification System
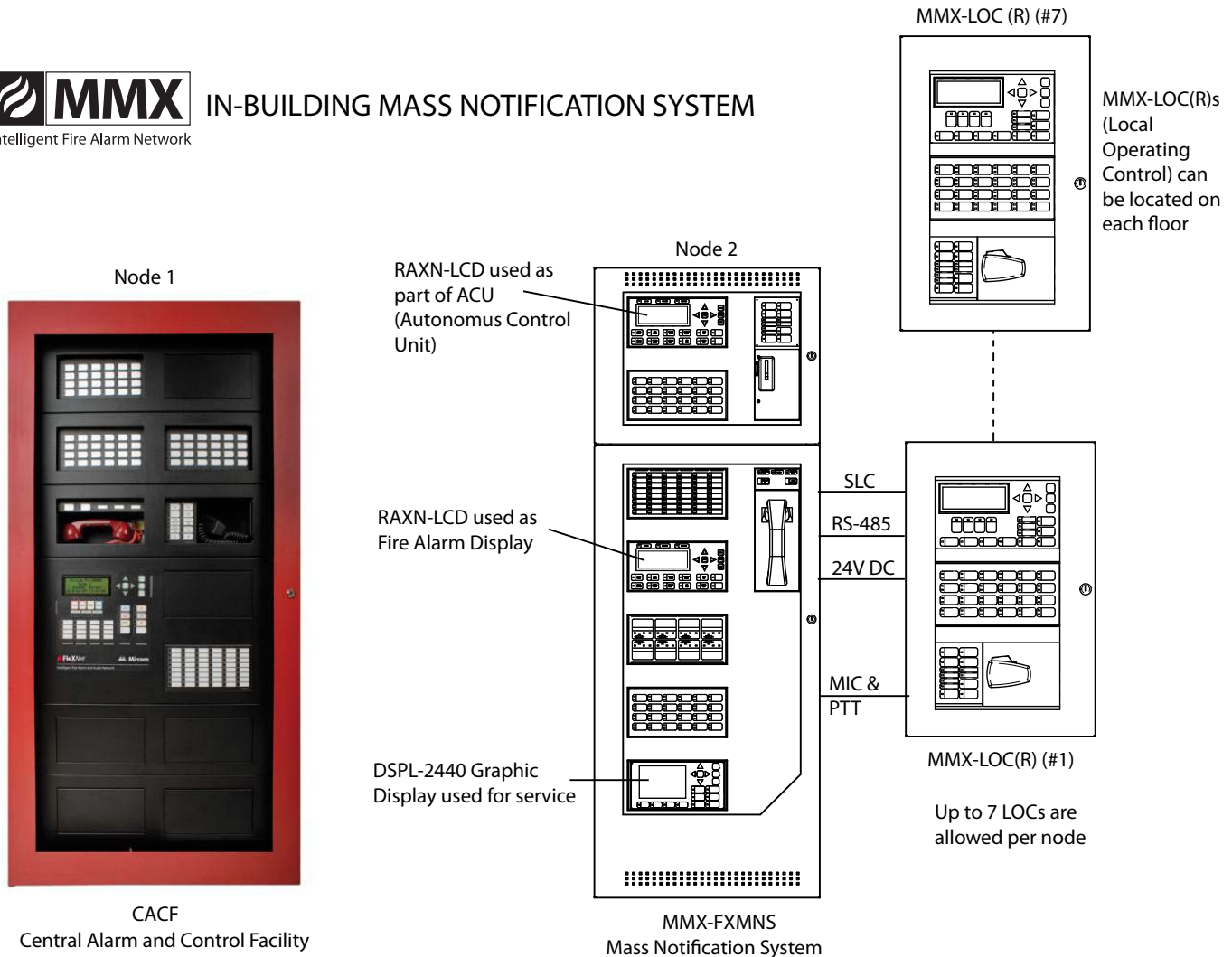
QMP-5101N Network Paging Wiring for Mass Notification

QMP-5101N Network Master Paging Control Module Wiring to the ANC-5000 Audio Network Controller Module

MNS - ACU

FX- LOC(R)

QMP-5101N Network Master Paging Module

QMP-5101N Network Master Paging Module

TWISTED SHIELDED PAIR CABLE

+ −   + S −
PTT   MIC

+ −   + S −
PTT   MIC

Daisy chain PTT and MIC to next FX-LOC(R). At the last FX-LOC(R) QMP-5101N Paging Mocule connect EOL resistors (3K9 ohms value) to + and - of both the MIC and PTT terminals.

Wire the Paging Bus to all other ANC-5000 Audio Network Controller Modules OUT to IN. See Figure 73 for more details.

TWISTED SHIELDED PAIR CABLE

This connection to Aux Power is not required when ANC-5000 is installed in the Audio Card Cage

NOT USED
G.A. Input IN
RS-485

OUT   IN

S − + S − + L − + S − + S − + − + − +
PAGING BUS   PTT   MIC   Remote Power Input

JW8 JW7

ANC-5000 Audio Network Controller Module in the MNS (ACU)

Jumpers JW7 and JW8 must be installed at all times.

Configuration for Mass Notification

There are two groups that can be created for the nodes; one group is the fire/central control and the second is mass notification.

In order to have this distinction, all zones have to be assigned a "Zone Priority". Priority can be high, low, normal or a percentage of + or - increments of 5. Maximum of +95 percent above normal and -95 percent below normal. This percentage allows specific levels of messaging priority above and below fire alarm messaging. For example one area of voice messaging may have +5 percent above normal zone priority, which means that this area has the first level priority (or override) above fire alarm messaging. Another area may have -10 percent below normal zone priority which will have this area two levels below fire alarm messaging priority.

The following are screen captures of the group and zone priority for an sample system with a CACF and MNS and two FX-LOC(R)s (refer to figure on page 139).

This screen capture shows selection of Node 1 as a Fire/Central Control
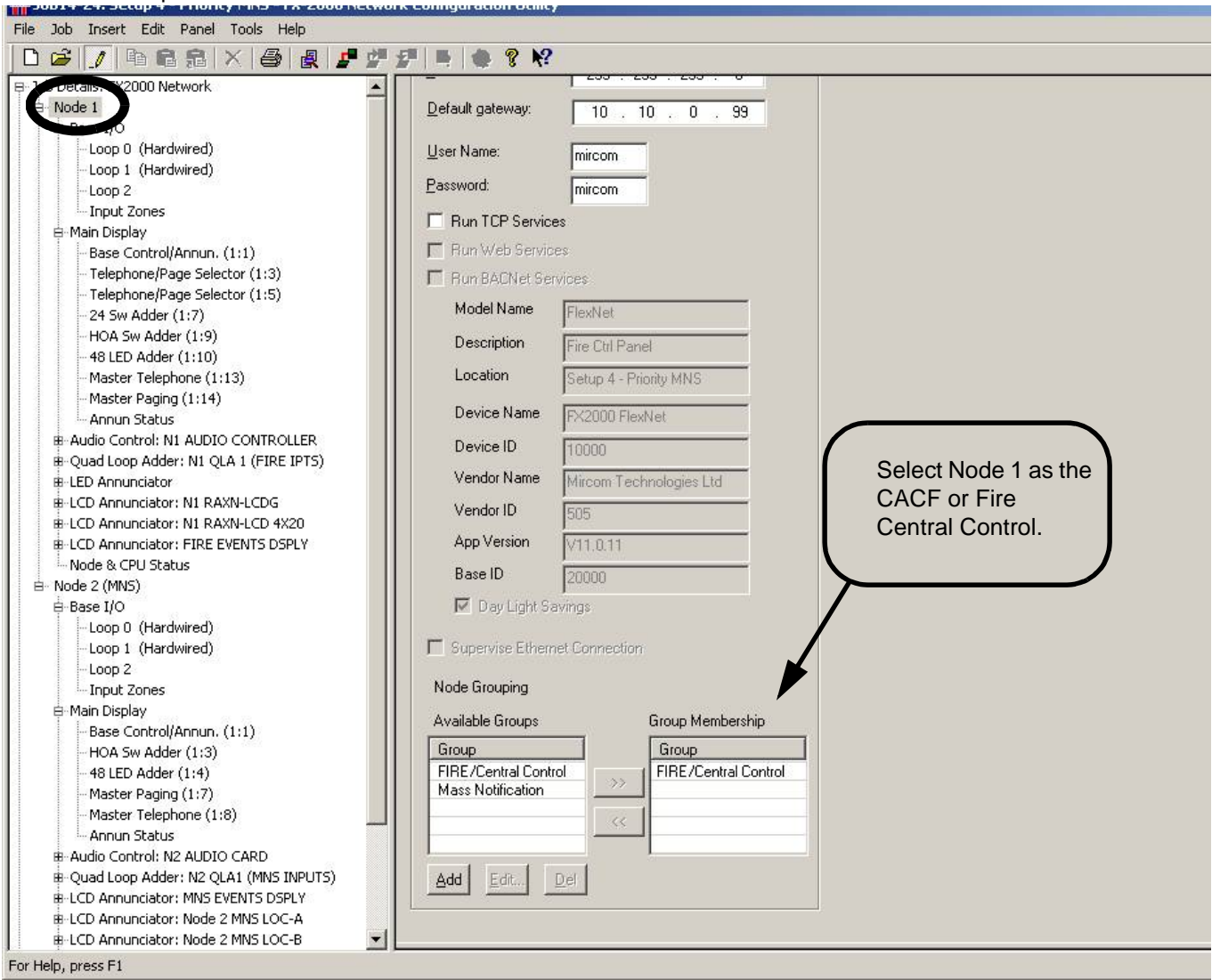
This screen capture shows selection of Node 2 as Mass Notification
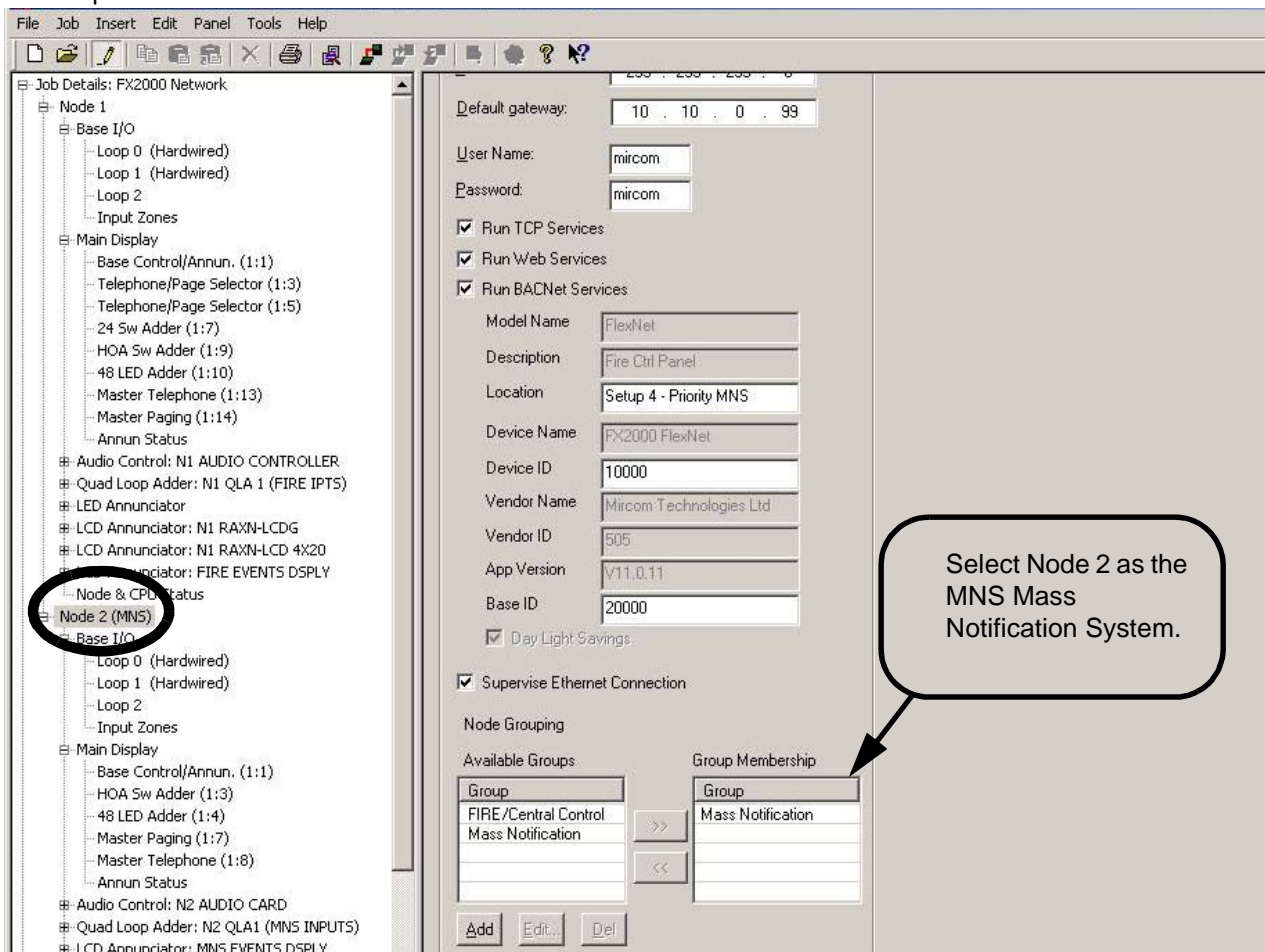
This screen capture shows input zone priority settings for the Mass Notification Node 2

FX-LOC(R) Active

As part of the Mass Notification requirements, an RAX-1048TZ Zone Annunciator is part of the MNS.   Configure one zone of the RAX-1048TZ per each FX-LOC(R) connected to the MNS (ACU). Each LED is configured to illuminate when the respective FX-LOC(R) paging is in use.

> **Note:** The RAX-1048TZ/TZDS normally displays Initiating circuit status and trouble indication, the FleX-Net^{TM} configuration must be used to configure each zone corresponding to a FX-LOC(R).

Reset

As per UL, resets are handled separately for Fire/Central Control and the Mass Notification System. They are mutually independent.

ACU Emergency Response Operation

1. Access control of ACU.
2. ACU will notify in use via LED on RAX-1048TZ/DS.
3. Select areas to receive paging or digitized messages or use all call.
4. Page or send digitized message as necessary.

Warranty & Warning Information

Warning Please Read Carefully

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

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.

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 MGC products contain software. With respect to those products, MGC 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. MGC shall not be liable for any delays, breakdowns, interruptions, loss, destruction, alteration or other problems in the use of a product arising our 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.

Limited Warranty

Mircom Technologies Ltd., MGC Systems Corp. and MGC System International Ltd. together with their subsidiaries and affiliates (collectively, MGC) warrants the original purchaser that for a period of three years from the date of shipment, proprietary manufactured product shall be free of defects in materials and workmanship, under normal use. During the warranty period, MGC 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. Non-proprietary, third party or OEM product shall be warranted in accordance with the warranty period of the manufacturer. 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 MGC 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.

International Warranty

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

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 MGC 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 MGC);

•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.

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 MGC must first obtain an authorization number. MGC will not accept any shipment whatsoever for which prior authorization has not been obtained. NOTE: Unless specific pre-authorization in writing is obtained from MGC management, no credits will be issued for custom fabricated products or parts or for complete fire alarm system. MGC will at its sole option, repair or replace parts under warranty. Advance replacements for such items must be purchased.

Note: MGC'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.

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. MGC neither assumes nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, or 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.

Out of Warranty Repairs

MGC 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 MGC must first obtain an authorization number. MGC will not accept any shipment whatsoever for which prior authorization has not been obtained.

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

Products which MGC 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: MGC 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 MGC 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.

MGC 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.

INX-10A
Intelligent NAC Expander Panel

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1.0 Introduction

This document provides information for the successful installation, operation and configuration of the INX-10A.

This chapter explains

- Feature Overview
- Contact Information

1.1 The INX-10A Intelligent NAC Expander Panel

Mircom's INX-10A is an Intelligent NAC Expander Panel for use with Mircom's FX-2000 Series addressable Fire Alarm Control Panels. The INX Series operates in CLIP (Classic Loop Interface Protocol) mode. Available as a 10 Amp configuration, the INX-10A extends the power capabilities of existing notification appliance circuits and provides power for other ancillary devices.

The INX-10A also has the ability to operate with any UL Listed 24 VDC conventional fire alarm control panel to provide Notification Appliance Circuit expansion.

1.1.1 Compatible Fire Alarm Control Panels

Table 1 Compatible Fire Alarm Control Panels

Manufacturer	Fire Alarm Control Panel Series
Mircom	FX-2003-12N
	FX-2017-12N
	FX-2009-12N
	FX-2003-6
	FX-2003-12
	FX-2003S-12
	FX-2017-12A
	FX-2017S-12A
	FX-2009-12
	FX-2009S-12
Secutron	MR-2100 / MR-2200 Series
	MR-2900 Series

1.1.2 Features

- Supports 8 synchronized panels on one node to meet sync timing requirements
- Supports up to 14 panels per node using minimal configuration (7 SLC points per booster)
- Supports up to 6 panels per node using maximum configuration (15 points for extended trouble reporting and two-stage operation).
- Outputs used as power supply outputs do not require panel configuration or SLC addresses
- Utilizes DIP switches for configuration
- DC regulated outputs
- Configurable NAC, Power and Door Holder Outputs
- Configurable AC Power fail delay
- Enable or disable Ground fault
- Separate Relay for Ground Fault and Common Trouble available on terminals

- Enable or disable the Battery Charger on activation
- Class A or B output signals
- Horn/Strobe sync protocols include Mircom, Amseco, Gentex, System Sensor and Wheelock
- Ability to sync outputs for multiple INX-10A units
- 2 wire horn/strobe Sync mode allows audible notification appliances (horns) to be silenced while visual notification appliances (strobes) continue to operate
- Audible signals may be configured for Steady, Temporal Code, California Code and March Time
- Output fault notification to FACP
- Built-in charger for sealed lead acid or gel type batteries
- Enclosure fits 4AH, 7AH and 12AH batteries
- 2.5 Amp max current per output
- 1.7 Amp auxiliary power output
- Unit includes power supply and charger, red enclosure, cam lock, transformer and battery leads
- Compatible with 24VDC fire panels
- Surface or flush-mountable

1.1.3 General Notes

Circuits And Zones

Circuits refers to an actual electrical interface, Input (Detection), NAC Notification Appliance Circuit) which connect audible and visible notification appliances to the fire alarm system control unit (Signal), or Relay.

Wiring Styles

- Input Circuits are configured as Class B (Style B).
- NAC Circuits may be individually wired as Class A (Style Z) or Class B (Style Y) without affecting the number of circuits available.
- Signal Line Circuit Class A (Style 7) and Class B (Style 3).

1.2   Contact Us

For General Inquiries, Customer Service and Technical Support you can contact us Monday to Friday 8:00 A.M. to 5:00 P.M. E.S.T.

1.2.1   General Inquiries

Toll Free	1-888-660-4655 (North America Only)
Local	905-660-4655
Email	mail@mircom.com

1.2.2   Customer Service

Toll Free	1-888-MIRCOM5 (North America Only)
Local	905-695-3535
Toll Free Fax	1-888-660-4113 (North America Only)
Local Fax	905-660-4113
Email	salessupport@mircom.com

1.2.3   Technical Support

Toll Free	1-888-MIRCOM5 (North America Only)
	888-647-2665
International	905-647-2665
Email	techsupport@mircom.com

1.2.4   Website

www.mircom.com

2.0 INX-10A Overview

This chapter lists the components of the INX-10A.
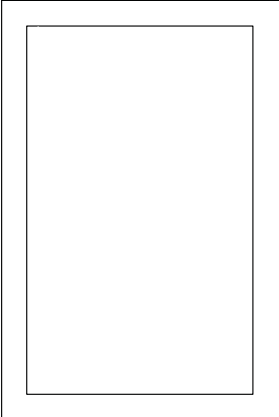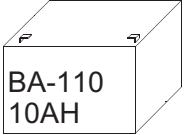
This chapter explains

- INX-10A Components

2.1 INX-10A Components

The following table describes the components of the INX-10A.

Table 2 FX-3500 Components

	Model	Description
	INX-10A	Intelligent NAC Expander, 10 Amps
	FA-300TR	Flush Trim Ring, Red
W= 5.94" H= 3.94" D= 3.86" BA-110 10AH	**BA-104, BA-1065, BA-110**	12 VOLT Batteries (4Ahr to 12AH)

3.0 Installation

This chapter describes the installation of the INX-10A

This chapter explains

- How to mount the Enclosure
- Main Chassis Board Connections

3.1   Enclosure Dimensions

Outer Dimensions	14.23" x 4.42" x 19.85"
Distance between upper mounting screws	11"
Distance between lower mounting screws	11"
Distance between upper and lower mounting screws	14.1"
FA-300TR Dimensions	17" x 22.5"

3.2   Installing the INX-10A Enclosure

The INX-10A can be surface mounted with four screws as shown in Figure 1 or flush mounted as shown in Figure 3 on page 17.

External Dimensions

Top View

Mounting Dimensions

Side View
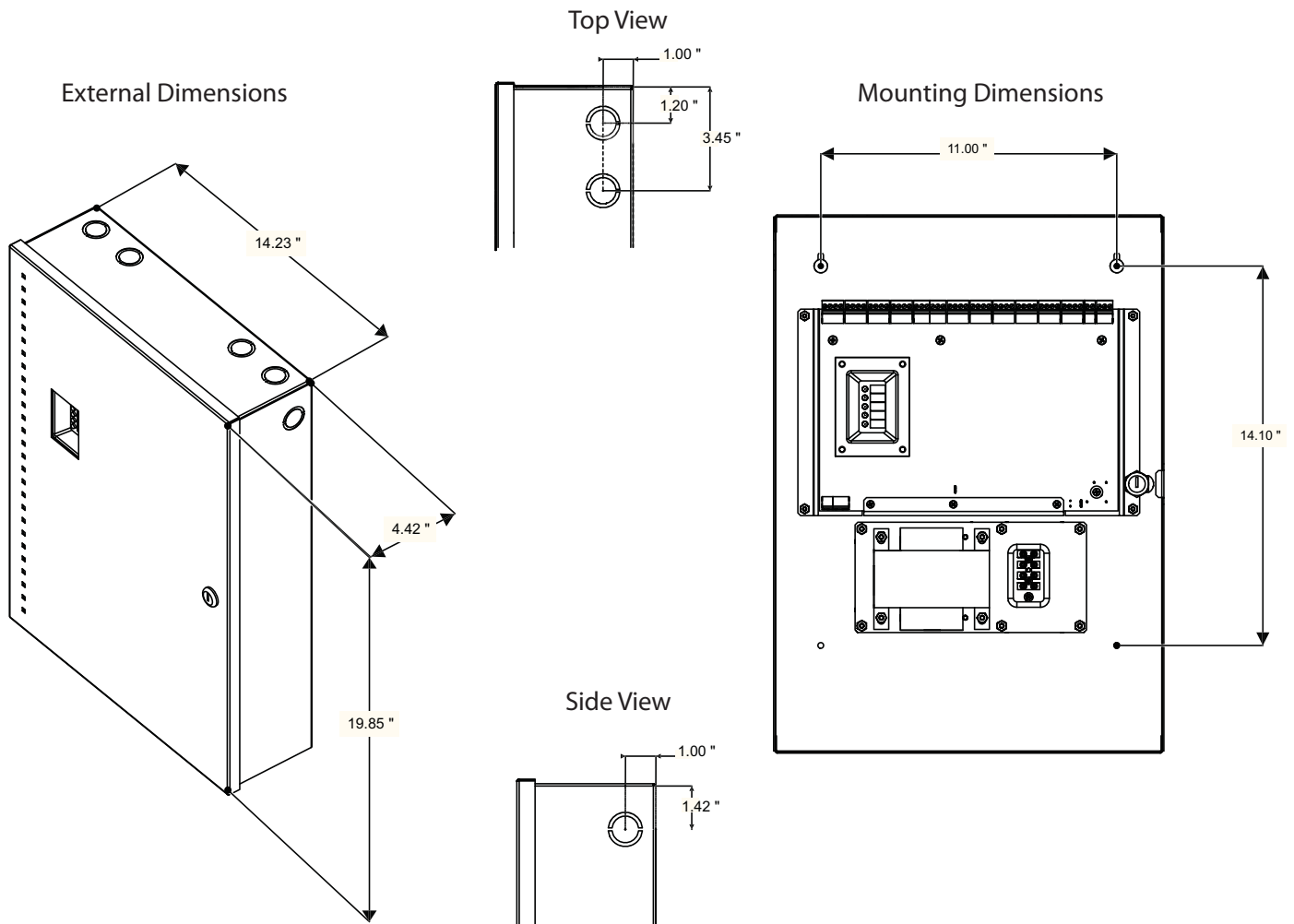
Figure 1   INX-10A Dimensions

To Surface Mount the Enclosure

1. Using the INX-10A back plate as a template, mark the top of the two mounting hole locations 11" apart as shown in Figure 1 INX-10A Dimensions.

2. Place the screws halfway into the wall in the position shown using a suitable screw.

3. Hang the box onto the two screws.

4. Screw the other two screws at the bottom of the panel.

5. Tighten all four screws into place.

Trim Ring Dimensions
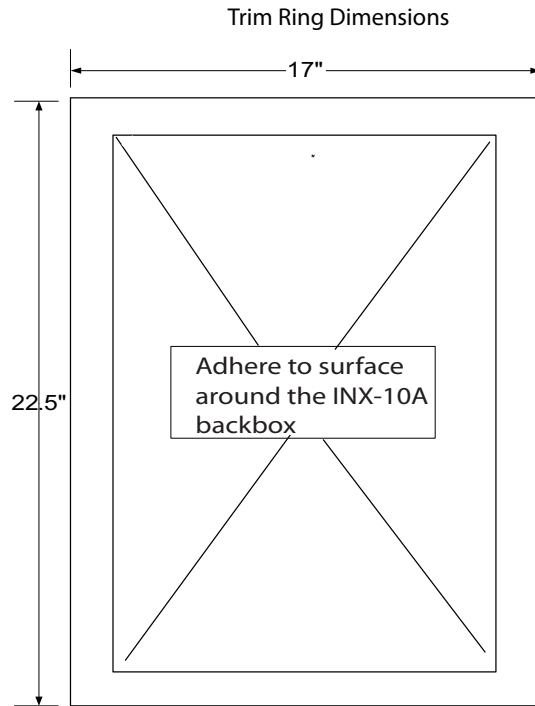
Figure 2   FA-300TR Dimensions
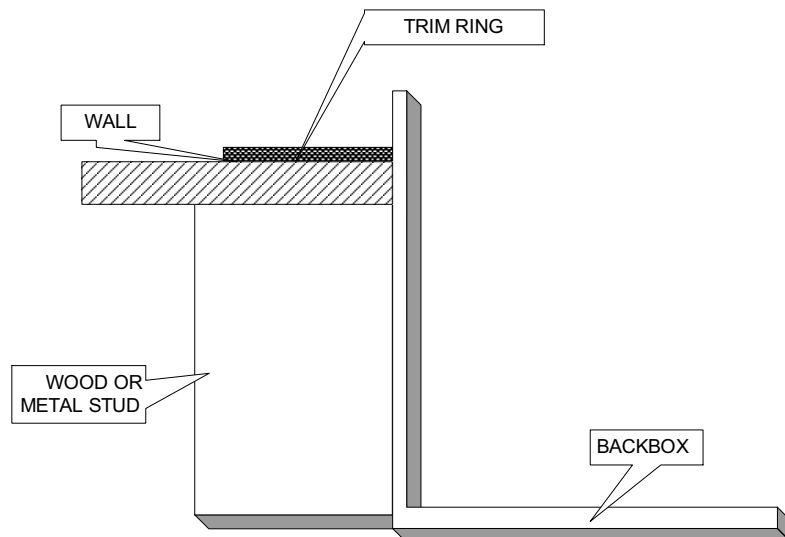
Figure 3   Flush mounting the enclosure

To Flush Mount the Enclosure

1. Unscrew and remove Main Chassis and Transformer from the enclosure.

2. Unscrew the wingnut and remove the door.

3. Mount the backbox into the wall.

4. After the wall is finished, peel the adhesive cover from the trim ring and stick to the wall surface around the backbox.

> **Note:** Figure 3 shows a cross-section of the semi-flush mounted backbox and the trim ring. Allow a minimum depth of 1" above the wall surface for proper door opening.

3.2.1 Installation Tips

• Group the incoming wires through the top of the enclosure. Use a wire tie to group wires for easy identification and neatness.

• 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.

> **Attention: DO NOT install cable through bottom of the box. This space is reserved for Batteries.**

3.3 Chassis Board Connections

The Main Chassis is pre-installed in the INX-10A Enclosure as shown in Figure 1 INX-10A Dimensions on page 16. The connections are shown in Figure 4 INX-10A Chassis Board Connectors and Jumpers on page 19 and are described in Table 3 INX-10A Chassis Board Connectors and Jumpers on page 19.
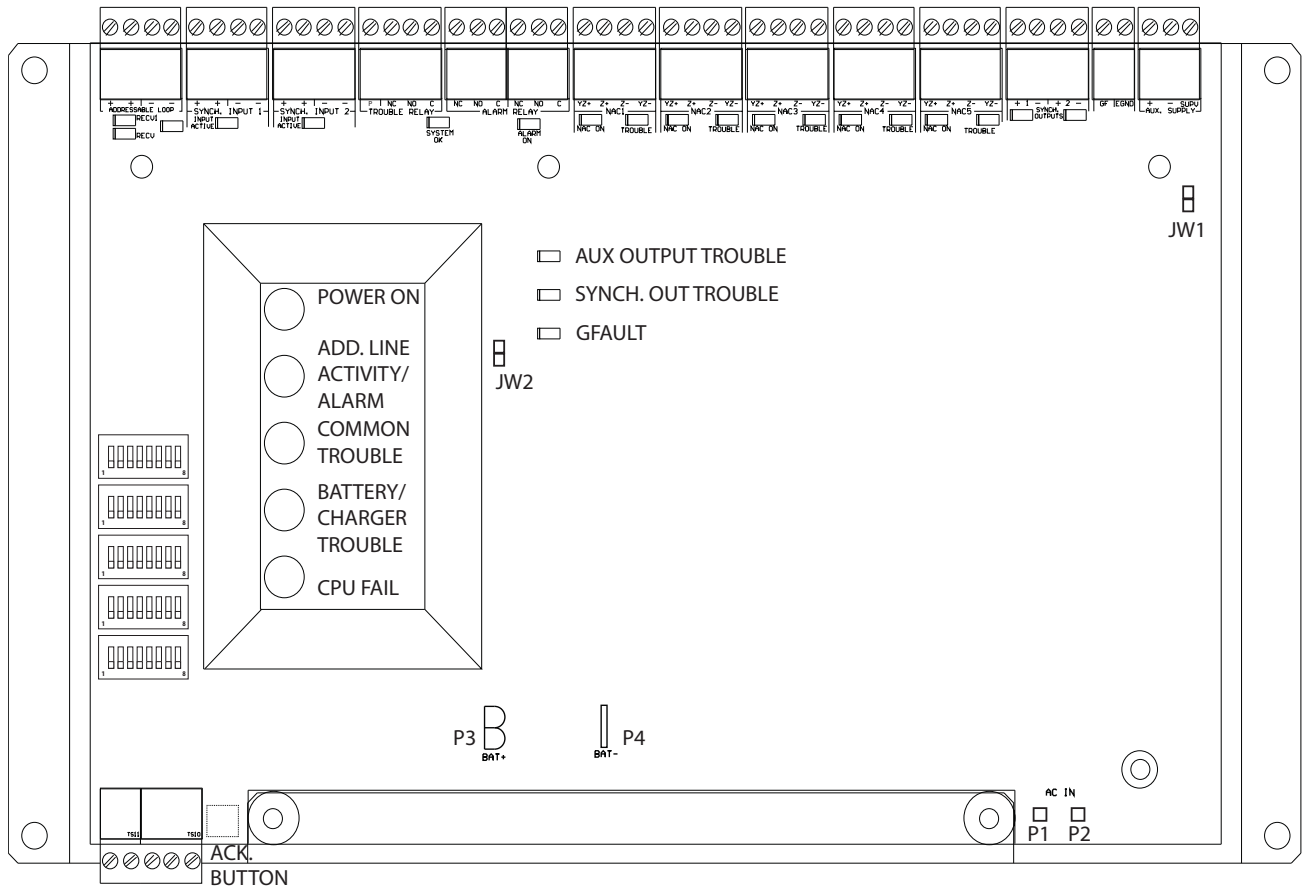
Figure 4   INX-10A Chassis Board Connectors and Jumpers

Table 3 INX-10A Chassis Board Connectors and Jumpers

Connector/Jumper	Description
P1,2	Connection for 29VAC AC In
P3,4	Connection to Battery Red(+) to P3 Black(-) to P4
JW1	Auxiliary Power Supervision. Factory set ON. Leave in place for supervision. Remove for non-supervision.
JW2	Factory set (closed), leave in place

4.0 Indication & Controls

This chapter describes the LED indicators and controls of the INX-10A.

This chapter explains

- Main Chassis Board LED Indicators
- Flash Rates
- Acknowledge button
- DIP switches

4.1 Indication and Controls

The INX-10A has 5 main annunciation indicators located on the main display panel. For troubleshooting purposes there are 3 trouble LED indicators located directly on the main board. There are also other LED's for SLC activity, synchronized input and output activity, and trouble and alarm relay. These indicators are only visible after opening the enclosure. Indicators may be Amber, Red, or Green, and may illuminate continuously (steady), or at the Trouble Flash Rate. For additional information see 4.1.4 Flash Rate on page 23.

There is one control button, the acknowledge button, located underneath the main display panel. There are also five Dipswitches used for configuration. For additional information see Chapter 6.0 Configuration on page 30.

Figure 5 displays the LED indicators and the control button on the INX-10A main board.
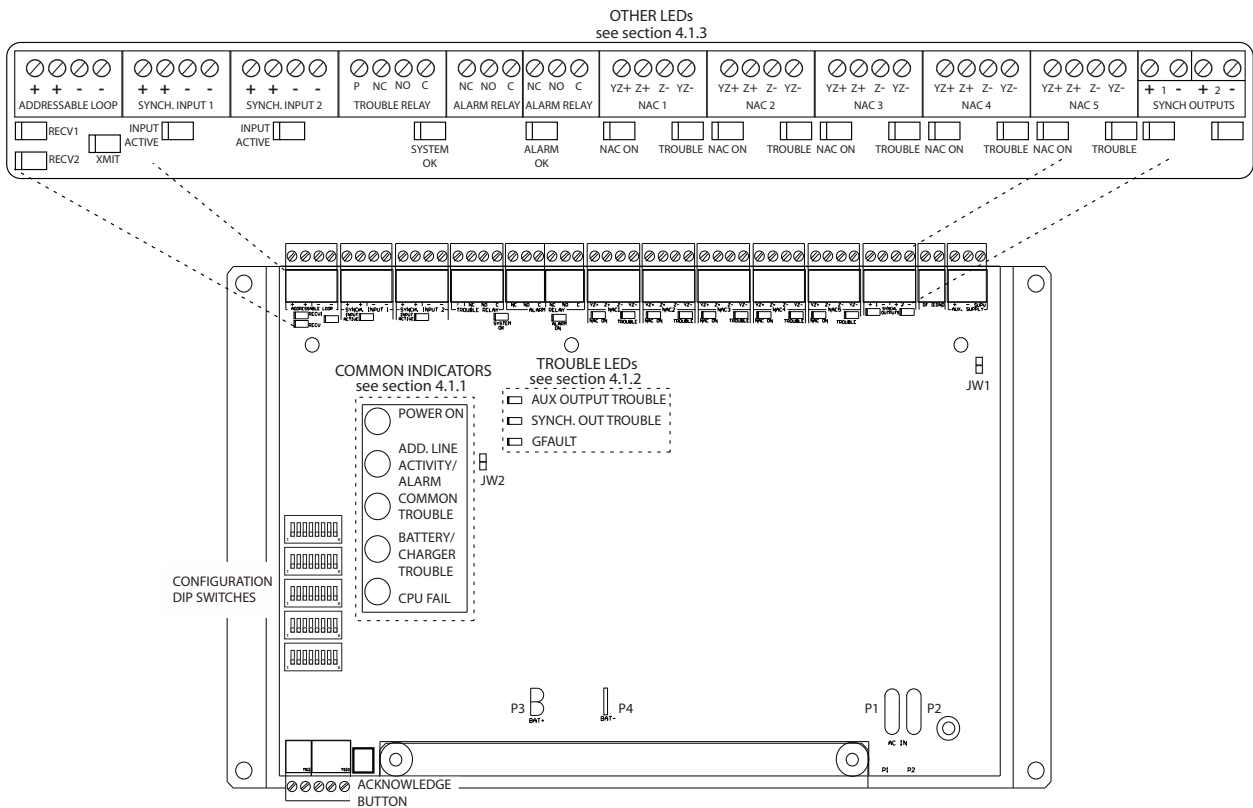
Figure 5   Main Board highlighting Common Indicators, Trouble LED's, Other LED's

4.1.1 Common Indicators

The main display panel has 5 common LED indicators; Power On, Add. Line Activity/Alarm, Common Trouble, Battery / Charger Trouble and CPU fail.

Power On

The Power On LED Indicator activates steady green while the main AC power is within acceptable levels. It flashes green to display a trouble when the level falls below the power-fail threshold and the panel is switched to standby (battery) power.

Addressable LIne Activity / Alarm (Add. Line Activity / Alarm)

The Addressable Line Activity / Alarm Indicator flashes red whenever there is activity on the addressable circuit(s). It activates steady red when there is an alarm.

Common Trouble

The Common Trouble LED Indicator activates steady amber to indicate any active trouble and flashes for restored troubles. To clear the trouble and reset the panel press the acknowledge button. The additional troubleshooting LED's on the main board can provide more information on what the trouble is. See 4.1.2 Trouble LEDs below for a description.

Figure 6   Common Indicators

Battery / Charger Trouble

The Battery / Charger Trouble LED Indicator activates steady amber when the Battery is either low (below 20.4 VDC), or the Battery or Charger are disconnected. It flashes amber for a restored trouble. For configuration information see 6.2.2 Setting Protocols, Reporting, Charger, Battery Installed on page 34.

CPU Fail

The CPU Fail LED Indicator flashes amber when the processor ceases functioning.

4.1.2 Trouble LEDs

The main board has three onboard LEDs to aid in troubleshooting.The door must be opened in order to view these LEDs.

Figure 7   Trouble LEDs

Auxiliary Supply Trouble

Flashes amber when there is a trouble with the auxiliary supply output, check for shorts or excessive load.

Synchronized Output Trouble

Flashes amber when there is a trouble with the synchronized output. Check the circuit for presence of EOL or short.
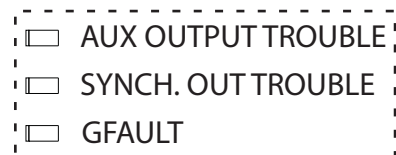
Ground Fault Trouble

Flashes amber when there is a ground fault trouble. To correct the fault, check for any external wiring touching the chassis. Jumper, a wire loop, must be installed to enable Ground Fault detection. For wiring information see Figure 37 Relay, Ground Supervision and Auxiliary Supply Wiring on page 74. For configuration information see 6.2.2 Setting Protocols, Reporting, Charger, Battery Installed on page 34.

4.1.3 Other LEDs
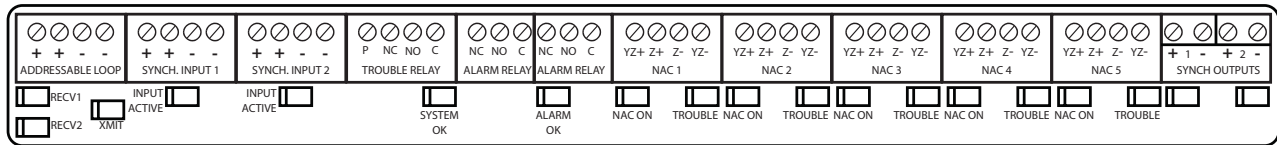
Figure 8   Additional LEDs

Addressable (SLC) Loop Indicators

Three LEDs. Two LED's that flash green for incoming activity for each loop, and one that flashes red for outgoing loop activity.

Synchronized Input Indicators

Two LEDs. One LED on each input that flashes green for incoming activity.

Trouble Relay Indicator

One LED that is steady green for system OK.

Alarm Relay Indicator

One red LED that is steady red when an alarm is activated.

NAC Circuit Indicators

Each NAC Circuit has one red LED that flashes when activated and one amber that activates solid when a trouble occurs. To clear the trouble and reset the panel press the acknowledge button.

Synchronized Output Indicators

Two LEDs. One LED on each output that flashes green for outgoing activity.

4.1.4 Flash Rate

Trouble Flash

20 flashes per minute, 50% duty cycle.

4.1.5 Controls

Acknowledge Button

This button is used to clear any trouble indications on the INX-10A.

Configuration DIP switches

The DIP switches are used for a variety of different configuration settings. For more information see Chapter 6.0 Configuration on page 30.

5.0 Operation

This chapter describes operational capabilities of the INX-10A

This chapter explains

- Circuit Types
- Synchronization Modes
- Power Supply Modes
- Evacuation Codes

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
Second Stage Enabled	YES	Second Stage Enabled/Disabled (Free loop addresses base +7 to base +11)	Second Stage Enabled
AC Trouble	YES	Return Specific ULC Trouble/Free loop addresses base +2 to base +4	Reporting of ULC Specific trouble is permitted
Battery/Charger Trouble	YES	Return Specific ULC Trouble/Free loop addresses base +2 to base +4	Reporting of ULC Specific trouble is permitted
Ground Fault	YES	Return Specific ULC Trouble/Free loop addresses base +2 to base +4	Reporting of ULC Specific trouble is permitted

5.1 Circuit Types

Any failure on the SLC loop activates any configured NAC Circuits.

Attention: If the INX-10A has configured NAC circuits the Evacuation Rate or Strobe Rate MUST be set via the appropriate DIP switches or a trouble will sound. For more information see 6.2.3 Charger Settings, Synchronization Settings, NAC Input Settings on page 35 and 6.2.4 Setting Alert Rates, Evacuation Rates, NAC 5 Output Functions on page 36.

5.1.1 NAC (Output) Circuits Types

Signal

For audible devices such as bells and piezo mini-horns. While sounding, these follow the pattern appropriate for the condition;

• the configured Evacuation Code (default is Temporal Code) during Single-Stage Alarm

• Two-Stage General Alarm

• or the Alert Code during Two-Stage's Alert (First) Stage.

Strobe

For visual devices such as strobes that use no code pattern (they are continuous) and follow input contact.

Synchronized Strobes

For visual devices such as strobes that support Mircom/Amseco, System Sensor, Gentex, Wheelock proprietary code patterns, configure to the appropriate pattern.

DC Power Supply

Uses no code pattern (they are continuous) and cannot be silenced. Configured via DIP switches and is not allocated an SLC address.

5.2 Intelligent NAC Expander (INX) Modes

The INX-10A is capable of synchronizing signal rates internally or receiving the signals externally. The INX-10A also has the ability to synchronize the signal rates for another INX-10A in a Master - Slave relationship.

Attention: When using multiple INX-10A panels in a Master - Slave relationship, always assign a lower address to the master INX-10A panel.
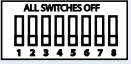
5.2.1 INX Internal Sync Mode

In this mode all signal and sync strobe rates are produced in the INX-10A. When a NAC circuit is commanded by the FACP to turn on, the NAC output signals are produced based on how the DIP switches are configured.

The Sync Outputs will be activated when one of the NAC circuits has been activated. If two stage operation is used, Sync Output1 is to produce the rate for first stage signal and Sync Output 2 is to produce the second stage signal.

Set Dip SW3, Bit 8 to zero.

For information on configuring signal and strobe rates see Table 8 Setting Alert Rates, Evacuation Rates, NAC 5 Output Functions on page 36 and Table 9 Setting Strobe Types, NAC 1-3 Supply Settings, NAC 4 Output Function on page 37.

5.2.2 INX External Sync Mode

When one of the Sync Inputs is activated, the INX-10A outputs follow the signal pattern of the Sync Input. The INX-10A must be configured as a slave to operate in this mode.

All synchronization signals are supplied from the FACP or Master INX-10A.

To enable this mode for Bell Signals set Dip SW3, Bit 8 to one, and set Alert (Dip SW4, Bits 1-3) Evacuation (Dip SW4, Bits 4-6) and Strobe (Dip SW5, Bits 1-3) rates to zero. The NAC and Sync outputs are to follow the Sync Inputs.

To enable this mode for other signals for sync Horn Strobes, set Dip SW3, Bit 8 to one and set Alert (Dip SW4, Bits 1-3) and Evacuation (Dip SW4, Bits 4-6) to use the Stobe Manufacturer Sync Rate (1-0-0) and Strobe (Dip SW5, Bits 1-3) to match the protocol being used in the system. The NAC and Sync Outputs are to follow the Sync Inputs.

If the INX-10A loses synchronization with the FACP during alarm, the INX-10A will default to the internal configured rate. A trouble will be generated back to the FACP. The INX-10A will continue to use the default rate until the FACP is reset.

Attention: External Sync Mode cannot be used in conjunction with Independent Mode.

5.2.3 INX Mode with Redundant Input

The system continuously monitors the SLC loop. If there is no activity for a notable time (80 seconds typical), an SLC trouble will be generated. While SLC trouble is active, if either of the Sync Inputs are activated then all NAC outputs follow.

5.2.4 Independent Mode - Driving Signals and Strobes

The INX-10A can drive Signals and Strobes on separate NAC circuits.

To enabled Independent Mode set SW4 Bit 4-6 to 010, 110, 001, 101, or 011 and set SW5 Bit 1-3 to 100, 110, 001 or 101. When using a Two stage application SW4 bits 1-3 are required to set the alert rate. For a comprehensive description of Independent Mode options see 6.5 Independent Mode Configuration Options on page 62.

5.3 Power Supply Modes

In addition to the operation modes above, some or all of the NAC outputs can be configured as power supply outputs. The circuit ratings are same as the NAC circuits. Three types of power output can be configured as described below:

5.3.1 NAC Outputs as Power Supply Outputs

Any NAC output can be configured as a power supply. SLC and Sync Inputs are ignored for the power supply outputs.

For configuration information see Chapter 6.2.4 Setting Alert Rates, Evacuation Rates, NAC 5 Output Functions on page 36 and Chapter 6.2.5 Setting Strobe Types, NAC 1-3 Supply Settings, NAC 4 Output Function on page 37.

5.3.2 NAC Outputs for Door Release

Only NAC 4 and/or 5 can configured for this option, NAC 4 or 5 are turned off (cut supply) when any alarm input is active. This is used for devices which must be un-powered during alarm like door releases.

For configuration information see Chapter 6.2.4 Setting Alert Rates, Evacuation Rates, NAC 5 Output Functions on page 36 and Chapter 6.2.5 Setting Strobe Types, NAC 1-3 Supply Settings, NAC 4 Output Function on page 37.

5.3.3 NAC Outputs for 4 Wire Smoke Supply

Only NAC 4 and/or 5 can configured for this option, NAC 4 and 5 can be selected to turn-off for 2 seconds when an alarm ends (inputs inactive for more than five seconds). This is typically used to reset four wires detectors.

For configuration information see Chapter 6.2.5 Setting Strobe Types, NAC 1-3 Supply Settings, NAC 4 Output Function on page 37.

5.4   Evacuation Codes

5.4.1   Single stage codes

Continuous

On 100% of the time.

Temporal Code

0.5 second on, 0.5 second off, 0.5 second on, 0.5 second off, 0.5 second on, 0.5, 1.5 second off, then repeat.

March Code

0.5 second on, 0.5 second off.

California Code

5 seconds on, 10 seconds off.

5.4.2   Two-stage codes

Alert Code

0.5 second on, 2.5 seconds off.

General Alarm

Evacuation code as selected from above.

5.5   Horn Strobe Rates

Horn Strobe rates are fixed at the following rates.

5.5.1   Single Stage

Temporal Code

3 of 0.5 second on, 0.5 second off, 1.5 second pause, then repeat.

5.5.2   Two-stage codes

Alert Code

0.5 second on, 2.5 seconds off.

Temporal Code

3 of 0.5 second on, 0.5 second off, 1.5 second pause, then repeat.
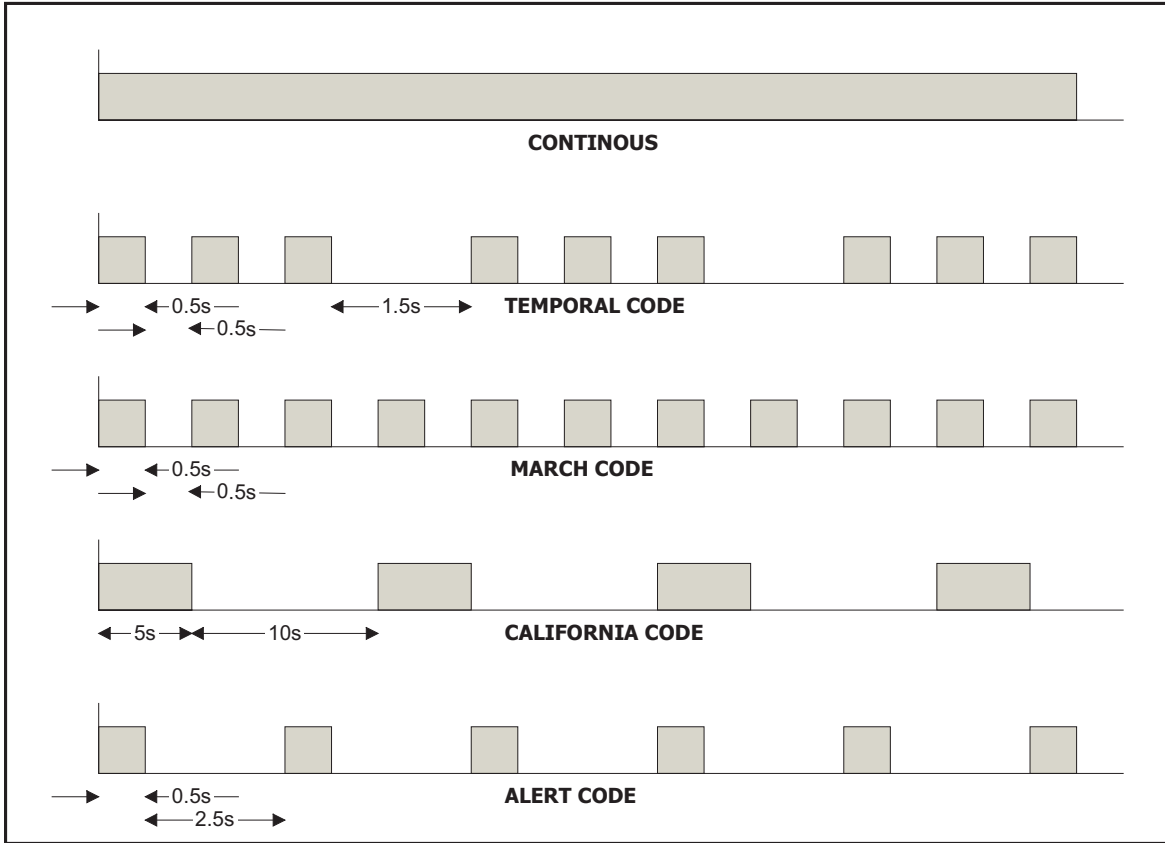
Figure 9   Evacuation Codes

6.0 Configuration

The chapter describes how to configure the INX-10A with the DIP switches located on the main board.

This chapter explains

- Using DIP Switches
- Single Stage and Two Stage Addressing
- Adding Functions in the FX-2000 configurator
- Assigning Protocols
- Trouble Reporting
- AC Fail Delay
- Charger and Battery Settings
- Synchronization Settings
- Configuring NAC's
- Alert and Evacuation Rates
- Strobe Types

6.1 Dip Switches

The following diagram displays the five DIP switches used by the INX-10A.
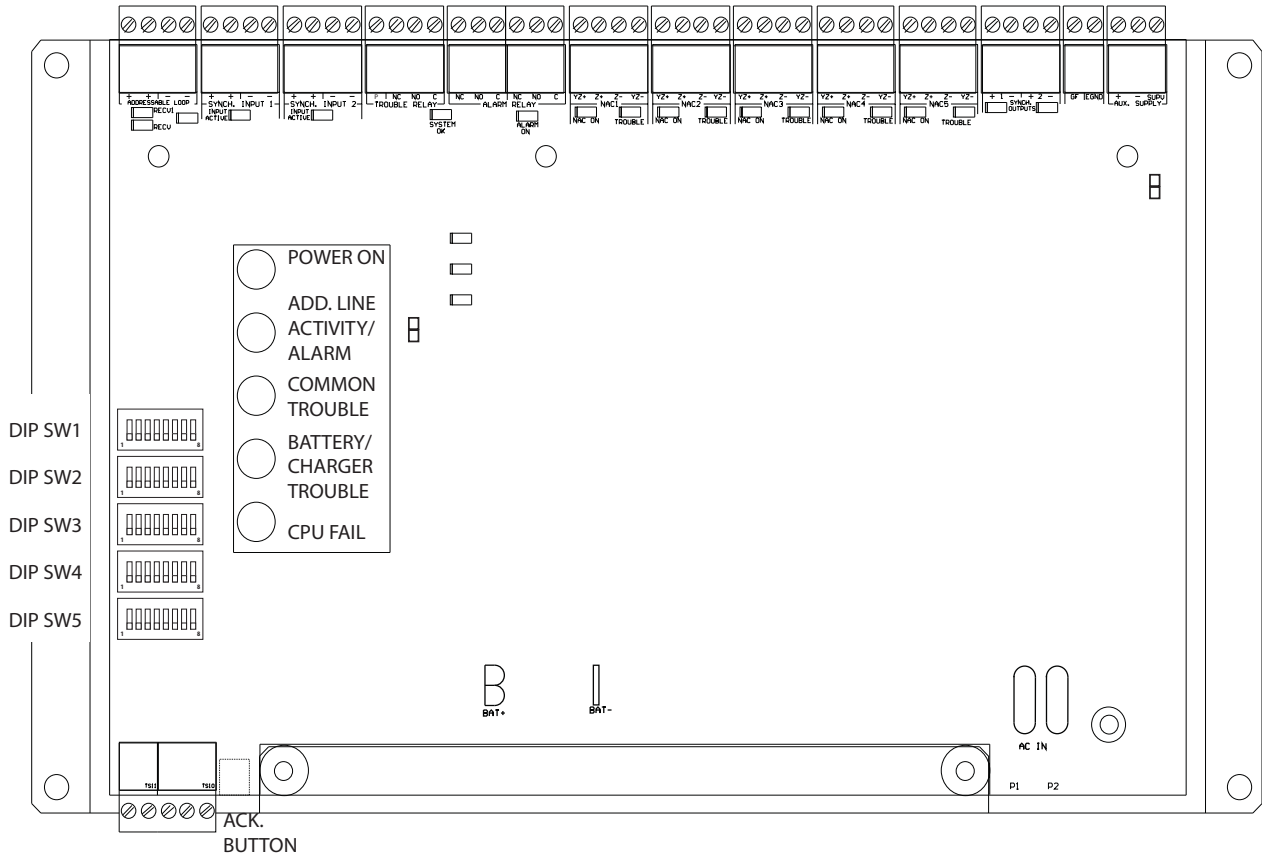
6.1.1 Using the DIP switches

Configuring the INX-10A is done with 5 banks of DIP switches. They are named SW1, SW2, SW3, SW4 and SW5. Each bank has 8 switches, numbered 1 to 8. Flipping a switch up places it in the ON position. **For the purposes of the configuration tables ON = 1 and OFF = 0**. For an illustration of the DIP switch settings see Figure 10.
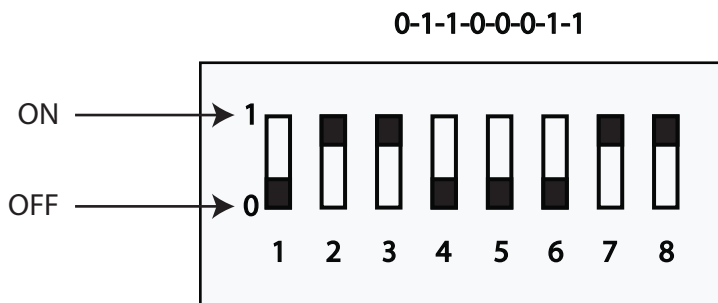
Figure 10   DIP switch positions

6.2   DIP Switch Configuration

Configuration is done via a group a five DIP switches located to the left of the LED display board.

6.2.1   Setting Loop Base Address, Disabling Addressable Loop Interface
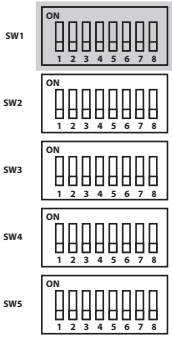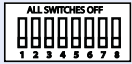
Use DIP switch 1 to

- Enable or disable the addressable loop.
- Set the Base Address of the INX-10A.

To configure the desired address, refer to Figure 11 and Table 5.

To disable, configure all switches to 0.

Table 4 Setting INX-10A Base Address/ Disabling Addressable Loop Interface

DIP switch 1	Switch #	Default Setting = 0	Activated Setting = 1	Notes/ Additional Diagrams
	All (1-8)	Addressable Loop Disabled	Sets the INX-10A base address. For an addressing example see Figure 11.	
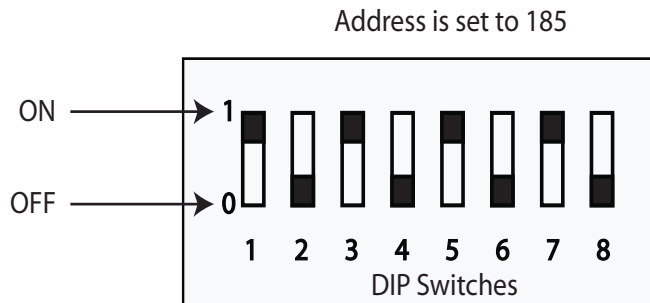
Figure 11   DIP switch address example

Table 5 INX-10A Base Address DIP switch positions

Address	Switch Setting	Address	Switch Setting	Address	Switch Setting	Address	Switch Setting	
101	1000 0000	126	0101 1000	151	1100 1100	176	0011 0010	
102	0100 0000	127	1101 1000	152	0010 1100	177	1011 0010	
103	1100 0000	128	0011 1000	153	1010 1100	178	0111 0010	
104	0010 0000	129	1011 1000	154	0110 1100	179	1111 0010	
105	1010 0000	130	0111 1000	155	1110 1100	180	0000 1010	
106	0110 0000	131	1111 1000	156	0001 1100	181	1000 1010	
107	1110 0000	132	0000 0100	157	1001 1100	182	0100 1010	
108	0001 0000	133	1000 0100	158	0101 1100	183	1100 1010	
109	1001 0000	134	0100 0100	159	1101 1100	184	0010 1010	
110	0101 0000	135	1100 0100	160	0011 1100	185	1010 1010	Two Stage Application with Enhanced Reporting
111	1101 0000	136	0010 0100	161	1011 1100	186	0110 1010	
112	0011 0000	137	1010 0100	162	0111 1100	187	1110 1010	
113	1011 0000	138	0110 0100	163	1111 1100	188	0001 1010	Two Stage Application with Basic Reporting
114	0111 0000	139	1110 0100	164	0000 0010	189	1001 1010	
115	1111 0000	140	0001 0100	165	1000 0010	190	0101 1010	Single Stage Application with Enhanced Reporting
116	0000 1000	141	1001 0100	166	0100 0010	191	1101 1010	
117	1000 1000	142	0101 0100	167	1100 0010	192	0011 1010	
118	0100 1000	143	1101 0100	168	0010 0010	193	1011 1010	Single Stage Application with Basic Reporting
119	1100 1000	144	0011 0100	169	1010 0010	194	0111 1010	
120	0010 1000	145	1011 0100	170	0110 0010	195	1111 1010	
121	1010 1000	146	0111 0100	171	1110 0010	196	0000 0110	
122	0110 1000	147	1111 0100	172	0001 0010	197	1000 0110	
123	1110 1000	148	0000 1100	173	1001 0010	198	0100 0110	
124	0001 1000	149	1000 1100	174	0101 0010	199	1100 0110	
125	1001 1000	150	0100 1100	175	1101 0010			

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Attention: When using multiple INX-10A panels in a Master - Slave relationship, always assign a lower address to the master INX-10A panel.

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Notes: Shaded addresses are the recommended range of addresses used for a single INX-10A.

Ensure that there are enough addresses for reporting and configured NACs. The highest address that a Single Stage Application with Basic Reporting with 5 configured NACs can be assigned is **193**.

6.2.2 Setting Protocols, Reporting, Charger, Battery Installed

Use DIP switch 2 to set device protocols, enable second stage reporting, set AC fail reporting, enabling or disabling the Charger, and if a battery is installed.
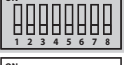
Table 6 Setting Protocols, Enabling Second Stage, Setting AC Fail Reporting, Enabling Charger, Battery Installed

DIP switch 2	Switch #	Default Setting = 0	Activated Setting = 1	Notes/ Additional Diagrams
	1	Reserve		
	2	Setting for Mircom FACPs	Setting for Secutron and other non-Mircom FACPs	For non-Mircom panels Signal Silence must be configured as a Control module in the proprietary configuration software.
	3	Enable Enhanced Reporting (AC, Battery/ Charger and Earth Ground) *See Board LED's for further trouble shooting*	Free loop addresses base +2 to base +4	Base address is set by SW1
	4	Second Stage Enabled	Free loop addresses base +8 to base +12 or if Enhanced Reporting is enabled frees addresses base +11 to base +15	Base address is set by SW1
	5-6	Configure Report Delay for AC fail The digits below refer to the corresponding bit number i.e. 01 means that bit 5 = 0 and bit 6 = 1 see corresponding diagram		
	5-6	00 = No Delay		
	5-6	10 = One Hour		
	5-6	01 = Two Hours		
	5-6	11 = Three Hours		
	7	Charger Enabled	Charger Disabled	
	8	Battery Installed	No Battery Required and Charger Disabled	

6.2.3 Charger Settings, Synchronization Settings, NAC Input Settings

Use DIP switch 3 to configure charger, synchronization and NAC Input settings.

Table 7 Charger Settings, Synchronization Settings, NAC Input Settings

DIP switch 3	Switch #	Default Setting = 0 ALL SWITCHES OFF 1 2 3 4 5 6 7 8	Activated Setting = 1 ALL SWITCHES ON 1 2 3 4 5 6 7 8	Notes/ Additional Diagrams
SW1 SW2 SW3 SW4 SW5	1	Charger Cut When all NAC's activated	Charger Always "ON"	Remember Bit 7 on DIP Switch 2 must be set to "OFF" to enable Charger
	2-6	Reserve		SW3
	7	Independent Mode NAC 1 and 2 = Signals Configured NAC's = Sync Strobes	Independent Mode NAC 1 to 3 = Signals Configured NAC's = Sync Strobes	For a comprehensive description of Independent Mode options see 6.5 Independent Mode Configuration Options on page 62
		Independent mode is active if SW4 Bit 4-6 Evacuation Rates is set to 010, 110, 001, 101, or 011 **AND** SW5 Bit 1-3 Setting Strobe Manufacturer Type set to 100, 110, 001 or 101.		
	8	Synchronous Signal Master	Synchronous Signal Slave	

!
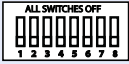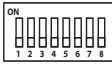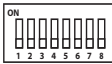
Attention: If Independent Mode is not being used SW3-7 must be set to OFF.

SW3 ON
1 2 3 4 5 6 7 8
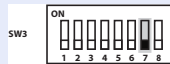
6.2.4 Setting Alert Rates, Evacuation Rates, NAC 5 Output Functions

Use DIP switch 4 to configure Alert and Evacuation Rates, and NAC Output functions.

Table 8 Setting Alert Rates, Evacuation Rates, NAC 5 Output Functions

DIP switch 4	Switch #	Default Setting = 0 ALL SWITCHES OFF	Activated Setting = 1 ALL SWITCHES ON	Notes/ Additional Diagrams
SW1 SW2 SW3 SW4 SW5	1-3	Setting Alert Rates NOT USED FOR SINGLE STAGE APPLICATIONS		
	1-3	000 - Disable (No Output)		SW4
	1-3	100 - Uses Strobe Manufacturer Sync Rate		SW4
	1-3	010 - Continuous		SW4
	1-3	110 - 0.5s ON, 2.5s OFF, Repeat (20 PPM as in FA-1000 or FX-2000)		SW4
	1-3	001 - 20 PPM, 50% Duty Cycle		SW4
	4-6	Setting Evacuation Rates		
	4-6	000 - Disable **If the INX-10A has NAC circuits configured the Evacuation Rate or Strobe Rate MUST be enabled or a trouble will sound.**		SW4
	4-6	100 - Uses Strobe Manufacturer Sync Rate **NOT AFFECTED BY SIGNAL SILENCE**		SW4
	4-6	010 - Continuous		SW4
	4-6	110 - Temporal		SW4
	4-6	001 - March Time		SW4
	4-6	101 - California		SW4
	4-6	011 - 120 PPM, 50% Duty Cycle		SW4
	7-8	NAC 5 Output Settings		
	7-8	00 - Normal NAC		SW4
	7-8	10 - Continuous Supply		SW4
	7-8	01 - Cut on Alarm		SW4
	7-8	11 - 2 Seconds Cut on Reset		SW4

6.2.5   Setting Strobe Types, NAC 1-3 Supply Settings, NAC 4 Output Function

Use DIP switch 5 to configure Strobe types, NAC 1-3 settings and NAC 4 output functions.

Table 9 Setting Strobe Types, NAC 1-3 Supply Settings, NAC 4 Output Function

DIP switch 5	Switch #	Default Setting = 0	Activated Setting = 1	Notes/ Additional Diagrams
	1-3	**Setting Strobe Manufacturer**		
	1-3	000 - Disable **If the INX-10A has NAC circuits configured the Evacuation Rate or Strobe Rate MUST be enabled or a trouble will sound.**		
	1-3	100 - Mircom/Amseco		
	1-3	010 - Not Used		
	1-3	110 - System Sensor		
	1-3	001 - Secutron/Gentex		
	1-3	101 - Wheelock		
	4	NAC 1 - NAC	NAC 1 - Continuous Supply	
	5	NAC 2 - NAC	NAC 2 - Continuous Supply	
	6	NAC 3 - NAC	NAC 3 - Continuous Supply	
	7-8	**NAC 4 Output Settings**		
	7-8	00 - NAC		
	7-8	10 - Continuous Supply		
	7-8	01 - Cut on Alarm		
	7-8	11 - 2 seconds Cut on Reset		

6.3   Single Stage Addressing

Address Assignments are done via DIP switch 2(SW2) which is located to the left of the Main LED display board. The addresses for the functions are dependant upon the Base Address of the INX Panel.

There are two types of addressing options

- Basic Reporting

- Enhanced Reporting

In addition, the addressing can be changed by having NACs configured as Power Supplies. For further information on setting the Base Address of the INX Panel see Figure 11.

6.3.1   Single Stage with Basic Reporting Addressing

To configure the recommended base address
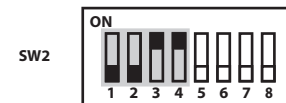
Set DIP switch SW1 as: 1-0-1-1-1-0-1-0

ON-OFF-ON-ON-ON-OFF-ON-OFF

To configure the INX for Single Stage with Basic Reporting in a Mircom system

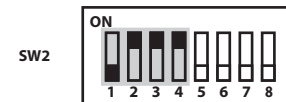Set DIP switch SW2-1 to SW2-4 as: 0-0-1-1

OFF-OFF-ON-ON

To configure the INX for Single Stage with Basic Reporting in a Secutron system

Set DIP switch SW2-1 to SW2-4 as: 0-1-1-1

OFF-ON-ON-ON

Table 10 Configuring Single Stage Functions

Function	Address	Recommended Address
Common Trouble	Base Address	193
Signal Silence	Base Address + 1	194
Activate NAC1, return NAC1 line status	Base Address + 2	195
Activate NAC2, return NAC2 line status	Base Address + 3	196
Activate NAC3, return NAC3 line status	Base Address + 4	197
Activate NAC4, return NAC4 line status	Base Address + 5	198
Activate NAC5, return NAC5 line status	Base Address + 6	199

Notes: Table 10 represents all NACs configured as NAC circuits.

Mircom recommends always using the upper range of addresses available for the INX-10A.

If any NAC circuit is configured as a Power Supply see 6.3.3 Single Stage with Basic Reporting and Power Supply Output Addressing for an explanation on addressing.
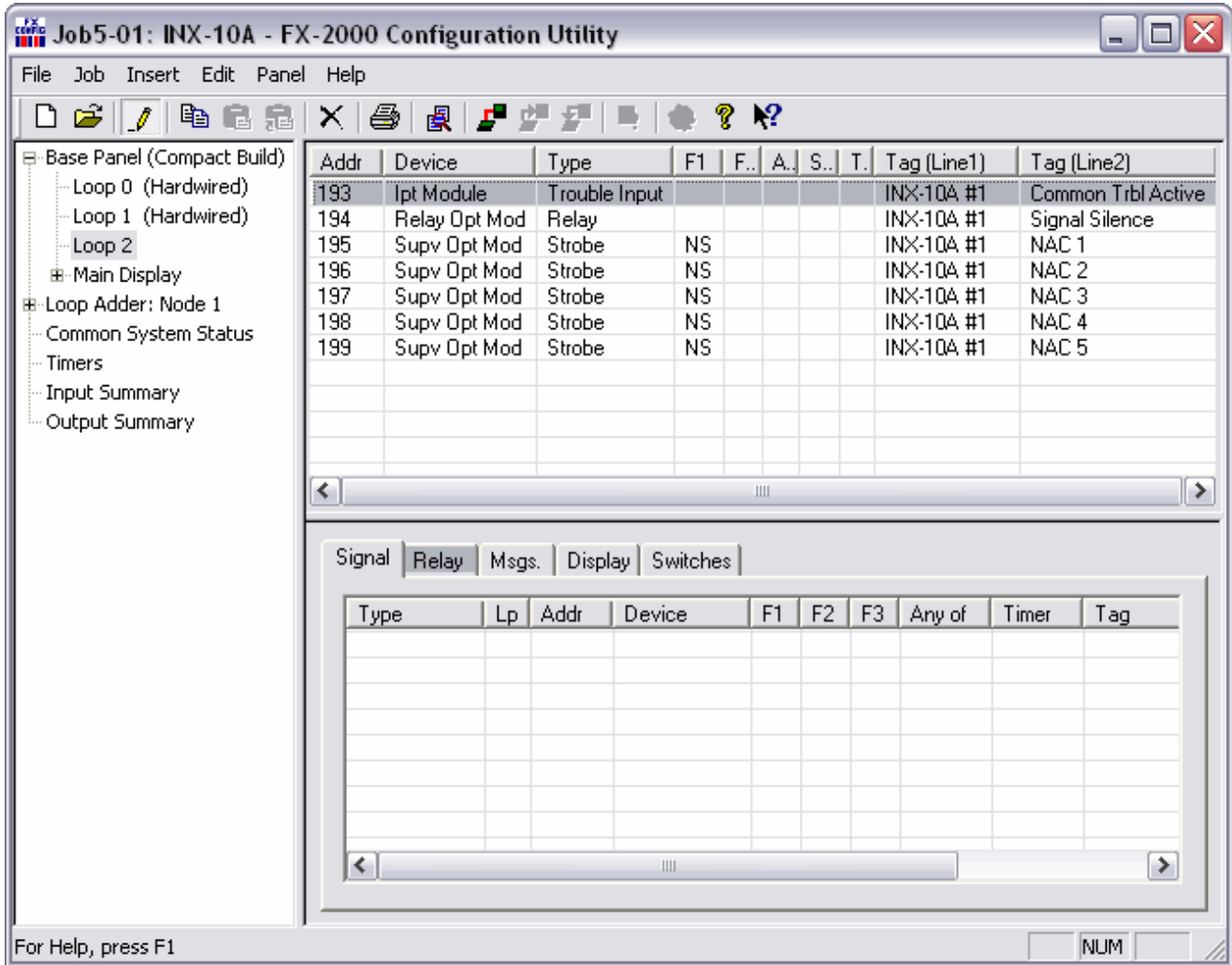

Figure 12   FX-2000 Configurator Settings - INX-10A Single Stage with Basic Reporting
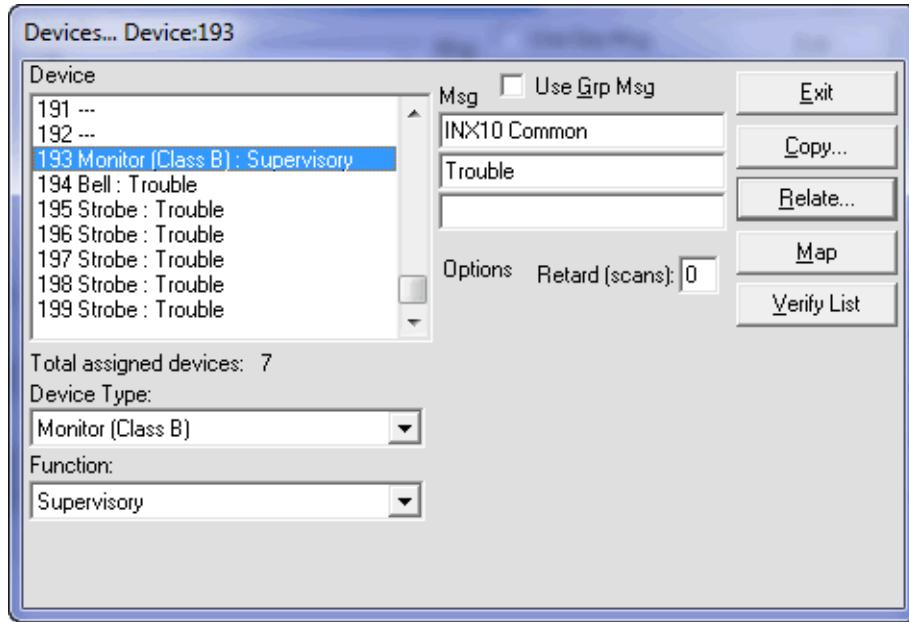
Figure 13   Secutron Configuration Settings - INX-10A Single Stage with Basic Reporting

6.3.2 Single Stage with Enhanced Trouble Reporting Addressing

To configure the recommended base address

Set DIP switch SW1 as: 0-1-0-1-1-0-1-0

OFF-ON-OFF-ON-ON-OFF-ON-OFF

To configure the INX for Single Stage with Enhanced Trouble Reporting in a Mircom System

Set DIP switch SW2-1 to SW2-4 as: 0-0-0-1

OFF-OFF-OFF-ON

To configure the INX for Single Stage with Enhanced Trouble Reporting in a Secutron System

Set DIP switch SW2-1 to SW2-4 as: 0-1-0-1

OFF-ON-OFF-ON

Table 11 Configuring Single Stage with Enhanced Reporting Functions

Function	Address	Recommended Address
Common Trouble	Base Address	190
Signal Silence	Base Address + 1	191
Monitor AC trouble	Base Address + 2	192
Monitor Battery/Charger trouble	Base Address + 3	193
Monitor Earth Ground Fault	Base Address + 4	194
Activate NAC1, return NAC1 line status	Base Address + 5	195
Activate NAC2, return NAC2 line status	Base Address + 6	196
Activate NAC3, return NAC3 line status	Base Address + 7	197
Activate NAC4, return NAC4 line status	Base Address + 8	198
Activate NAC5, return NAC5 line status	Base Address + 9	199

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Notes: Table 11 represents all NACs configured as NAC circuits.

Mircom recommends always using the upper range of addresses available for the INX-10A.

If any NAC circuit is configured as a Power Supply see 6.3.4 Single Stage with Enhanced Reporting and Power Supply Output Addressing for an explanation on addressing.
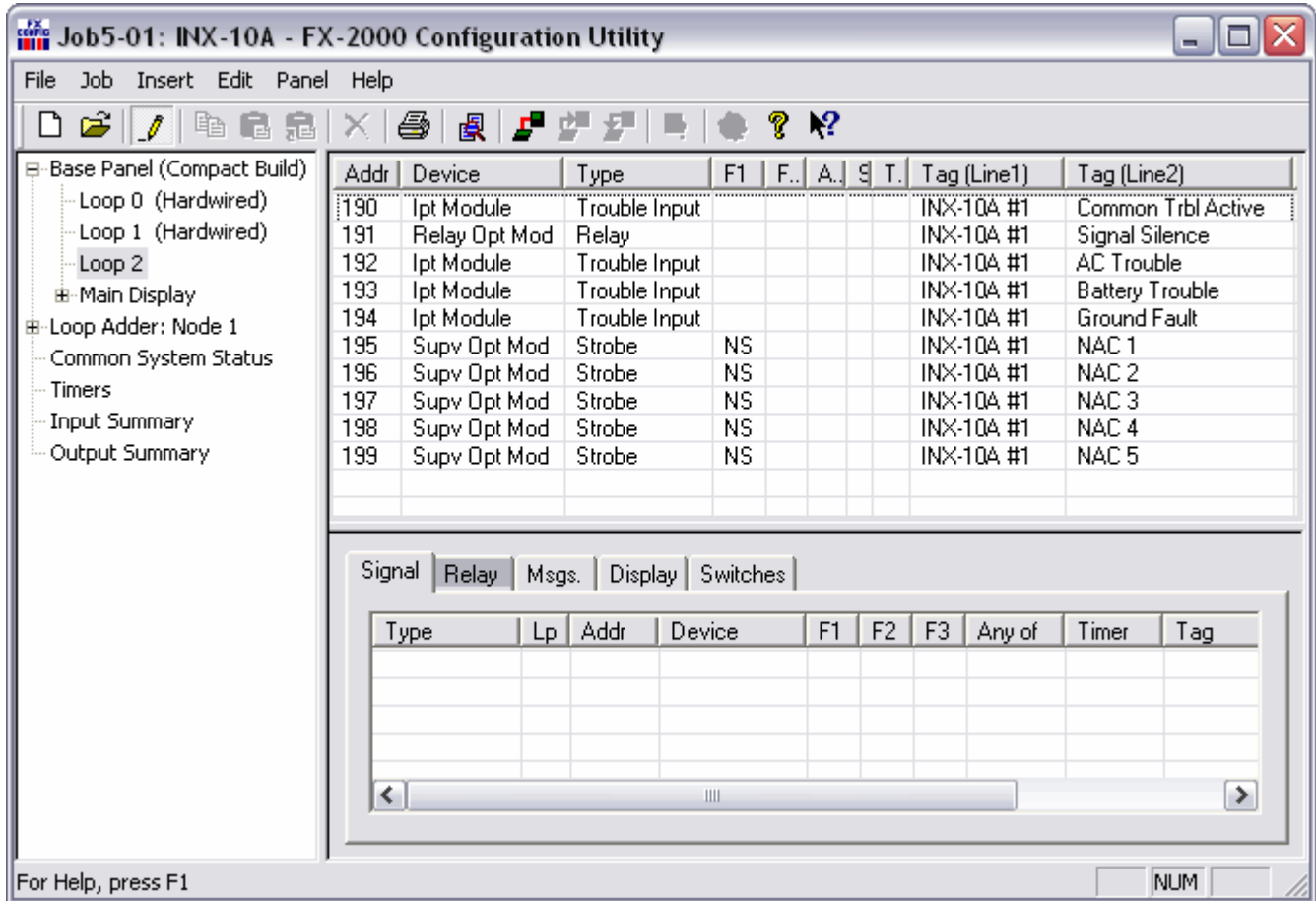
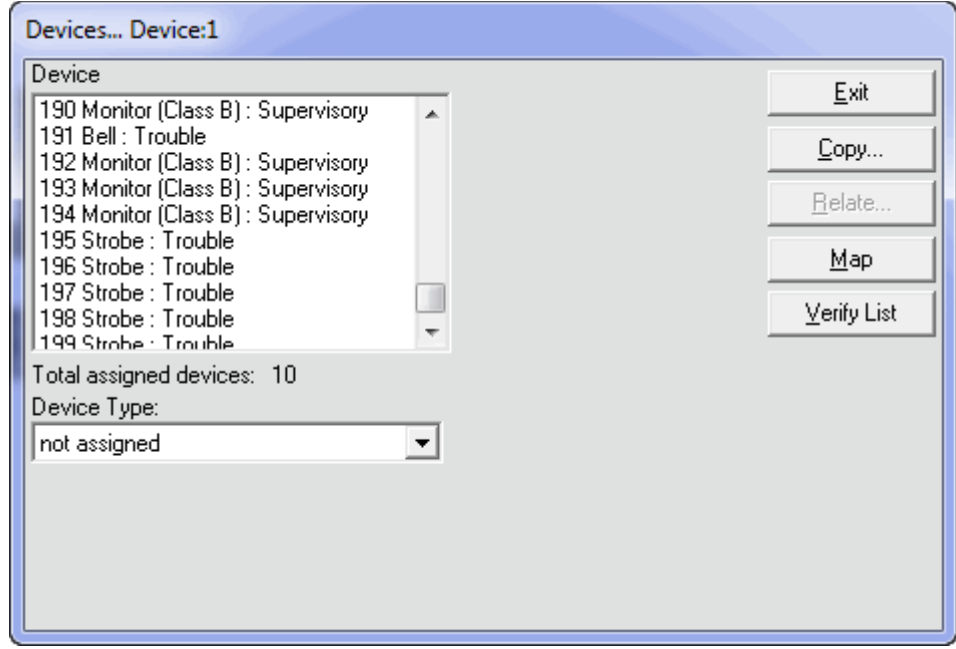**Figure 14   FX-2000 Configurator Settings - INX-10A Single Stage with Enhanced Reporting**

Figure 15   Secutron Configuration Settings - INX-10A Single Stage with Enhanced Reporting

6.3.3 Single Stage with Basic Reporting and Power Supply Output Addressing

In order to maximize the amount of addresses available, if a NAC circuit is configured as a Power Supply, the next configured NAC Circuit is assigned the address reserved for the previous Circuit.

Example Application

- NAC 5 configured as a Power Supply.
- INX-10A Common Trouble reporting address is 194.

To configure the recommended base address

Set DIP switch SW1 as: 0-1-1-1-1-0-1-0

OFF-ON-ON-ON-ON-OFF-ON-OFF

To configure the INX for Single Stage with Basic Reporting in a Mircom System

Set DIP switch SW2-1 to SW2-4 as: 0-0-1-1

OFF-OFF-ON-ON

To configure the INX for Single Stage with Basic Reporting in a Secutron System

Set DIP switch SW2-1 to SW2-4 as: 0-1-0-1

OFF-ON-OFF-ON

To configure NAC 5 as a Continuous Power Supply

Set DIP switch SW4-7 and SW4-8 as: 1-0

ON-OFF

Table 12 Assigning Addresses - Single Stage with Basic Reporting and Power Supply Output

| Function	Address	Recommended Address
Common Trouble	Base Address	194
Signal Silence	Base Address + 1	195
Activate NAC1, return NAC1 line status	Base Address + 2	196
Activate NAC2, return NAC2 line status	Base Address + 3	197
Activate NAC3, return NAC3 line status	Base Address + 4	198
Activate NAC4, return NAC4 line status	Base Address + 5	199

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Notes: Mircom recommends always using the upper range of addresses available for the INX-10A.

Mircom recommends always using the upper range of NACs (NAC5 then NAC4 then NAC3 etc.) when configuring as a Power Supply.
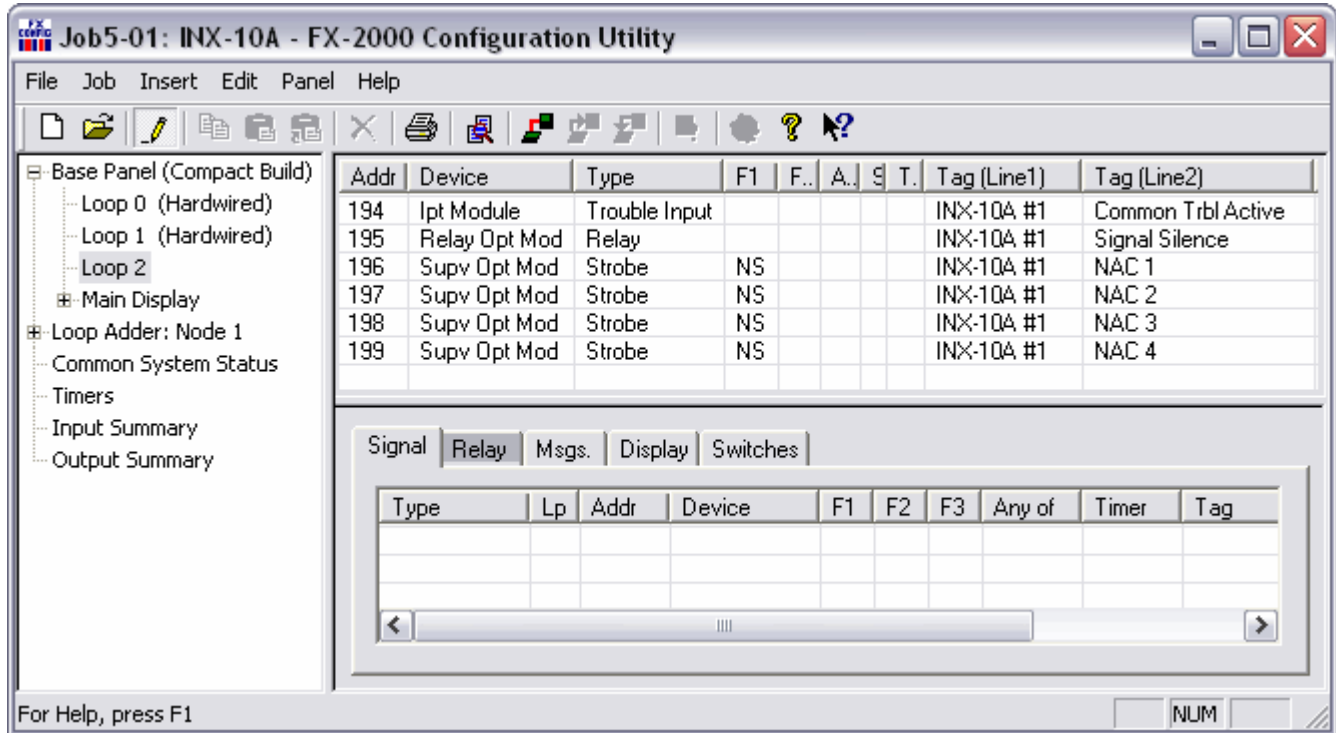
Figure 16   FX-2000 Configurator Settings - INX-10A Single Stage with Basic Reporting and Power Supply Output
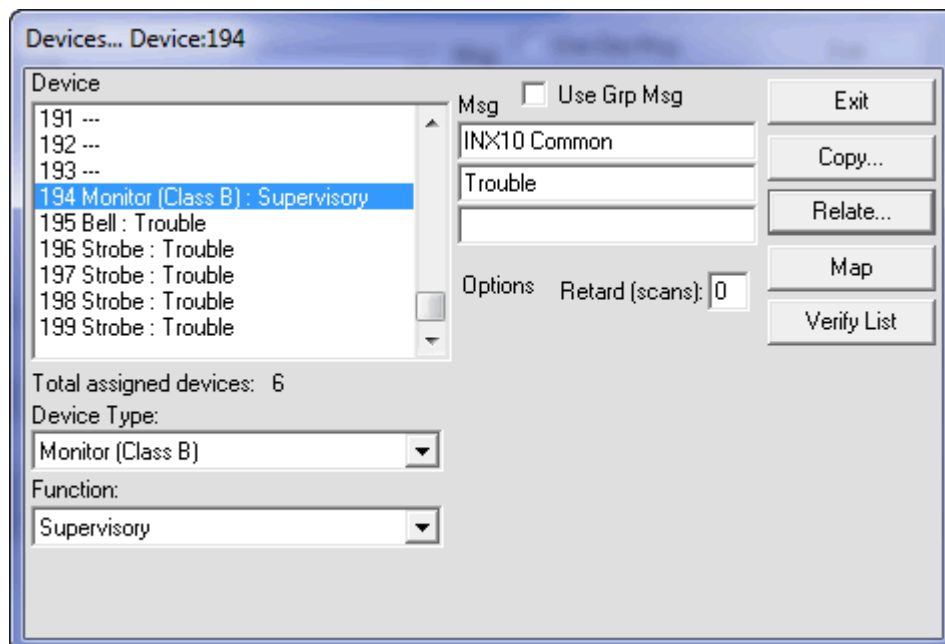
Figure 17   Secutron Configurator Settings - INX-10A Single Stage with Basic Reporting and Power Supply Output

6.3.4 Single Stage with Enhanced Reporting and Power Supply Output Addressing

In order to maximize the amount of addresses available, if a NAC circuit is configured as a Power Supply, the next configured NAC Circuit is assigned the address reserved for the previous Circuit.

Example Application

- NAC 5 configured as a Power Supply.
- INX-10A Common Trouble reporting address is 194.

To configure the recommended base address

Set DIP switch SW1 as: 1-1-0-1-1-0-1-0

ON-ON-OFF-ON-ON-OFF-ON-OFF

To configure the INX for Single Stage with Enhanced Reporting in a Mircom System

Set DIP switch SW2-1 to SW2-4 as: 0-0-0-1

OFF-OFF-OFF-ON

To configure the INX for Single Stage with Enhanced Trouble Reporting in a Secutron System
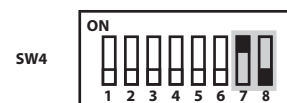
Set DIP switch SW2-1 to SW2-4 as: 0-1-0-1

OFF-ON-OFF-ON

To configure NAC 5 as a Continuous Power Supply

Set DIP switch SW4-7 and SW4-8 as: 1-0

ON-OFF

Table 13 Assigning Addresses - Single Stage Application, 1 Power Supply Output

Function	Address	Recommended Address
Common Trouble	Base Address	191
Signal Silence	Base Address + 1	192
Monitor AC trouble	Base Address + 2	193
Monitor Battery/Charger trouble	Base Address + 3	194
Monitor Earth Ground Fault	Base Address + 4	195
Activate NAC1, return NAC1 line status	Base Address + 5	196
Activate NAC2, return NAC2 line status	Base Address + 6	197
Activate NAC3, return NAC3 line status	Base Address + 7	198
Activate NAC4, return NAC4 line status	Base Address + 8	199

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Notes: Mircom recommends always using the upper range of addresses available for the INX-10A.

Mircom recommends always using the upper range of NACs (NAC5 then NAC4 then NAC3 etc.) when configuring as a Power Supply.
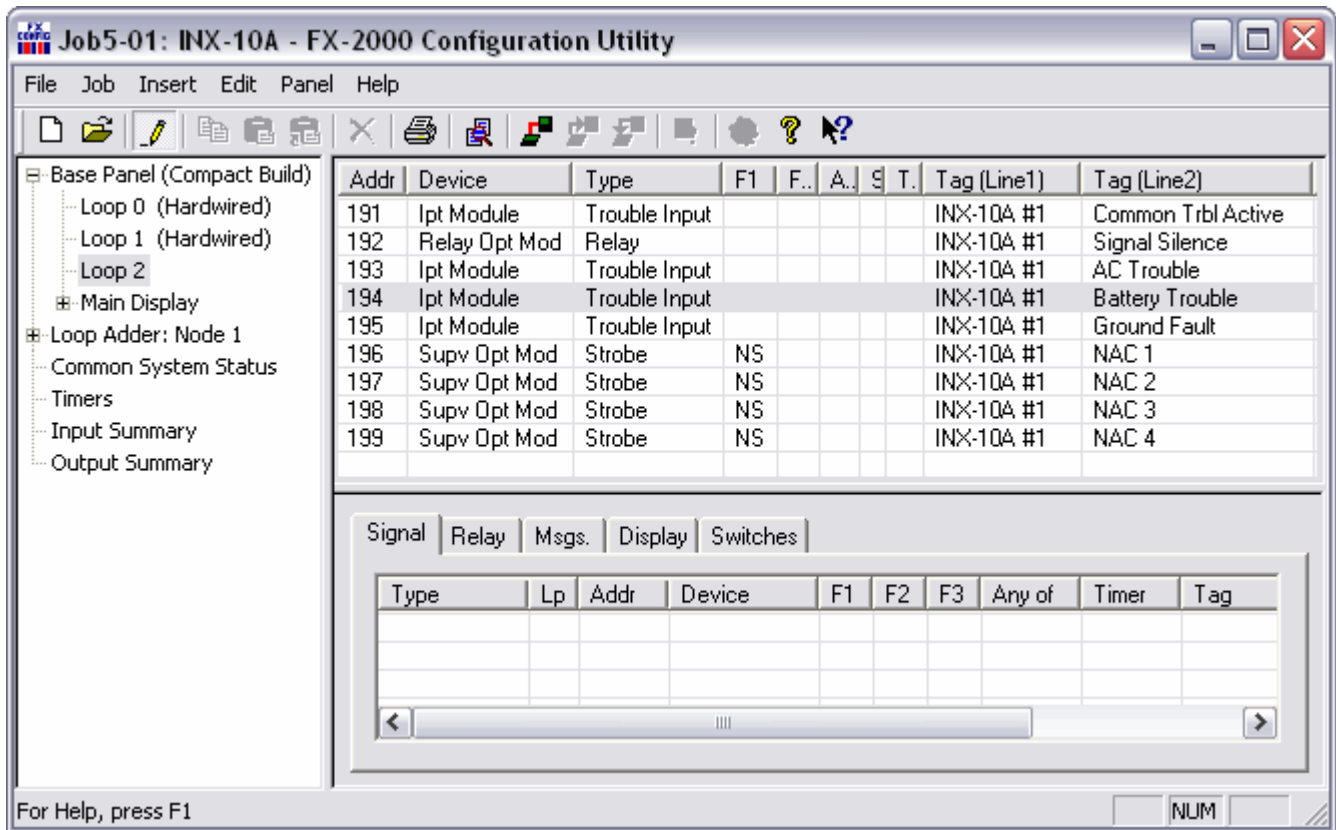
Figure 18   FX-2000 Configurator Settings - INX-10A Single Stage with Enhanced Reporting and Power Supply Output
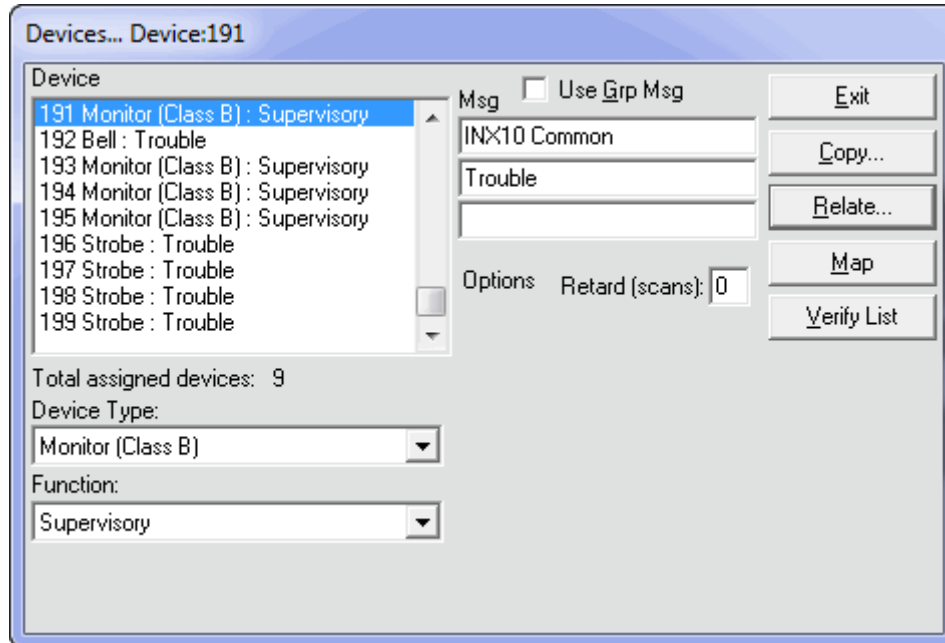
Figure 19   Secutron Configurator Settings - INX-10A Single Stage with Power Supply Output

6.4 Two Stage Addressing Options

Address Assignments are done via DIP switch 2(SW2) which is located to the left of the Main LED display board. The addresses for the functions are dependant upon the Base Address of the INX Panel.

For Further information on setting the Base Address of the INX Panel see Figure 11 DIP switch address example on page 32.

6.4.1 Two Stage with Basic Reporting Addressing

To configure the recommended base address

Set DIP switch SW1 as: 0-0-0-1-1-0-1-0

OFF-OFF-OFF-ON-ON-OFF-ON-OFF

To configure the INX for Two Stage with Basic Reporting in a Mircom system

Set DIP switch SW2-1 to SW2-4 as: 0-0-1-0

OFF-OFF-ON-OFF

To configure the INX for Single Stage with Basic Reporting in a Secutron system

Set DIP switch SW2-1 to SW2-4 as: 0-1-1-0

OFF-ON-ON-OFF

Table 14 Configuring Two Stage Functions

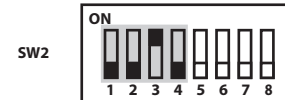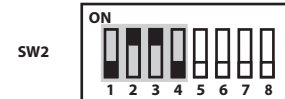| Function	Address	Recommended Address
Common Trouble	Base Address	188
Signal Silence	Base Address + 1	189
Activate NAC1, return NAC1 line status	Base Address + 2	190
Activate NAC2, return NAC2 line status	Base Address + 3	191
Activate NAC3, return NAC3 line status	Base Address + 4	192
Activate NAC4, return NAC4 line status	Base Address + 5	193
Activate NAC5, return NAC5 line status	Base Address + 6	194
Second Stage NAC1	Base Address + 7	195
Second Stage NAC2	Base Address + 8	196
Second Stage NAC3	Base Address + 9	197
Second Stage NAC4	Base Address + 10	198
Second Stage NAC5	Base Address + 11	199

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Notes: Table 14 represents all NACs configured as NAC circuits.

Mircom recommends always using the upper range of addresses available for the INX-10A.

If any NAC circuit is configured as a Power Supply see 6.4.3 Two Stage with Basic Reporting and Power Supply Output Addressing for an explanation on addressing.

Figure 20   FX-2000 Configurator Settings - INX-10A Two Stage with Basic Reporting
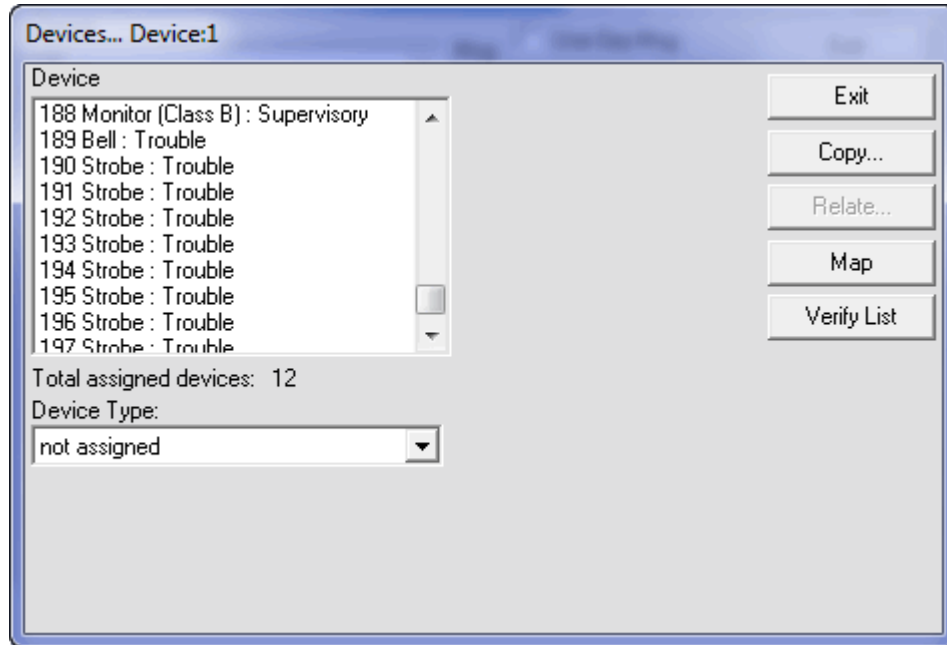
Figure 21   Secutron Configurator Settings - INX-10A Two Stage with Basic Reporting

6.4.2 Two Stage Address Assignment with Enhanced Trouble Reporting

To configure the recommended base address

Set DIP switch SW1 as: 1-0-1-0-1-0-1-0

ON-OFF-ON-OFF-ON-OFF-ON-OFF

SW1

To configure the INX for Two Stage with Enhanced Trouble Reporting in a Mircom System

Set DIP switch SW2-1 to SW2-4 as: 0-0-0-0

OFF-OFF-OFF-OFF

SW2

To configure the INX for Two Stage with Enhanced Trouble Reporting in a Secutron System

Set DIP switch SW2-1 to SW2-4 as: 0-1-0-1

OFF-ON-OFF-ON

SW2

Attention: Two Stage Enhanced reporting is mandatory to meet ULC requirements.

Table 15 Configuring Two Stage Address Assignment with Enhanced Trouble Reporting

Function	Address	Recommended Address
Common Trouble	Base Address	185
Signal Silence	Base Address + 1	186
Monitor AC trouble	Base Address + 2	187
Monitor Battery/Charger trouble	Base Address + 3	188
Monitor Earth Ground Fault	Base Address + 4	189
Activate NAC1, return NAC1 line status	Base Address + 5	190
Activate NAC2, return NAC2 line status	Base Address + 6	191
Activate NAC3, return NAC3 line status	Base Address + 7	192
Activate NAC4, return NAC4 line status	Base Address + 8	193
Activate NAC5, return NAC5 line status	Base Address + 9	194
Second Stage NAC1	Base Address + 10	195
Second Stage NAC2	Base Address + 11	196

**Table 15 Configuring Two Stage Address Assignment with Enhanced Trouble
Reporting (Continued)**

Function	Address	Recommended Address
Second Stage NAC3	Base Address + 12	197
Second Stage NAC4	Base Address + 13	198
Second Stage NAC5	Base Address + 14	199

Notes: Table 15 on the previous page represents all NACs configured as NAC circuits.

Mircom recommends always using the upper range of addresses available for the INX-10A.

If any NAC circuit is configured as a Power Supply see 6.4.4 Two Stage Address Assignment with Enhanced Trouble Reporting and Power Supply Addressing for an explanation on addressing.

Figure 22   FX-2000 Configurator Settings - INX-10A Two Stage with Enhanced Reporting
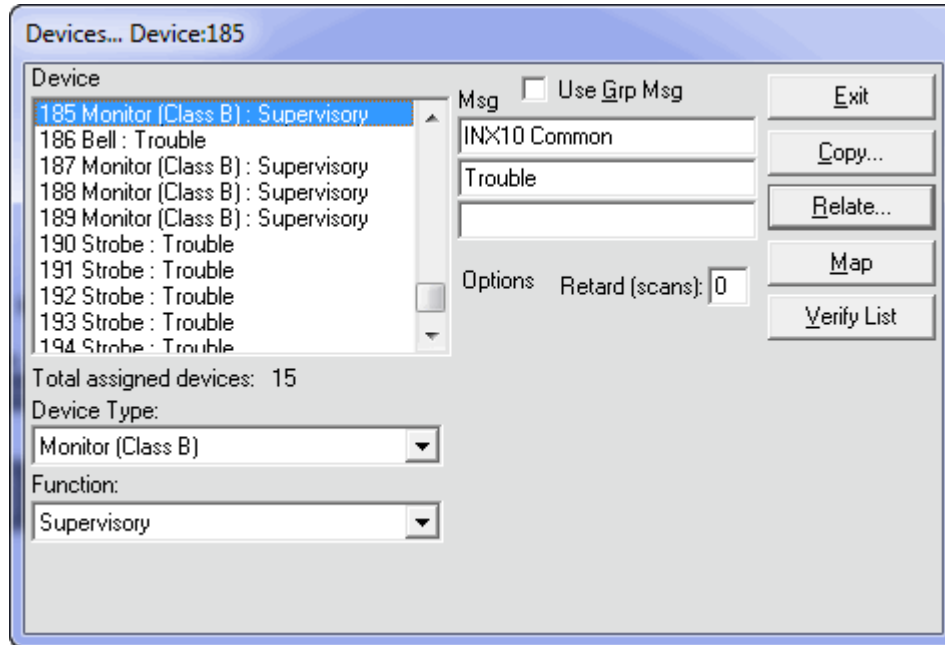
Figure 23   Secutron Configurator Settings - INX-10A Two Stage with Enhanced Reporting

6.4.3 Two Stage with Basic Reporting and Power Supply Output Addressing

In order to maximize the amount of addresses available, if a NAC circuit is configured as a Power Supply, the next configured NAC Circuit is assigned the address reserved for the previous Circuit.

Example Application

- NAC 5 configured as a Power Supply.
- INX-10A Common Trouble reporting address is 190.

To configure the recommended base address

Set DIP switch SW1 as: 0-1-0-1-1-0-1-0

OFF-ON-OFF-ON-ON-OFF-ON-OFF

To configure the INX for Two Stage with Basic Reporting in a Mircom system

Set DIP switch SW2-1 to SW2-4 as: 0-0-1-0

OFF-OFF-ON-OFF

To configure the INX for Single Stage with Basic Reporting in a Secutron system

Set DIP switch SW2-1 to SW2-4 as: 0-1-1-0

OFF-ON-ON-OFF

To configure NAC 5 as a Continuous Power Supply
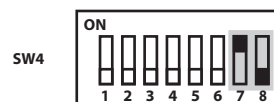
Set DIP switch SW4-7 and SW4-8 as: 1-0

ON-OFF

Table 16 Assigning Addresses - Two Stage Application, 1 Power Supply Output

Function	Address	Recommended Address
Common Trouble	Base Address	190
Signal Silence	Base Address + 1	191
Activate NAC1, return NAC1 line status	Base Address + 2	192
Activate NAC2, return NAC2 line status	Base Address + 3	193
Activate NAC3, return NAC3 line status	Base Address + 4	194
Activate NAC4, return NAC4 line status	Base Address + 5	195
Second Stage NAC1	Base Address + 6	196

Table 16 Assigning Addresses - Two Stage Application, 1 Power Supply Output (Continued)

Function	Address	Recommended Address
Second Stage NAC2	Base Address + 7	197
Second Stage NAC3	Base Address + 8	198
Second Stage NAC4	Base Address + 9	199

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Notes: Mircom recommends always using the upper range of addresses available for the INX-10A.

Troubles occurring on a NAC circuit are only reported via the first stage address.
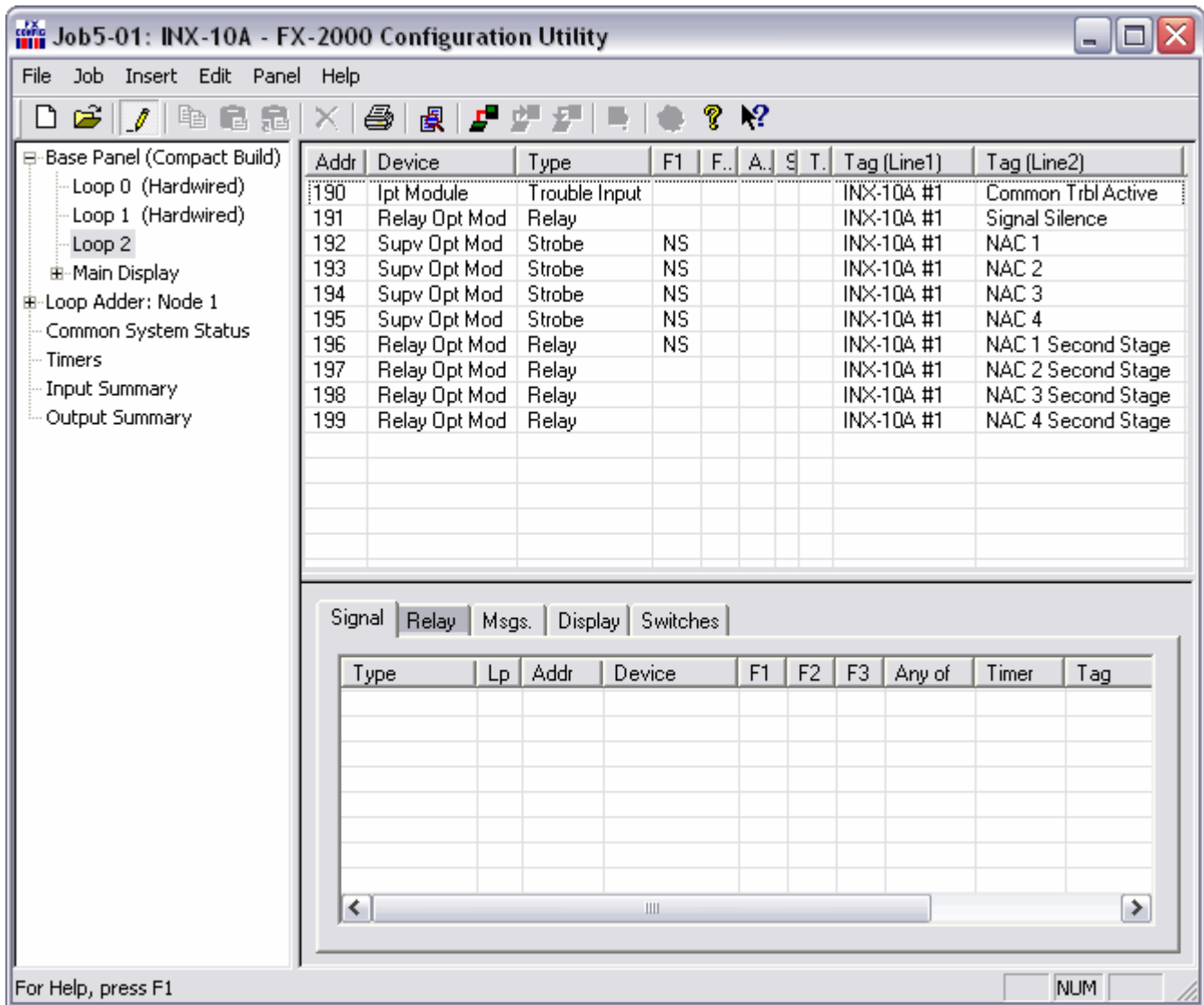
Figure 24   FX-2000 Configurator Settings - INX-10A Two Stage with Power Supply Output
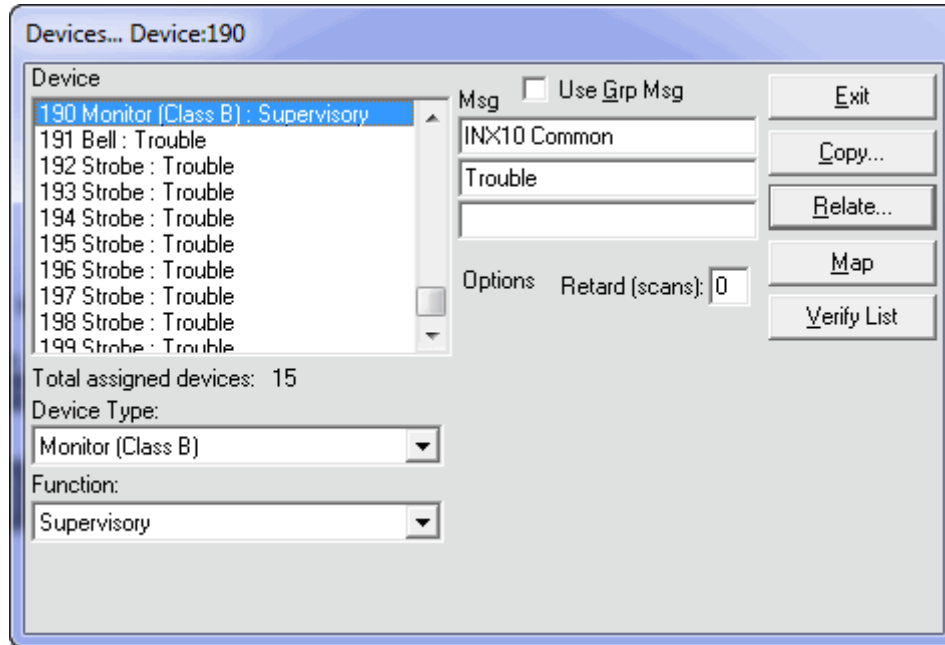
Figure 25   Secutron Configurator Settings - INX-10A Two Stage with Power Supply Output

6.4.4 Two Stage Address Assignment with Enhanced Trouble Reporting and Power Supply Addressing

In order to maximize the amount of addresses available, if a NAC circuit is configured as a Power Supply, the next configured NAC Circuit is assigned the address reserved for the previous Circuit.

> **!** **Attention: Two Stage Enhanced reporting is mandatory to meet ULC requirements.**

Example Application

- NAC 5 configured as a Power Supply.
- INX-10A Common Trouble reporting address is 194.

To configure the recommended base address

Set DIP switch SW1 as: 1-1-1-0-1-0-1-0

ON-OFF-ON-OFF-ON-OFF-ON-OFF

To configure the INX for Two Stage with Enhanced Trouble Reporting in a Mircom System

Set DIP switch SW2-1 to SW2-4 as: 0-0-0-0

OFF-OFF-OFF-OFF
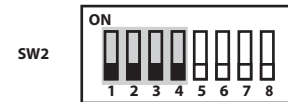
To configure the INX for Two Stage with Enhanced Trouble Reporting in a Secutron System

Set DIP switch SW2-1 to SW2-4 as: 0-1-0-1

OFF-ON-OFF-ON

To configure NAC 5 as a Continuous Power Supply

Set DIP switch SW4-7 and SW4-8 as: 1-0

ON-OFF
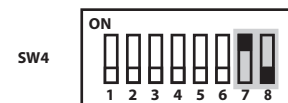
Table 17 Configuring Two Stage Address Assignment with Enhanced Trouble Reporting and Power Supply Addressing

| Function	Address	Recommended Address
Common Trouble	Base Address	187
Signal Silence	Base Address + 1	188
Monitor AC trouble	Base Address + 2	189
Monitor Battery/Charger trouble	Base Address + 3	190
Monitor Earth Ground Fault	Base Address + 4	191
Activate NAC1, return NAC1 line status	Base Address + 5	192
Activate NAC2, return NAC2 line status	Base Address + 6	193
Activate NAC3, return NAC3 line status	Base Address + 7	194
Activate NAC4, return NAC4 line status	Base Address + 8	195
Second Stage NAC1	Base Address + 10	196
Second Stage NAC2	Base Address + 11	197
Second Stage NAC3	Base Address + 12	198
Second Stage NAC4	Base Address + 13	199

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Notes: Mircom recommends always using the upper range of addresses available for the INX-10A.

Troubles occurring on a NAC circuit are only reported via the first stage address.
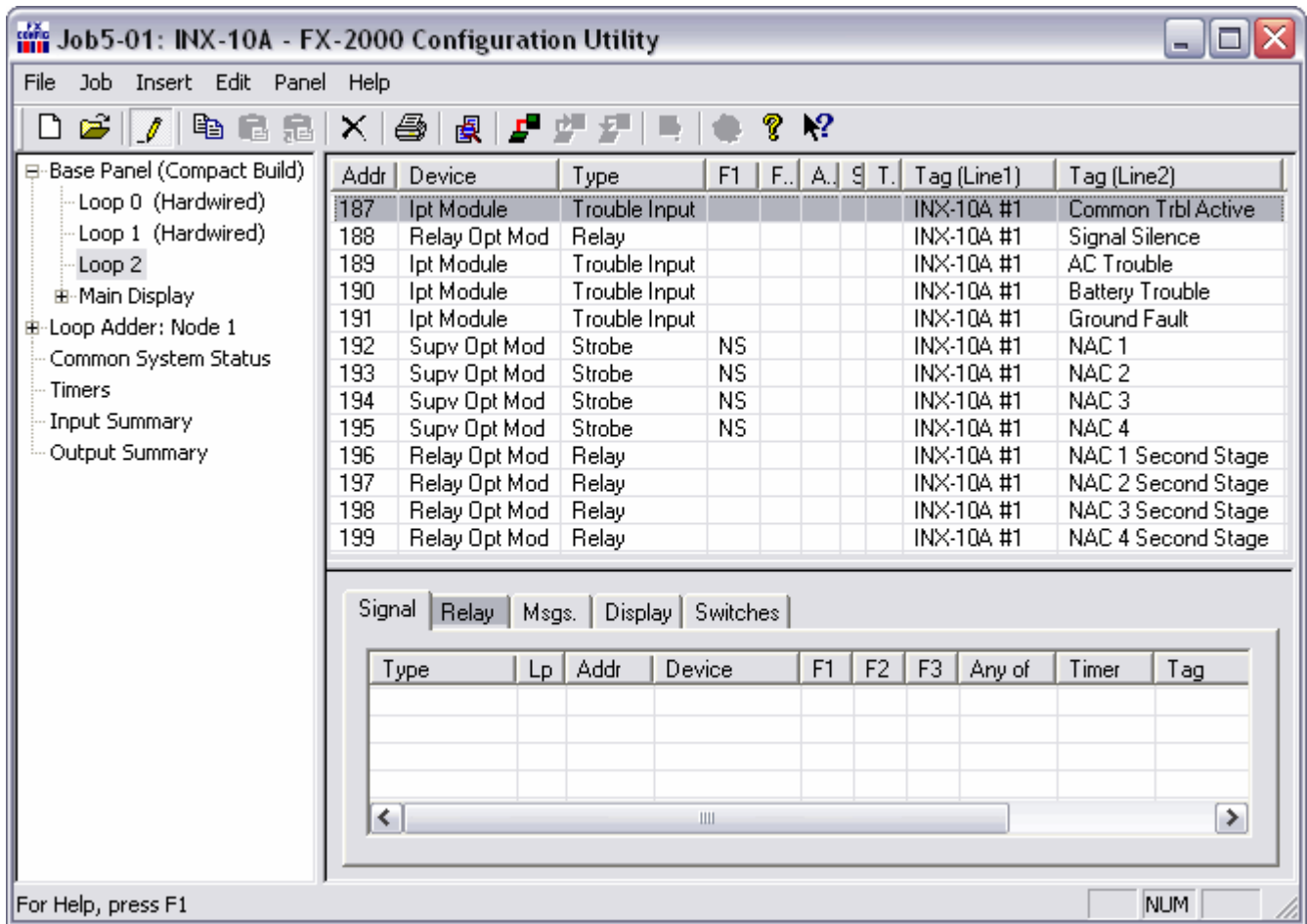
Figure 26   FX-2000 Configurator Settings - INX-10A Two Stage with Enhanced Reporting and Power Supply Addressing
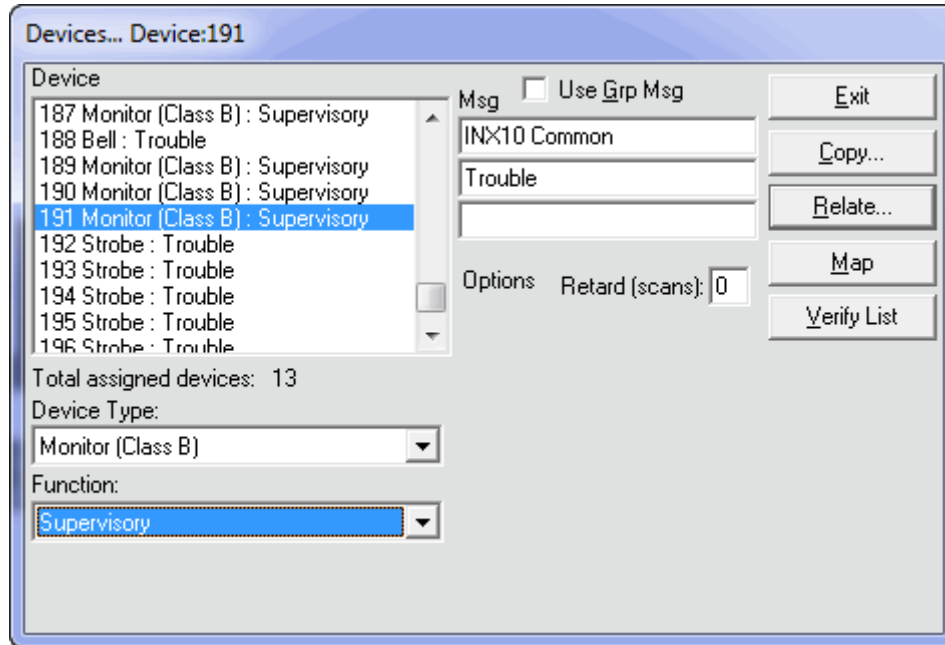
Figure 27   Secutron Configurator Settings - INX-10A Two Stage with Enhanced Reporting and Power Supply Addressing

6.4.5   Adding Functions in the FX-2000 Configurator Software

1.   Open Job in Configurator.

2.   Select the appropriate loop.

3.   Click **INSERT > ADD DEVICE.**

4.   From the Add Devices window, use the drop down menus to select the type of virtual device **Supv Opt Mod**, the base address of the INX panel. how many NAC circuits are being supervised.

5.   Click **ADD > CLOSE** to return to the main window.
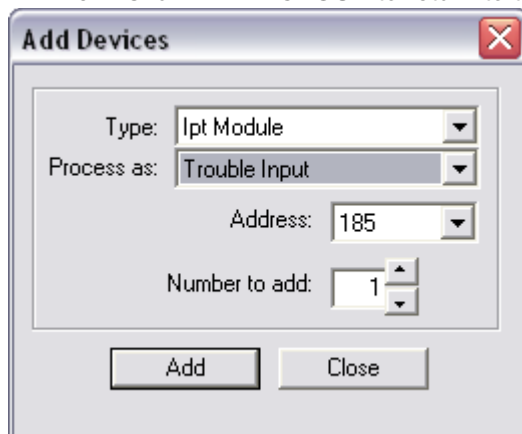
Figure 28   Add Devices Window

6.   Add the appropriate TAG(s) to the new devices by double clicking the appropriate cell.

7.   To assign correlations to each virtual device right click the device and select **ADD CORRELATIONS** and then select the appropriate items to **ADD**.

6.5   Independent Mode Configuration Options

NAC circuits on the INX-10A can be configured to drive both Signals and Strobes.

6.5.1   NACs 1 and 2 Configured as Signals

To configure NAC1 and NAC2 to drive signals set SW3-7 to 0 (OFF).

Configure the Strobe Manufacturer and Signal Rate by setting SW4-4, SW4-5, SW4-6, SW5-1 SW5-2 and SW5-3 as described in Table 18.

Notes: Using Independent Mode in a Two Stage Application

When driving Signals and Strobes in a Two Stage Application configure the Alert Rate by setting SW4-1, SW4-2 and SW4-3 as follows:

 100 - Uses Strobe Manufacturer Sync Rate

 010 - Continuous

 110 - 0.5s ON, 2.5s OFF, Repeat (20 PPM as in FA-1000 or FX-2000)

 001 - 20 PPM, 50% Duty Cycle

Table 18 Independent Mode DIP Switch Settings - NAC1 and NAC2 configured as Signals

NAC3 NAC4 and NAC5	NAC1 and NAC2	CONFIGURE SWITCHES AS SHOWN		
Strobe Manufacturer (SW5 1-3)	Signal Rate (SW4 4-6)	SW3	SW4	SW5
Mircom/Amseco	Continuous			
Mircom/Amseco	Temporal			
Mircom/Amseco	March Time			
Mircom/Amseco	California			
Mircom/Amseco	120 PPM, 50% Duty Cycle			
System Sensor	Continuous			

Table 18 Independent Mode DIP Switch Settings - NAC1 and NAC2 configured as Signals (Continued)

NAC3 NAC4 and NAC5	NAC1 and NAC2	CONFIGURE SWITCHES AS SHOWN		
Strobe Manufacturer (SW5 1-3)	Signal Rate (SW4 4-6)	SW3	SW4	SW5
System Sensor	Temporal			
System Sensor	March Time			
System Sensor	California			
System Sensor	120 PPM, 50% Duty Cycle			
Secutron/Gentex	Continuous			
Secutron/Gentex	Temporal			
Secutron/Gentex	March Time			
Secutron/Gentex	California			
Secutron/Gentex	120 PPM, 50% Duty Cycle			
Wheelock	Continuous			
Wheelock	Temporal			
Wheelock	March Time			
Wheelock	California			
Wheelock	120 PPM, 50% Duty Cycle			

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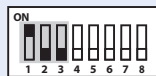### 6.5.2 NAC1, NAC2 and NAC3 Configured as Signals

To configure NAC1, NAC2 and NAC3 to drive signals set SW3-7 to 1 (ON).

Configure the Strobe Manufacturer and Signal Rate by setting SW4-4, SW4-5, SW4-6, SW5-1 SW5-2 and SW5-3 as described in Table 19.

> **Notes:** Using Independent Mode in a Two Stage Application
>
> When driving Signals and Strobes in a Two Stage Application configure the Alert Rate by setting SW4-1, SW4-2 and SW4-3 as follows:
>
> 100 - Uses Strobe Manufacturer Sync Rate
>
> 010 - Continuous
>
> 110 - 0.5s ON, 2.5s OFF, Repeat (20 PPM as in FA-1000 or FX-2000)
>
> 001 - 20 PPM, 50% Duty Cycle

Table 19 Independent Mode DIP Switch Settings - NAC1, NAC2 and NAC3 configured as Signals

NAC4 and NAC5	NAC1, NAC2 and NAC3	CONFIGURE SWITCHES AS SHOWN		
Strobe Manufacturer (SW5 1-3)	Signal Rate (SW4 4-6)	SW3	SW4	SW5
Mircom/Amseco	Continuous			
Mircom/Amseco	Temporal			
Mircom/Amseco	March Time			
Mircom/Amseco	California			
Mircom/Amseco	120 PPM, 50% Duty Cycle			
System Sensor	Continuous			
System Sensor	Temporal			

Table 19 Independent Mode DIP Switch Settings - NAC1, NAC2 and NAC3 configured as Signals (Continued)

NAC4 and NAC5	NAC1, NAC2 and NAC3	CONFIGURE SWITCHES AS SHOWN		
Strobe Manufacturer (SW5 1-3)	Signal Rate (SW4 4-6)	SW3	SW4	SW5
System Sensor	March Time	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
System Sensor	California	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
System Sensor	120 PPM, 50% Duty Cycle	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Secutron/Gentex	Continuous	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Secutron/Gentex	Temporal	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Secutron/Gentex	March Time	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Secutron/Gentex	California	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Secutron/Gentex	120 PPM, 50% Duty Cycle	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Wheelock	Continuous	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Wheelock	Temporal	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Wheelock	March Time	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Wheelock	California	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)
Wheelock	120 PPM, 50% Duty Cycle	(DIP switch setting)	(DIP switch setting)	(DIP switch setting)

7.0 Wiring

This chapter describes the proper field wiring for the INX-10A.

This chapter explains

- Maximum wiring distances
- Wiring Terminal Connections
- Wiring Power Supply Connections

7.1 Wiring Tables

Table 20 Wiring Table for Input Circuits

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

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Note: Maximum Loop Resistance Should Not Exceed 100 Ohms.

Table 21 Wiring Table for NAC and Auxiliary Power Circuits

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

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Notes: Main Board NAC Circuits are rated for 2.5 Amperes each.

Maximum Voltage Drop Should Not Exceed 1.8 Volts

7.2   Main Board Terminal Connections

Wire devices to terminals as shown below. See 7.1 Wiring Tables on page 67, Table 21 Wiring Table for NAC and Auxiliary Power Circuits on page 67 and 9.0 Appendix A - Specifications And Features - for more information.
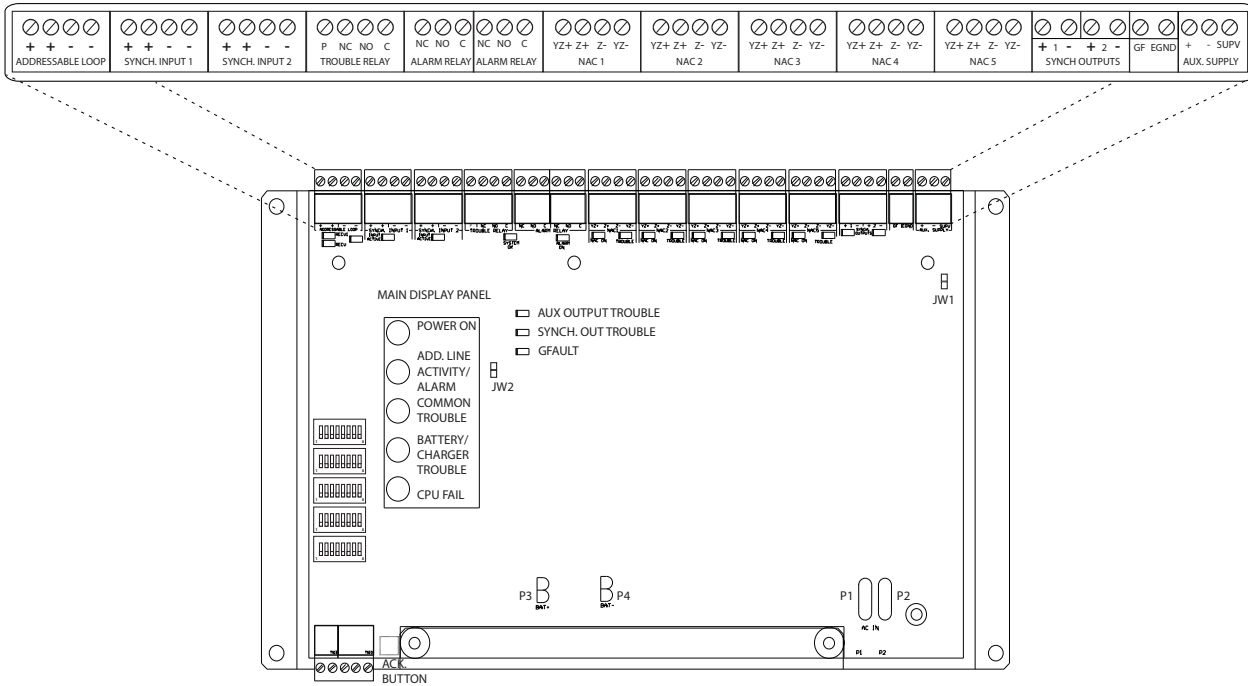

Figure 29   Main Board Terminal Blocks

Attention: DO NOT exceed power supply ratings: Total current including Main Chassis, AUX, and NAC circuits is 10A max.

Ground Fault Detection is required at all times. INX Ground fault detection can only be disabled IF it is interfering the FACPs Ground Fault Detection operation AND the FACP is used to manage the Ground Fault Detection.

Notes: The Terminal Blocks are depluggable for ease of wiring.

All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.
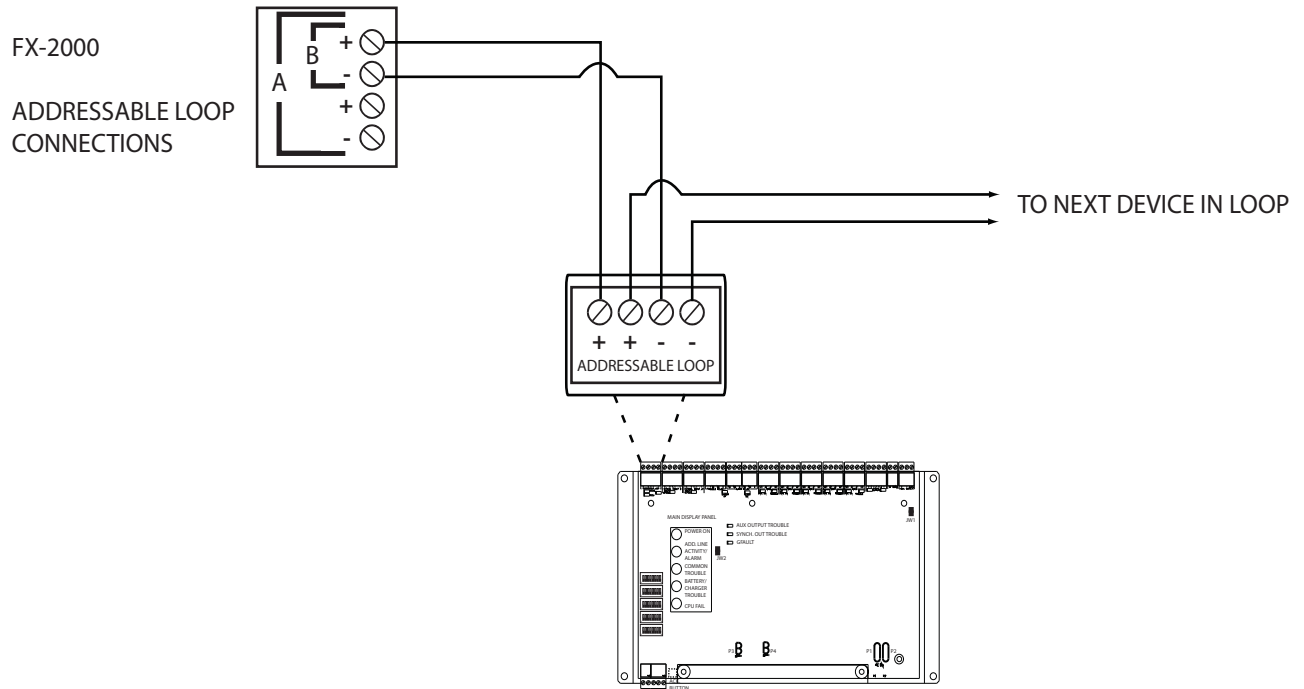
7.2.1 SLC Loop Wiring - Class B

Figure 30   SLC Loop Wiring - Class B

7.2.2 SLC Loop Wiring - Class A
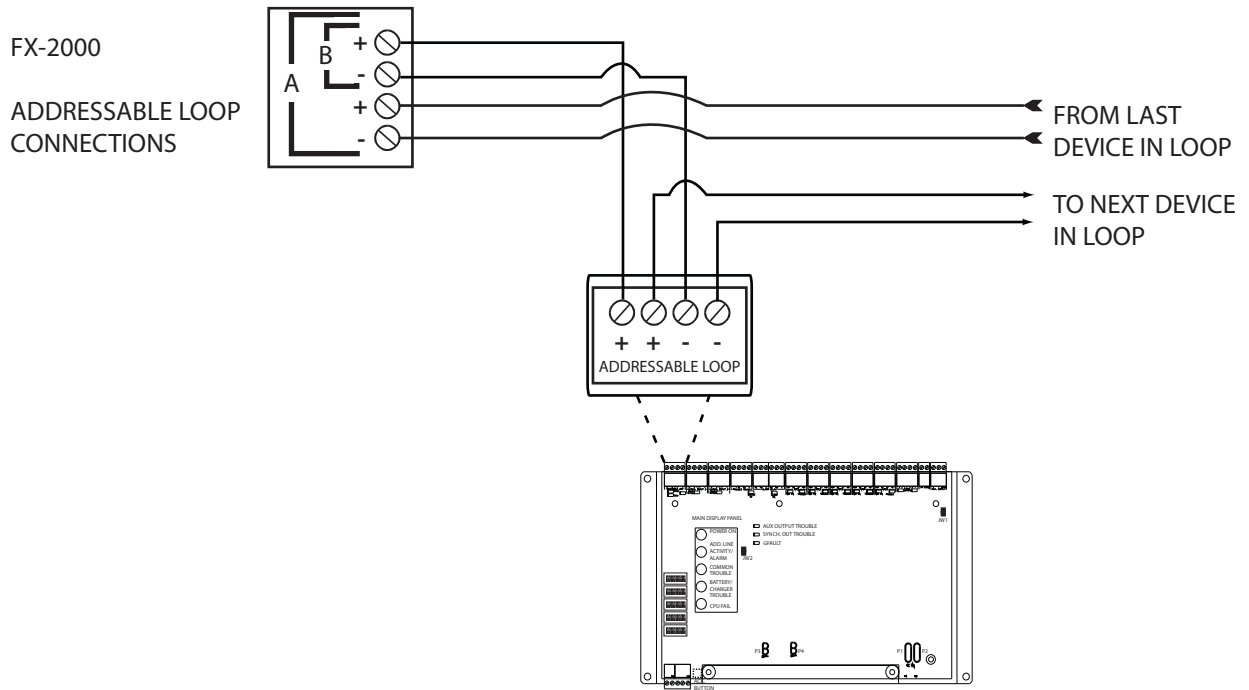
Figure 31   SLC Loop Wiring - Class A

7.2.3 Synchronized Input from FACP Wiring - Class B

SYNCH SIGNAL FROM FACP

Figure 32   Synchronized Input from FACP Wiring - Class B

Attention: DO NOT USE AN SLC LOOP IN THIS APPLICATION.

7.2.4 Synchronized Input from FACP Wiring- Class A
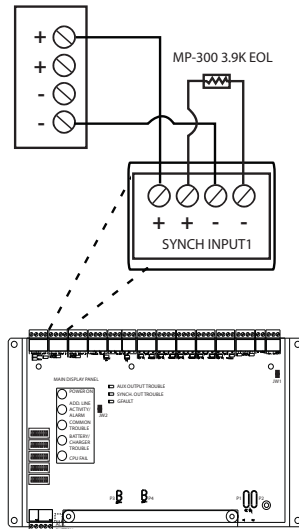

SYNCH SIGNAL FROM FACP
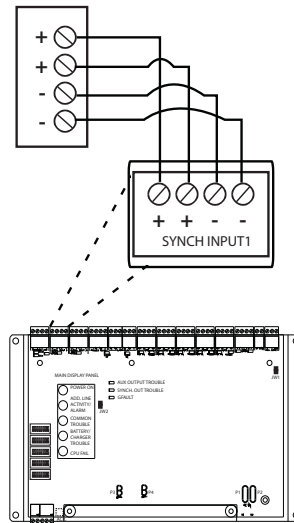
Figure 33   Synchronized Input from FACP Wiring - Class A

Attention: DO NOT USE AN SLC LOOP IN THIS APPLICATION.

7.2.5 Synchronized Input from INX-10A Wiring - Class B Single Slave

SYNCH SIGNAL FROM INX-10A CLASS B ONLY

Figure 34   Synchronized Input from INX-10A Wiring - Class B Single Slave

Attention: CLASS B WIRING ONLY

7.2.6 Synchronized Input from INX-10A SIngle Stage Wiring - Class B Multiple Slaves

SYNCH SIGNAL FROM INX-10A CLASS B ONLY

Figure 35   Synchronized Input from INX-10A Wiring - Class B Multiple Slaves

> **Attention:** **SYCNHRONIZING SIGNALS FROM THE INX-10A CAN USE CLASS B WIRING ONLY**
>
> **MIRCOM RECOMMENDED SETUP FOR MULTIPLE SLAVES**

7.2.7 Synchronized Input from INX-10A Two Stage Wiring - Class B Multiple Slaves

SYNCH SIGNAL FROM INX-10A CLASS B ONLY
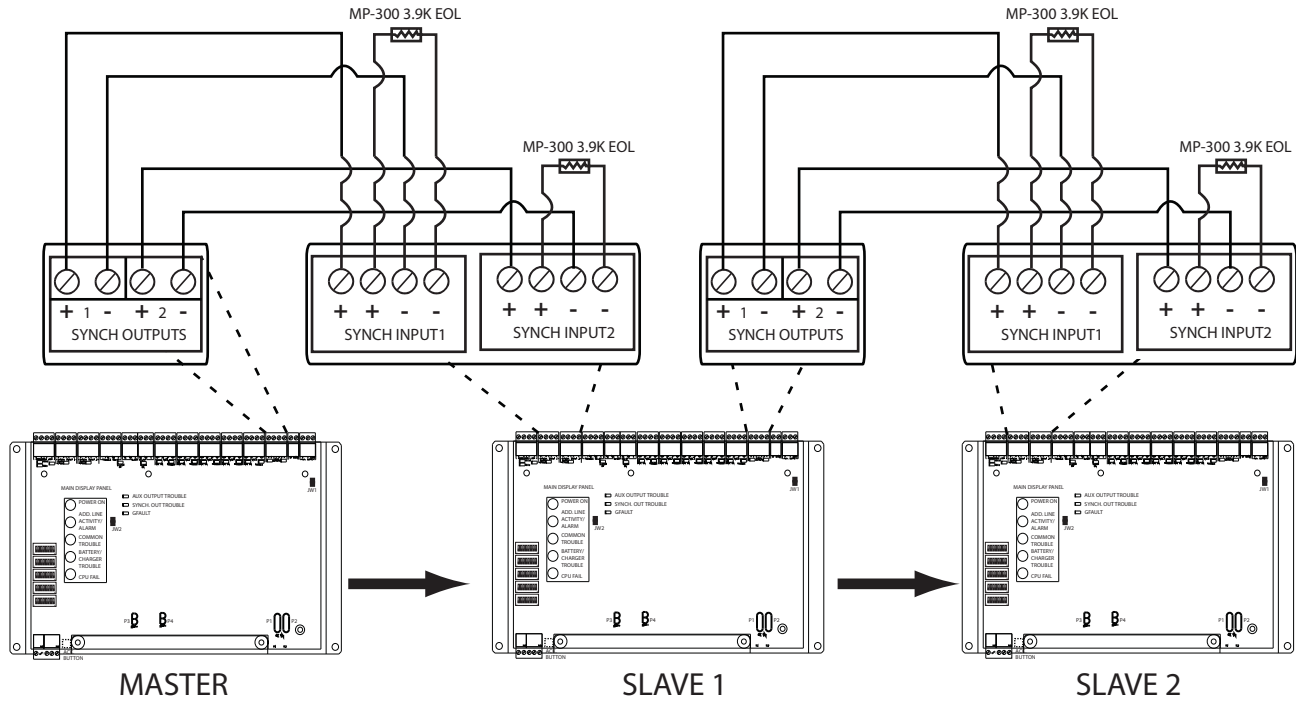

Figure 36   Synchronized Input from INX-10A Wiring - Class B Multiple Slaves

Attention: SYCNHRONIZING SIGNALS FROM THE INX-10A CAN USE CLASS B WIRING ONLY

MIRCOM RECOMMENDED SETUP FOR MULTIPLE SLAVES

7.2.8 Relay, Ground Supervision and Auxiliary Supply Wiring

COMMON TROUBLE CONTACTS
28 VDC, 1 AMP RESISTIVE LOAD

REMOVE TO DISABLE
GROUND FAULT
SUPERVISION

1.7AMPS MAXIMUM
24VDC REGULATED
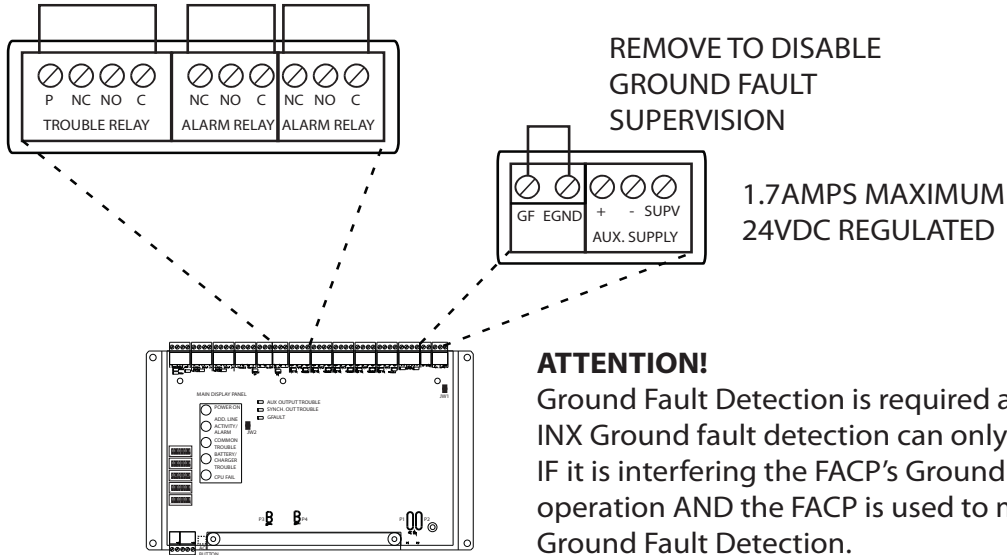
ATTENTION!
Ground Fault Detection is required at all times.
INX Ground fault detection can only be disabled
IF it is interfering the FACP's Ground Fault Detection
operation AND the FACP is used to manage the
Ground Fault Detection.

Figure 37   Relay, Ground Supervision and Auxiliary Supply Wiring

7.2.9 Supervision of Auxiliary Supply Wiring

ITEM THAT REQUIRES
SUPERVISION
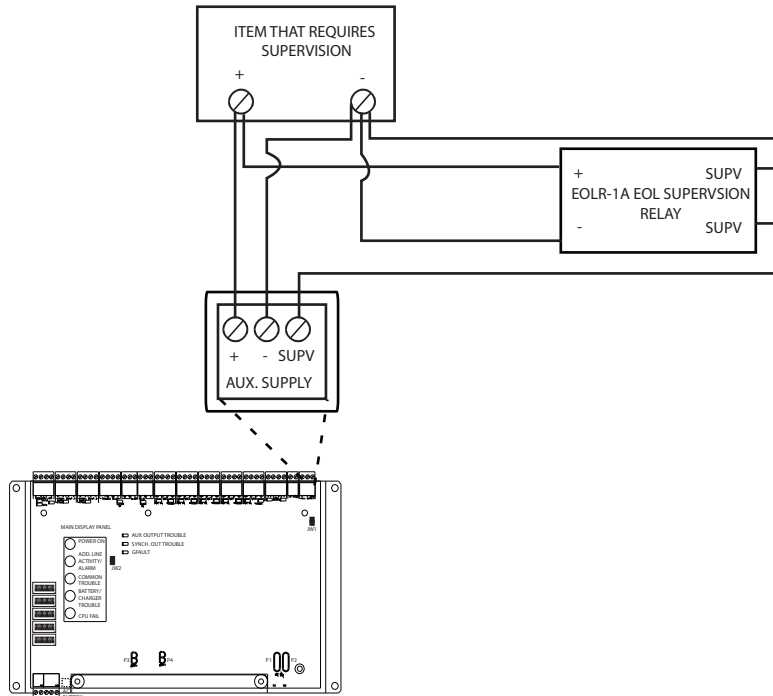
Figure 38   Relay, Ground Supervision and Auxiliary Supply Wiring

7.2.10 NAC CIrcuit Wiring - Class B

3.9K 1/2W ELR Listed S5434
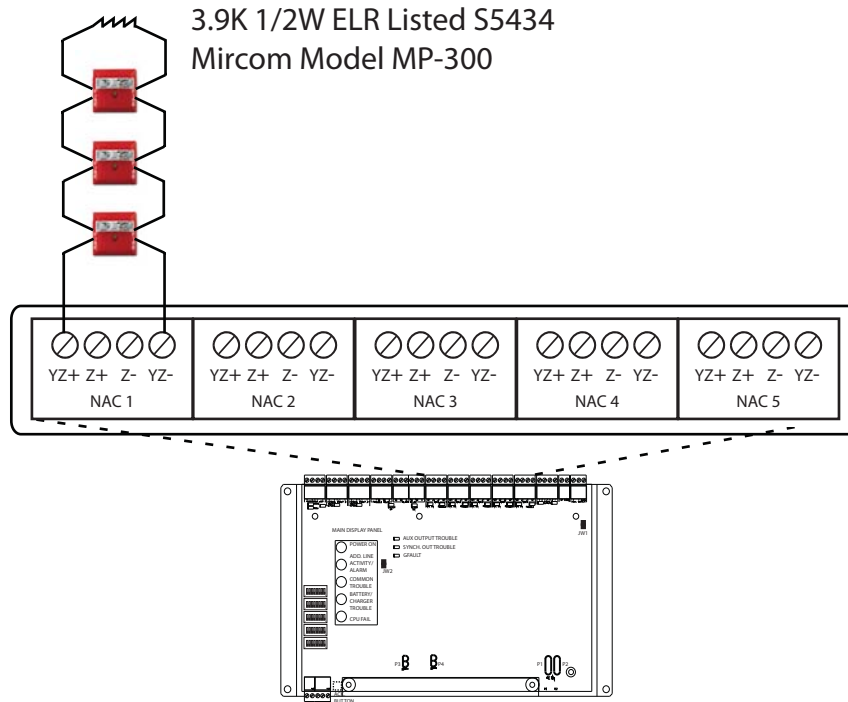Mircom Model MP-300

Figure 39   NAC CIrcuit Wiring - Class B

7.2.11 NAC CIrcuit Wiring - Class A
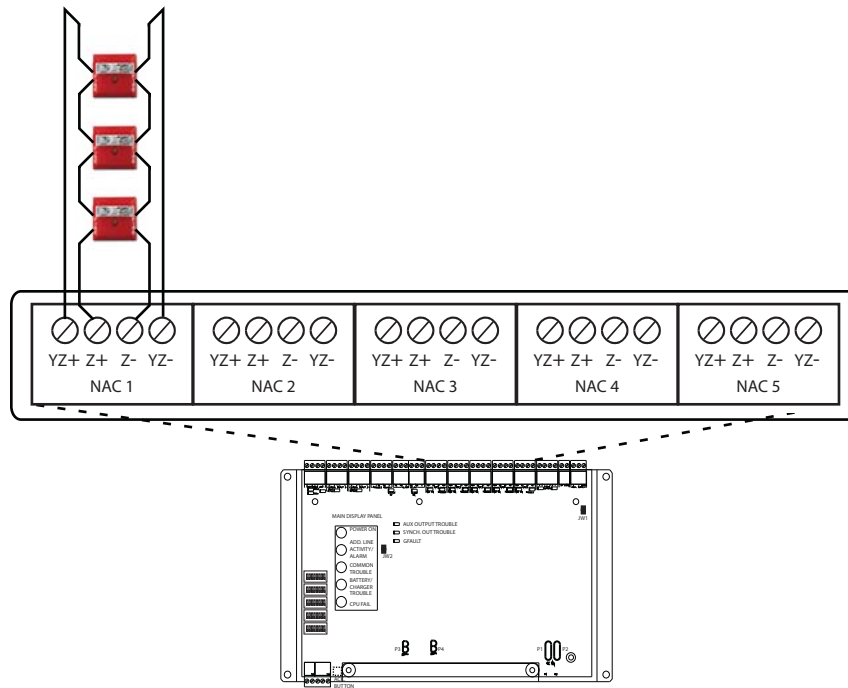

Figure 40   NAC CIrcuit Wiring - Class A

7.3 Power Supply Connections

The power supply is pre-installed as part of the Main Chassis. The following table displays the electrical ratings. Figure 41 Power Supply Connections shows the proper connections to wire the Power Supply successfully.

Table 22 Power Supply Electrical Ratings

Connector/Jumper	Description
Electrical input ratings	120 VAC, 60 Hz, 2 A / 240 VAC, 50 Hz, 1A
Power supply total current	10 A maximum
Battery Fuse	Replace with WX-058 Battery Cable Assembly
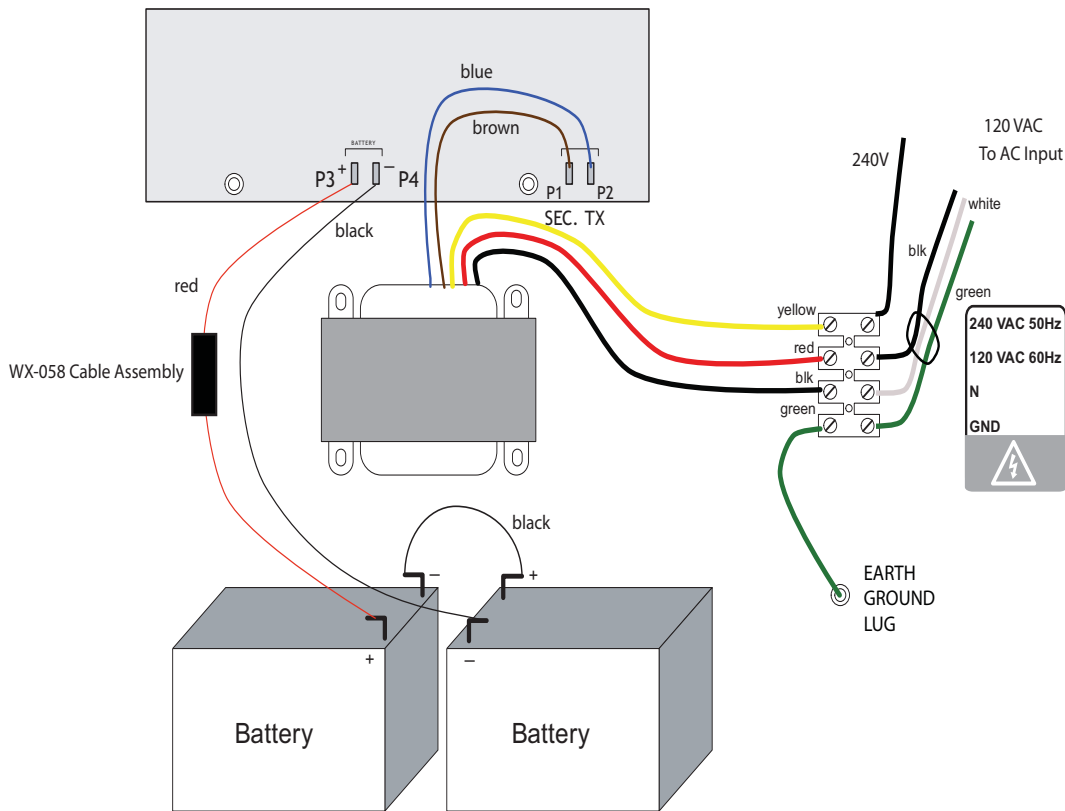
Figure 41   Power Supply Connections

Attention: DO NOT exceed power supply ratings. Wire as shown using proper wire gauges.

Connect batteries after the system main A.C. power is turned on to reduce sparking.

7.4 System Checkout

The following are the recommended steps before and during the powering up of the INX-10A.

7.4.1 Before Turning The Power ON

1. To prevent sparking, DO NOT connect the batteries first. Connecting the batteries is only to be done after the system has been powered from the main AC Supply.

2. Check all field (external) wiring for opens, shorts, and ground.

3. Check that all interconnection cables are secure, and that all connectors are plugged-in properly.

4. Check all Jumpers and Switches for proper setting.

5. Check the AC power wiring for proper connection.

6. Check that the chassis is connected to EARTH GROUND (cold water pipe).

7. Close the front cover plate before powering the system from main AC supply.

7.4.2 Power-up Procedure

1. After completing 7.4.1 Before Turning The Power ON procedures, power-up the panel. The green **AC-ON** LED should illuminate.

2. Since the batteries are not connected, the **Battery Trouble** LED should illuminate, the **Common Trouble** LED should flash and the Trouble Relay (on the main board) will be active.

3. Connect the batteries while observing correct polarity; the red wire is positive (+) and black wire is negative (-).

4. All indicators should extinguish except for normal power **AC-ON** green LED.

7.5 Troubleshooting

The following are common methods to solving Circuit Ground Fault, Battery and Common troubles.

7.5.1 Circuit Trouble

Normally when a circuit trouble occurs, the Common Trouble indicator will be illuminated and the common trouble relay will be active. Additionally, the corresponding LED on the main board will be illuminated. This can be viewed by opening the panel and looking the top of the board. To correct the fault, check for open wiring on that particular circuit loop.

7.5.2 Ground Fault

This panel has a common ground fault detector. To correct the fault, check for any external wiring touching the chassis or other Earth Ground connection.

7.5.3 Battery Trouble

Check for the presence of batteries and their conditions. Low voltage (below 20.4V) will cause a battery trouble. If battery trouble condition persists, replace batteries as soon as possible.

7.5.4 Common Trouble

If only a common trouble is indicated on the main panel and none of those above confirming trouble indicators are on, then check the following for possible fault

- any missing interconnection wiring
- improperly secured cabling

8.0   Warranty and Warning Information

8.1   Warning Please Read Carefully

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> **Note:** This equipment is subject to terms and conditions of sale as follows:

8.2   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.

8.3   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:

8.3.1   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.

8.3.2   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.

8.3.3   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.

8.3.4 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.

8.3.5 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.

8.3.6 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.

8.3.7 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 our 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.

8.3.8 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.

8.3.9 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.

8.3.10 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.

8.3.11 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.

8.3.12 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.

8.3.13 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.

8.4 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.

8.4.1 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.

8.4.2 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.

8.5 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.

8.6 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.

8.7 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 preceding 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.

9.0 Appendix A - Specifications And Features

Table 23 INX-10A Specifications and Features

INX-10A Main Chassis		
General	Micro-controller based design, fully configurable from DIP Switches on front panel.	
NAC Circuits	5 Style Y or Z (Class B or A) configurable as strobes or audibles. Terminals are labelled "NAC". Power limited / 24 VDC regulated / 2.5 A @ 49° C per Circuit	
Aux. Power Supply.	Terminals are labelled **AUX PWR**. Power limited / 24 VDC Filtered (special application) / 1.7 A @ 49° C	
Auxiliary relays (resistive loads)	Must be connected to a Listed Power Limited Source of Supply. Terminals are labelled "GROUND" and "TROUBLE".	
	Ground Fault	Form C, 1 Amp, 28 VDC
	Common Trouble	Form C, 1 Amp, 28 VDC
Electrical ratings	**AC line voltage**	120V 60Hz / 240V, 50Hz
		2 Amps / 1 Amp (primary)
	NAC Circuits	24VDC regulated, Power Limited
		10A Total, 2.5A maximum per circuit
Battery	**Type**	2 x 12VDC, Gel-Cell/Sealed Lead-Acid
	Charging capability	4Ah to 40Ah batteries
	Current Consumption	standby: 200 mA
		alarm: 350 mA
Compliance	**System Model**	INX Addressable NAC Expander
	Applicable Standards	ULC S527-99, UL 864 R9 and UL 1481 R5

10.0 Appendix B - Power Supply & Battery Calculations

Use the form below to determine the required Main Chassis and Secondary Power Supply (batteries).

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 9.0 Appendix A - Specifications And Features for specifications.							
Power Requirements (All currents are in amperes)							
Model Number	Description	Qty		Standby	Total Standby	Alarm	Total Alarm
INX-10A	Main Chassis (10 Amp)		X	0.200	=	0.350	=
Signal Load (bells, horns, strobes, and etc.)			X				=
Auxiliary Power Supply					=	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

Battery Selection

Multiply (C) by 1.20 to derate battery.

Batteries BA-104(4AH), BA-1065(7AH) and BA-110(12AH) will fit into the INX-10A

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

11.0 Appendix C - Sample Applications

11.1 Minimal Size Single Stage Addressable System - Factory Default Settings

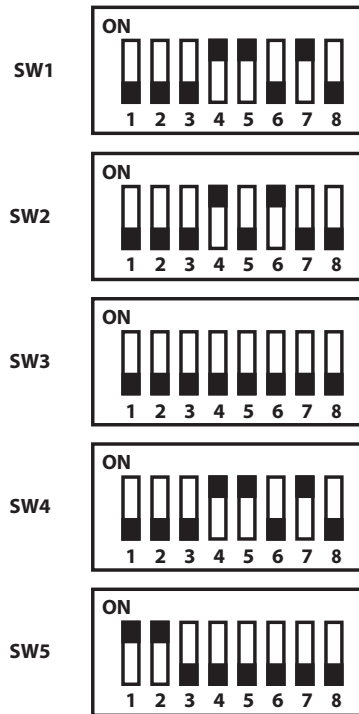In a minimal size system the INX-10A will require 7 addresses. The following are the specs for the system.

Base Address	193
Protocol	System Sensor
AC Failure Report Delay	No Delay
Charger	Yes
Battery	Yes
Cut Charger when NACs activated	Yes
Alert Rate	N/A
Evacuation Rate	Temporal
Strobe Type	None
NAC 4 Output Settings	NAC
NAC 5 Output Settings	NAC
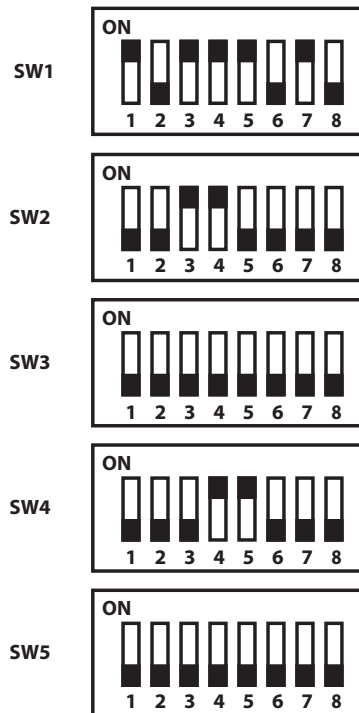
11.2 Minimal Two Stage Addressable System

In a minimal size system the INX-10A will require 7 addresses. The following are the specs for the system.

Base Address	188
Protocol	System Sensor
AC Failure Report Delay	2 hour
Charger	Yes
Battery	Yes
Cut Charger when NACs activated	Yes
Alert Rate	Follow Inputs
Evacuation Rate	Temporal
Strobe Type	None
NAC 4 Output Settings	NAC
NAC 5 Output Settings	Continuous Supply

SW1

ON
1 2 3 4 5 6 7 8

SW2

ON
1 2 3 4 5 6 7 8

SW3

ON
1 2 3 4 5 6 7 8

SW4

ON
1 2 3 4 5 6 7 8

SW5

ON
1 2 3 4 5 6 7 8

11.3 Minimal ULC Two Stage Addressable System

In a minimal size system the INX-10A will require 7 addresses. The following are the specs for the system.

Base Address	185
Protocol	System Sensor
AC Failure Report Delay	2 hour
Charger	Yes
Battery	Yes
Cut Charger when NACs activated	Yes
Alert Rate	Follow Inputs
Evacuation Rate	Temporal
Strobe Type	None
NAC 4 Output Settings	NAC
NAC 5 Output Settings	Continuous Supply
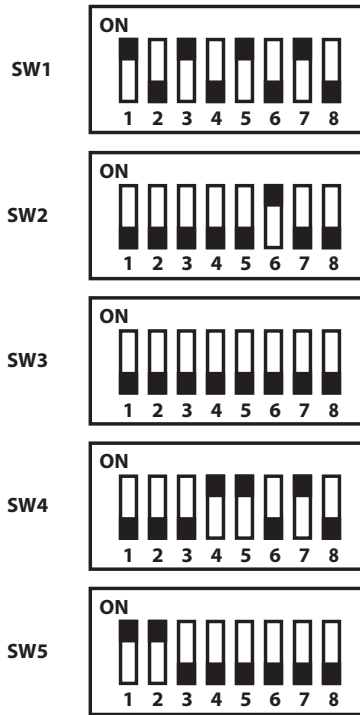
12.0 Appendix D - FX-2000 and FleX-Net Series ULI Compatible Devices

12.1 Horns and Bells

Table 24 FX-2000 and FLeX-Net Series ULI Compatible Horns and Bells

Manufacturer	Device Type	Horn Model	Max. Strobe/NAC
System Sensor -SpectrAlert	Horn	H12/24	n/a
	Horn	H12/24W	n/a
Wheelock	Horn	AH-24-R	n/a
	Horn	AH-24-WP-R	n/a
	Horn	MT-12/24-ULC	n/a
	Horn	AMT-12/24-R-ULC	n/a
	Bell	MB-G6-24-R	n/a
	Bell	MB-G10-24-R	n/a

12.2 Synchronized Strobes

Table 25 FX-2000 and FLeX-Net Series ULI Compatible Synchronized Strobes

Manufacturer	Brand	Strobe Model	Max. Strobe/NAC
Amseco/Potter	Mircom	FHS-240-110	15
Gentex Corp.	Secutron	MRA-HS3-24ww	20
SpectrAlert	System Sensor	P1224 MC	25
Wheelock	Wheelock	NS-24 MCW -FW	25