



FX-4000 Intelligent Fire Detection and Voice Evacuation System



All MGC MIX-4000 Series Detectors are not FM Approved

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1.0

Introduction

1.1 About the FleX-Net™ FX-4000 Intelligent Fire Detection and Voice Evacuation System

Mircom's FleX-Net™ FX-4000 Intelligent Fire Detection and Voice Evacuation System 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™ allows for a maximum of 63 nodes (a node can be a control center or a floor panel) while providing reliability and flexibility.

Each base panel consists of 4 Class A or B Indicating Circuits or notification appliance circuit (NACs) rated at 1.7 amperes each. A large 4 x 20 back-lit alphanumeric 8- line LCD display and a 24 line graphical display are available. Additional SLC loops are available with MGC Protocol Quad Loop Adder module ALCN-960MISO for expanding addressable loops (SLC) by 2; together with daughter board ALCN-960D expanding addressable loops by a total of 4. Also available is the Quad Loop Adder module ALCN-4792MISO for expanding addressable loops (SLC) by 2; with daughter board ALCN-792D expanding addressable loops by a total of 4.

The configuration allows the FleX-Net™ 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™ Integrated Fire and Audio panel can be used to provide a fully distributed audio and/or integrated telephone system.

The FleX-Net™ FX-4000 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 an 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-4000 Audio Network Card, a TNC-5000 Telephone Network Card and up to 4 amplifiers, a fire alarm portion FX-4000MNS 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, a firefighters' telephone and associated selector panels. 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™ Network Central Alarm and Control Facility (CACF).

1.2 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.
- Supports a request, grant, or deny system with all controls disabled on node annunciators (ancillary displays only) as per ULC 527-11.
- Supports a degraded mode of operation (more than one operating node) and a standalone mode of operation (only one operating node) as per ULC 527-11.

- MGC Protocol Quad Loop Adder module ALCN-960MISO for expanding addressable loops (SLC) by 2; with daughter board ALCN-960D expanding addressable loops by a total of 4. Each SLC Loop is set to function with MGC MIX-4000 Series addressable modules (240 sensors and modules) and can be wired as Class A (Class X) or Class B.
- AP Protocol Quad Loop Adder module ALCN-4792MISO for expanding addressable loops (SLC) by 2; with daughter board ALCN-792D expanding addressable loops by a total of 4.
- 12 Ampere Power Supply.
- Four Class A or B 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, Assisted Walk Test.
- Outputs for 4 Wire resettable Smoke Power Supply, Auxiliary Power Supply, and an interface to the Mircom RTI-1 Remote Trouble Indicator.
- 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 acknowledge with Alarm Queue, Supervisory Queue, Trouble Queue, and BLDG (Monitor) Queue LED indicators and pushbuttons.
- 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.
- Common Controls and Indicators for System Reset, Lamp Test (Visual Indicator Test), Fire Drill, Signal Silence, General Alarm, General Alarm Cancel (Automatic Alm Sig Stop), AC On, CPU Fault, and Ground Fault.
- Two Spare configurable switches and LED Indicators.
- 16 Zone configurable LED (bi-coloured) Annunciator with slide-in labels for Zone Description with the DSPL-420-16TZDS Display.
- 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.
- **OPEN Graphic Navigator Software Package** allows 3D graphic display of premises and devices. Use the Ethernet port on the main board to connect to OpenGN graphics software.

1.3 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 BBX-FXMNS.
- Maximum of 360 Watts per QBB-5001(R) expansion cabinet and 1260 Watts of total power per BBX-FXMNS node with maximum expansion [180W +360W(3)=1260W].
- Optional redundant backup amplifier per node.

1.4 Document Conventions

1.5 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.

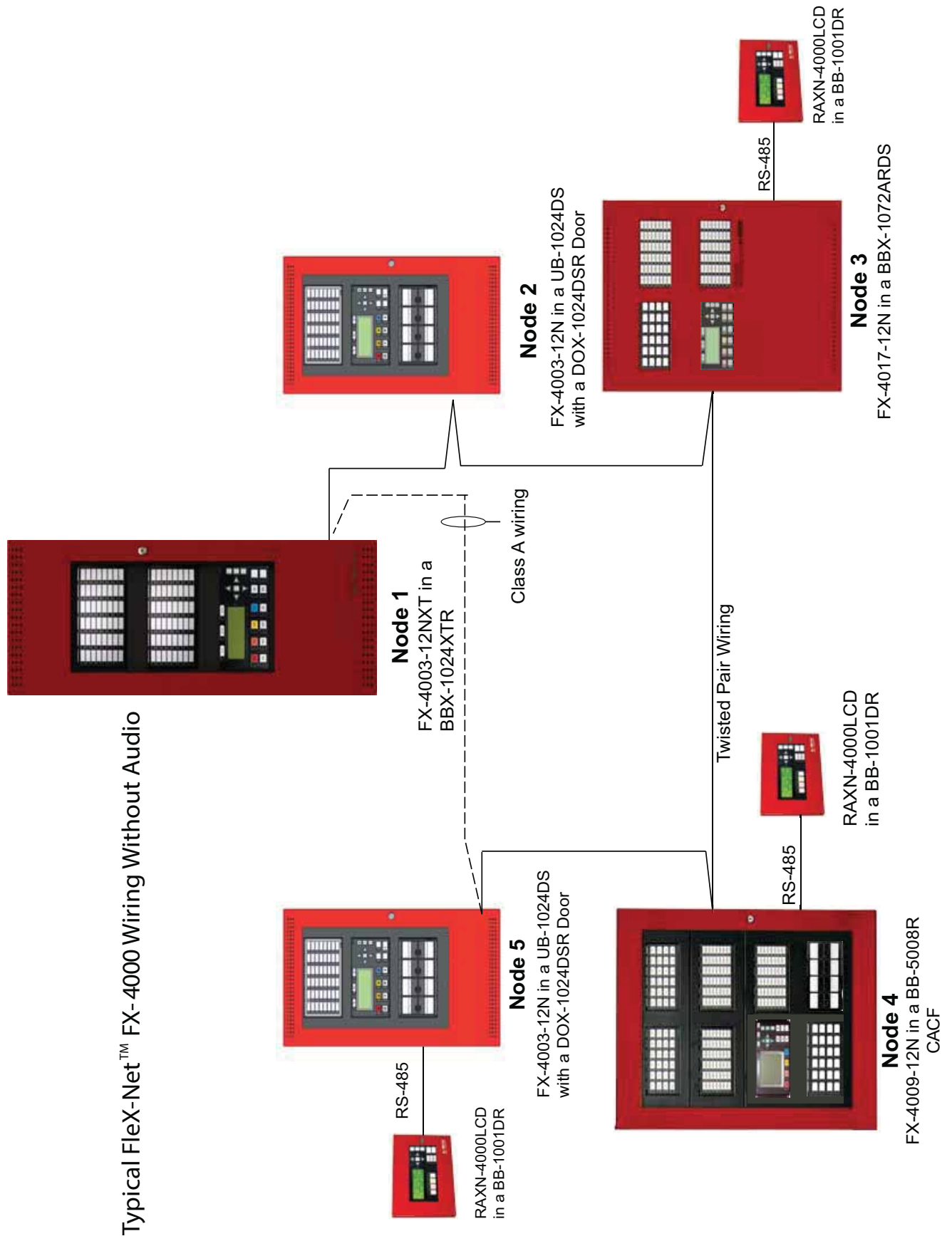
On the FleX-Net™ circuits can be hardwired inputs and outputs or addressable inputs and outputs. Both hardwired inputs and outputs, and addressable inputs and outputs may be grouped together to form logical zones.

1.6 Wiring Styles

Initiating circuits are configured by default as Class B. They may be configured as Class A as described in System Configuration. This operation uses odd and even pairs of two-wire Class B circuits to make one four-wire Class A circuit, thus cutting in half the number of available initiating circuits.

Indicating circuits (NACs) may be individually wired as Class A or Class B without affecting the number of circuits available.




Addressable Loops may be configured system wide as Class B, Class A. With the addition of isolators, a Class A will become a Class X.



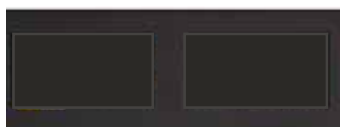






2.0 System Components



2.1 Chassis Types

	Model	Description
	FX-4003-12N	<p>12 Amp Main Chassis. This main chassis provides four Class A or B NACs (1.7 Amp each), and a 12 ampere power supply which charges 17-65 AH batteries. The FX-4003-12N supports the FNC-2000 Network Controller Module and 2 adder modules over the main board plus additional space in the chassis for 2 annunciator or programmable modules. This chassis mounts in the BBX-1024DS enclosure comprising a UB-1024DS black backbox and a door. A white door DOX-1024DS or DOX-1024DSR red door are available.</p> <p>Shown here with a DSPL-420DS 4 line by 20 character LCD display.</p> <p>This model does not support any network audio.</p>
	FX-4003-12NXT	<p>12 Amp Expanded Main Chassis. This expanded main chassis provides four Class A or B NACs (1.7 Amp each), and a 12 ampere power supply which charges 17-65 AH batteries. The FX-4003-12NXT supports the FNC-2000 Network Controller Module and 2 adder modules over the main board plus additional space in the chassis for 6 adder boards and 2 annunciator or programmable modules. This chassis mounts in the BBX-1024DS enclosure comprising a UB-1024DS black backbox and a door. A white door DOX-1024DS or DOX-1024DSR red door are available.</p> <p>Shown here with a DSPL-420DS 4 line by 20 character LCD display.</p> <p>This model does not support any network audio.</p>
	FX-4017-12N	<p>12 Amp Mid-Size Main Chassis. This mid-size main chassis provides four Class A or B NACs (1.7 Amp each), and a 12 ampere power supply which charges 17-65 AH batteries. The FX-4017-12N supports the FNC-2000 Network Controller Module and 2 adder modules over the main board plus additional space in the chassis for 14 adder boards and 3 annunciator or programmable module. This chassis mounts in the BBX-1072ADS black backbox/white door or BBX-1072ARDS black backbox/red door.</p> <p>Shown here with a DSPL-420DS 4 line by 20 character LCD display.</p> <p>This model does not support any network audio.</p>






	Model	Description
	FX-4009-12N	<p>12 Amp Large Main Chassis. This large main chassis provides four Class A or B NACs (1.7 Amp each), and a 12 ampere power supply which charges 17-65 AH batteries. The FX-4009-12N supports the FNC-2000 Network Controller Module and 2 adder modules over the main board plus additional space in the chassis for 6 adder boards and 3 annunciator or programmable modules. This chassis mounts in the BB-5008 or BB-5014 black backbox/black door or BB-5008R black backbox/red door.</p> <p>Shown here with a DSPL-420DS 4 line by 20 character LCD display.</p> <p>This is model does not support any network audio.</p>
	FX-4000MNS	Consists of a backplate which is mounted into the BBX-FXMNS backbox and a FX-4000N Fire Alarm Control board and a battery disconnect board.
	ECX-0012	Expander Chassis to use with the FX-4009-12N. It provides space for 12 adder modules and two display modules. This chassis mounts into the BB-5008(R) or BB-5014 backbox.





2.1 Network Controller Modules

	Model	Description
	FNC-2000	Provides network capability for the FX-4000N 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-4000N main board.
	ANC-4000	Audio Network Controller module. The ANC-4000 Audio Network Controller module is mounted over a metal plate (which is packaged with the FX-4009-12N) 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.




	Model	Description
	TNC-5000	Telephone Network Controller module. The TNC-5000 Telephone Network Controller module is mounted over the ANC-4000 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-UM	Fiber Optics Module (Optional) Connects to the FNC-2000 Fire Alarm Network Controller Module and allows fiber optics cabling.

2.2 Adder Modules

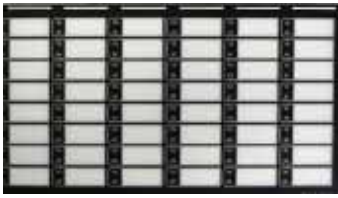


	Model	Description
	ALCN-960MISO	MGC Protocol Quad Loop Adder module provides two SLC loops.
	ALCN-960D	MGC Protocol Quad Loop Daughter Adder board provides an additional two SLC loops to the two provided with the ALCN-906MISO.
	ALCN-4792MISO	AP Protocol Quad Loop Adder module provides two SLC loops.
	ALCN-792D	AP Protocol Quad Loop Daughter Adder board provides an additional two SLC loops to the two provided with the ALCN-4792MISO.
	DM-1008A	Eight Initiating Circuit Module

	Model	Description
	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




2.3 Display Modules




	Model	Description
	DSPL-420DS	4 line by 20 character display which can be mounted into backboxes BBX-1072ADS(ARDS), BB-5008(R), BB-5014 and the BBX-FXMNS Backbox.
	DSPL-2440	Graphic display which can be mounted in backboxes BBX-1072ADS(ARDS), BB-5008(R), BB-5014 and the BBX-FXMNS Backbox
	DSPL-420-16TZDS	4 line by 20 character display which provides 16 zone alarm and trouble indicators. can be mounted in backboxes, BBX-1072ADS(ARDS), BB-5008(R), BB-5014 and the BBX-FXMNS Backbox.

2.4 Programmable Modules


	Model	Description
	IPS-4848DS	48 Programmable Input Switches Module
	IPS-2424DS	24 Programmable Input Switches Module
	FDX-008W FDX-008WKI	Fan Damper Module with white LEDs for AUTO switch position indication. FDX-008W provides switch operation of 8 fan damper zones and the FDX-008WKI provides switch operation of 7 fan damper zones and one keyswitch operation of the 8th fan damper zone.

2.5 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-5348DS	48 Zone Paging and Telephone Selector Panel
	QAZT-5302DS	24 Zone Paging and Telephone Selector Panel


2.6 Booster Power Supply


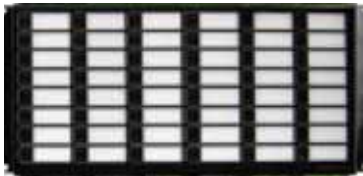
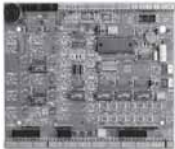
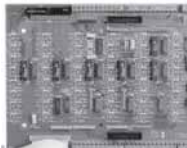
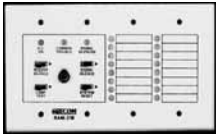
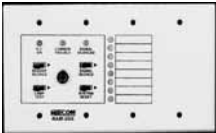

	Model	Description
	INX-10AC	Addressable Booster Power Supply mounts to backboxes BB-5014 and BBX-FXMNS. Same unit as the INX-10A and INX-10ADS, except this model comes with a chassis for mounting. Refer to LT-899 manual for more detailed instructions.

2.7 Enclosures


	Model	Description
	BBX-1024DS white door black backbox (add suffix "R" for red door/black backbox)	Enclosure 27.5"H x 16.5"W x 5.5"D
	BBX-1024XT white door black backbox (add suffix "R" for red door/black backbox)	Enclosure 35.5"H x 16.5"W x 5.5"D
	BBX-1072ADS white door black backbox (or BBX-1072ARDS for red 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 white door assembly (add suffix "R" for red door/black backbox)	Backbox 61.5"H x 22"W x 9"D
	FA-1072TR Flush Trim Ring	Black flush trim for BBX-1072ADS and BBX-1072ARDS Backboxes.

2.8 Remote Annunciators


	Model	Description
	RAXN-4000LCD	Remote Shared Display Annunciator. Please refer to LT- 895MP RAXN-4000LCD manual for further information.
	RAXN-4000LCDG	Remote Shared Graphical Display Annunciator. Please refer to LT-6033MP RAXN-4000LCDG manual for further information.
	DSPL-420-16TZDS	4 line by 20 character display which provides 16 zone alarm and trouble indicators. can be mounted in the BBX-FXMNS- 6000 backbox

	Model	Description
	RAM-1032TZDS RAM-1032TZDS-CC	Model RAM-1032TZDS Main Chassis Remote Annunciator with 16 Bi-coloured LEDs and 32 trouble LEDs. Model RAM-1032TZDS-CC is the same as the RAM-1032TZDS, except it has conformal coating and is to be used in a BB-1001WP(R)A or BB-1002WP(R)A weather protected box.
	RAX-1048TZDS RAX-1048TZDS-CC	Model RAX-1048TZDS Adder Annunciator Chassis with 48 Bi-coloured LEDs and 48 trouble LEDs. Model RAM-1048TZDS-CC is the same as the RAM-1058TZDS, except it has conformal coating and is to be used in a BB-1002WP(R)A weather protected box.
	MGD-32	Master Graphic Driver Annunciator Board
	AGD-048	Adder Graphic Driver Board
	RAM-216(R)	Annunciator with 16 Bi-coloured LEDs.
	RAM-208(R)	Annunciator with 8 Bi-coloured LEDs.
	RTI-1	Remote Trouble Indicator (single LED and trouble buzzer).

2.9 FX-LOC(R) Local Operating Console

	Model	Description
	<p>FX-LOC(R) consists of:</p> <p>FX-LOC Enclosure includes backbox, inner door and outer white door.</p> <p>FX-LOC(R), the R suffix represents a red door.</p> <p>Main Display RAXN-4000LCD.</p> <p>Audio indication and selector panel QAZT-5348DS.</p> <p>Master paging microphone, model QMP-5101N.</p>	<p>The FX-LOC(R) Local Operating Console along with the Mircom FleX-Net™ Network Fire Alarm system facilitates a Mass Notification System.</p> <p>The FX-LOC(R) provides critical emergency (as well as fire) information to be communicated within buildings.</p> <p>Refer to LT-6039 FX-LOC(R) Installation Instruction Manual for further details.</p>

2.10 Batteries

	Model	Description
	<p>BAT-12V18A</p> <p>BAT-12V26A</p> <p>BAT-12V33A</p> <p>BAT-12V42A</p> <p>BAT-12V55A</p> <p>BAT-12V75A</p>	<p>Batteries available from 18 to 75 AH</p> <p>FleX-Net™ charging range is 17 to 65 AH.</p>

2.11 FleX-Net™ Accessories

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

3.0 Mechanical Installation and Dimensions

Install the enclosure as shown for the BBX-1024DS installation information is in Figure 1. For the BBX-1072ADS see Figure 2. Figure 3 demonstrates the BB-5008 backbox installation.

Figure 1 .BX-1024DS Flush and Surface Enclosure Installation and Dimensions

BBX-1024DS BACKBOX AND DOOR

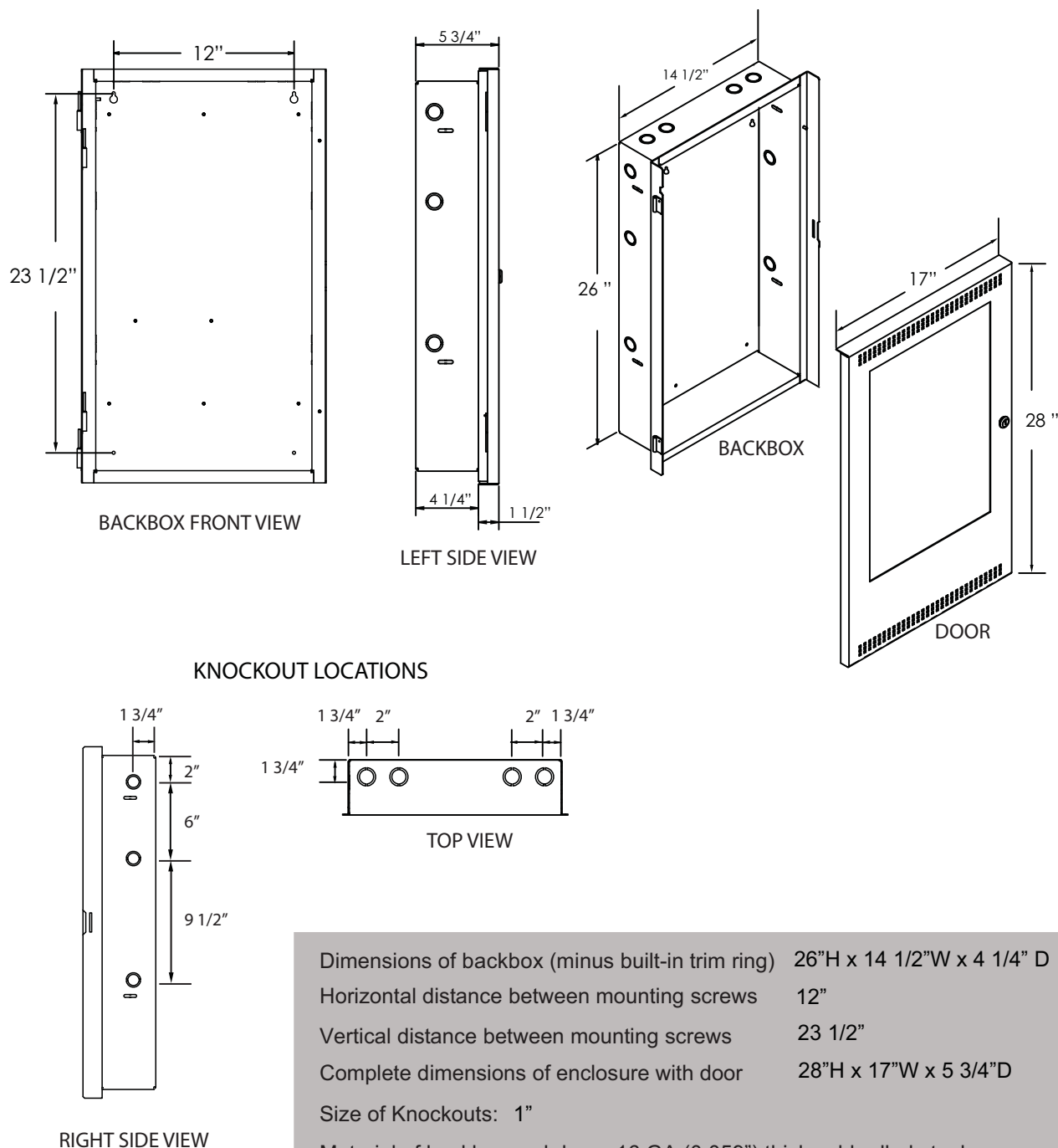


Figure 2 BBX-1072ADS Flush and Surface Installation and Dimensions

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

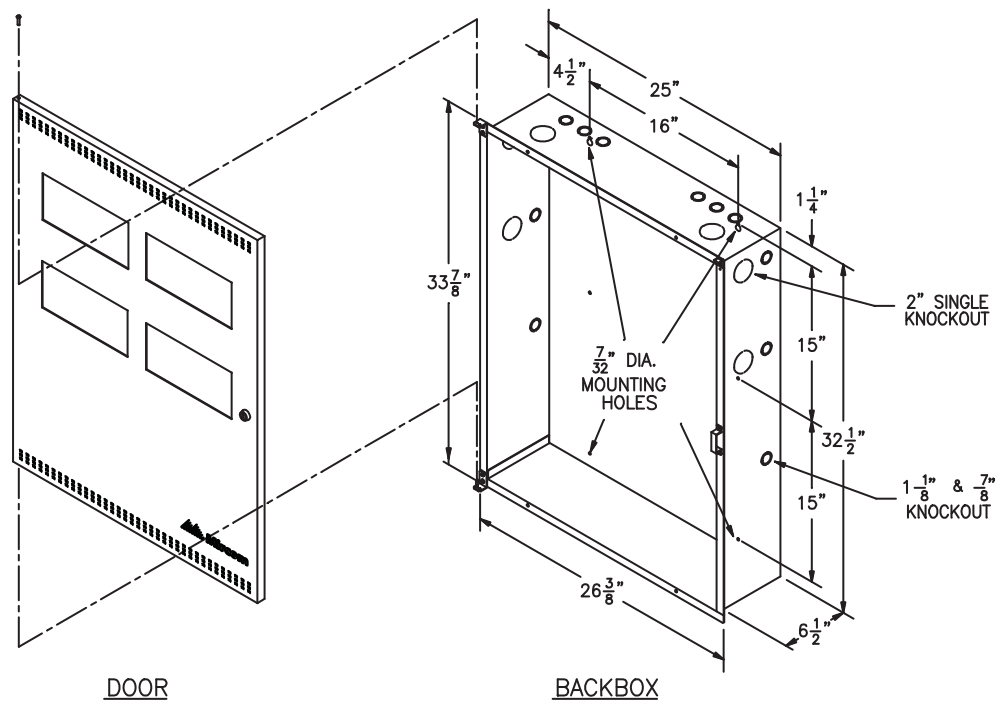
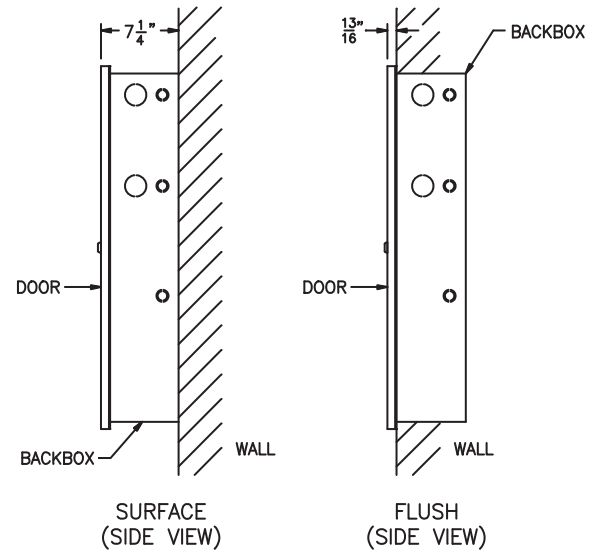
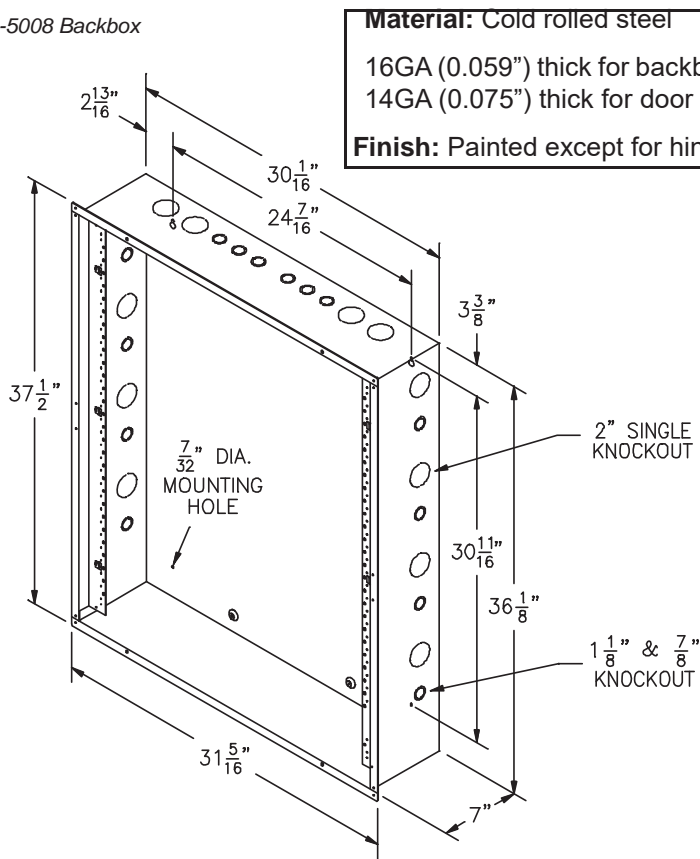
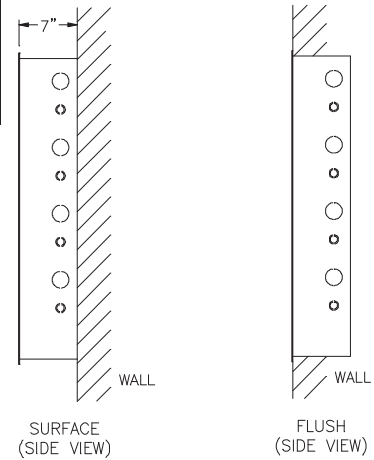


Figure 3 BB-5008 Enclosure Installation Instructions and Dimensions

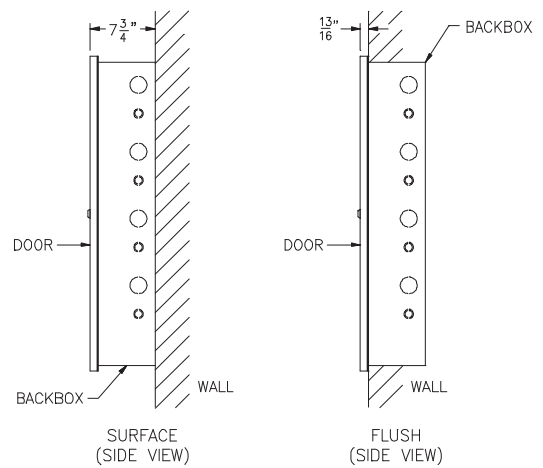
BB-5008 Backbox



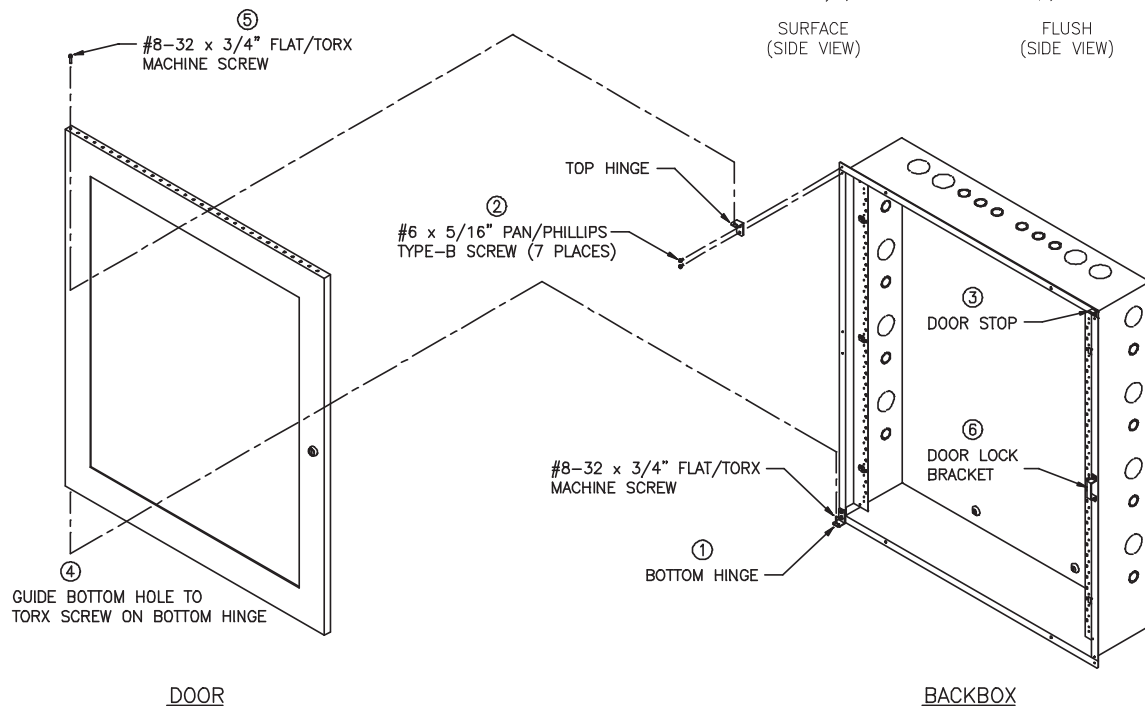
Backbox



Backbox with DOX-5008M Door



DOX-5008M Metal Door

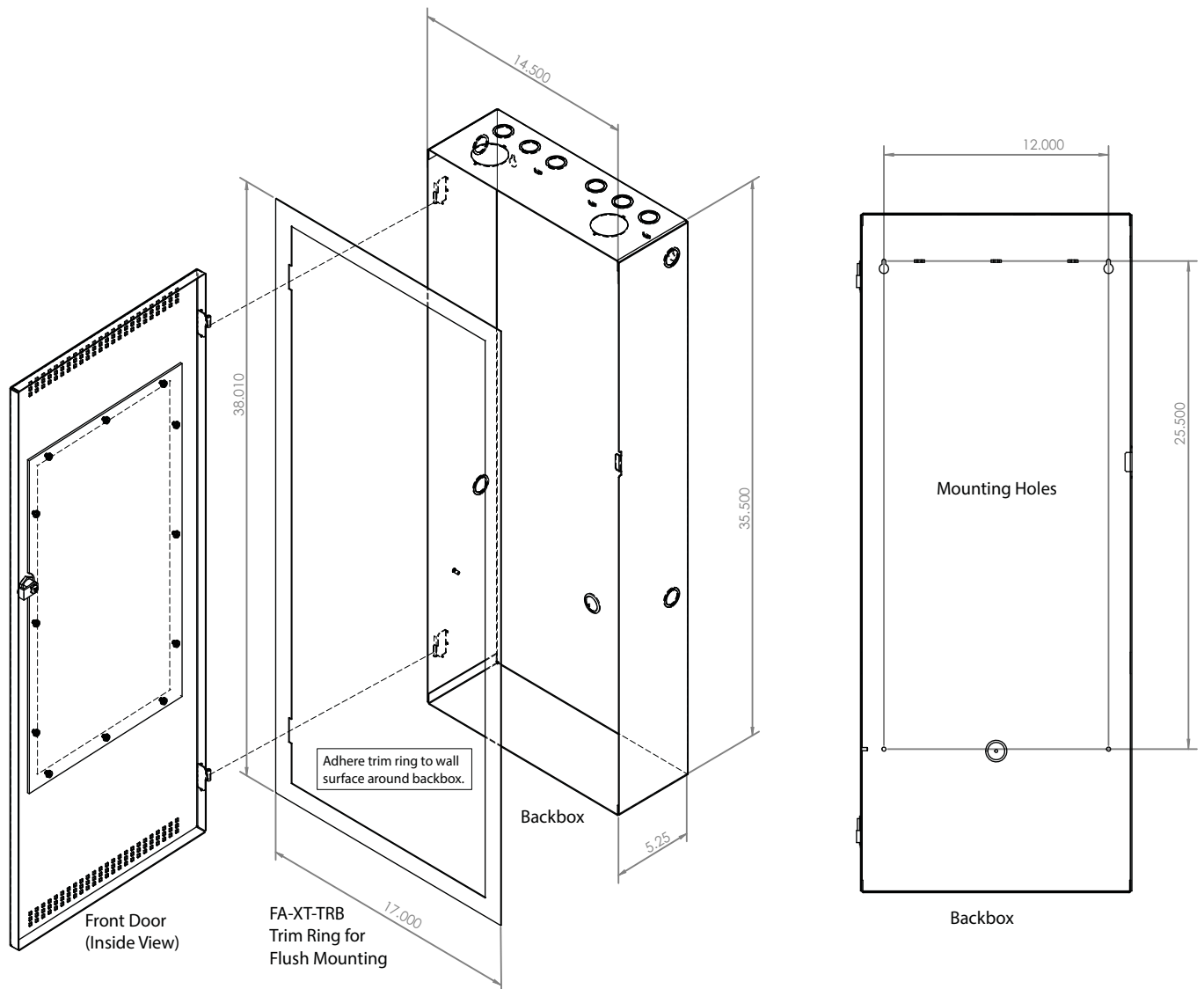


3.1 BBX-1024XT(R) Mechanical Installation

The model FX-4003-12NXT is an expanded version of the FX-4003-12N chassis. The FX-4003-12NXT mounts into the BBX-1024XT(white enclosure) and the BBX-1024XTR(red enclosure)

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

Figure 4 BBX-1024XT(R) Backbox Enclosure with Trim Ring



3.2 General 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.

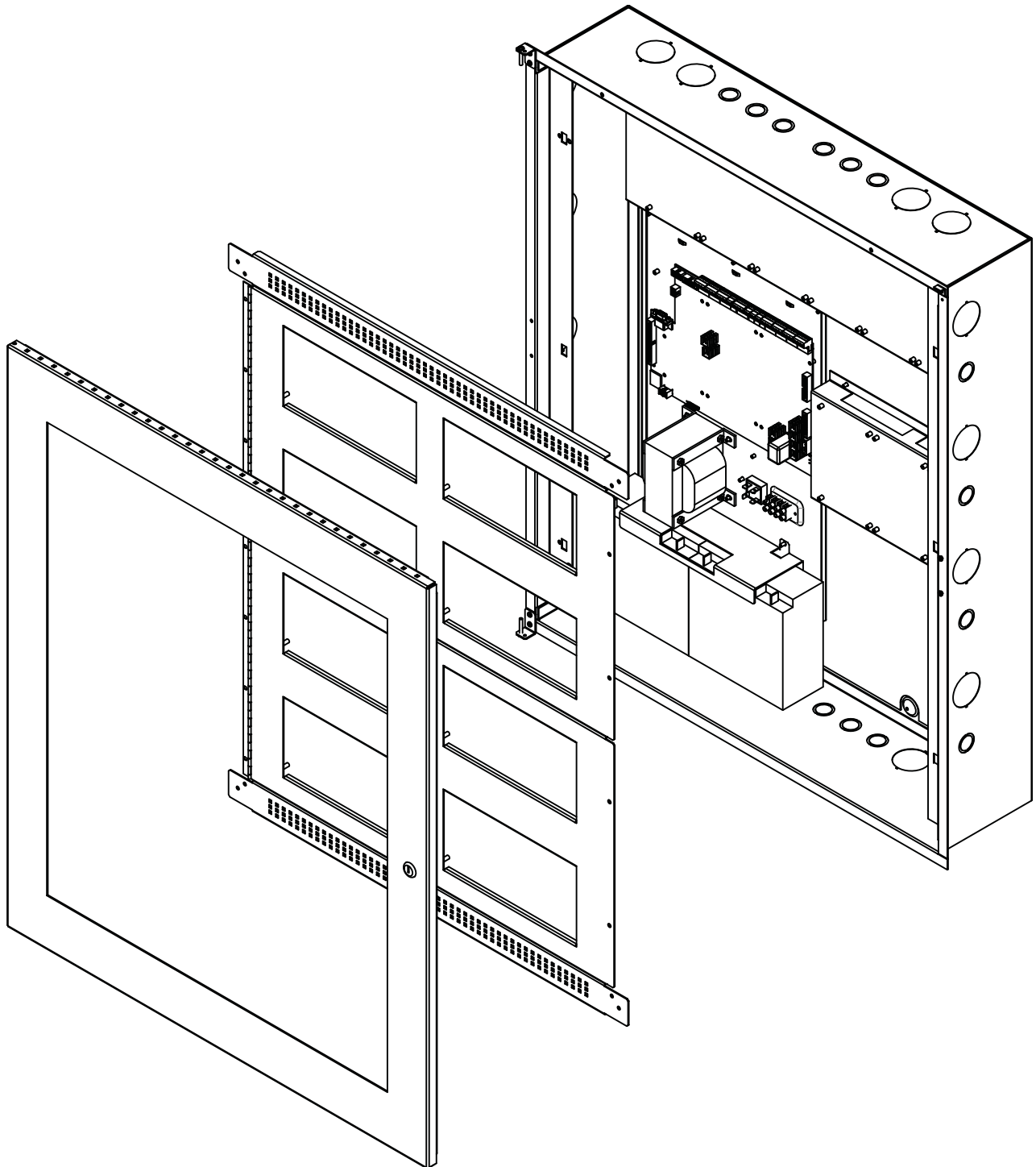
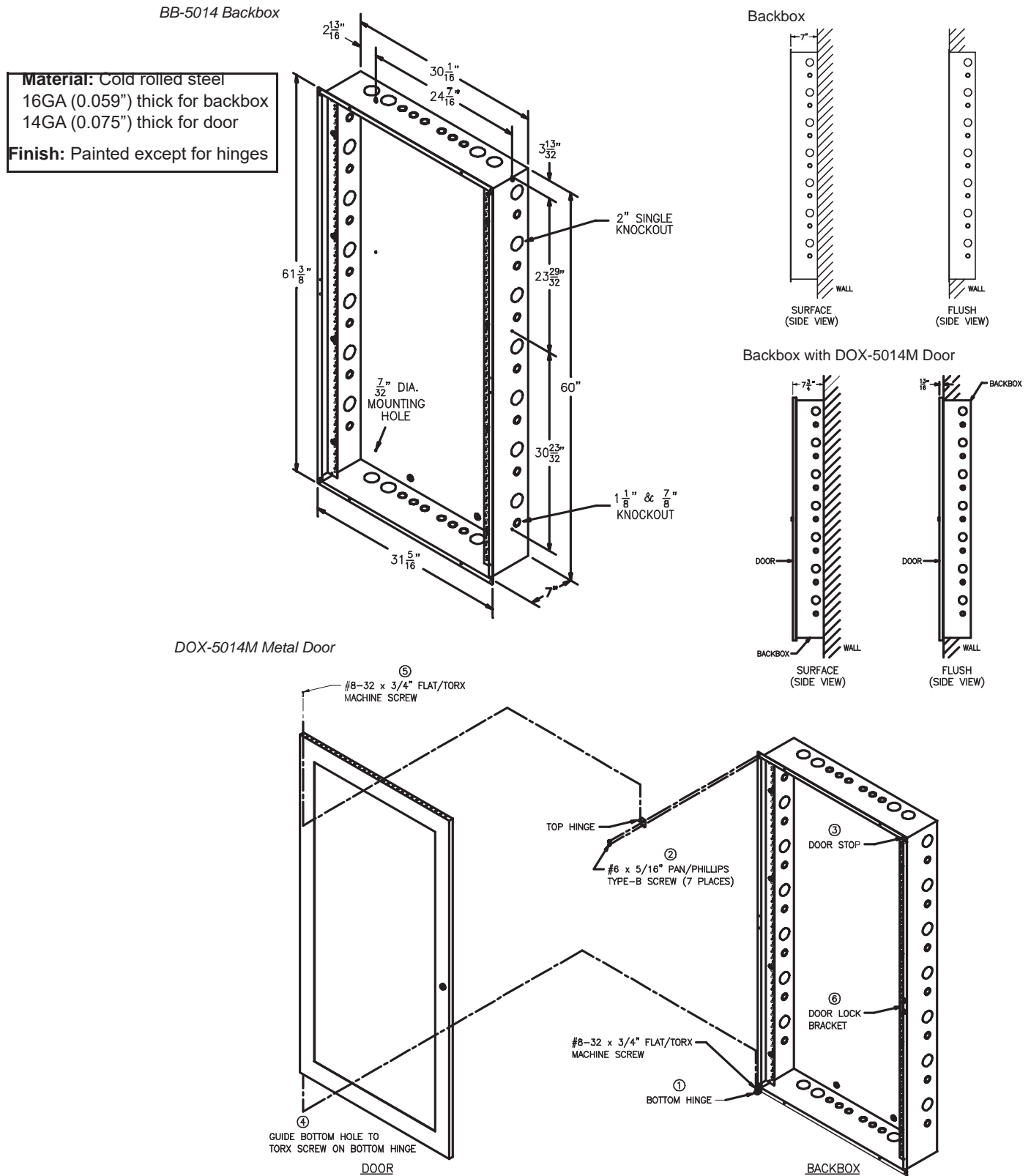


Figure 5 Installation Instructions and Dimensions for BB-5014



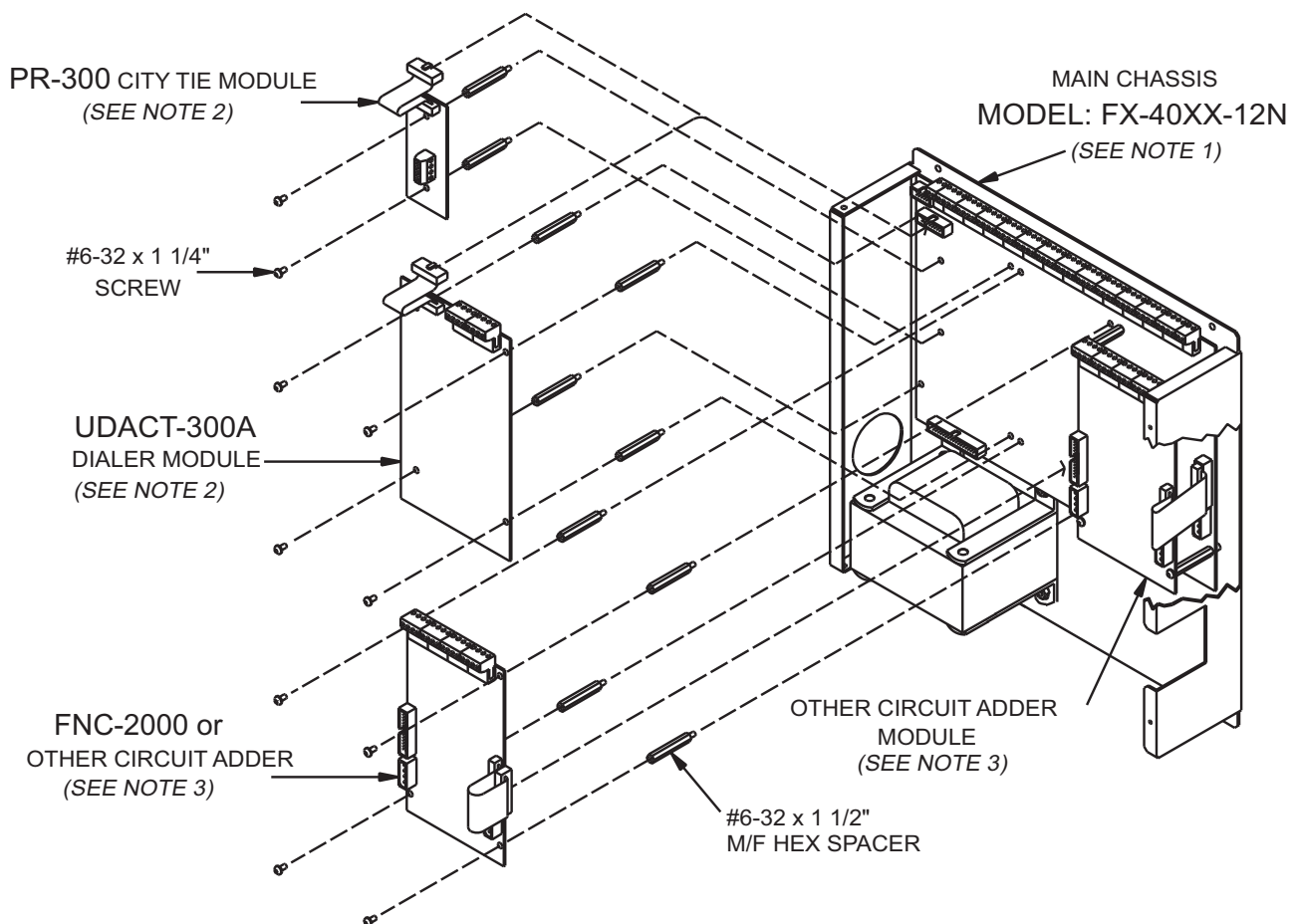
3.3 Module Mounting Locations

The FX-4003-12N or FX-4017-12N Main Chassis come pre-assembled with a main fire alarm board. Install the adder modules of different types as shown in the following diagrams.



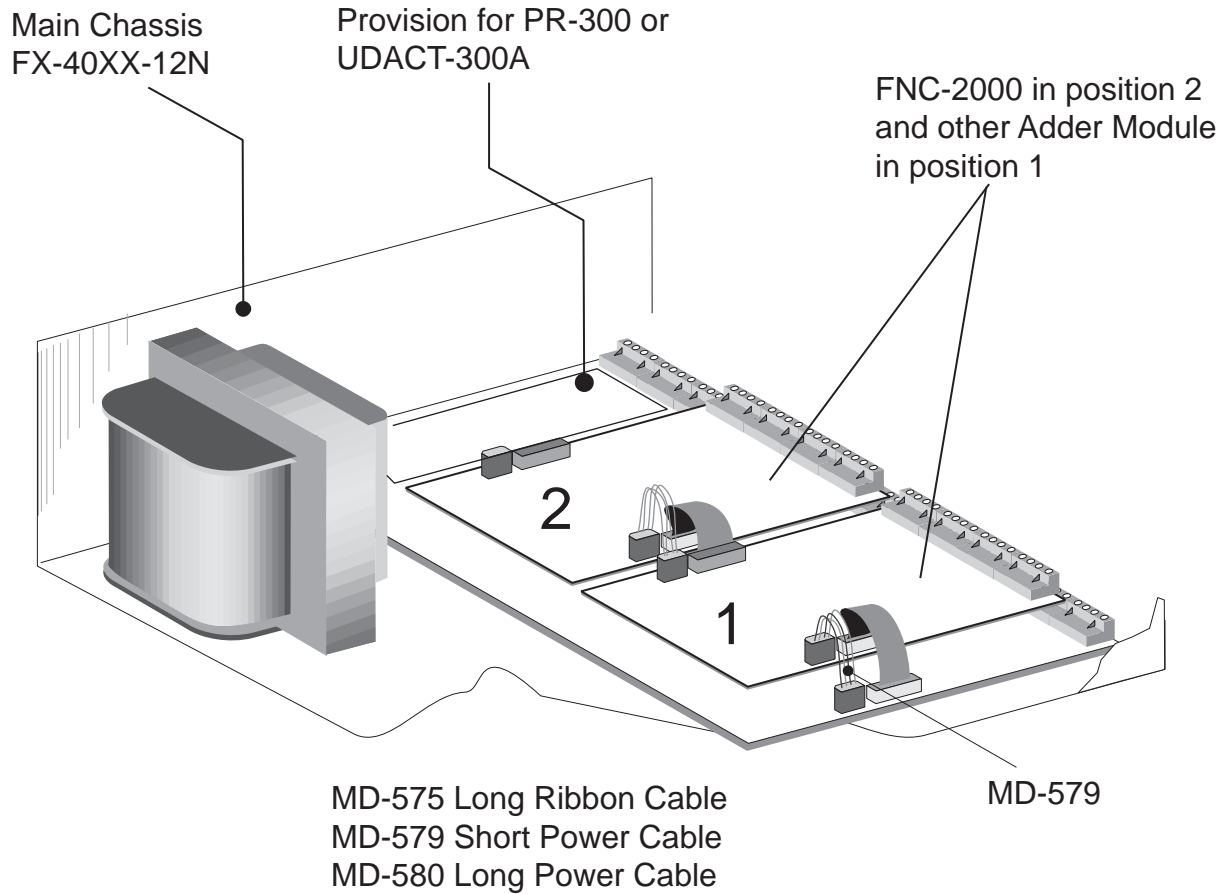
Notes: For many adder modules to enable communication from the main module to all of the adder modules, it is necessary to add a continuity jumper on the last adder module in a chain (see the appropriate module settings section to verify the location of the continuity jumper on a particular circuit adder 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 6 Module Mounting Locations View #1



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-960MISO and ALCN-960D Quad Loop Adder Modules
 - ALCN-4792MISO and ALCN-792D Quad Loop Adder Modules

Figure 7 Module Mounting Locations View #2



3.4 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.

4.0 Display and Adder Modules Mounting Locations

4.1 FX-4003-12N Compact Main Chassis

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

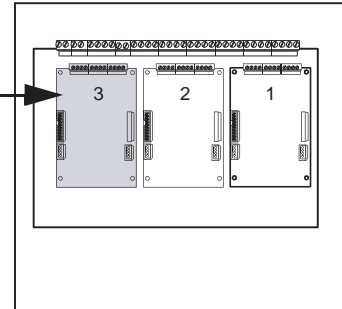
Interior View



Inside Backbox 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-UM board, if used, is mounted over the FNC-2000 board.



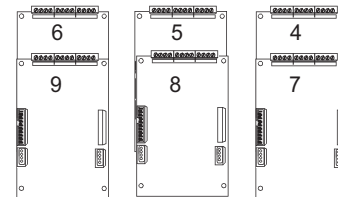
4.2 FX-4003-12NXT Mid-size Main Chassis

Mount into the BBX-1024XT enclosure, and supports two display modules and

Interior View

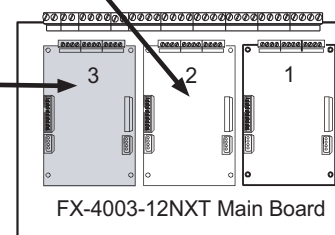


Inside Backbox View



Slot is reserved for FNC-2000. If not required, this slot can be used to mount any of the adder modules.

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



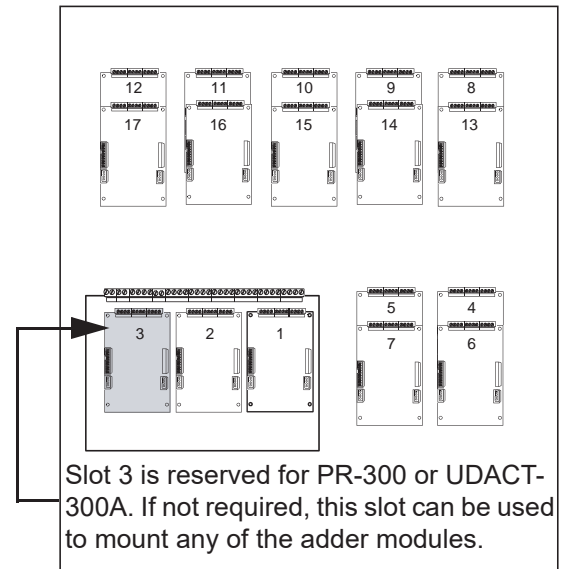
4.3 FX-4017-12N Mid-size Main Chassis

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

Interior View



Inside Backbox View



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

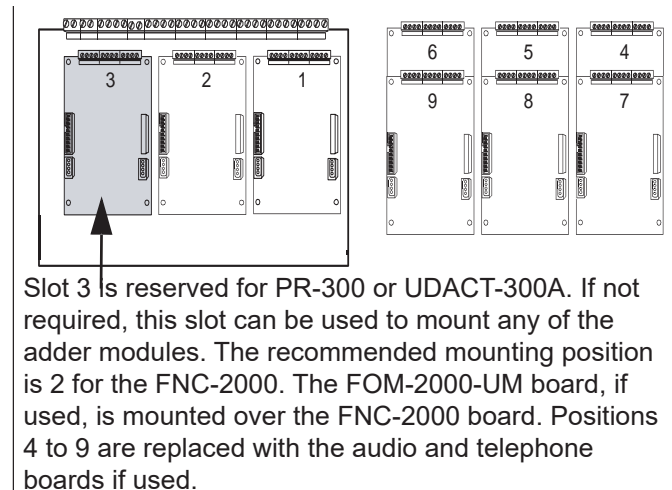
4.4 FX-4009-12N Large Main Chassis

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.

Interior View



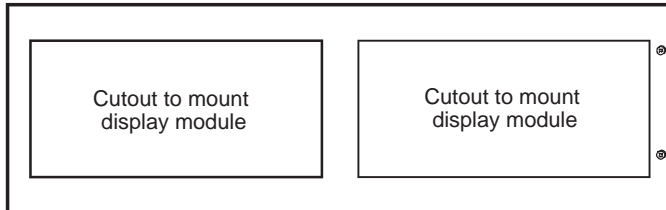
Inside Backbox View



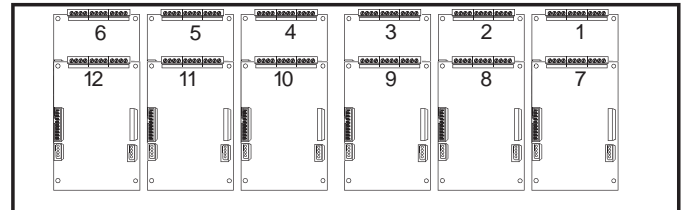
4.5 ECX-0012 Expander Chassis for FX-4009-12N

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

Interior View



Inside Backbox View



4.6 Network Controller Modules

The FNC-2000 Fire Network Controller module is mounted in position 2 over the FX-4000N main board. The TNC-5000 Telephone Network Controller module is mounted over the ANC-4000 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.



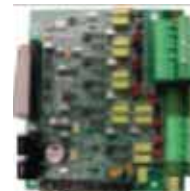
FNC-2000

Fire Network Controller Module



ANC-4000

Audio Network Controller Module



TNC-5000

Telephone Network Controller Module



FOM-2000-UM

Fiber Optics Module

Mounts over the FNC-2000 Fire Network Controller Module

4.6.1 Adder Modules

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

- FX-4003-12N Compact Main Chassis
- FX-4003-12NXT Mid-size Main Chassis
- FX-4017-12N Mid-size Main Chassis
- FX-4009-12N Large Main Chassis and ECX-0012 Expander Chassis for FX-4009-12N



ALCN-960MISO or ALCN-4792MISO

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-960D or ALCN-792D

Daughter Board Analog 2 Loop Adder Module. Mounts over ALCN-960MISO

or ALCN-4792MISO



UDACT-300A

Digital Alarm Communicator Module



PR-300

Polarity Reversal/ City Tie Module

4.6.2 Display Modules

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

- FX-4003-12N Compact Main Chassis
- FX-4003-12NXT Mid-size Main Chassis
- FX-4017-12N Mid-size Main Chassis
- FX-4009-12N Large Main Chassis
- ECX-0012 Expander Chassis for FX-4009-12N

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-4000LCD as a driver) "Frame" is a measure of display capacity, used in the programming of the system.

DSPL-420DS
Narrow Display Control(3 Frames)



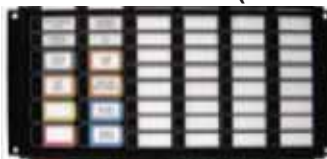
DSPL-2440
Graphic Display Control(3 Frames)



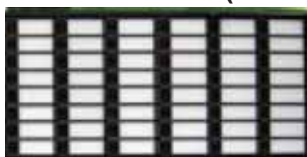
FDX-008W(KI)
Fan Damper Module (1 Frame)



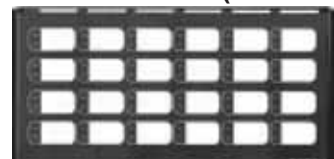
RAM-1032TZDS
Programmable Zone LED
Annunciator Module (3 Frames)



RAX-1048TZDS
Programmable Zone/Trouble LED
Annunciator Module (3 Frames)



IPS-2424DS
Programmable Input
Switches Module (2 Frames)



IPS-4848DS
Programmable Input
Switches Module (2 Frames)



5.0 Module Settings

5.1 Main Fire Alarm Module (MD-871A “N” Version Main Chassis)

This main board has one addressable loop and network capability.

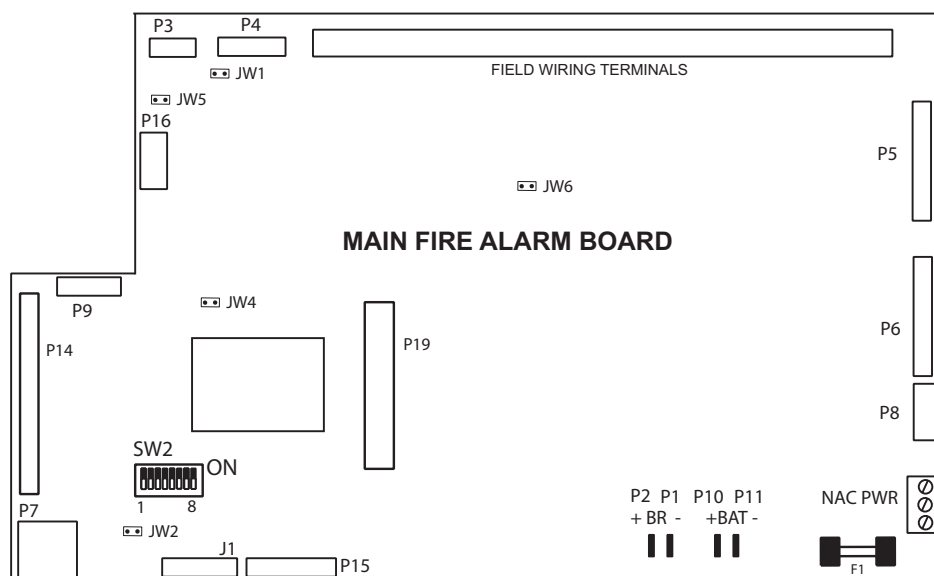
JW1	Jumper is removed if a PR-300 or UDACT-300A is installed.
JW2,JW4	Jumpers are Factory Set and should not be changed.
JW5	Normally un-installed, add jumper to silence on-board buzzer.
JW6	Normally installed, remove jumper to enable external power supply supervision.
P1,2	Factory connection to Bridge Rectifier.
P3	Black RS-485 Connector connects to the Adder Loop ALCN-4792MISO if used (Address Loops 3 and 4) or ALCN-960MISO (Address Loop 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, J1	Connectors for Factory Use.
P16	High speed RS-485 audio link to ANC-4000 Audio Network Controller Module. When connected provides ARCnet or Fiber 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 8 Main Fire Alarm Module (MD-871A “N” Version Main Chassis)



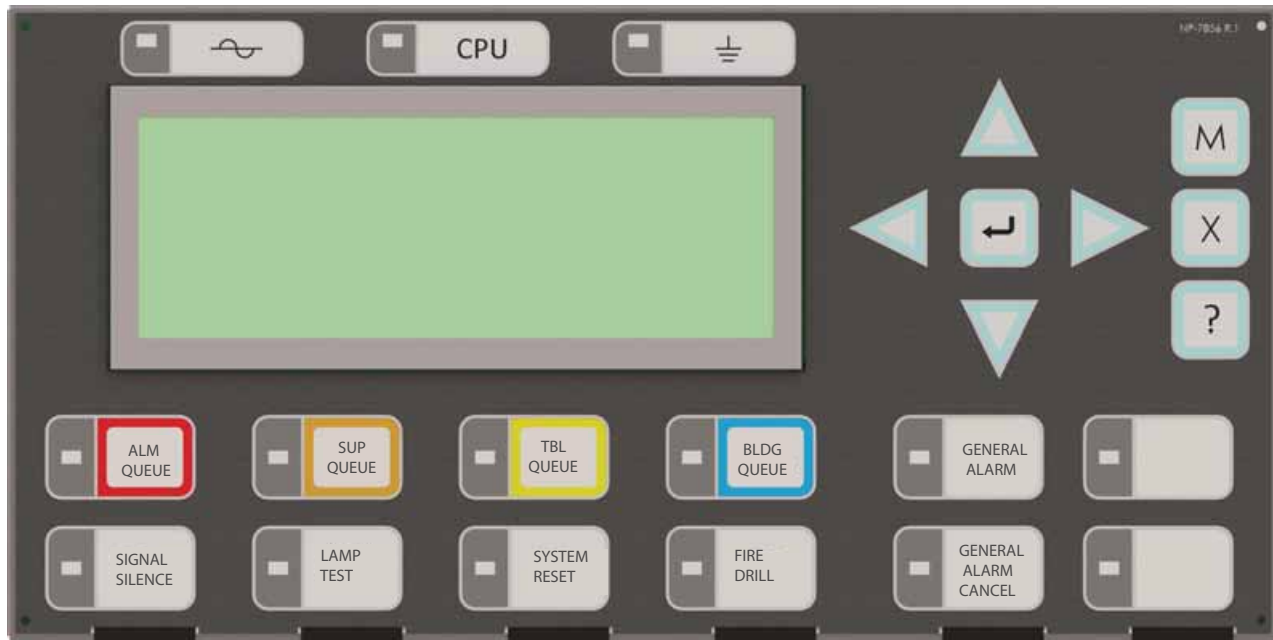
SW2 DIP Switch Node Address Setting on Main Fire Alarm Module

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

5.2 DSPL-420DS Main Display Module

The DSPL-420DS mounts into backboxes BBX-1072ARDS, BB-5008(R), BB-5014(R) and BBX-FXMNS.

Figure 9 DSPL-420DS Main Display Module



P1: Cable connects to P14 of the FX-4000N main fire alarm board (Figure 8).

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

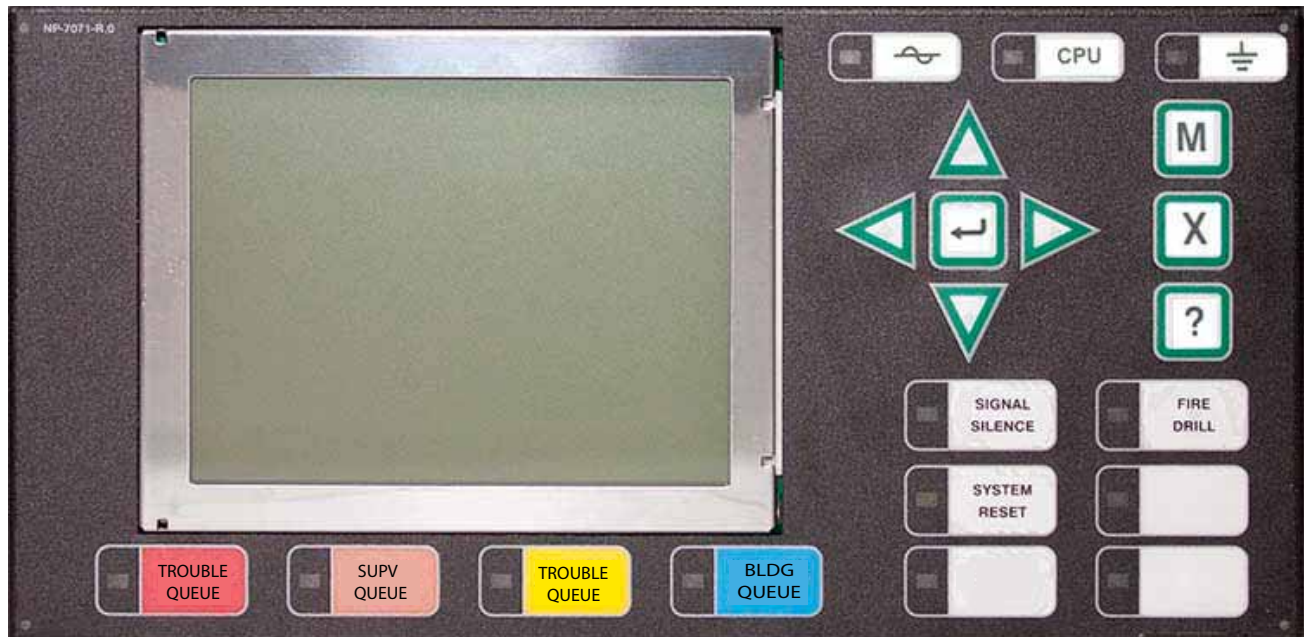


Note: The main display module comes with slide-in paper labels including both English and French slide-ins, and laser printer-compatible blanks for zone labelling.

5.3 DSPL-2440 Graphical Main Display Module

The DSPL-2440 is a separate item. It can be mounted into backboxes BBX-1072ARDS, BB-5008(R), BB-5014(R) and BBX-FXMNS.

Figure 10 DSPL-2440 Graphical Main Display Module



P1: Cable connects to P14 of the FX-4000N main fire alarm board (Figure 8).

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.

5.4 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-UM Fiber Optics Module.

Figure 11 FNC-2000 Fire Network Controller Module

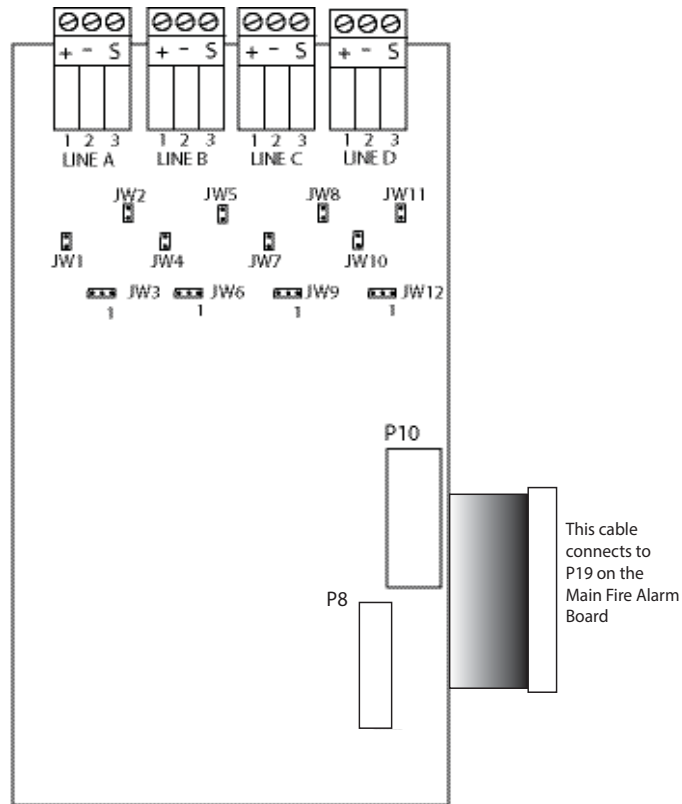


Table 1 FNC-2000 Module List of Connectors and Jumpers and Functions

CONNECTOR OR JUMPERS	Function
P8	P8 is for Factory Use Only.
P10	P10 connects to P1 of the FOM-2000-UM 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.



Note: Network connection is through twisted cable from Line A, B, C and D. Refer to Figure 36 for specific wiring and cable information.

5.5 FOM-2000-UM Multi Mode Fiber Optic Network Module

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

Figure 12 FOM-2000-UM Multi Mode Fiber Optic Network Module

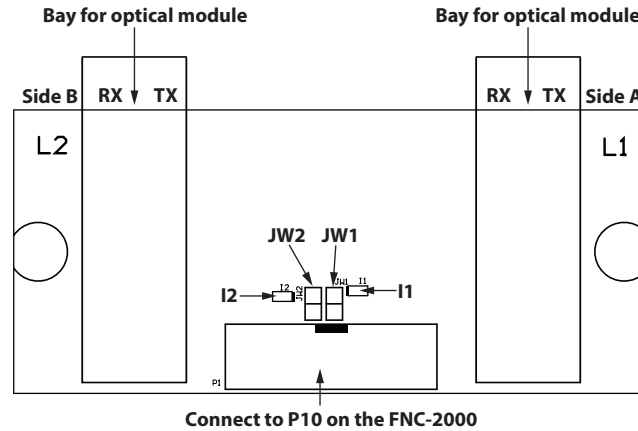


Table 2 FOM-2000-UM Fiber Optic Network Module Cable/Jumper Connection

Connector and Jumpers	Function
P1	P1 cable attaches to P10 of the FNC-2000 Fire Network Controller Module.
JW1 on FOM-2000-UM	Remove jumper JW1 if there is no optical module installed in L1 bay. Connect jumper (closed) when installing an optical module in L1 bay.
JW2 on FOM-2000-UM	Remove jumper JW2 if there is no optical module installed in L2 bay. Connect jumper (closed) when installing an optical module in L2 bay.

5.6 RAX-1048TZDS Zone Display Module

Figure 13 Zone Display Module (RAX-1048TZDS)

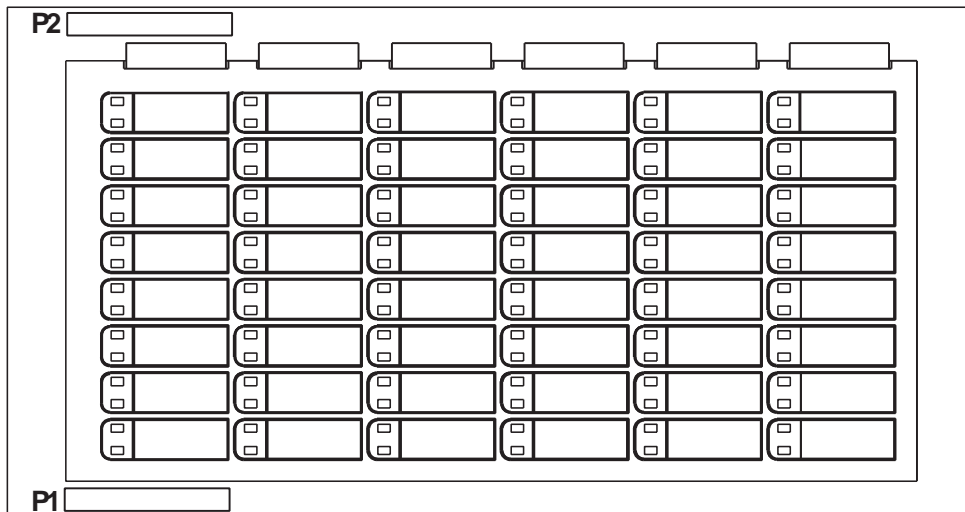


Table 3 RAX-1048TZDS Zone Display Module Cable Function

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



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

5.7 IPS-4848DS Programmable Input Switches Module

The IPS-4848DS Programmable Input Switches Module provides 48 programmable switches, 48 bi-coloured (red/amber) LEDs for fire alarm zone annunciation and 48 amber trouble LEDs.

Figure 14 IPS-4848DS Programmable Input Switches Module

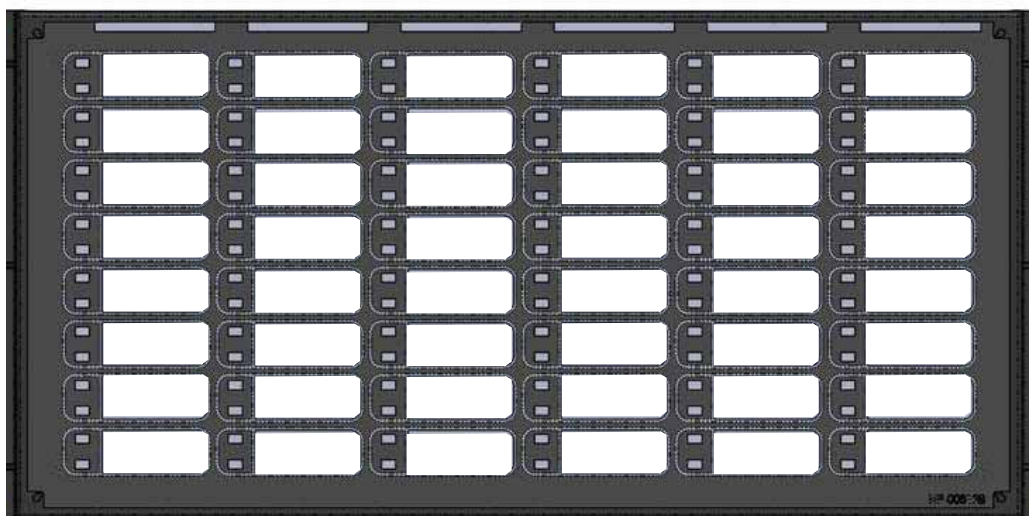


Figure 15 IPS-4848DS Cable Connection on the back side of board

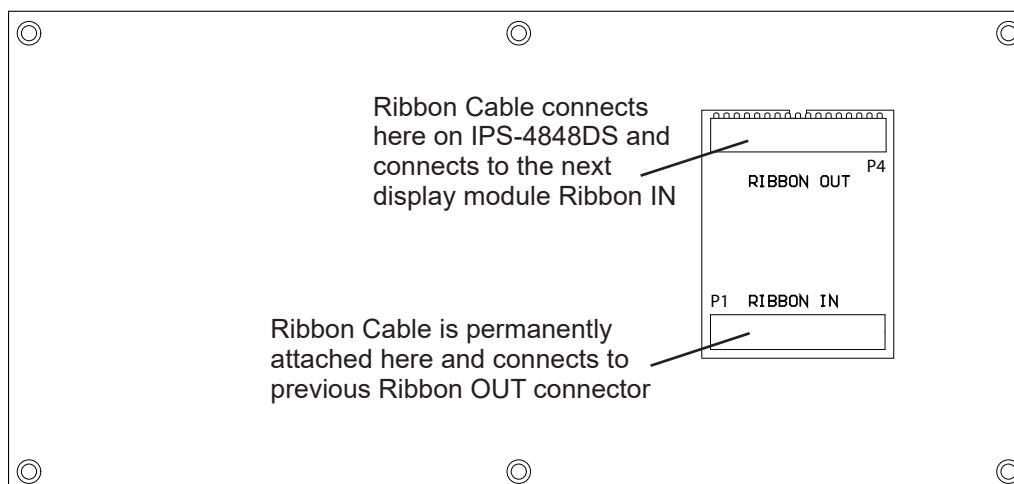


Table 4 IPS-4848DS Programmable Input Switches Module Cable Function

Connector	Function
P1	P1 Permanently connected cable connects to P2 or P4 of previous display module.
P4	P4 Cable connects to P1 of next display module



Note: The IPS-4848DS module comes with laser printer-compatible slide-in paper labels for zone labelling.

5.8 IPS-2424DS Programmable Input Switches Module

The IPS-2424DS Programmable Input Switches Module provides 24 programmable switches, 24 bi-coloured (red/amber) LEDs for fire alarm zone annunciation and 24 amber trouble LEDs

Figure 16 IPS-2424DS Programmable Input Switches Module

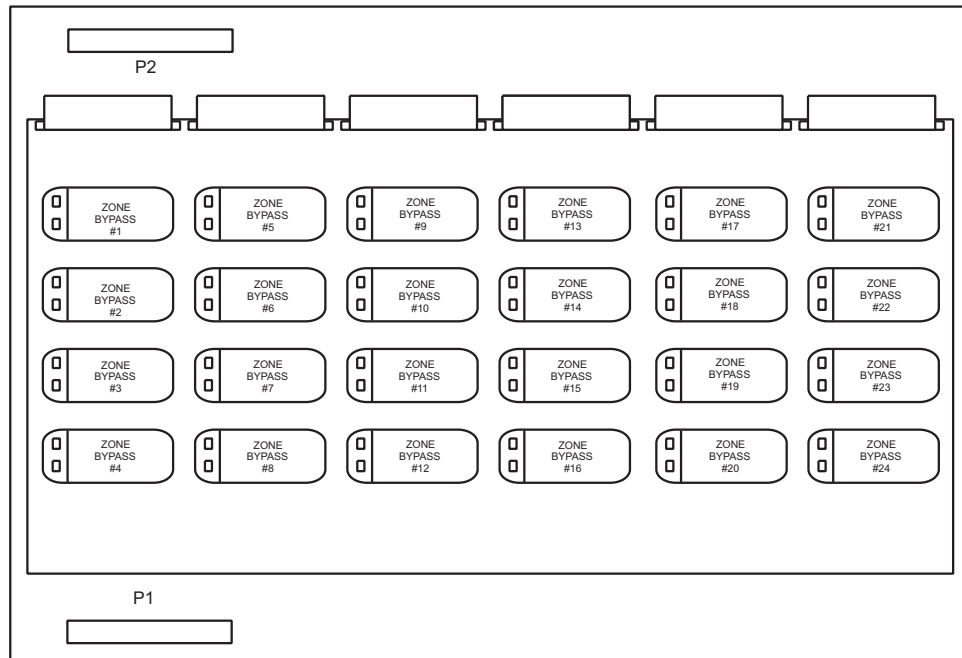


Table 5 IPS-2424DS Programmable Input Switches Module Cable Function

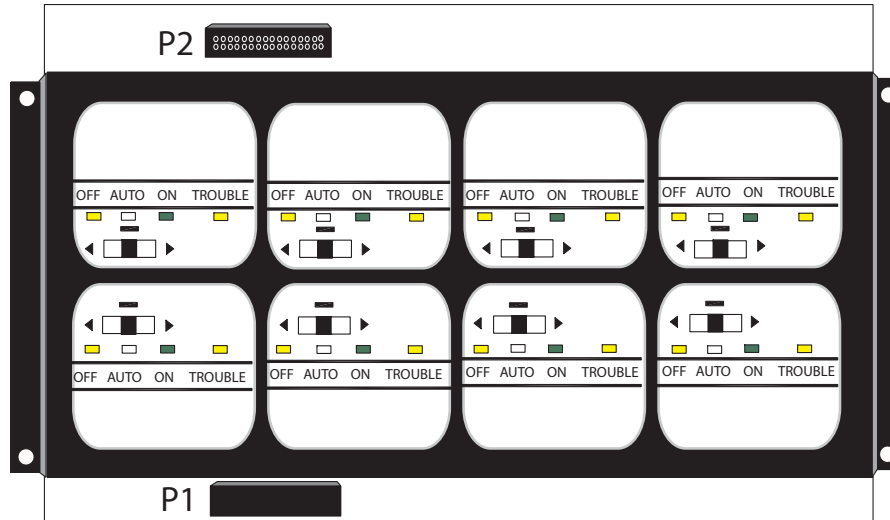
Connector	Function
P1	P1 Cable connects to P2 of previous display module.
P2	P2 Cable connects to P1 of next display module



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

5.9 Fan Damper Control Display Module (FDX-008W(KI))

There are two models of the Fan Damper Control Display modules available. The FDX-008W provides switch control and LED indication of 8 fan damper zones. The FDX-008WKI 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-008WKI. Both the FDX-008W and the FDX-008WKI are used in conjunction with an FX-4000N Fire Alarm Control Panel.



5.9.1 Fan Damper Operation

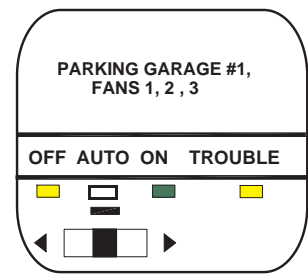
The FDX-008W Fan Damper Control Display module has eight configurable output circuits, each with a three position switch. The FDX-008WKI operates in the same manner as the FDX-008W except zone 8 is controlled by a remote keyswitch. Each switch has an ON and OFF position, plus an AUTO position. If the switch is placed in the AUTO position, the white AUTO LED will illuminate steady and 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-008W or FDX-008WKI Fan Damper Control Display module is to operate exhaust fans and confirm fan operation (via monitor modules). See FDX-008W 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 (white AUTO LED on steady). 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.



AUTO LED shows steady for switch in AUTO position.

ON LED shows steady for all outputs operating and confirmed.

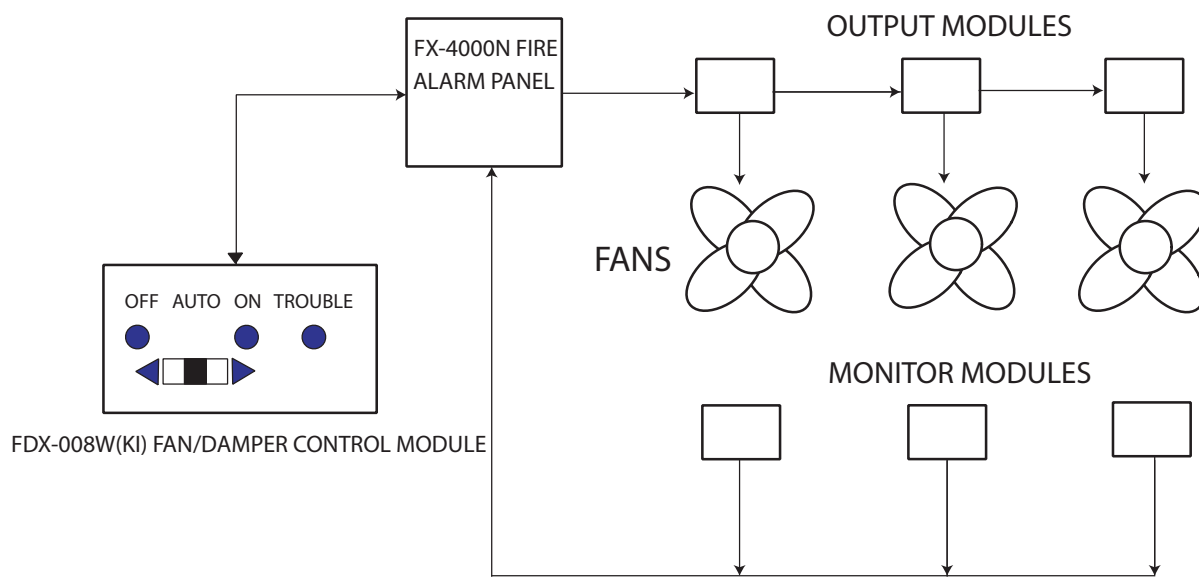
OFF LED shows steady for all outputs NOT operating and confirmed.

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



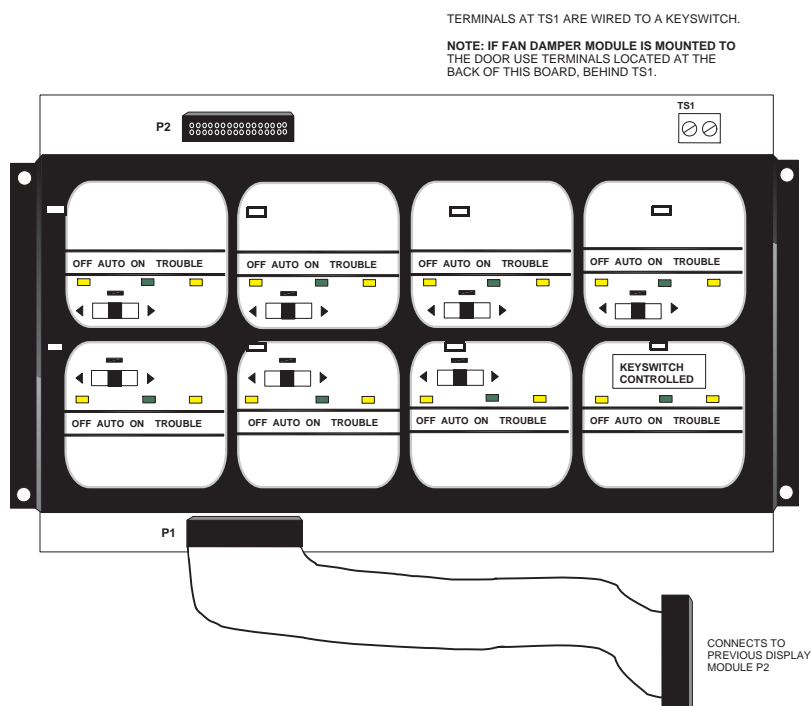
Note: A bypass function always has priority, so that if a circuit is bypassed by moving the switch manually or by loop bypass (FX-4000N Fire Alarm Panel), no other action will operate this switch other than again moving the switch manually or by un-bypassing the loop.

Figure 17 FDX-008W(KI) Block Diagram of Fan and Monitor Set-up



Before mounting the FDX-008WKI module, if a keyswitch is to be connected, wire the keyswitch to terminals at TS1 as shown in Figure below. Mount the FDX-008W and FDX-008WKI Fan Damper Control Display modules in any position on the front part of the FX-4000N chassis and backbox.

Figure 18 FDX-008WKI Fan Damper Control Display Module



i

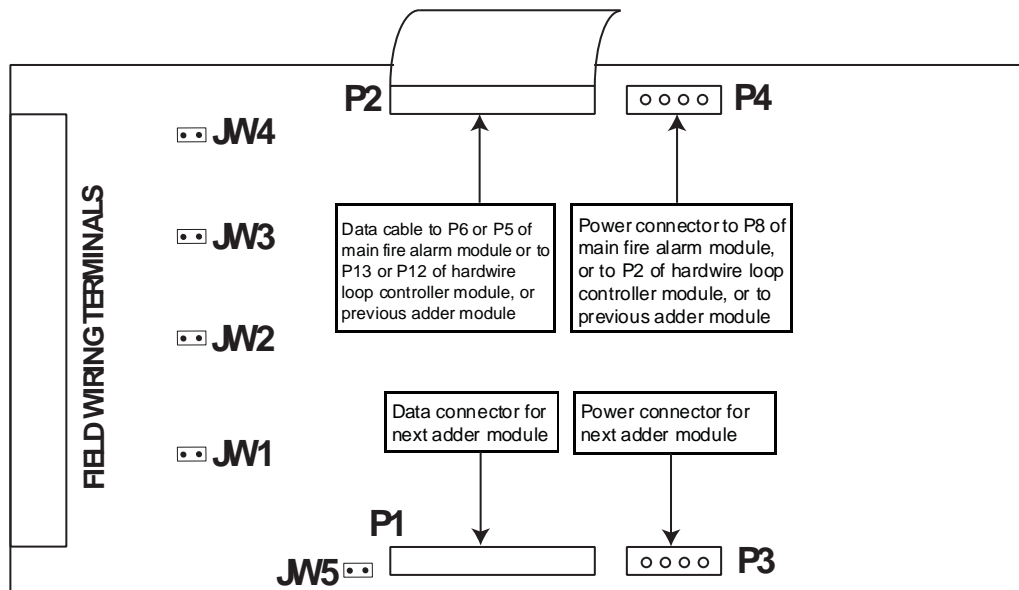
Note: There are also terminals located behind TS1 on the other side of the board for the convenience of wiring the keyswitch. The last fan damper zone in the bottom right position of the FDX-008WKI is controlled by the keyswitch.

5.9.2 UUKL with FDX-008W and FDX-008WKI

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

5.10 Hardwire Detection Adder Module (DM-1008A)

Figure 19 Hardwire Detection Adder Module (DM-1008A)



JW1: Install jumper for Class A operation of initiating circuits 1 and 2.

JW2: Install jumper for Class A operation of initiating circuits 3 and 4.

JW3: Install jumper for Class A operation of initiating circuits 5 and 6.

JW4: Install jumper for Class A operation of initiating circuits 7 and 8.

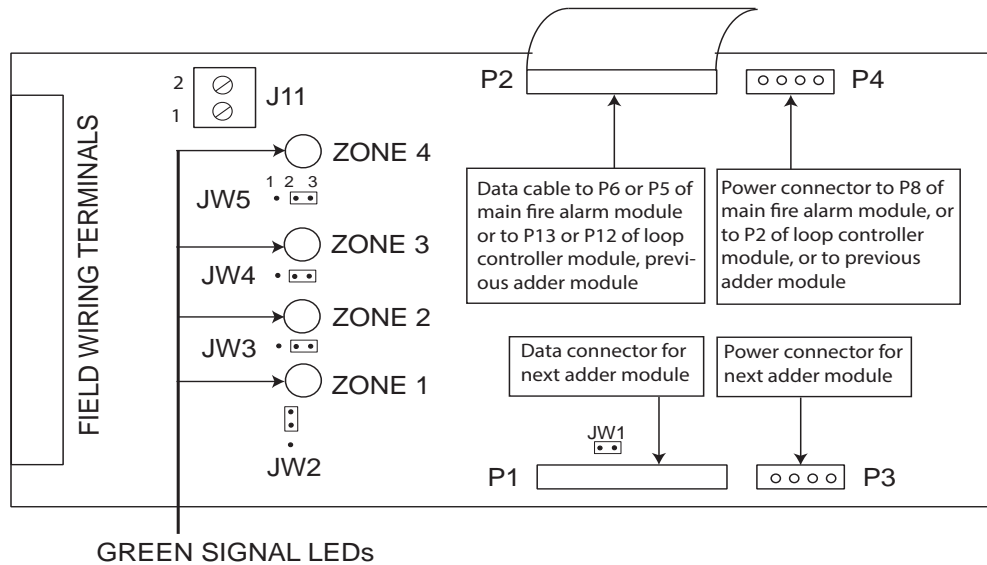
JW5: Remove continuity jumper if there are any more adder modules installed.



Note: For Class A operation the FX-4000N must be configured as Class A via the configuration program.

5.11 Hardwire Signal Adder Module (SGM-1008A)

Figure 20 Hardwire Signal Adder Module (SGM-1004A)



5.11.1 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.

5.11.2 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.

5.11.3 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 isolator 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.

5.11.4 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.

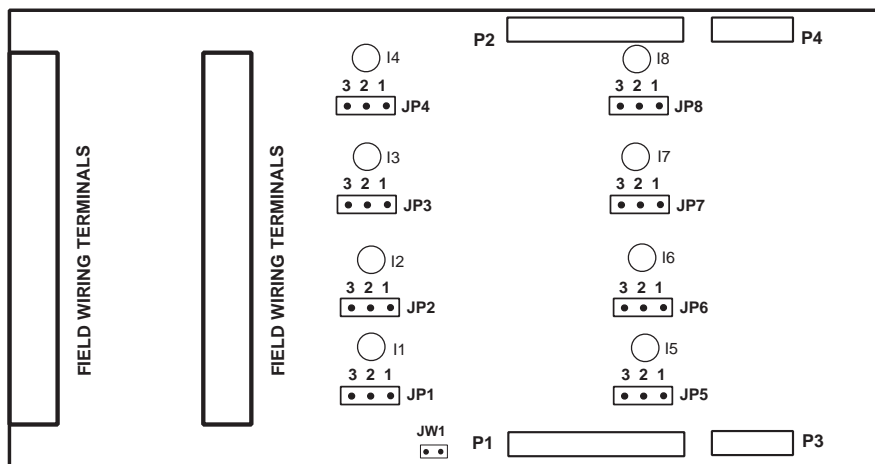


ATTENTION: Discard jumpers on zones that are not configured for isolators.

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

5.12 Hardwire Relay Adder Module (RM-1008A)

Figure 21 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.

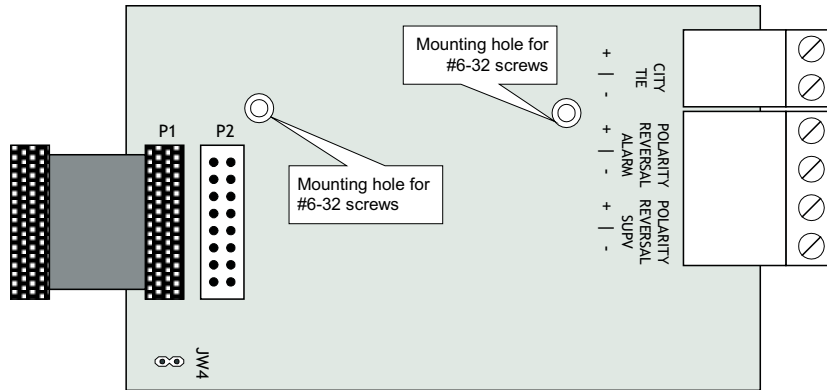
P3: Power connector for next adder module.

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.

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

Figure 22 Polarity reversal and city tie module



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

Table 6 PR-300 Connectors and Jumper Settings

P1	Cable connects to P4 on the FX-4000N 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.



Note: Jumper JW4 on the FX-4000N main fire alarm board must be removed if a city tie module is installed.

5.14 UDACT-300A Digital Alarm Communicator Module

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-4000N Configurator Software) the UDACT-300A. Refer to Figure below for location of jumpers, cable connections, pushbutton and LEDs. Table 7 following, provides a description of the user items on the UDACT-300A.

Figure 23 UDACT-300A Board Layout

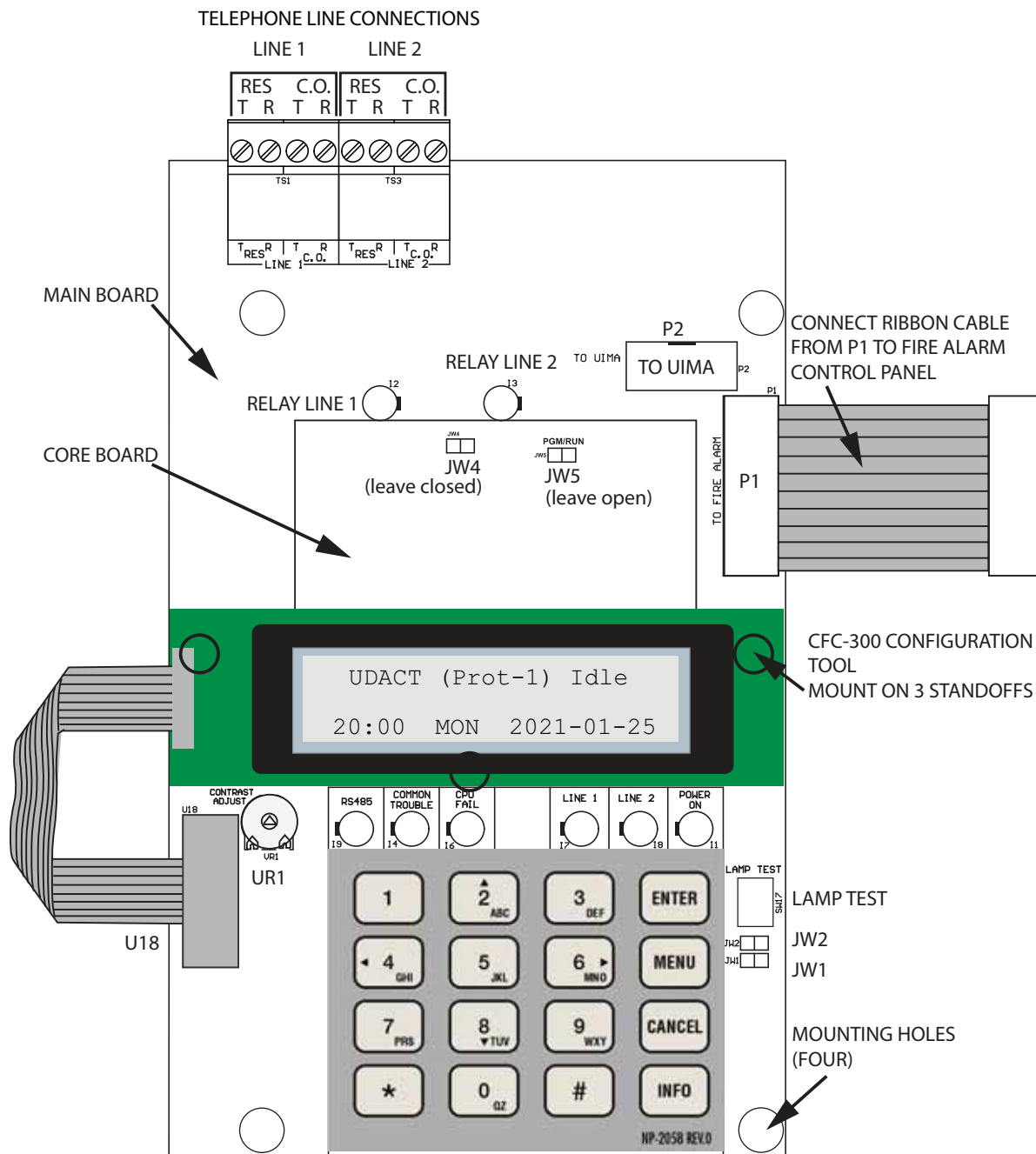


Table 7 UDACT-300A Cable Connectors and Miscellaneous

Cable Connector	Function
P1	Ribbon Cable for connecting to P4 of FX-4000N 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.

Table 8 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.

Table 9 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.
JW4	Leave closed. Jumper on.
JW5	Leave open. Jumper off.



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.

5.15 ALCN-960MISO Quad Loop Adder Module with ALCN-960D Daughter Board

The Quad Loop Adder module provides two SLC loops, plus an additional two SLC loops as part of the daughter board ALCN-960D which is mounted over the ALCN-960MISO. The Quad Loop Adder module may be mounted over the fire alarm board in 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 P4 on the ALCN-960MISO 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 P3 for ALCN-960MISO 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 Figure 33, Figure 34 and Figure 35.
Loop 2:	This is the addressable loop for all initiating devices. Wire the loop as shown in Figure 33, Figure 34 and Figure 35.
Shield:	If the loops are shielded, connect the shields to the terminals marked COM(-). To prevent the board reporting a ground fault, do not connect shields on SLC lines to earth ground. Note: Unshielded wiring is preferred.
Jumpers:	ALCN-960MISO •JW1: Factory use only. Leave open. •JW2: Factory use only. Leave closed.
JTAG Port:	This connection is for factory use only.
USB Port	This connection is for factory use only.

Figure 24 ALCN-960MISO Quad Loop Adder Module

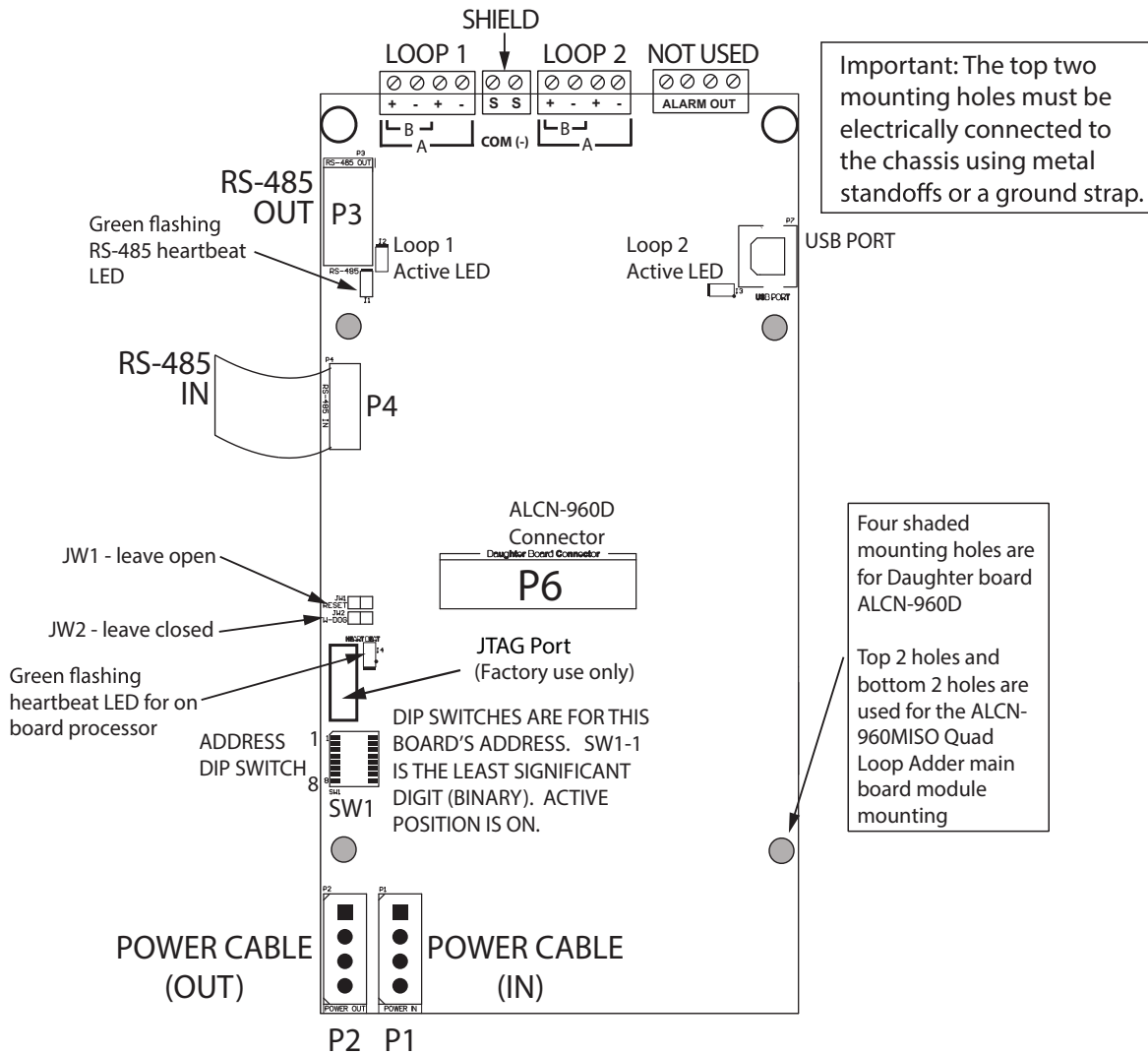
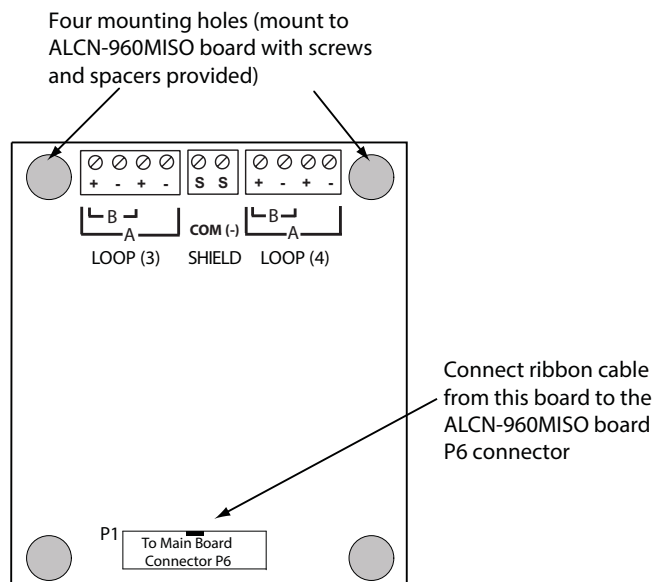


Figure 25 ALCN-960D Quad Loop Daughter board

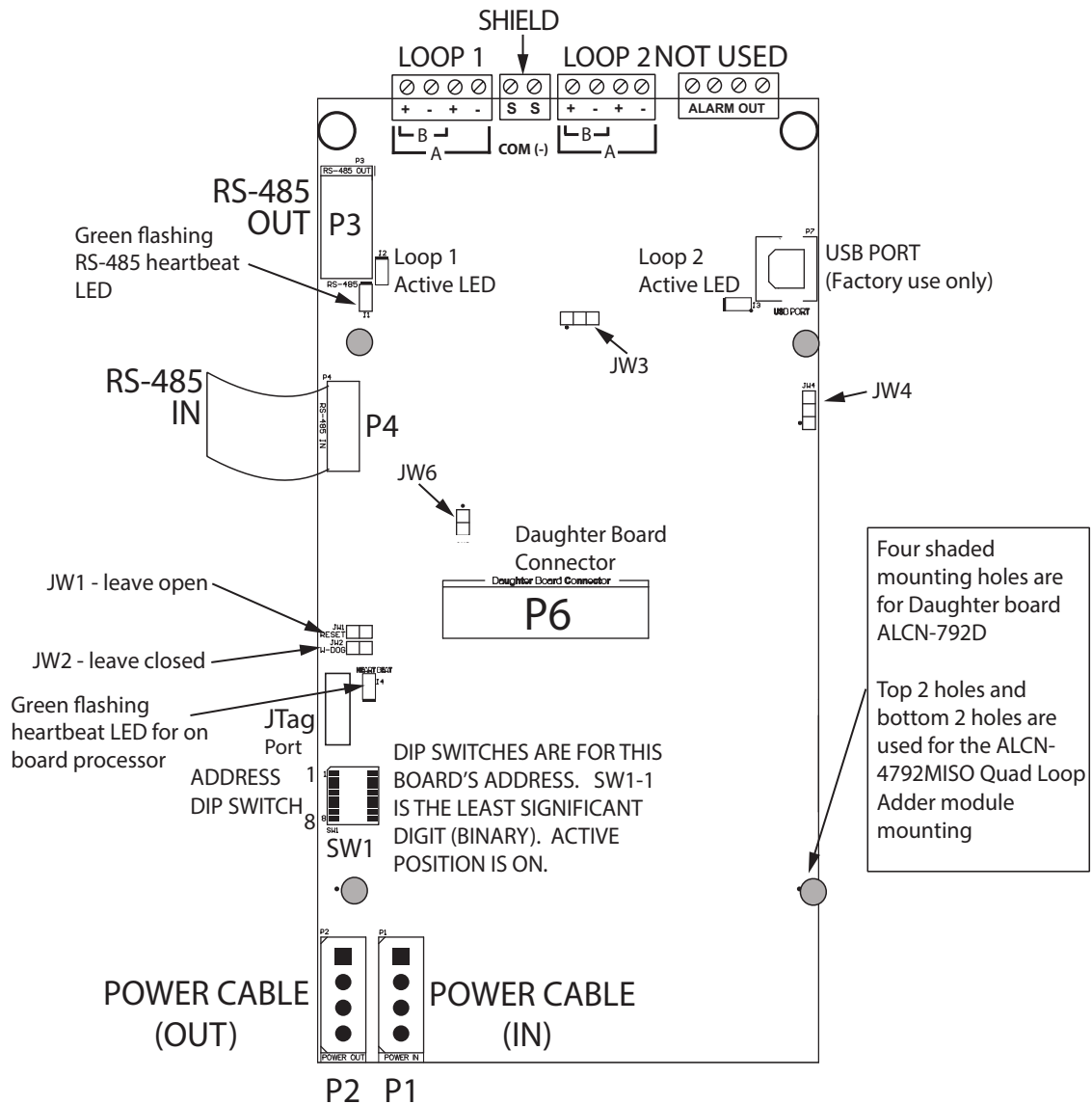


5.16 ALCN-4792MISO Quad Loop Adder Module with ALCN-792D Daughter Board

The Quad Loop Adder module provides two SLC loops plus an additional two SLC loops as part of the daughter board ALCN-792D which is mounted over the ALCN-4792MISO. The Quad Loop Adder module may be mounted over the main chassis of the fire alarm panel. 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 P4 on the ALCN-4792MISO 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 P3 for ALCN-4792MISO 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 Figure 33, Figure 34 and Figure 35.
Loop 2:	This is the addressable loop for all initiating devices. Wire the loop as shown in Figures Figure 33, Figure 34 and Figure 35.
Shield:	If the SLC loops are shielded, connect the shields to the terminals marked COM(-). To prevent the board reporting a ground fault, do not connect shields on SLC lines to earth ground. Note: Unshielded wiring is preferred.
Jumpers:	<p>ALCN-4792MISO:</p> <ul style="list-style-type: none"> •JW1: Factory use only. Leave open. •JW2: Factory use only. Leave closed. •JW3: 3 pin jumper. Normally set to 1-2, can be set to 2-3 to prevent noise from CLIP System Sensor sounder bases on Loop 1. Pin 1 is marked with a dot. •JW4: 3 pin jumper. Normally set to 1-2, can be set to 2-3 to prevent noise from CLIP System Sensor sounder bases on Loop 2. Pin 1 is marked with a dot. •JW6: Factory use only. Leave closed. <p>ALCN-792D:</p> <ul style="list-style-type: none"> •JW1: Three pin jumper. Normally set to 1-2, can be set to 2-3 to prevent noise from CLIP System Sensor sounder bases on Loop 4. Pin 1 is marked with a dot. •JW2: Three pin jumper. Normally set to 1-2, can be set to 2-3 to prevent noise from CLIP System Sensor sounder bases on Loop 3. Pin 1 is marked with a dot.
JTAG Port:	This connection is for factory use only.
USB Port	This connection is for factory use only.

Figure 26 ALCN-4792MISO Loop Adder Board



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Wiring the SLC Loops

There are two SLC loops present on this board that are wired in the same manner as shown in the wiring diagrams beginning with Figure 33. Although these drawings show only Loop 1; Loop 2 is wired in the same way as Loop 1 is.

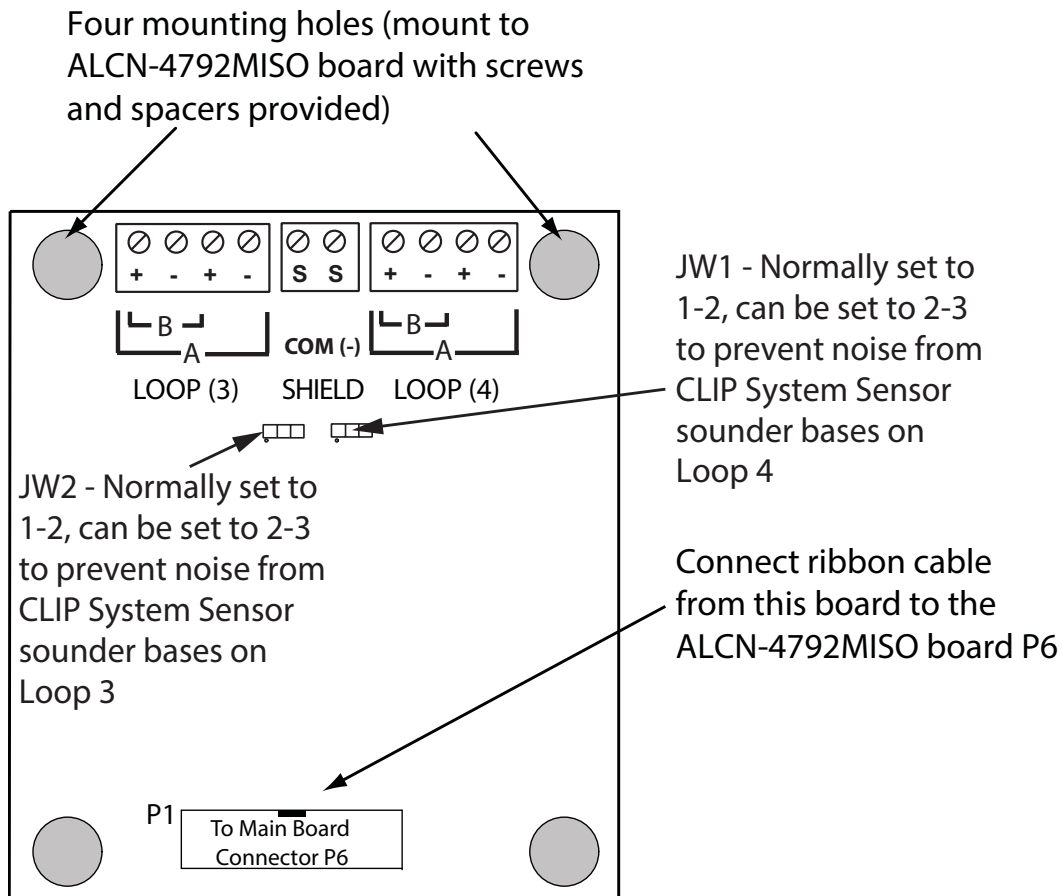
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Notes for ALCN-960MISO and ALCN-4792MISO:

- All circuits are power limited and must use type FPL, FPLR, or FPLP power limited cable.
- SLC Loop wiring: maximum loop resistance is 40 ohms total. These lines power-limited and fully supervised.

The ALCN-792D Daughter Board provides an additional two addressable loops when connected to the ALCN-4792MISO Quad Loop Adder Board. This daughter board is mounted over the ALCN-4792MISO. Wire the two addressable loops on the ALCN-792D Daughter Board in the same manner the ALCN-4792MISO addressable loops are wired.

Figure 27 ALCN-792D Daughter Board



Notes for ALCN-960D and 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.

6.0

Field Wiring

6.1 Main Fire Alarm Board Terminal Connections

Wire devices to terminals as shown in Figure 28 below. Refer to Appendix A for specifications and to LT-1023 for compatible devices.



Do not exceed power supply ratings: Main Chassis: FX-4003-12N, FX-4003-12NXT, FX-4009-12N or FX-4017-12N: total current for NACs is 10A max.



Notes: "All wiring shall be in accordance with NFPA 70 and CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code."

Terminal Blocks are removable for ease of wiring.

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

Figure 28 Main Fire Alarm Controller Board Field Terminal Connections

FX-4000 Main Fire
Alarm Controller board

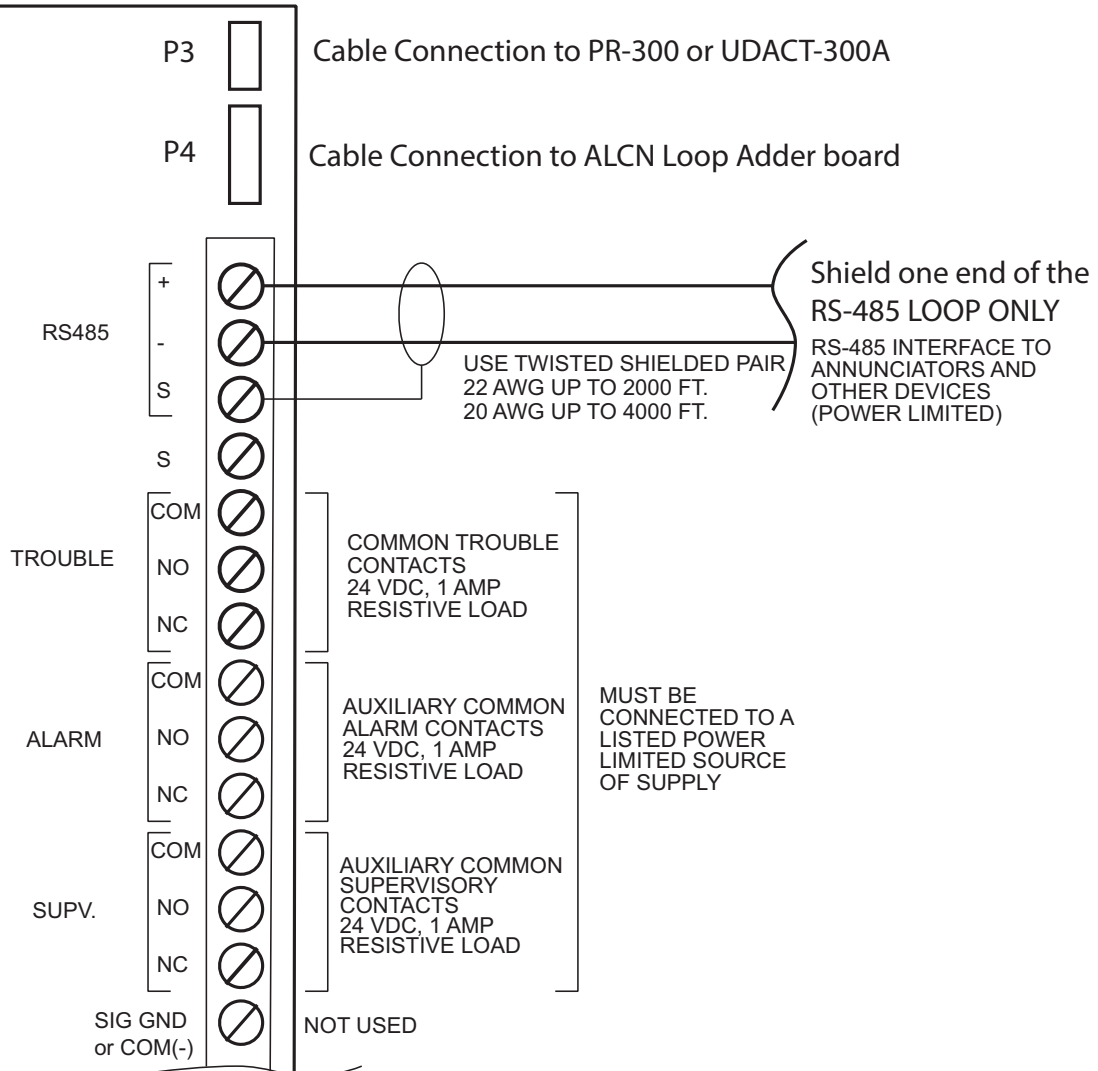
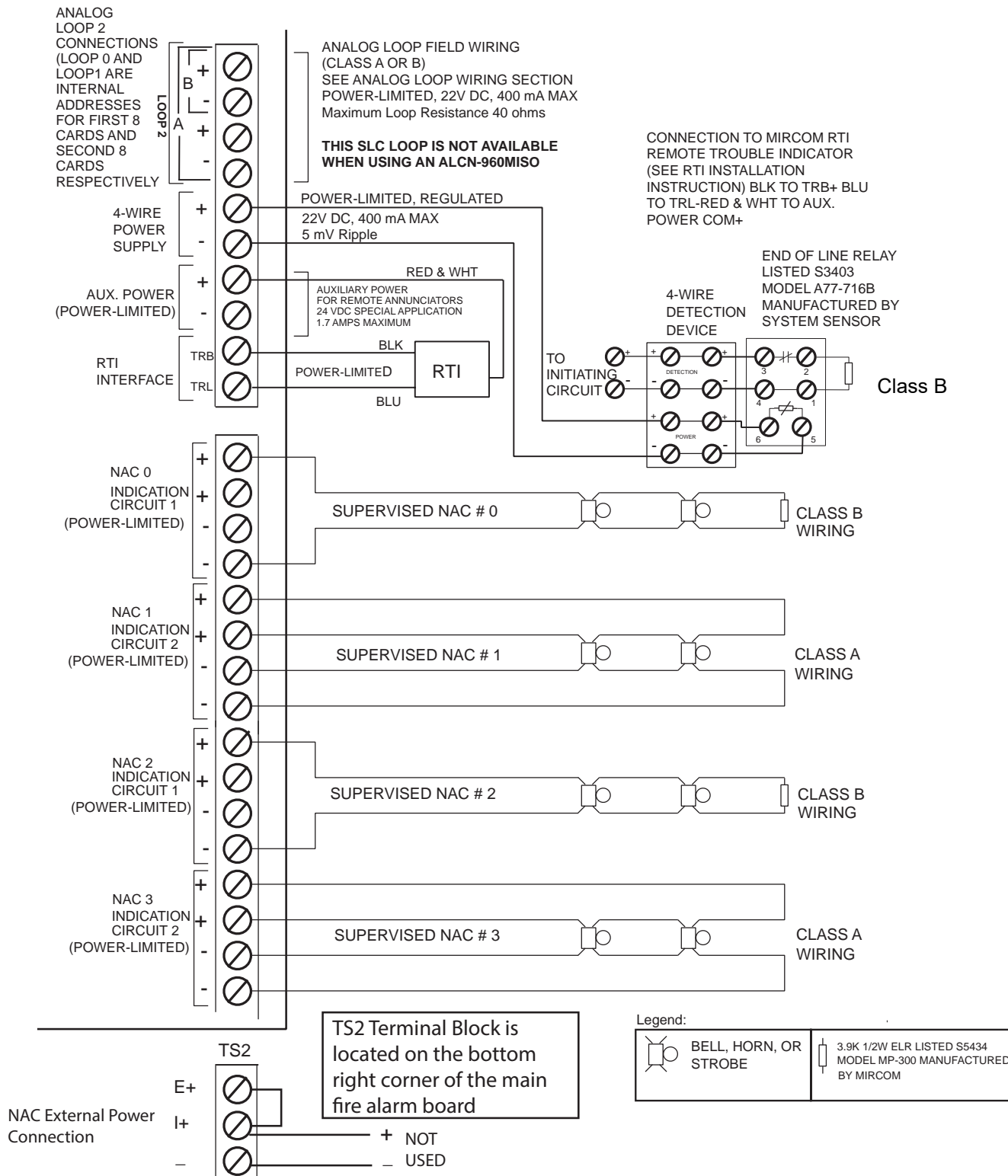


Figure 29 Main Fire Alarm Control board Field Terminal Connections (continued)



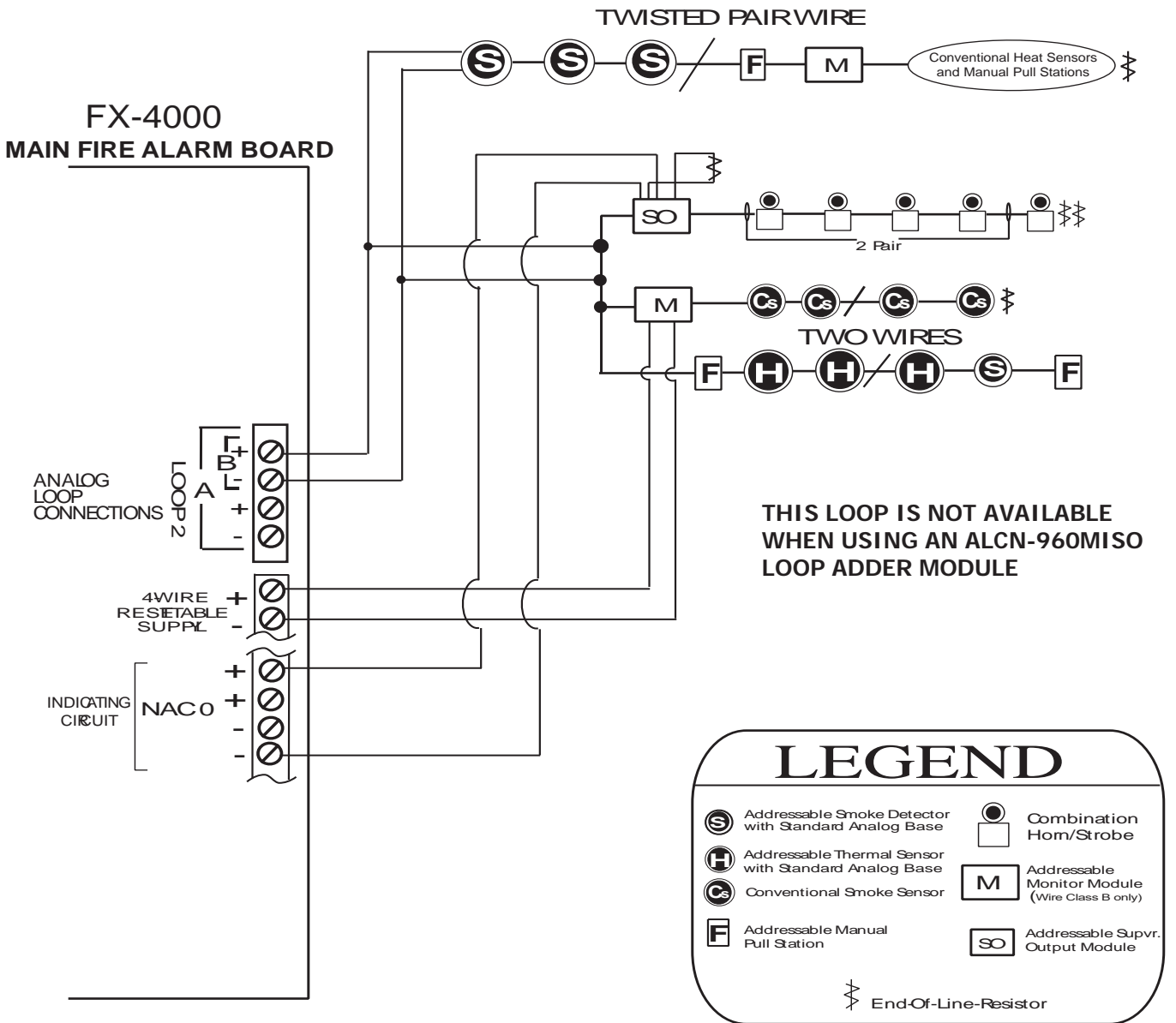
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Notes:

- 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 Regulated, 1.7A max. They must be wired as shown in the 6.11 Wiring Tables and Information on page 66.

6.2 SLC Loop Wiring

Figure 30 SLC Loop Terminal Connections - Class B

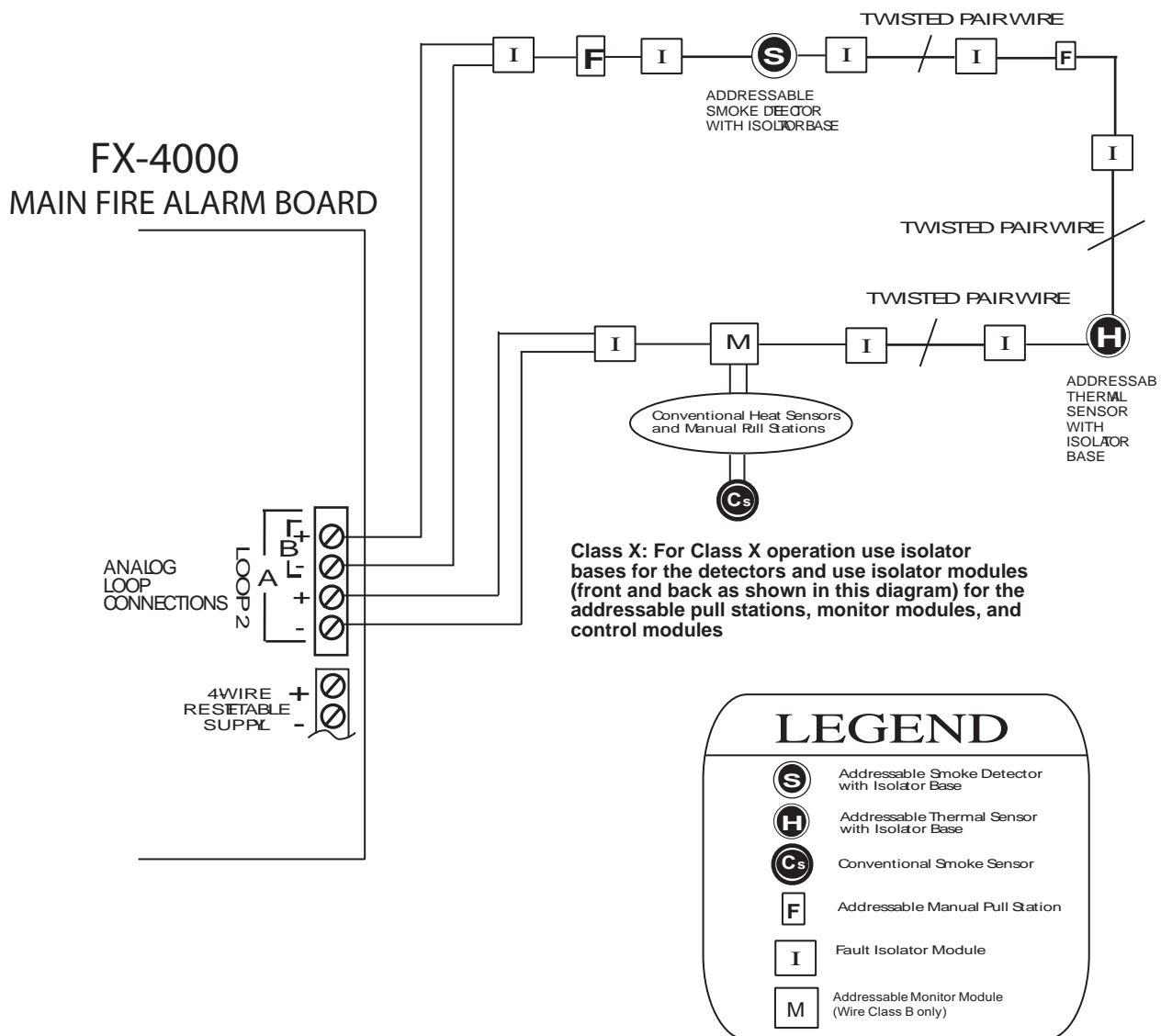


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Notes:

- 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 31 SLC Loop Terminal Connections - Class X



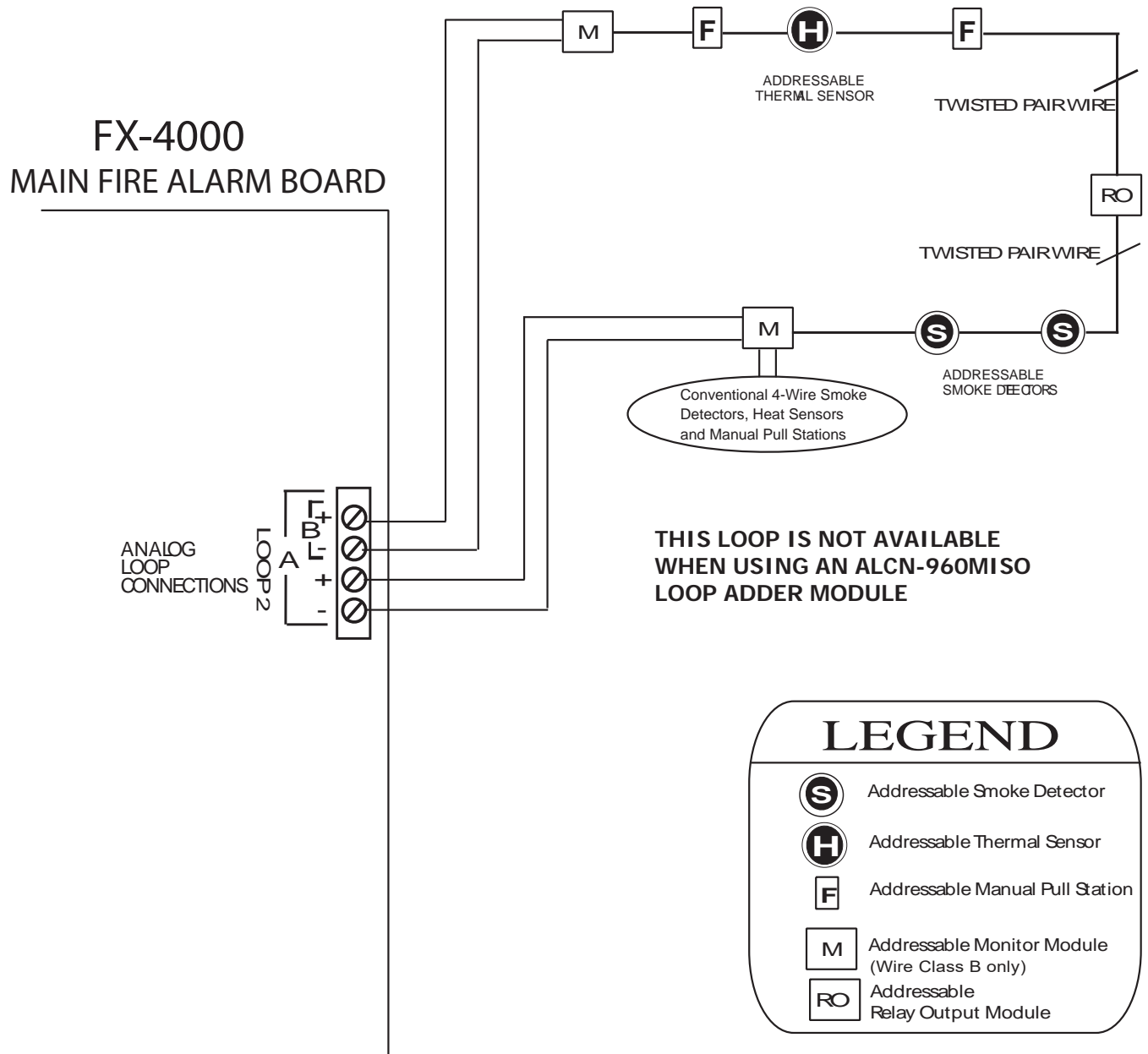
**THIS LOOP IS NOT AVAILABLE
WHEN USING AN ALCN-960MISO
LOOP ADDER MODULE**

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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 32 SLC Loop Terminal Connections - Class A



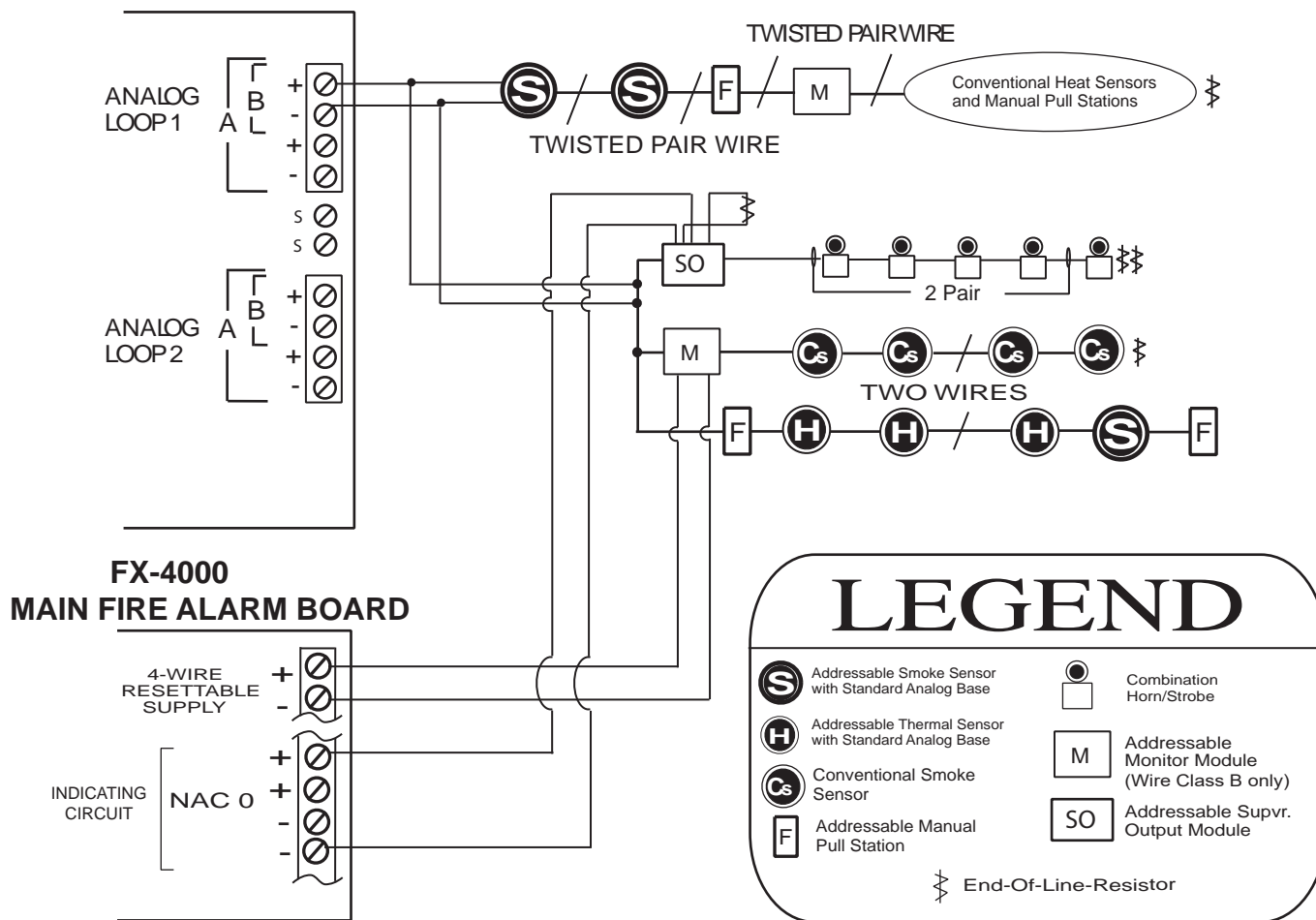
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Notes:

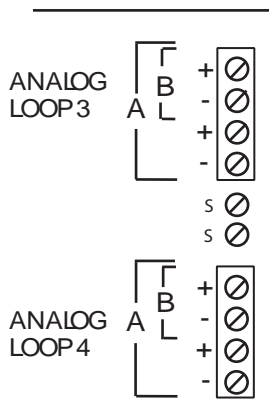
- All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.
- Loop wiring: maximum loop resistance is 40 ohms total. These lines power-limited and fully supervised.

Figure 33 Quad SLC Loop Terminal Connections - Class B

**ALCN-960MISO or ALCN-4792MISO
QUAD LOOP ADDER MODULE**



**ALCN-960D or ALCN -792D
DAUGHTER BOARD**



The ALCN-960D is mounted over the ALCN-960MISO Quad Loop Adder board to provide four SLC loops total.

The ALCN-792D board is mounted over the ALCN-4792MISO Quad Loop Adder board to provide four SLC loops total.

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

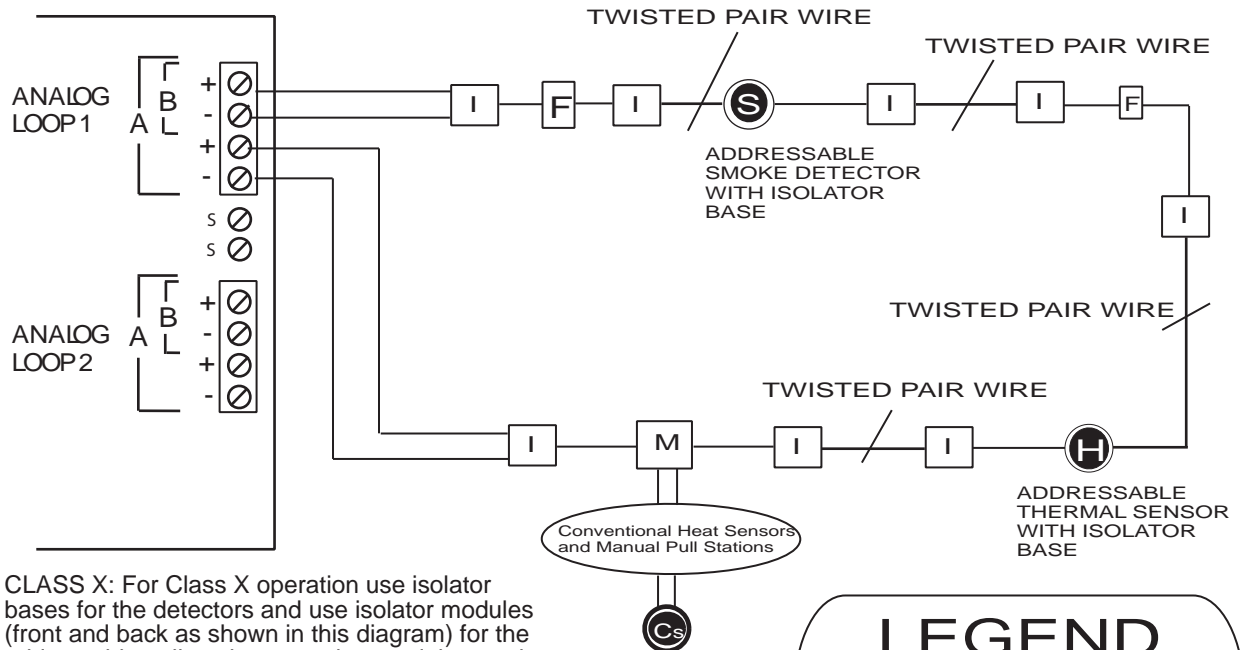


Notes:

- 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 power-limited and fully supervised.

Figure 34 Quad SLC Loop Adder Module Terminal Connections - Class X

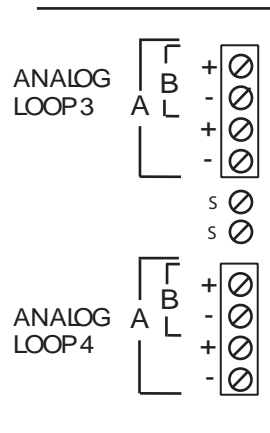
ALCN-960 MISO or ALCN-4792MISO QUAD LOOP ADDER MODULE



CLASS X: For Class X 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

ALCN-960D or ALCN-792D DAUGHTER BOARD



The ALCN-960D is mounted over the ALCN-960MISO Quad Loop Adder board to provide four SLC loops total.

The ALCN-792D board is mounted over the ALCN-4792MISO Quad Loop Adder board to provide four SLC loops total.

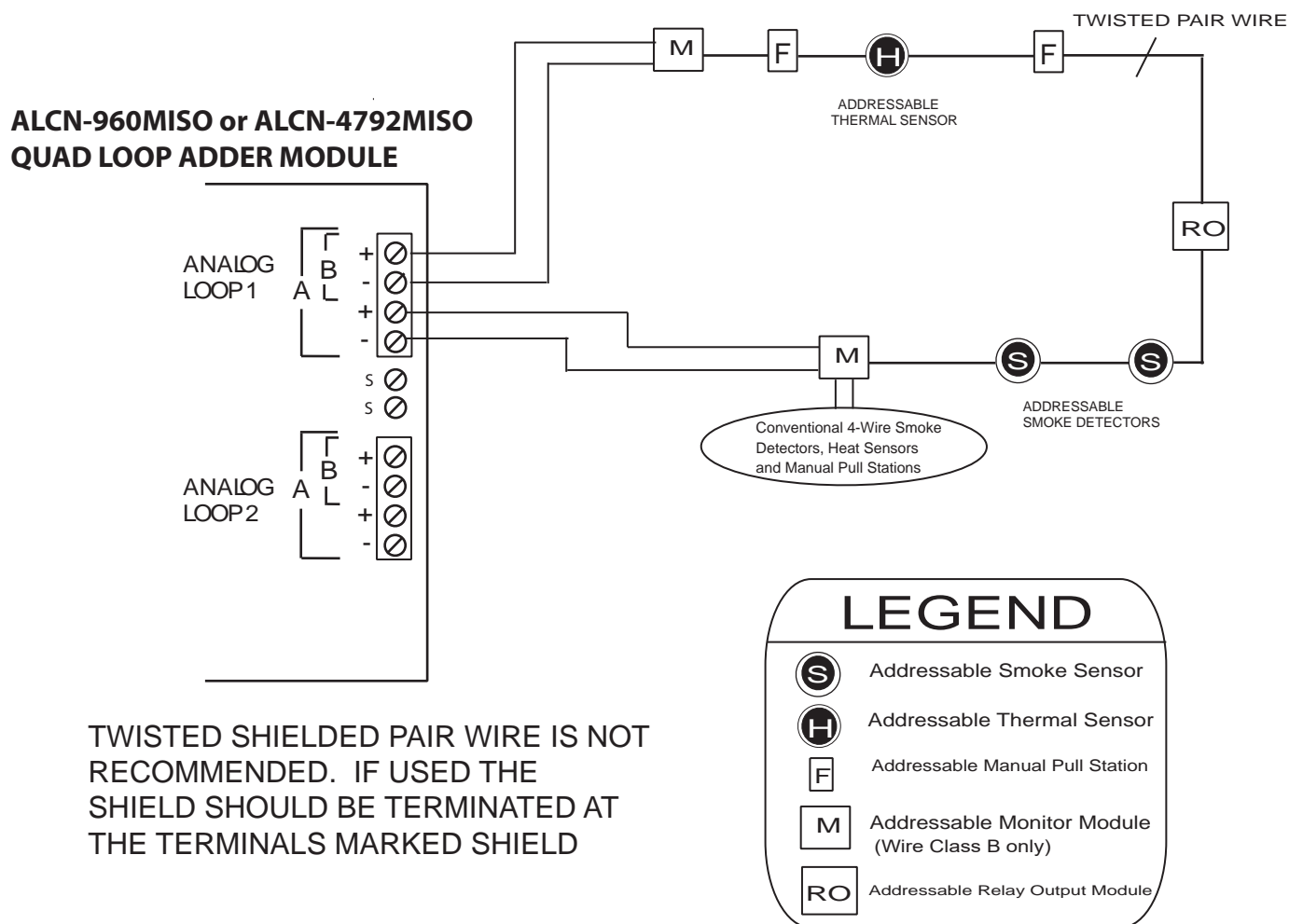
Wire loops 3 and 4 in the same manner as loops 1 and 2.



Notes:

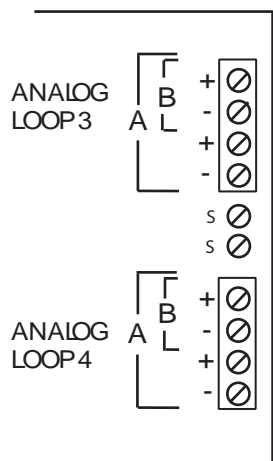
- All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.
- Isolators need to be close nipple connected to the device being protected.
- Loop wiring: maximum loop resistance is 40 ohms total. These lines are power-limited and fully supervised.

Figure 35 Quad SLC Loop Adder Module Terminal Connections - Class A



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

ALCN-960D or 792D DAUGHTER BOARD



The ALCN-960D is mounted over the ALCN-960MISO Quad Loop Adder board to provide four SLC loops total.

The ALCN-792D board is mounted over the ALCN-4792MISO Quad Loop Adder board to provide four SLC loops total.

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



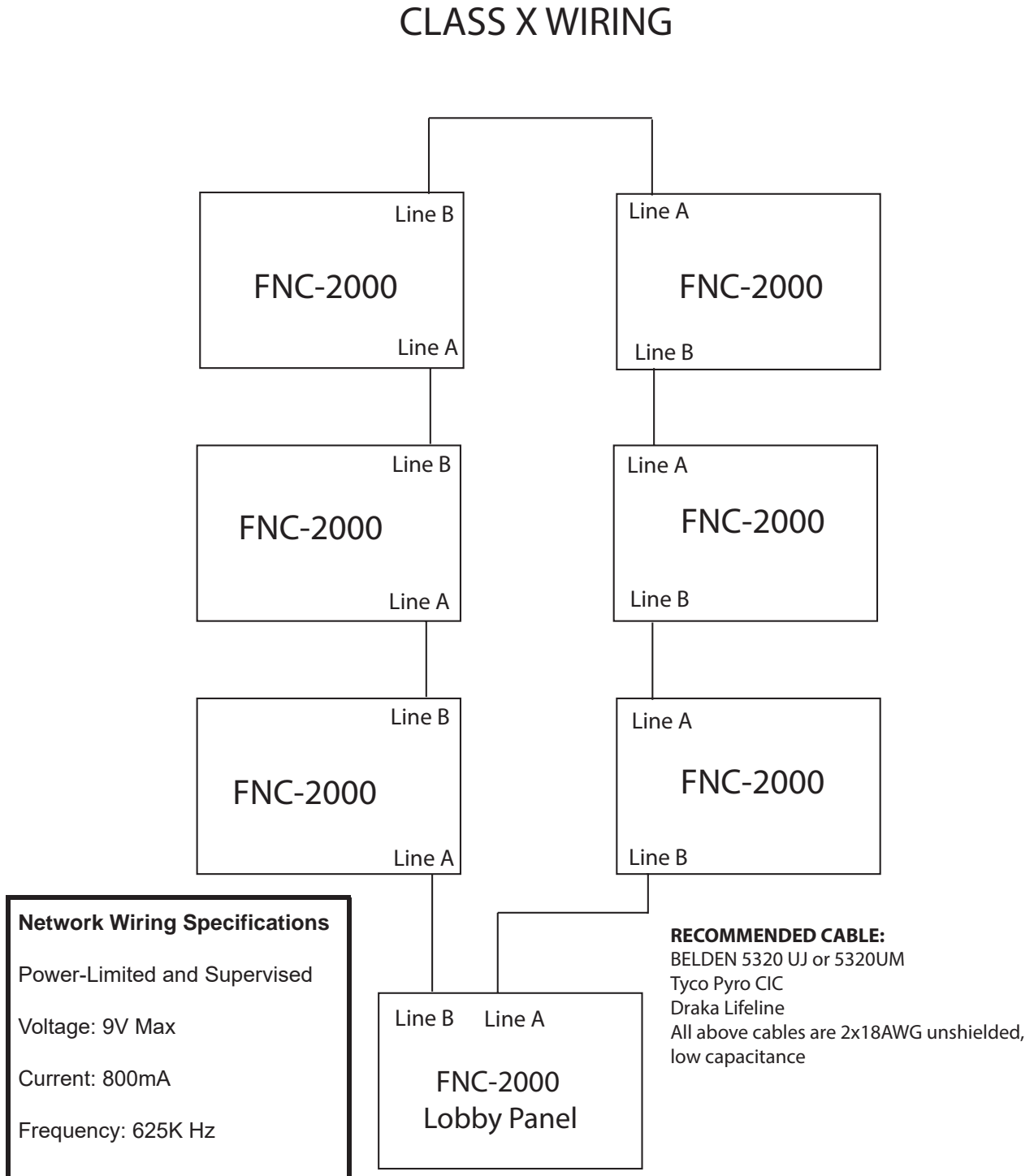
Notes:

- 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.

6.3 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 36) 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 X.

Figure 36 Class X Wiring for the FNC-2000 Module

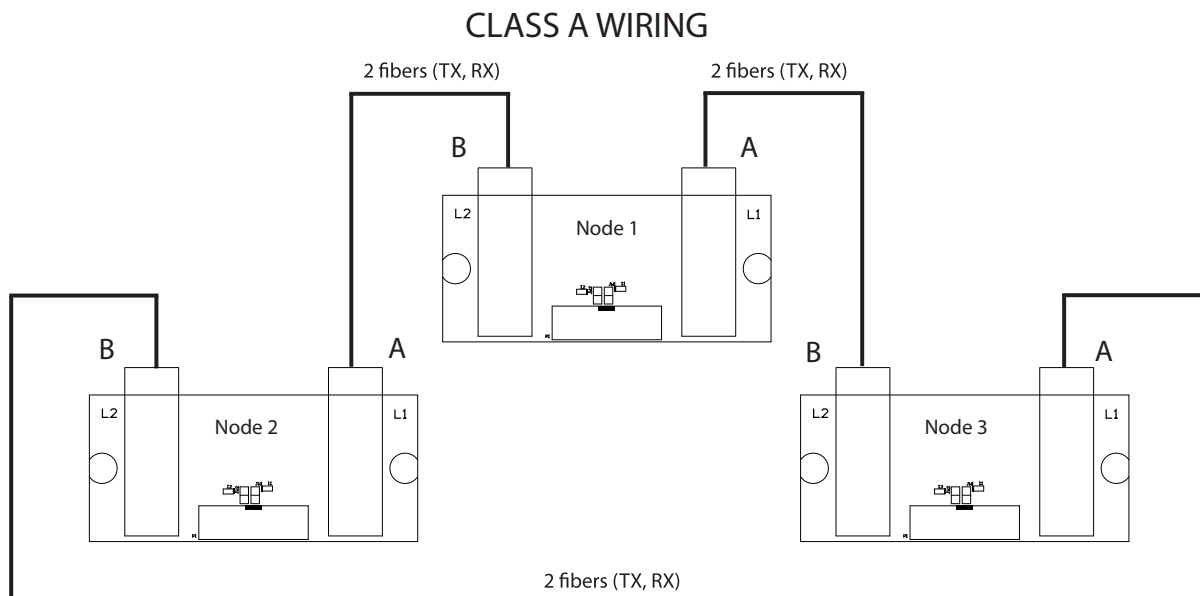


6.4 FOM-2000-UM Fiber Optic Network Adder Module

The FOM-2000-UM Fiber Optic Network Adder Module is wired with fiber optic cable. It is wired as shown in Figure 37 below.

Connect L1 to L2 and L2 to L1 as shown in the Class A wiring of Figure 37. Refer to LT-6907 document for more wiring and installation information.

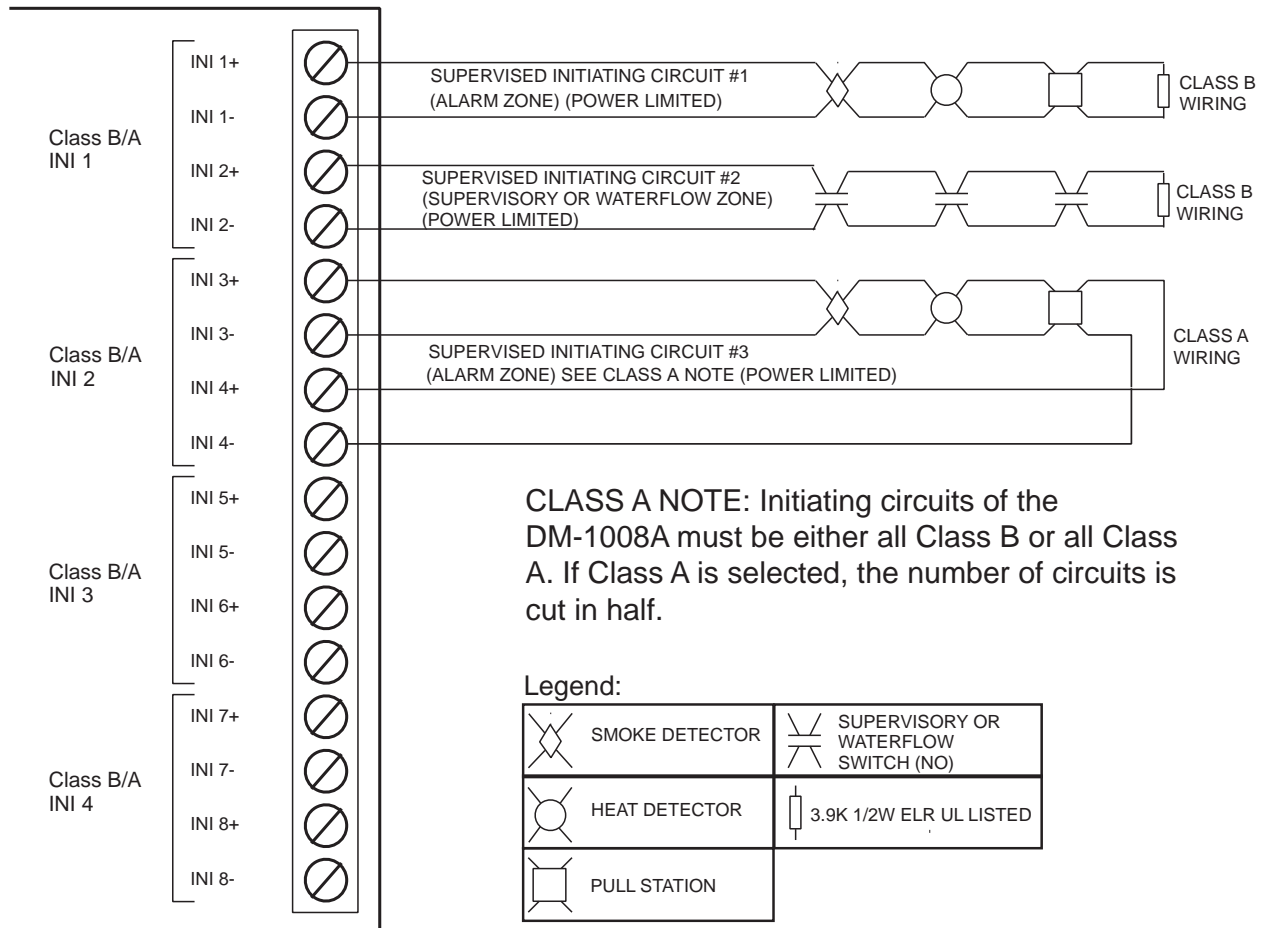
Figure 37 FOM-2000-UM Fiber Optic Network Adder Module Wiring



6.5 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 38 Hardwire Detection Module (DM-1008A) Terminal Connections



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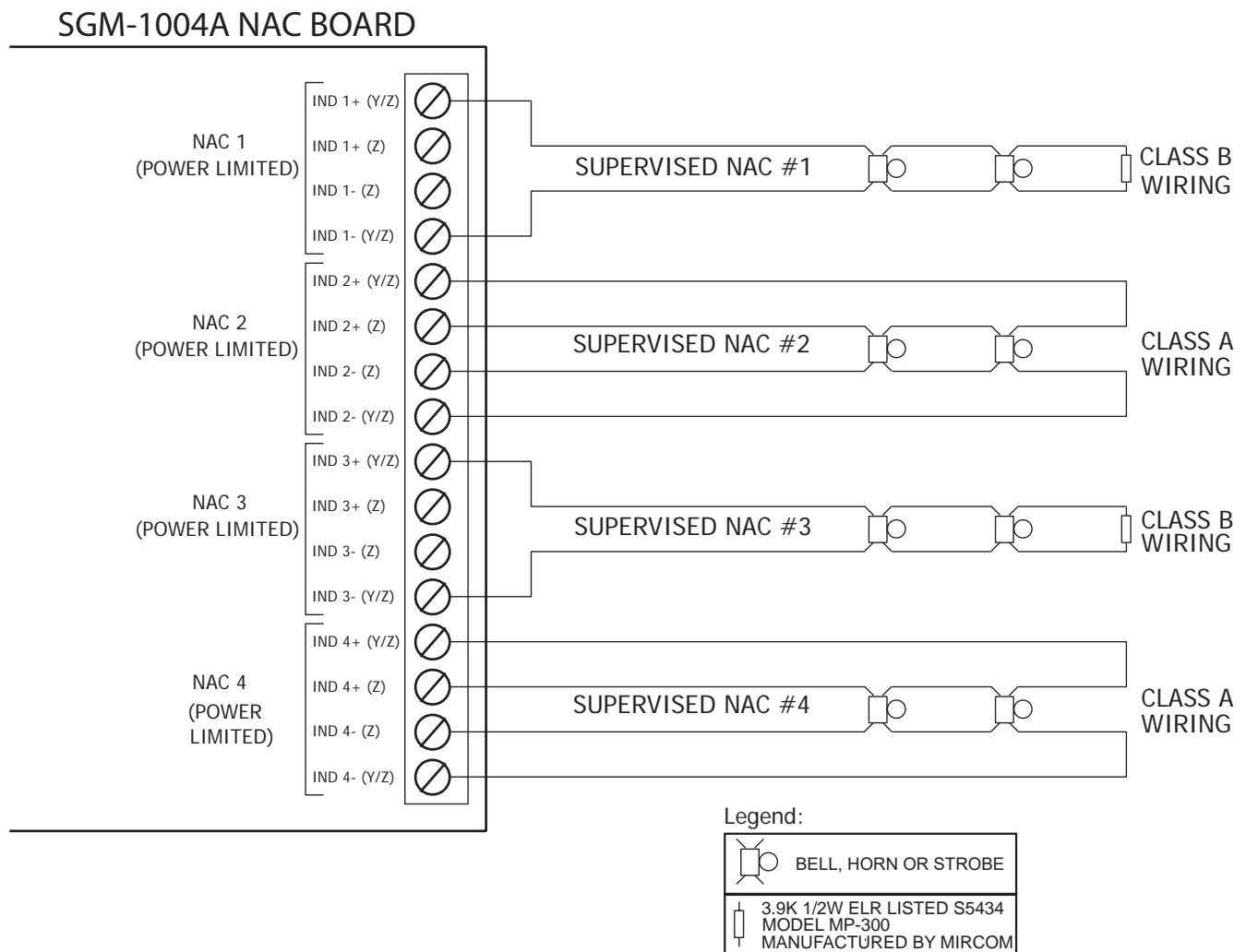
Notes:

- Terminal blocks are “depluggable” for ease of wiring.
- All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.
- Initiating circuits are fully supervised and rated for 22 VDC, 3 mA standby, 5 mV ripple, 50 mA max alarm. They may be configured as required. The alarm threshold is 21 mA. Maximum loop resistance is 100 ohms, 50 ohms per side.
- All conventional hardwire initiating circuits are Compatibility ID “A”.

6.6 Signal Module (SGM-1004A) Terminal Connections

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

Figure 39 Hardwire Signal Module Terminal Connections



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Notes:

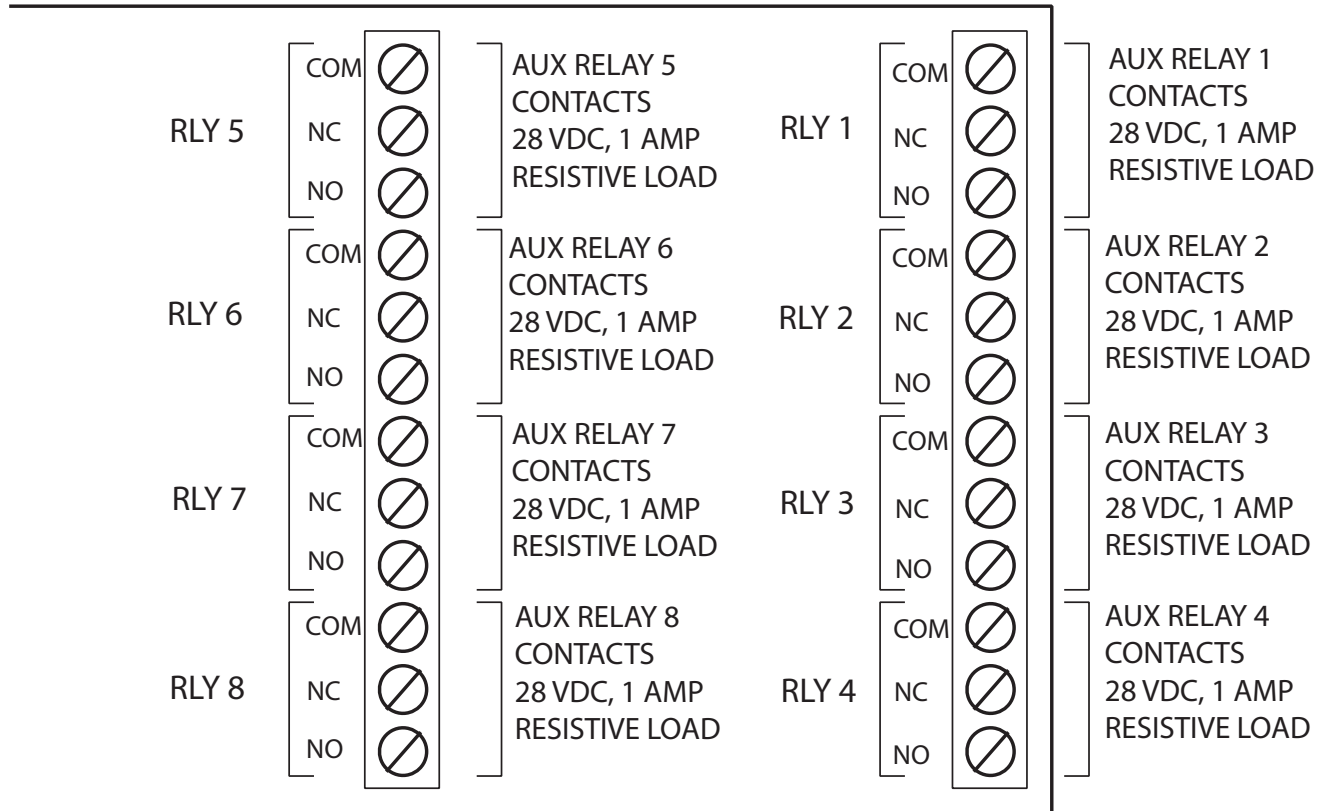
- The terminal blocks are “depluggable” for ease of wiring.
- All power limited circuits must use type FPL, FPLR, or FPLP power limited cable.
- SGM-1004A NACs are fully supervised and rated for 24 VDC Regulated, 1.7A max. They must be wired according to the Wiring Tables and Information on page 66

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

Relays are available as shown below.

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.

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

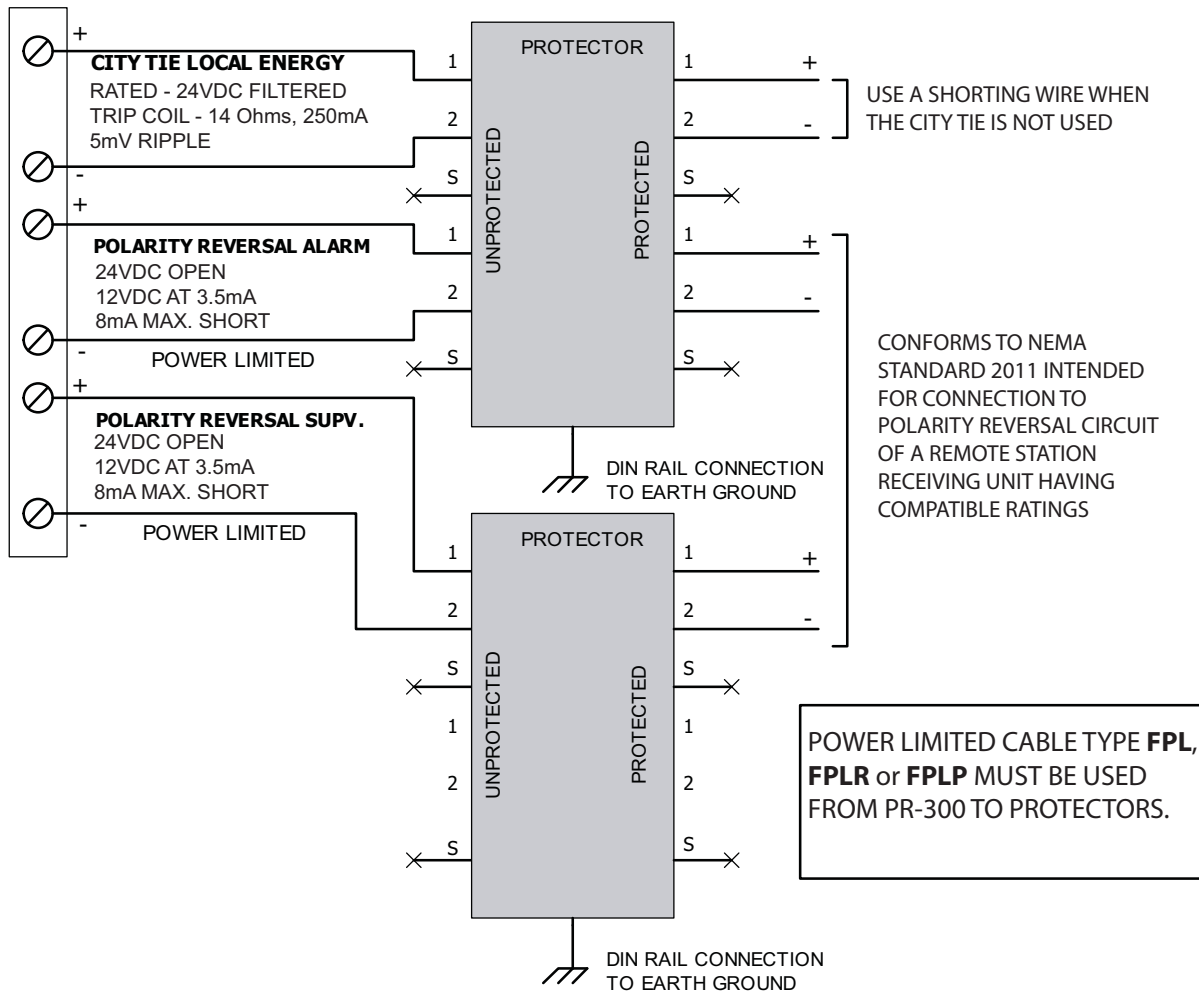
Wire PR-300 Polarity Reversal and City Tie Module (if used) as shown in Figure 40 below. Power Limited cable type FPL, FPLR or FPLP must be used.

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 40 Polarity reversal and city tie module terminal connection

PR-300



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-4000 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.

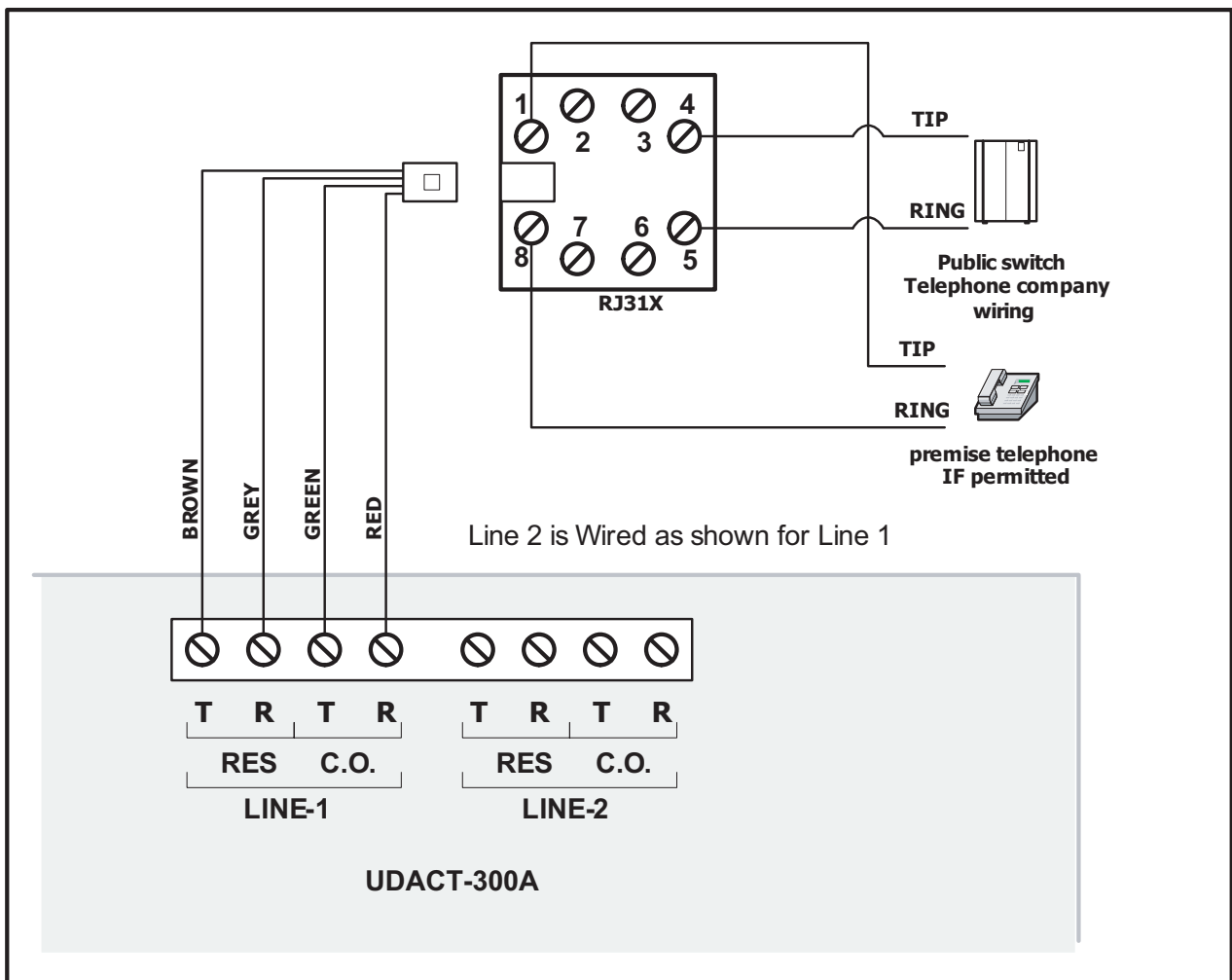
6.9 UDACT-300A Main Board Terminal Connections

Wire the two telephone lines to RJ31X Connector terminals as shown in Figure 41 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 41 Telephone Line Wiring Diagram



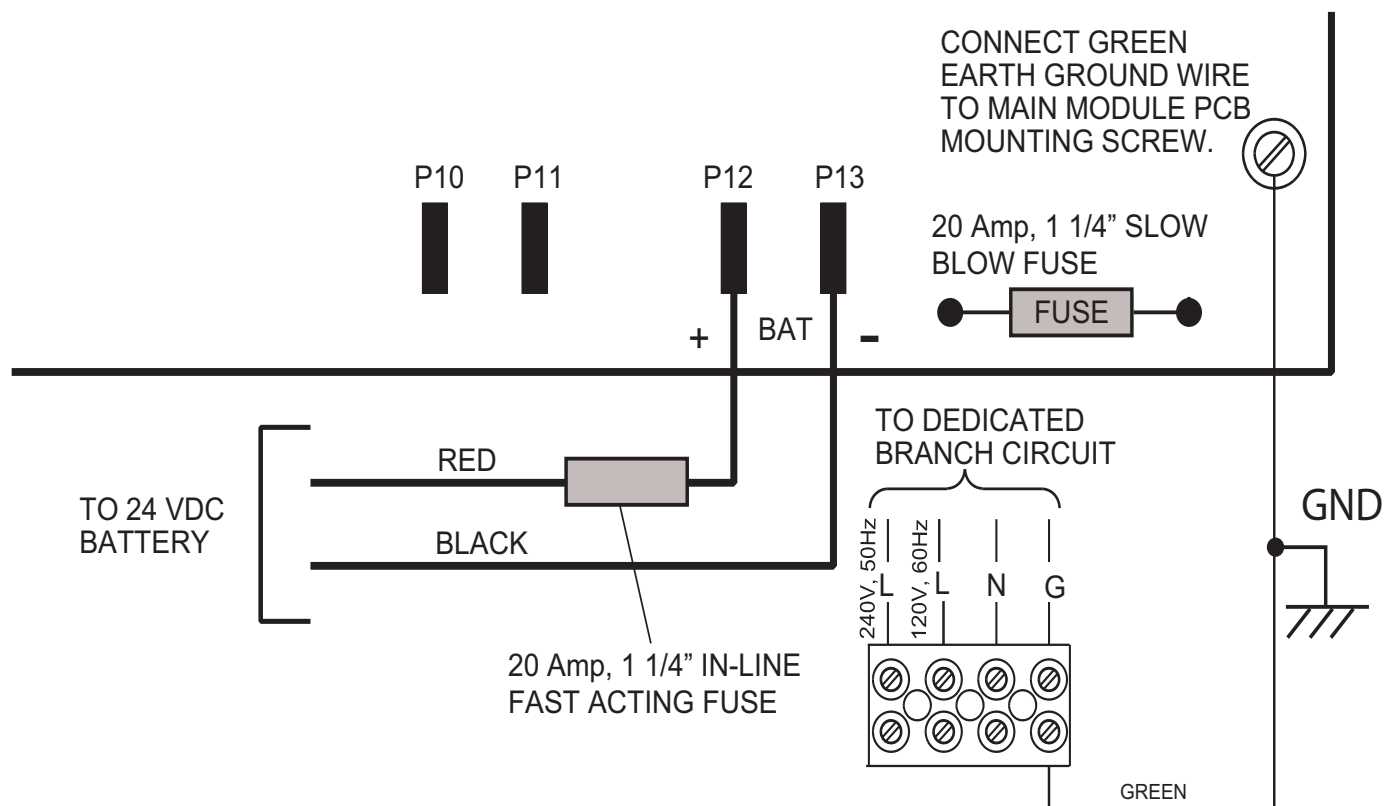
6.10 Power Supply Connections

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-4003-12N, FX-4003-12NXT & FX-4017-12N Main Chassis	120 VAC, 60 Hz, 4A / 240VAC, 50 Hz, 2A	12 amps maximum	20 Amp, 1-1/4" Slow Blow Non-replaceable Fuse
FX-4009-12N Main Chassis	120 VAC, 60 Hz, 4A / 240VAC, 50 Hz, 2A	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 42 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.

6.11 Wiring Tables and Information

Table 10 Wiring Table for Initiating Circuits.

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

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Note: Maximum loop resistance should not exceed 100 Ohms.

Table 11 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

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Note: Maximum voltage drop should not exceed 3.3 Volts for Class A and 3.7 Volts for Class B.

Table 12 Analog Loop Wiring

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

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Note:

- Line capacitance shall not exceed 0.5 μ F.
- Inductance shall not exceed 1 mH.
- Resistance shall not exceed 40 ohms.

Power Wiring: Use Table 11, Wiring Table for NACs, on page 66 for 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 Table for Initiating Circuits., on page 66.

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.

7.0

System Checkout

7.1 Before Turning the Power On

1. To prevent sparking, *do not* connect the batteries. Connect the batteries after powering the system from the main AC supply.
2. Check that all modules are installed in the proper location with the proper connections.
3. Check all field (external) wiring for opens, shorts, and ground.
4. Check that all interconnection cables are secure, and that all connectors are plugged in properly.
5. Check all jumpers and switches for proper setting.
6. Check the AC power wiring for proper connection.
7. Check that the chassis is connected to EARTH GROUND (cold water pipe). Refer to NFPA 70.
8. Make sure to *close the front cover plate* before powering the system from main AC supply.



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.

7.2 Power-Up Procedure

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

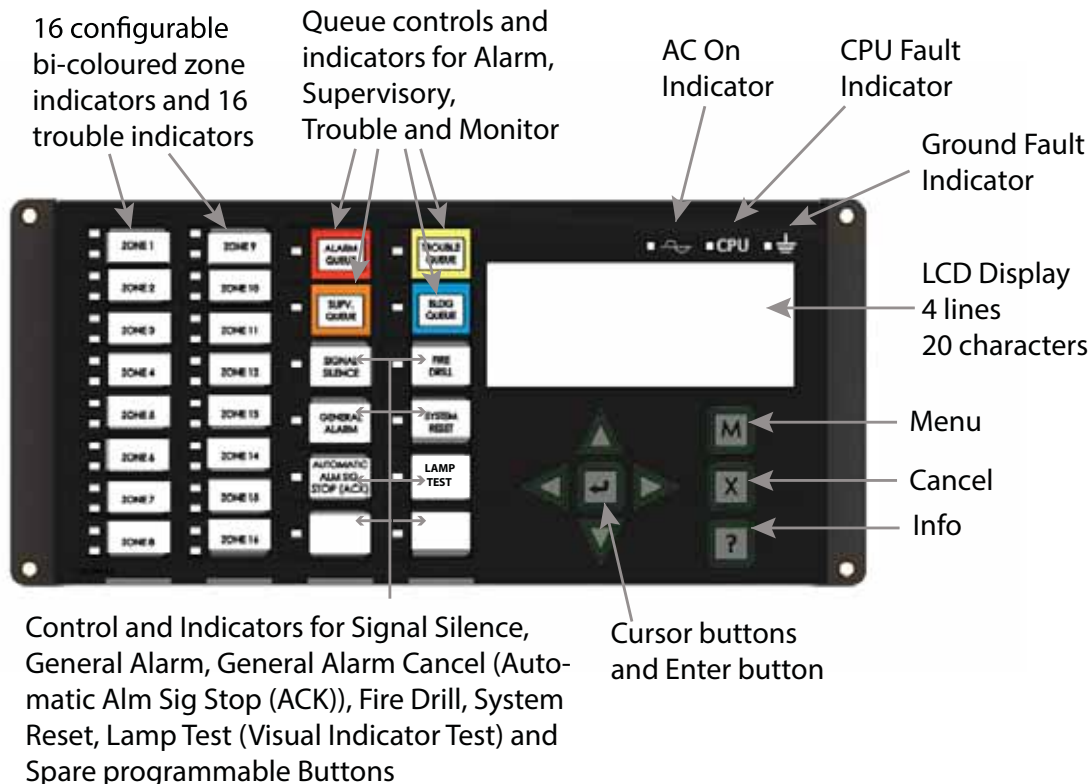
7.3 Troubleshooting

Message	Description
Circuit Trouble	Normally when a circuit trouble occurs, its designated trouble indicator will be illuminated, as well as the Common Trouble indicator and Trouble buzzer. To correct the fault, check for open wiring on that particular circuit loop or see if the circuit disconnect switch is in the ON or CLOSED position. <i>Note: disconnecting a circuit will cause a system trouble (off-normal position).</i>
Ground Fault	The FX-4000N 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.

8.0 Indicators, Controls, and Operation

Refer to Figure 43 below for LED indicators, control buttons, and switches locations.

Figure 43 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 General Alarm Cancel 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.

8.1 Common Indicators

Indicators	Description
Buzzer	<p>The Buzzer is activated by any of the following</p> <ul style="list-style-type: none"> Fire Alarm - Steady Supervisory Alarm - Fast Rate Trouble - Trouble Rate Monitor - Configurable to sound at Trouble Rate <p>If the Buzzer is turned on in response to a Non-Latching Trouble or Supervisory, it will be turned off if the condition causing it goes away and there is no other reason for it to be on.</p>
AC On LED	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. ACK 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.
BLDG Queue LED	The BLDG Queue LED flashes amber at the Trouble Flash Rate when there is any monitored building condition being detected on the panel. It is turned off when all building 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.
Automatic Alm Sig Stop (Ack) or General Alarm Cancel LED	If the Panel is configured as Two Stage, the General Alarm Cancel 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 General Alarm Cancel 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 LED is 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 LED 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.





8.2 Common Controls





8.2.1 LCD Display:





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





8.2.2 Queue Buttons

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

Press the **Alarm Queue** button to cycle through all the unacknowledged alarms. Press  and  to cycle through all the alarms, both acknowledged and unacknowledged. Press the right cursor button  to scroll up by 10 events at a time. Press the left cursor button  to scroll down by 10 events at a time.

Press the **Supervisory Queue** button to cycle through all the unacknowledged supervisory conditions. Press  and  to cycle through all supervisory conditions, both acknowledged and unacknowledged. Press the right cursor button  to scroll up by 10 events at a time. Press the left cursor button  to scroll down by 10 events at a time.

Press the **Trouble Queue** button to cycle through all the unacknowledged trouble conditions. Press  and  to cycle through all troubles, both acknowledged and unacknowledged. Press the right cursor button  to scroll up by 10 events at a time. Press the left cursor button  to scroll down by 10 events at a time.

Press the **Building Queue Button** to cycle through all the unacknowledged building (monitor) conditions. Press  and  to cycle through all queued monitor conditions, both acknowledged and unacknowledged. Press the right cursor button  to scroll up by 10 events at a time. Press the left cursor button  to scroll down by 10 events at a time.

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.

8.2.3 Cursor Buttons

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

Enter Button

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

Cancel Button

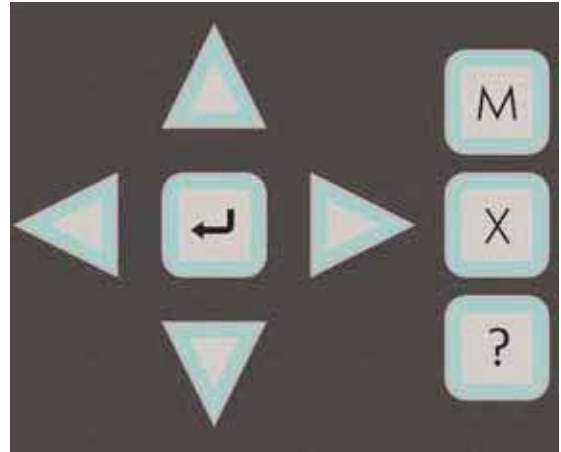
This button is used to cancel an operation.

Menu Button

This button is used to initiate the FX-4000N Menu System.

Info Button

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



8.2.4 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.

8.2.5 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 General Alarm Cancel button.

8.2.6 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.

8.2.7 General Alarm Cancel 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 Cancel button while the Auto General Alarm Timer is timing (there is an Alarm in the Panel, but it is still in the First Stage), that timer is cancelled, and the General Alarm Cancel Indicator is on steady amber.

8.2.8 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.

8.2.9 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.

8.3 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

8.4 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 General Alarm Cancel LED starts flashing.

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

- The buzzer sounds steadily
- If signals have been silenced as a result of the silence button or the Auto signal silence timer, signals are resounded as they were before signal silence, the Signal Silence LED turns off, and the Auto Signal Silence timer, if configured, is restarted
- If the panel is not already in General Alarm, additional non-disconnected signals programmed to the new input are activated with the Alert Code (*see Indicating (Signal) Circuit Types section page 76*).
- If the panel is not already in General Alarm and if the General Alarm Cancel LED is on steady indicating that the Auto General Alarm timer has been Acknowledged the timer is restarted and the General Alarm Cancel 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 General Alarm Cancel LED if on, turns off

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



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

8.5 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-4000N Configurator, "Subsequent Alarm" in "Common System Status" must be correlated to turn on the Remaining NAC circuits in the system. To confirm the alarm (i.e. subsequent alarm) the operator can press the "General Alarm" button on the panel or activate a Manual Station in the Control Room.



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

8.6 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.

8.6.1 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.

Initiating (Detection) Circuit Type	Description
Water-Flow Alarm	<p>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.</p> <p>Note: Do not use the retard operation with any external retarding device; maximum retard may not exceed 120 seconds.</p>
Sprinkler Alarm	<p>An alarm for sprinkler flow sensors. These alarms are identical to normal non-verified alarms unless the water-flow retard operation is enabled. If water-flow retard operation is enabled, then these circuits are sampled every one second; if ten samples are active within any 15 second interval, the sprinkler alarm is confirmed and processed. An alarm condition causes the associated circuit Status LED and the Common Alarm LED to illuminate red.</p> <p>Note: Do not use the retard operation with any external retarding device; maximum retard may not exceed 120 seconds.</p>
General Alarm	<p>These alarms provide remote general alarm such as for remote key switches. In a two stage system, these inputs perform exactly the same function as the front panel or remote annunciator General Alarm button. In a single stage system, these inputs act the same as non-verified alarms, but if correlations are enabled, general alarm initiating circuits are correlated to <i>all</i> NACs.</p>
Non-Latching Supervisory	<p>These alarms are for supervisory devices. An activation on these circuits will cause the Circuit Status LED and the Common Supervisory LED to illuminate amber. The buzzer will sound continuously. If the circuit activation is removed, the supervisory condition will clear (so long as there are no other supervisory conditions in the system) and the circuit Status LED will extinguish.</p>
Latching Supervisory	<p>These alarms are for supervisory devices. An activation on these circuits will cause the Circuit Status LED and the Common Supervisory LED to illuminate amber. The buzzer will sound continuously. If the circuit activation is removed, the Supervisory condition will <i>not</i> clear.</p>
Monitor (BLDG)	<p>This is a supervised general purpose non-latching input used mainly for correlating to a relay circuit. No other system condition occurs as a result of its activation (short-circuit), although it is supervised for trouble (open-circuit).</p>
Trouble-Only	<p>This circuit is used for monitoring a trouble condition from an external device such as a Mircom Series 500 Audio System. Both open and short circuits generate a non-latching trouble condition.</p>

8.6.2 Indicating (Signal) Circuits Types

Indicating (Signal) Circuit Type	Description
Silenceable Signal	<p>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.</p>

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

8.6.3 Evacuation Codes

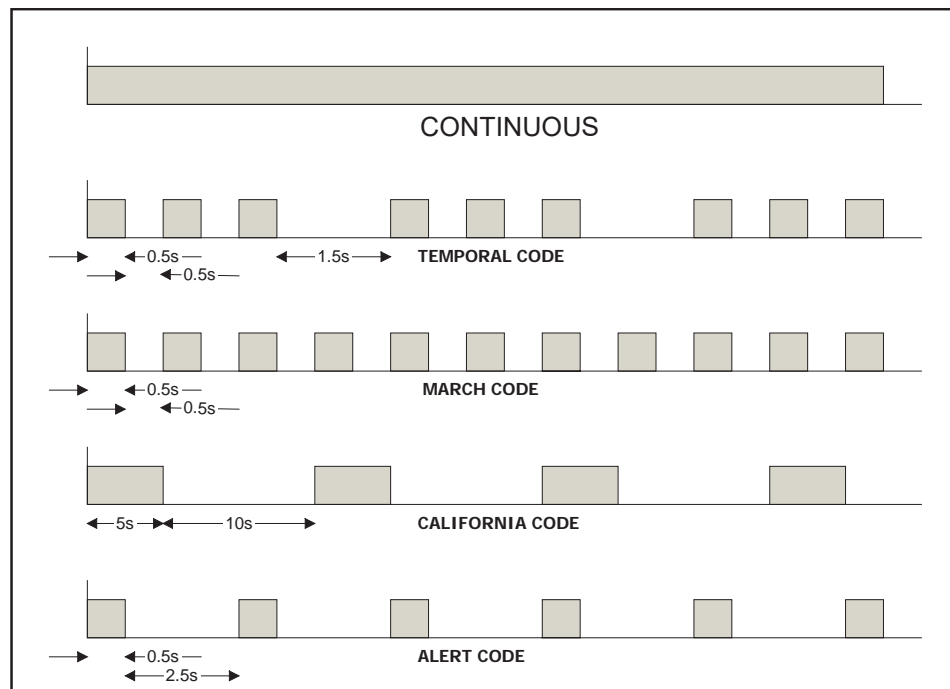
Single stage codes

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

Two-stage codes:

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

Figure 44 Evacuation Codes



9.0 Configuration

The FleX-Net™ network system which includes FX-4003-12N, FX-4003-12NXT, FX-4009-12N, FX-4017-12N, and FX-4000MNS is configured using MGC software MSW-036.

NOTE: When setting up a system to use the Request, Grant, Deny functionality, if any nodes within that system have annunciators attached, the controls must be disabled on those annunciators (ancillary displays only).

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 (OpenGN) 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.

10.0 Typical FleX-Net™ System Layouts with Audio

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

Figure 45 below shows a typical FleX-Net™ 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 45 Typical FleX-Net™ System with Audio Nodes

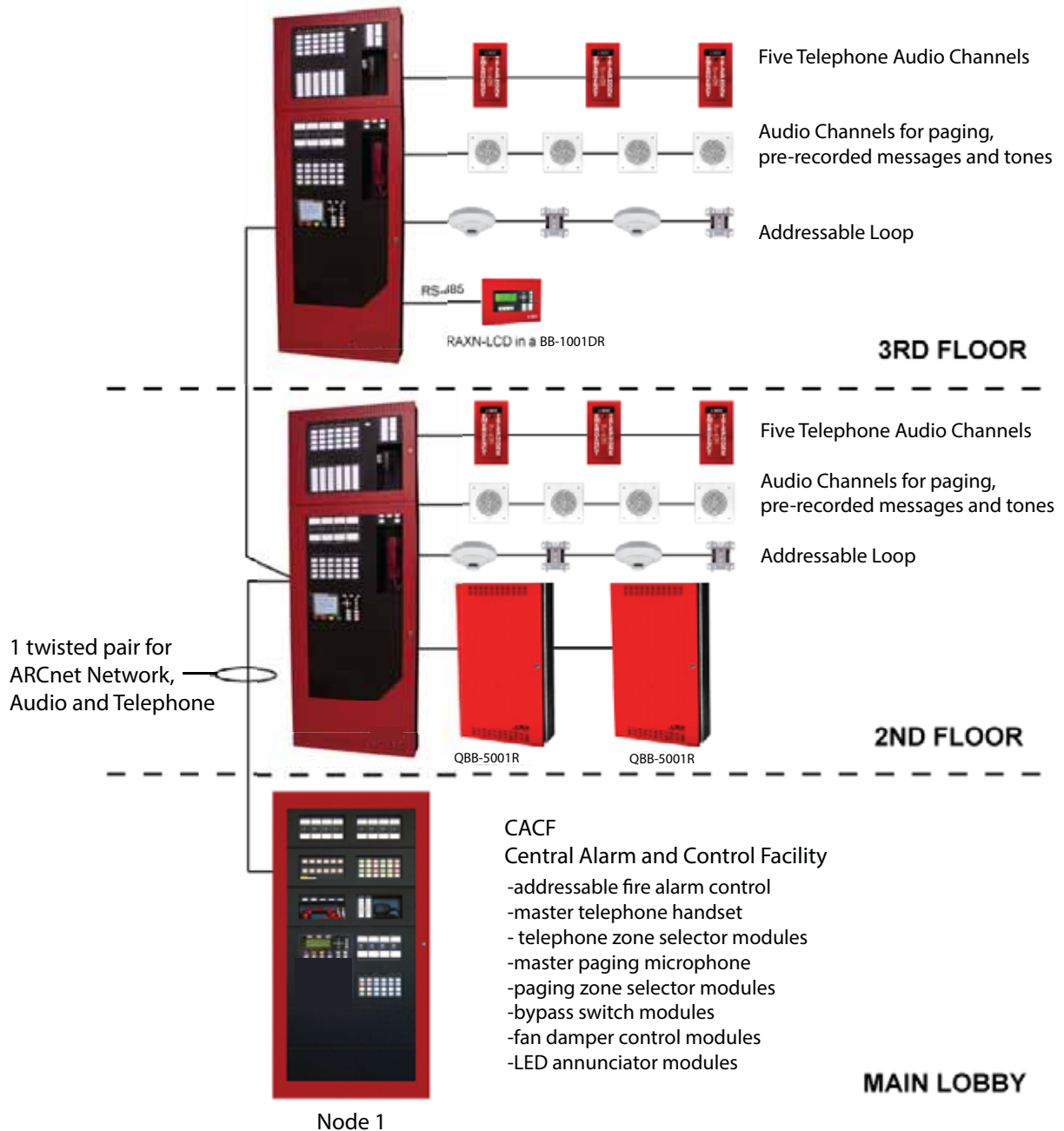
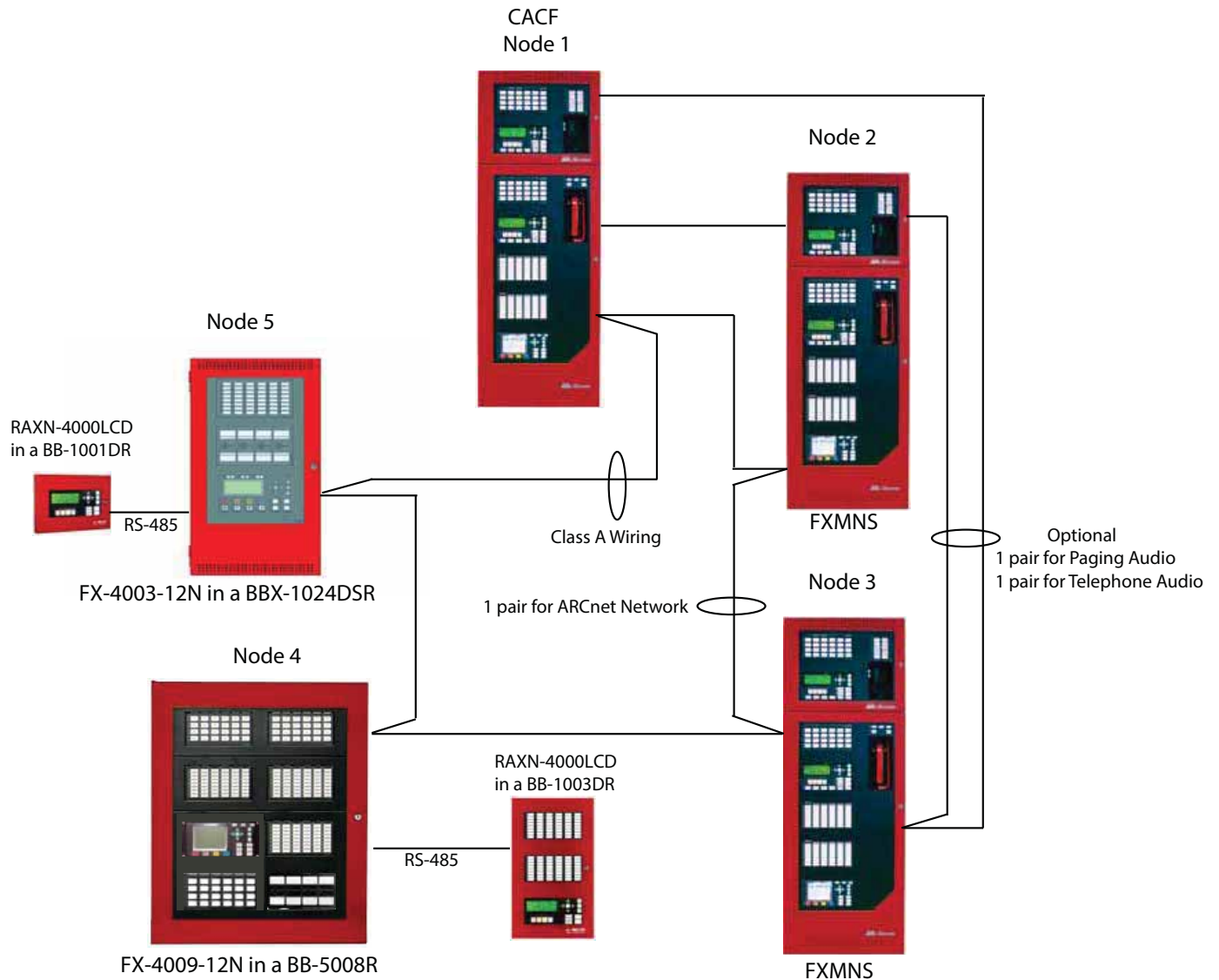


Figure 46 below shows the FleX-Net™ fire alarm and audio shown within the Integrated Network Fire/Audio cabinet as Node 2 and 3. Paging and telephone devices are hooked up to Nodes 2 and 3.

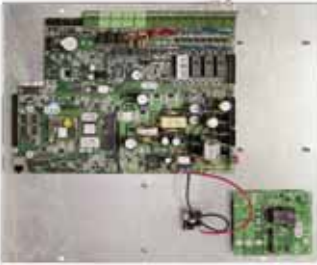
Figure 46 Typical FleX-Net™ Network System with Audio and Non-Audio Nodes






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

11.0 System Components for the Integrated Fire/Audio Cabinet


11.1 Network Fire Alarm

	Model	Description
	FX-4000MNS	Main network fire alarm board includes one SLC and four Class A/B NACs. The main board is mounted on a backplate which can hold up to 9 internal adder modules. This backplate mounts in the BBX-FXMNS enclosure.


11.2 Network Controller Modules

	Model	Description
	FNC-2000	Provides network capability for the FleX-Net™ 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-4000MNS main board.
	ANC-4000	Audio Network Controller module. The ANC-4000 Audio Network Controller module is mounted on a metal plate (which is packaged with the FX-4000MNS) and then the plate is mounted into BBX-FXMNS 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-4000 Audio Network Controller module and both are mounted on a metal plate and then the plate is mounted into the BBX-FXMNS backbox in position 1 of the QMB-5000N Card Cage.



11.3 Fiber Optics Module

	Model	Description
	FOM-2000-UM	Fiber Optics Module (Optional) Connects to the FNC-2000 Fire Alarm Network Controller Module and allows fiber optics cabling.



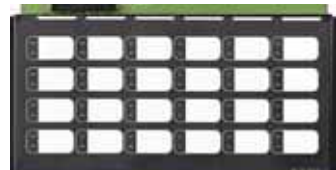
11.4 Adder Modules

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

11.5 Auxiliary Modules

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

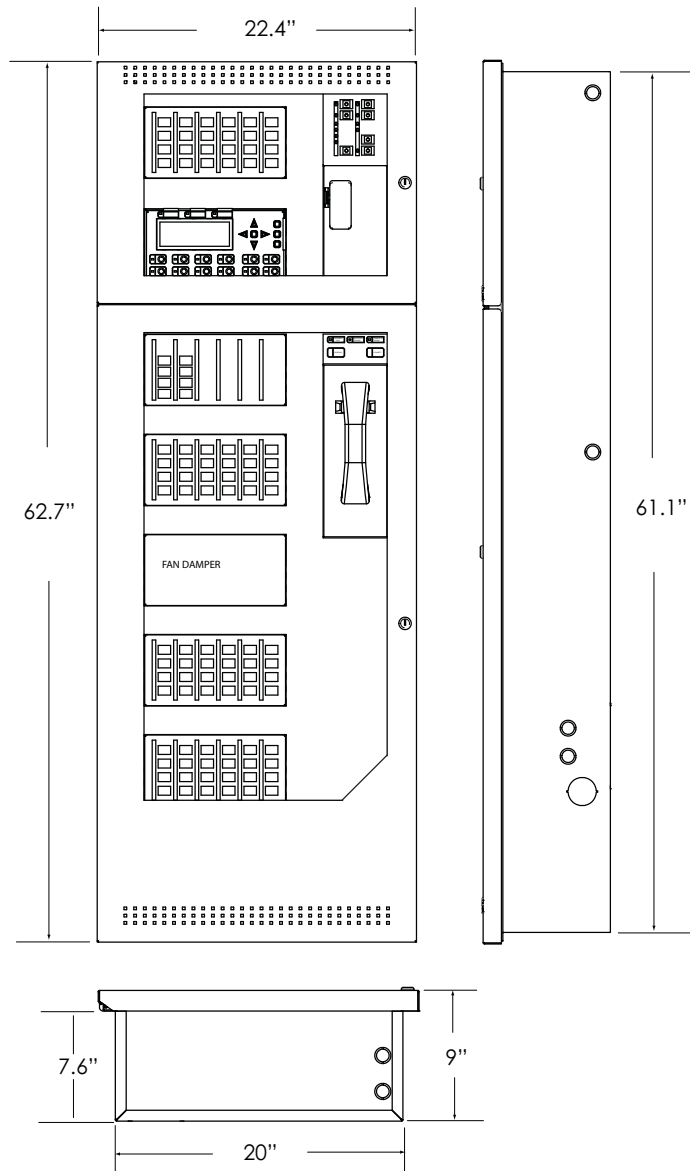
11.6 Programmable Modules

	Model	Description
	FDX-008W(KI)	Fan Damper Module
	IPS-4848DS	48 Programmable Input Switches Module
	IPS-2424DS	24 Programmable Input Switches Module

12.0 FleX-Net™ 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 47 BBX-FXMNS Enclosure



i

Note: When using the BBX-FMNS as a Mass Notification System (ACU) refer to Appendix I.

The BBX-FXMNS backbox supports the QMB-5000N amplifier backplane and card cage which holds up to four amplifiers, the FX-4000MNS Fire Alarm main board chassis and PS-2040 Power Supply.

Figure 48 BBX-FXMNS Backbox Dimensions and Contents

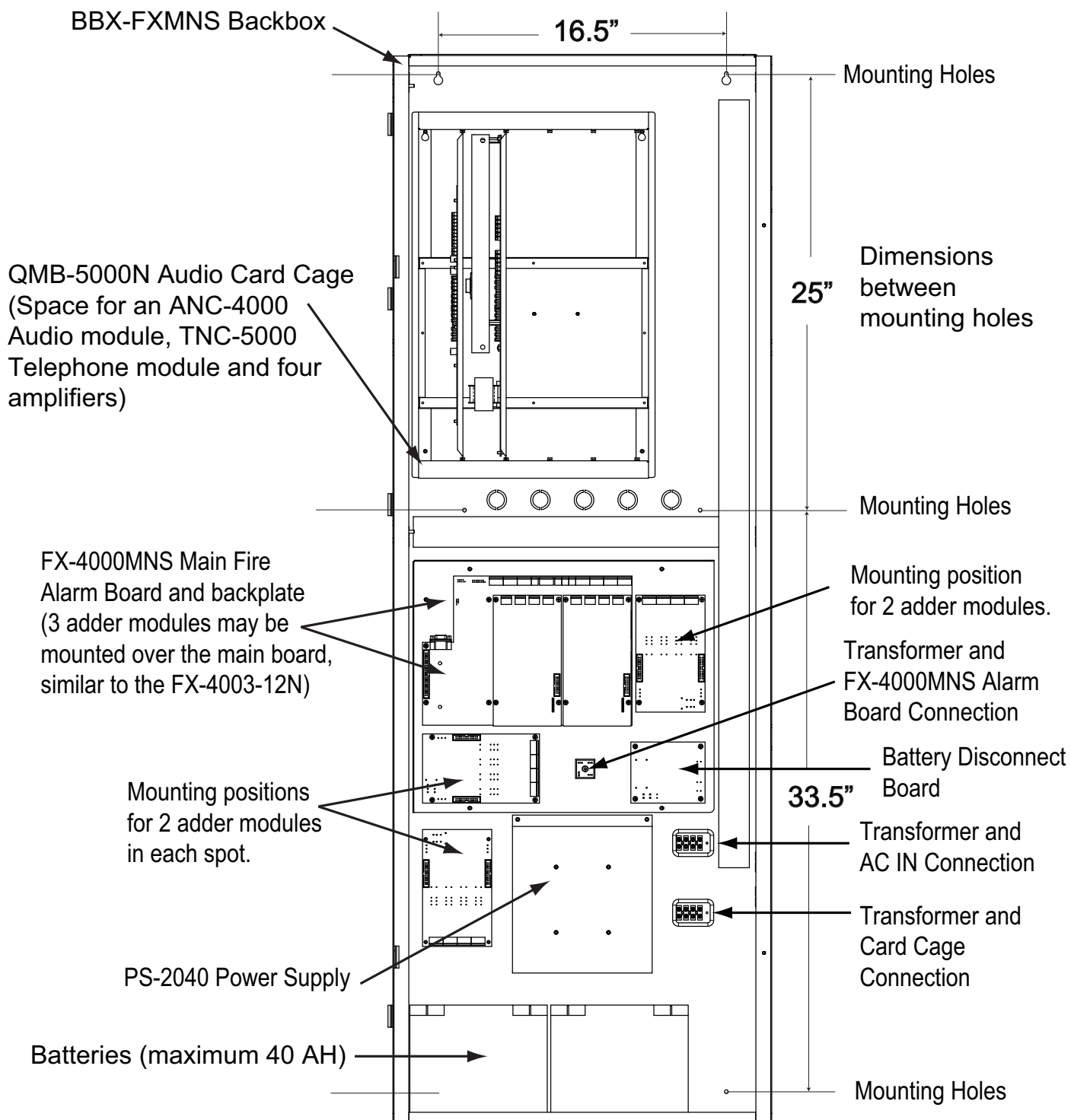


Figure 49 BBX-FXMNS Enclosure Complete View

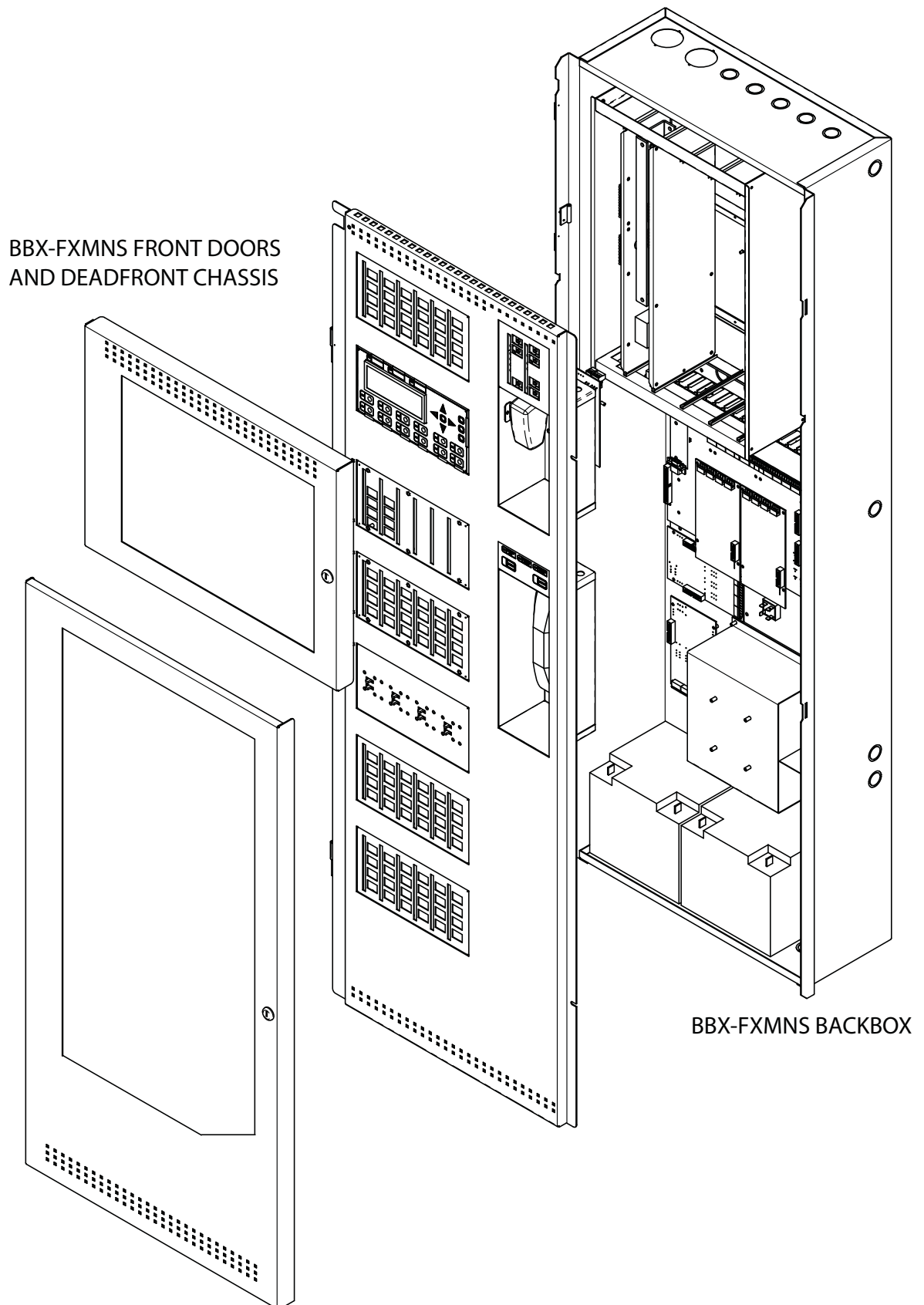
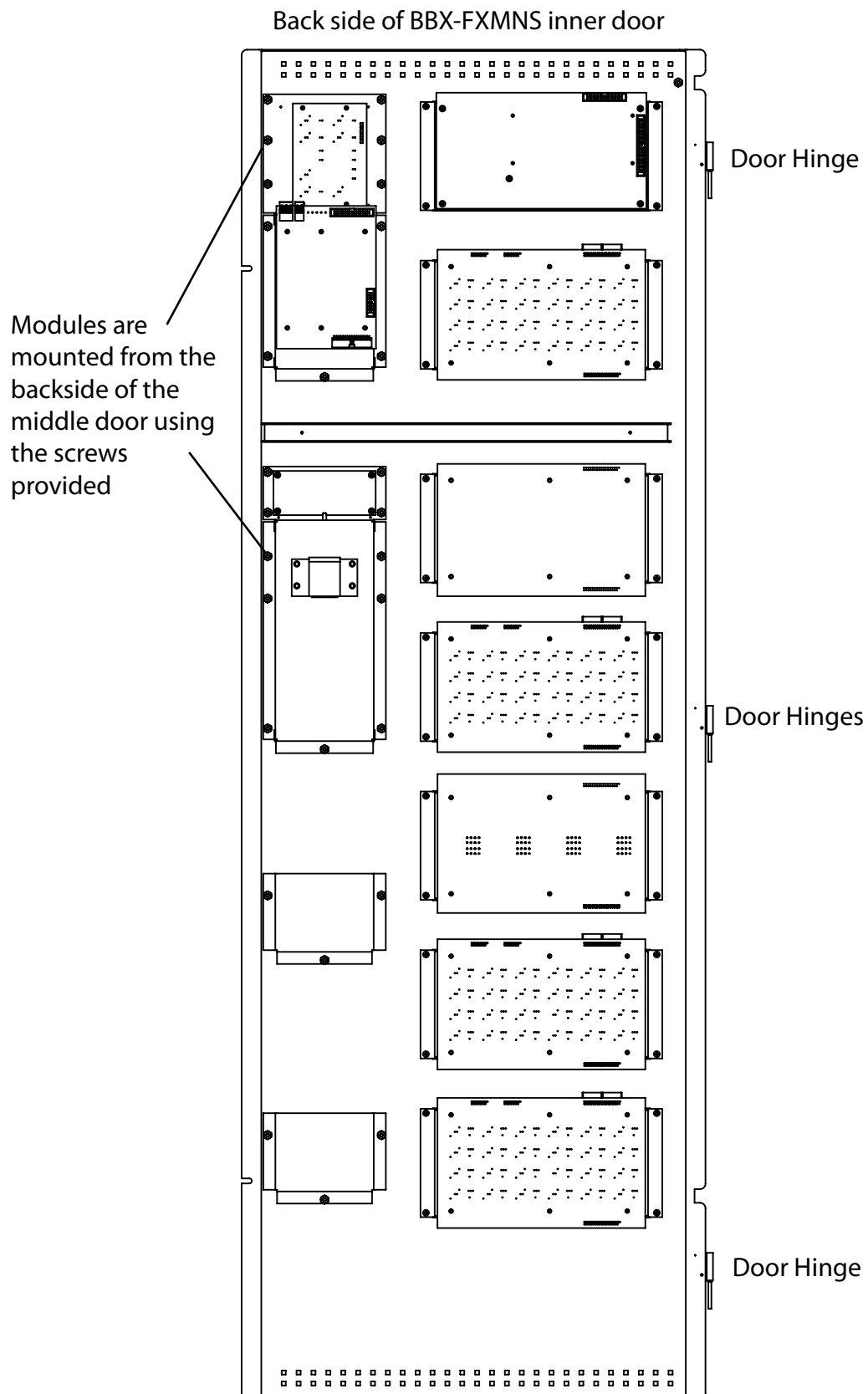


Figure 50 Mounting Vertical Microphone and Telephone Modules in the BBX-FXMNS

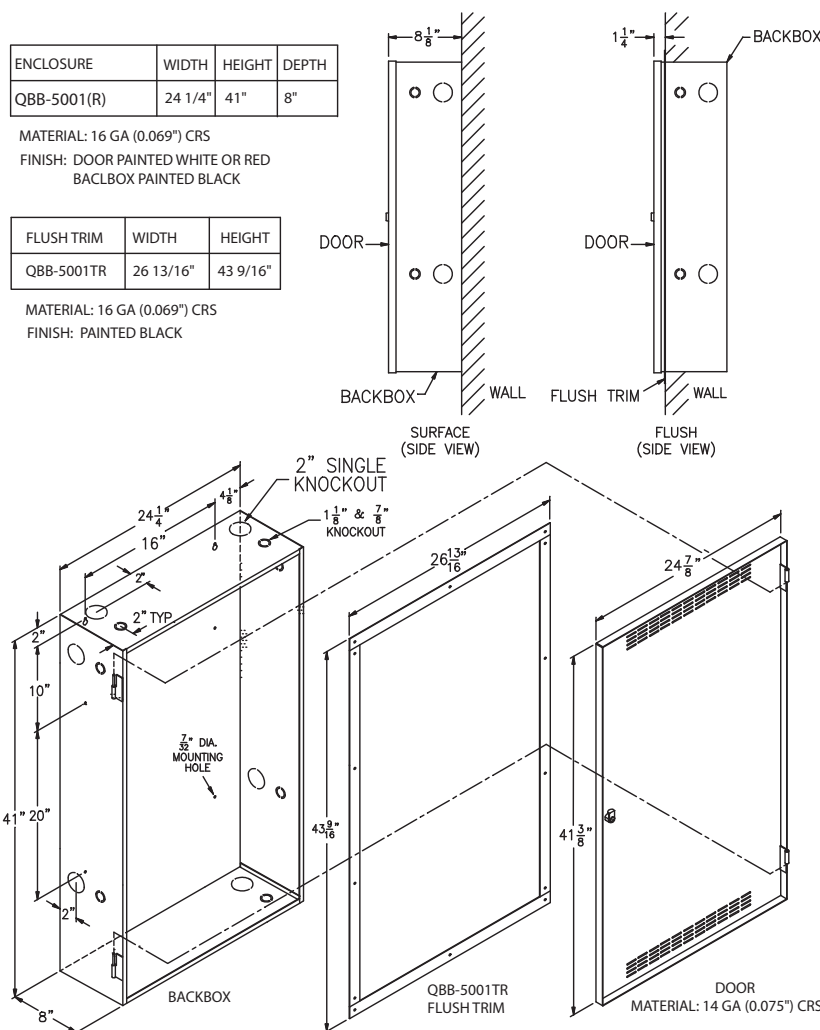


13.0

Mechanical Installation for the QBB-5001(R) Expansion Audio Cabinet

Expansion audio cabinets are mounted as shown in Figure 51 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 51 Expansion Audio Cabinet Mechanical Installation



Notes:

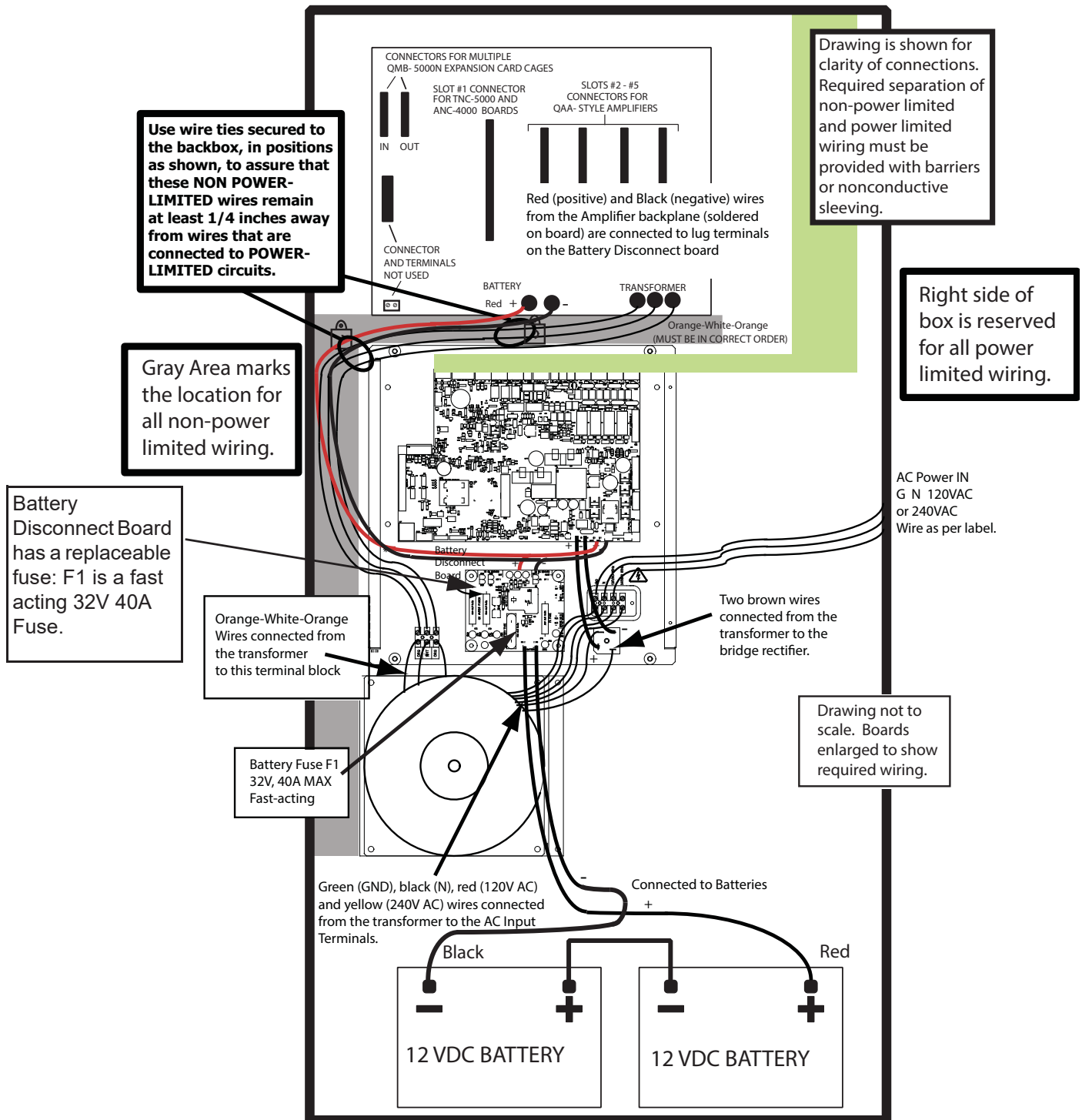
- It is extremely important to connect the audio cabinets earth-ground point (chassis ground) to the earth ground.
- The power supply mounts on the bottom left-hand corner of the backbox and the batteries are placed on the bottom to the right of the power supply. Conduits should be brought in only through the conduits provided at the bottom right hand corner of the cabinet.

14.0

BBX-FXMNS Audio Module Placement and Internal Wiring

The modules that mount into the audio card cage are the amplifier modules. Up to four amplifiers may be installed in each BBX-FXMNS enclosure with one of the four as a backup. Slot #1 is used for the ANC-4000 and/or TNC-5000 modules.

Figure 52 Integrated Fire/Audio Cabinet Internal Power Wiring.



15.0 Integrated Fire Alarm Connection

The FX-4000MNS Chassis consists of the Network Fire Alarm main board and chassis.

15.1 Battery Power

The power cable is used to provide power from the batteries to the FX-4000MNS 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 52.

15.2 Transformer Power

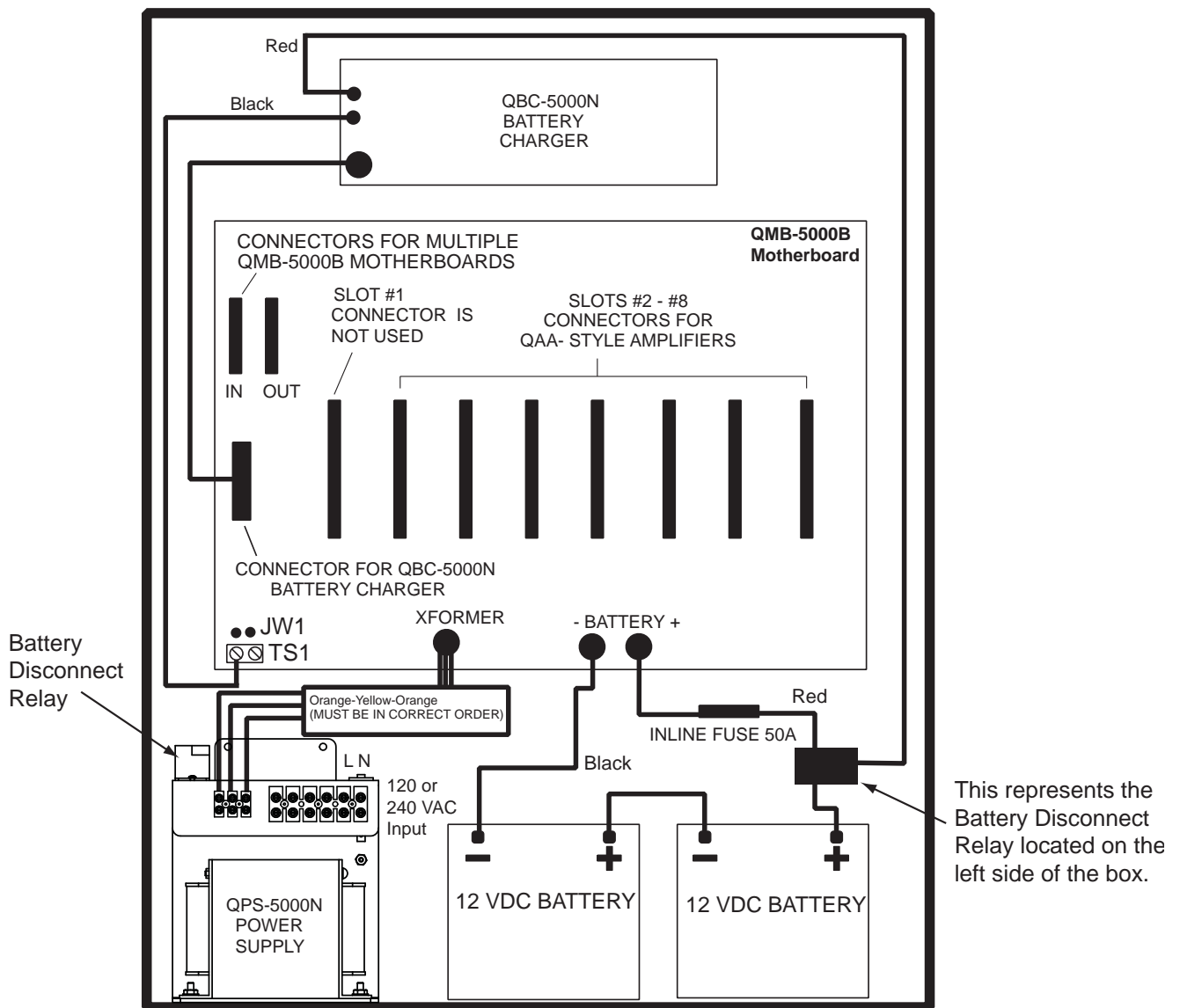
The orange, white, orange wires are soldered on the audio card cage motherboard. They are connected to the terminal block located on the power supply cover (which covers the transformer) in the order left to right, orange-white- orange. The orange-white-orange wires from the transformer are connected 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 52.

16.0 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 53. 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 53 QBB-5001/R Expansion Audio Cabinet Module Placement



SECURE QPS-5000N POWER SUPPLY TO BACKBOX WITH LUGS AND NUTS PROVIDED

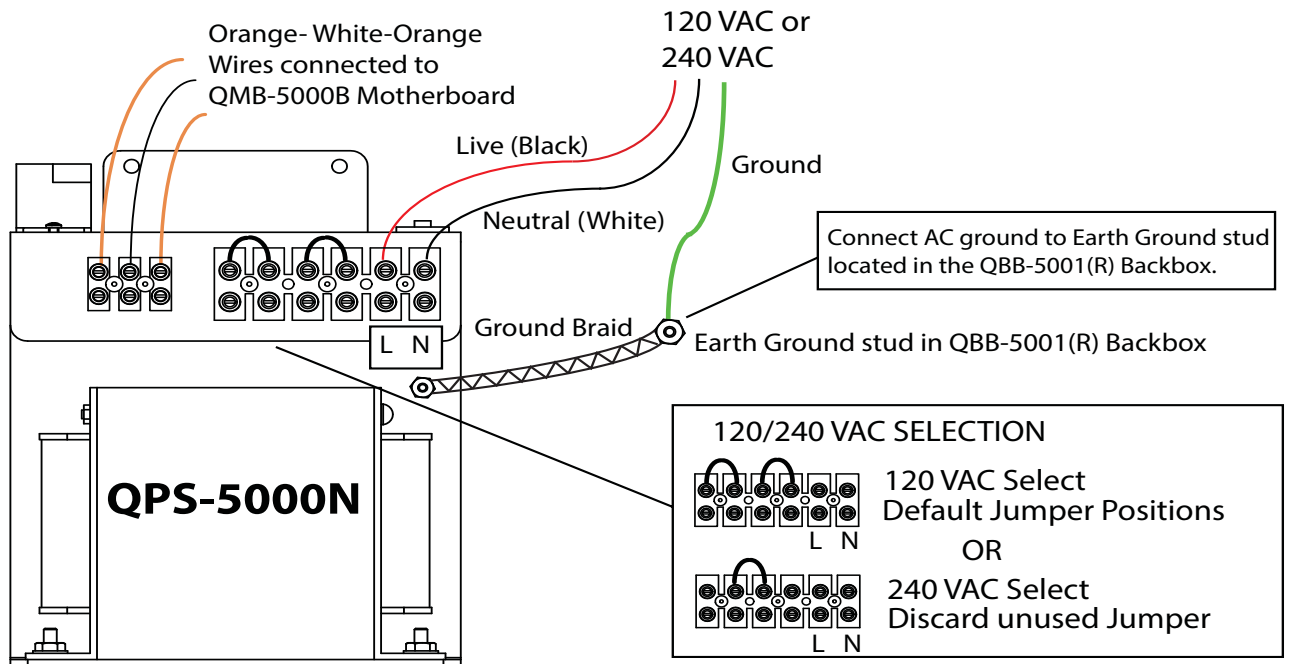
Components on the amplifiers should be facing left when inserted into motherboard. Make sure connections for the power supply and battery charger are as shown above. Place all amplifier modules from left to right in slot positions two to eight. Connect cable MD-525 from

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.

16.1 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.

Figure 54 QPS-5000N Power Supply Wiring Diagram



17.0 Installing and Removing Amplifiers



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

17.1 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.

17.2 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.

18.0

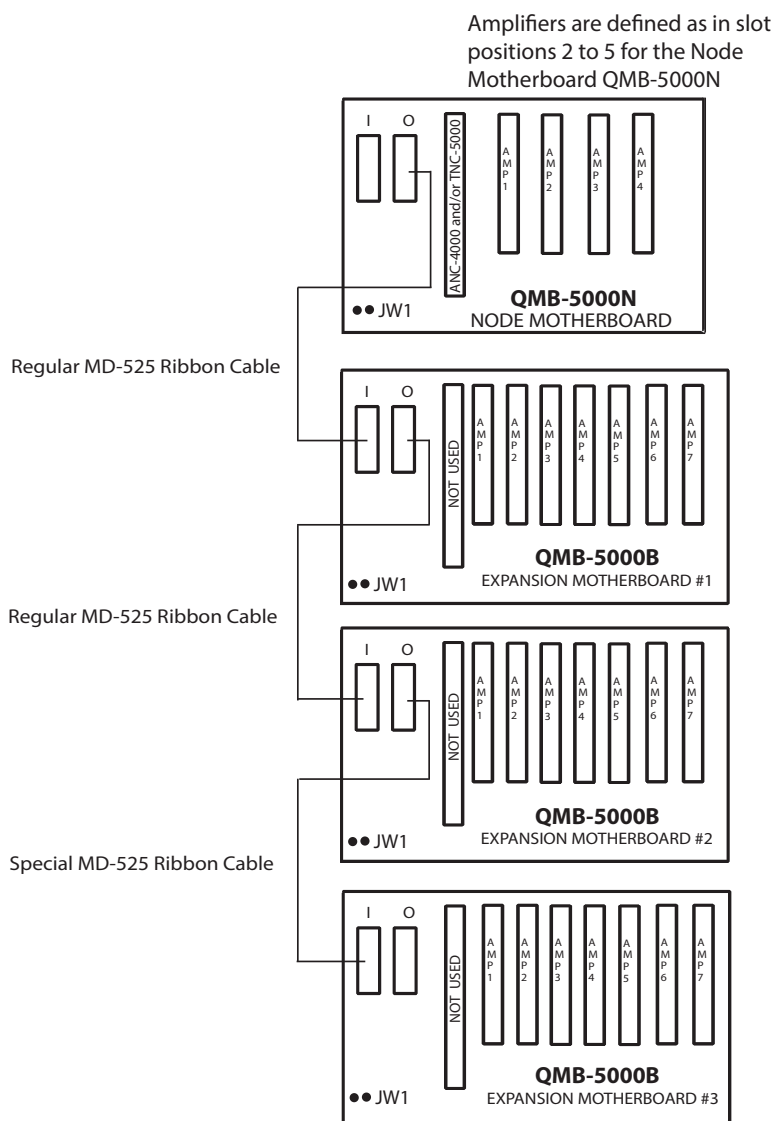
Multiple QBB-5001/R Cabinet Connections

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-4000MNS. 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 55 below). Again another MD-525 cable is connected from the output connector on motherboard #2 to the input connector on motherboard #3.

Figure 55 Interconnecting Extra QMB Motherboard



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

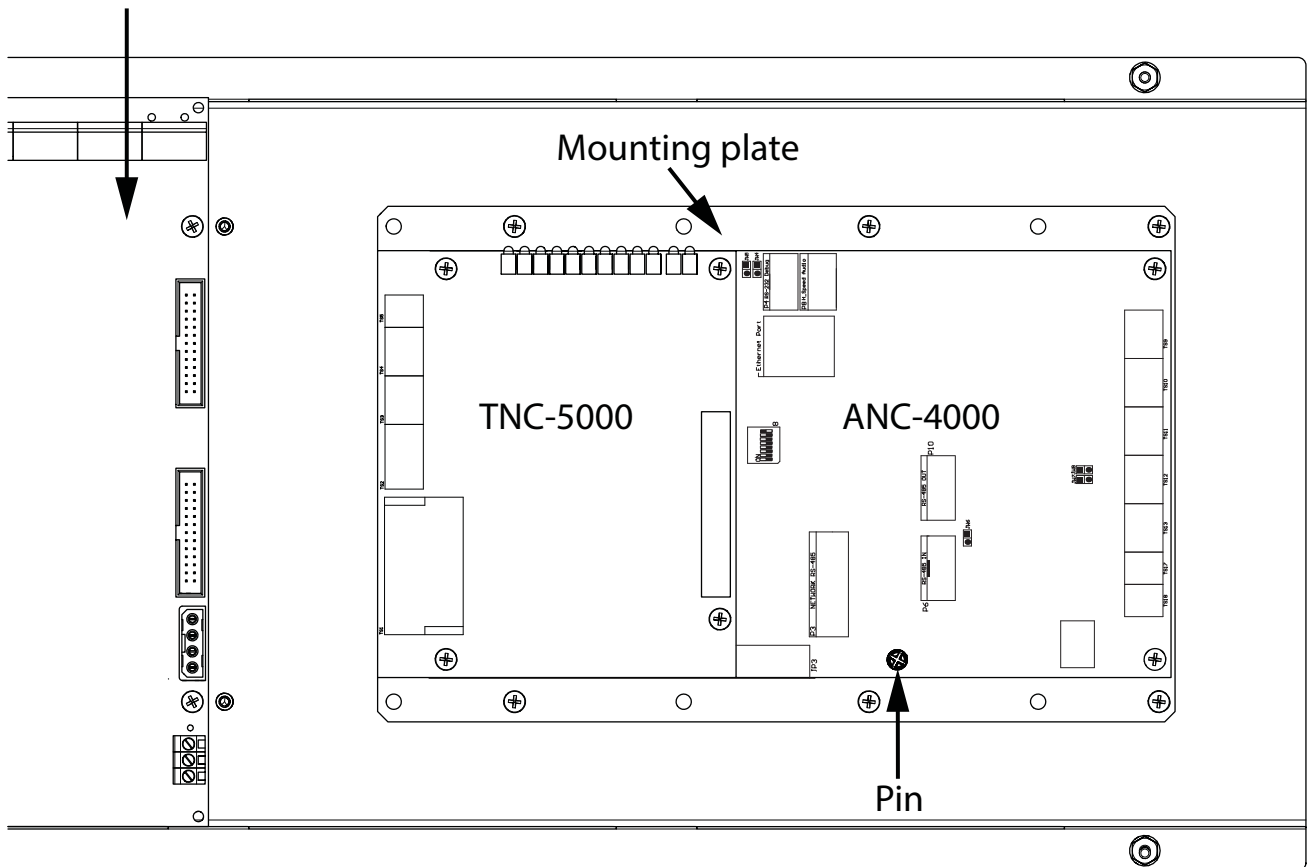
19.0 Audio Network Card and Telephone Network Card

Each Integrated Fire/Audio Cabinet requires an ANC-4000 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-4009-12N.

The ANC-4000 is fastened onto the BK-137 metal mounting plate. The TNC-5000 (if used) is mounted over the ANC-4000 as shown in Figure 56. The mounting plate is then installed to the right of the FX-4009-12N chassis main fire alarm board.

Figure 56 Installation of ANC-4000 and TNC-5000 for FX-4009-12N

Main fire alarm board



20.0 Audio Amplifier Wiring

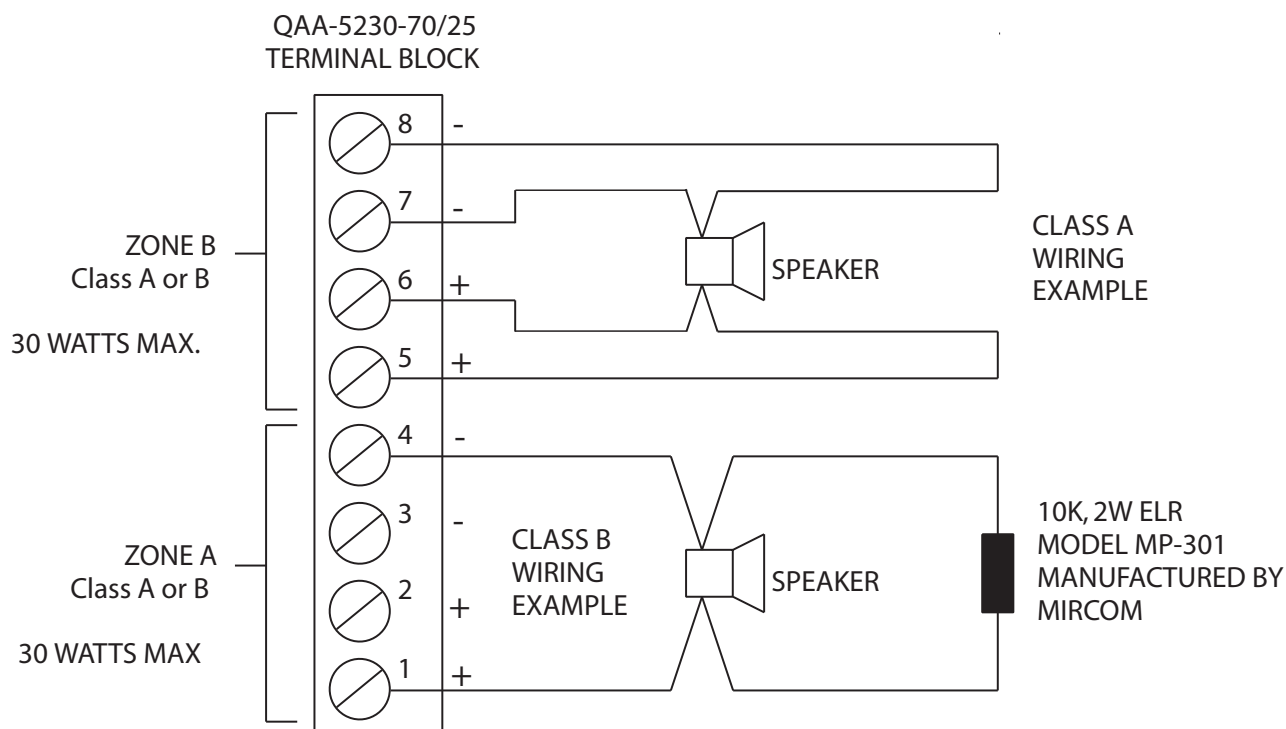
There are five types of amplifiers available:

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

20.1 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 57 QAA-5230-70/25 Wiring



Notes: All circuits are power limited and supervised.

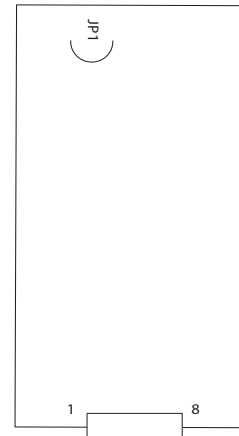
- Cut jumper J1 when using an isolator.
- There are two fuses on this board. Both are 4A fast blow.
- See speaker wiring chart for wire gauge selection.

Figure 58 Using a Speaker Isolator

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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.

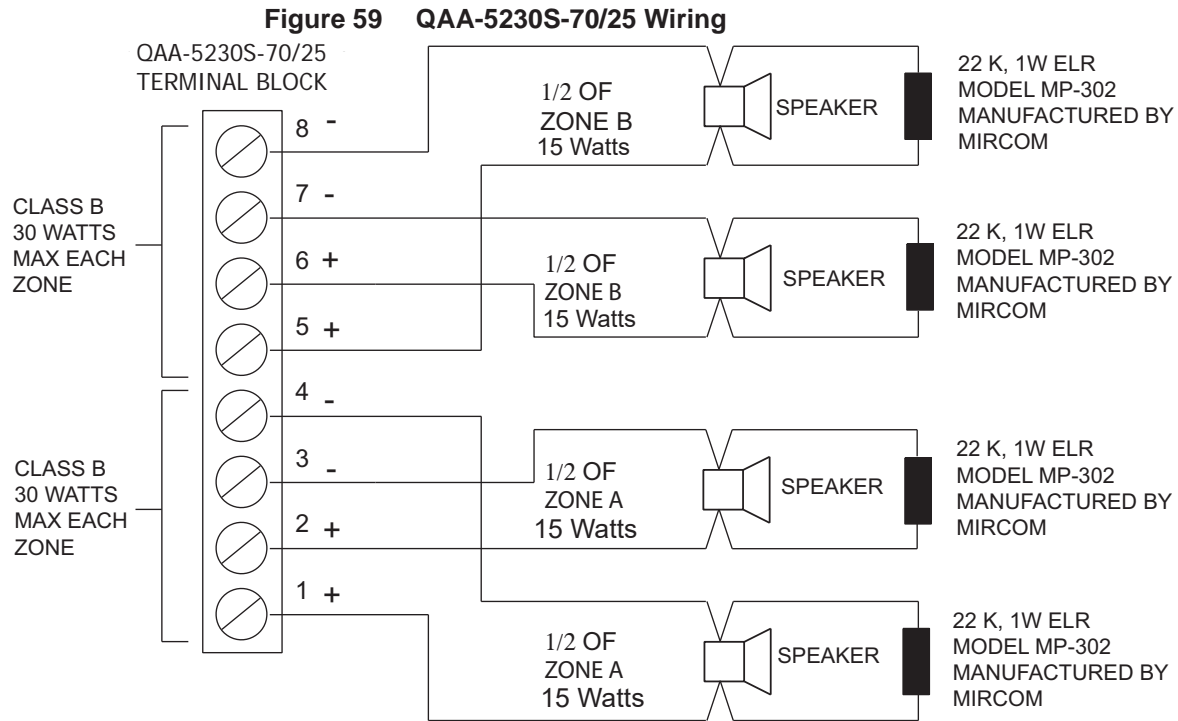
CUT JUMPER JP1 WHEN USING A SPEAKER ISOLATOR



QAA-5230-70/25 AND QAA-5160-70/25 AMPLIFIERS

20.2 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.



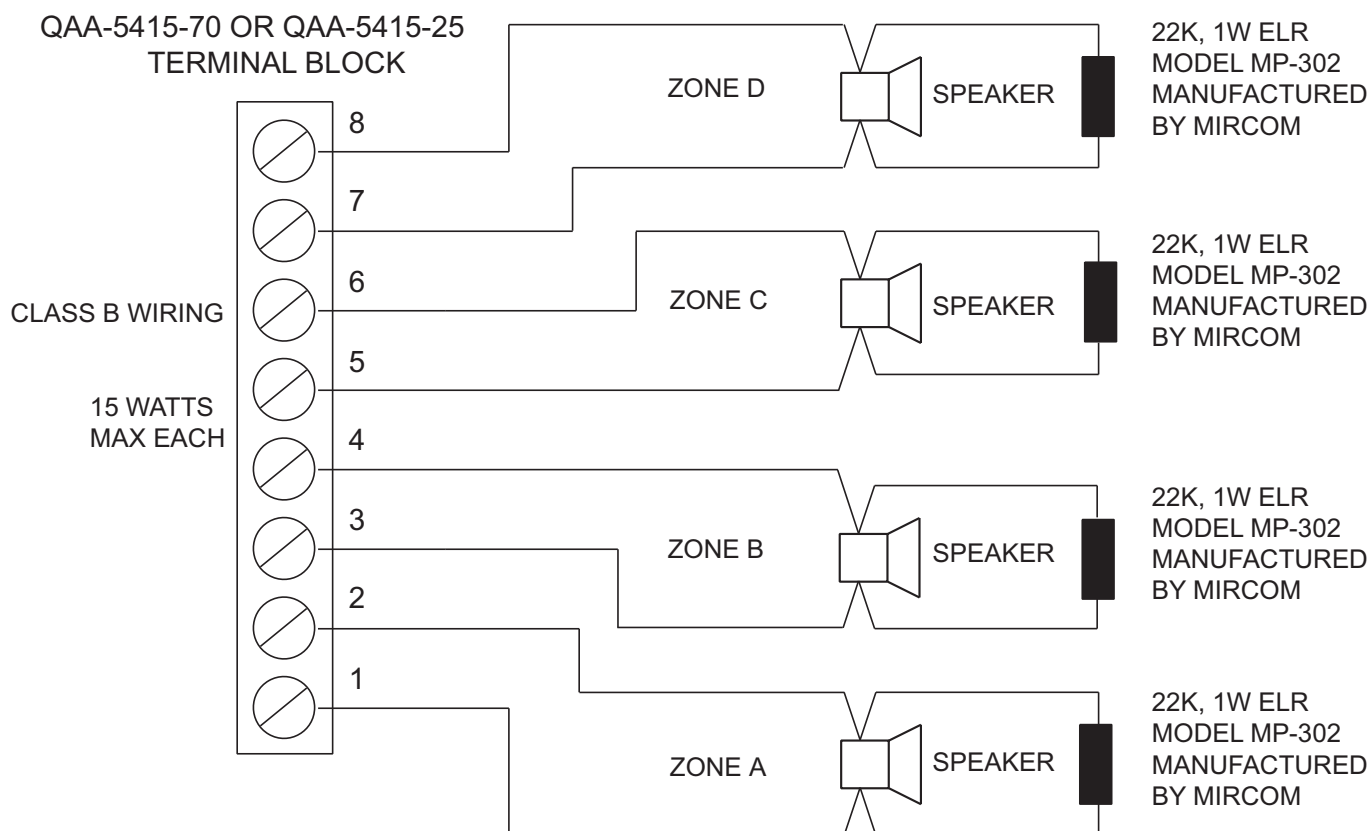
Notes:

- 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.

20.3 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 62. The QAA-5415-25 is the same quad amplifier as the QAA-5415 but instead of 70 Volts it is 25 Volts.

Figure 60 QAA-5415-70 or QAA-5415-25 Wiring

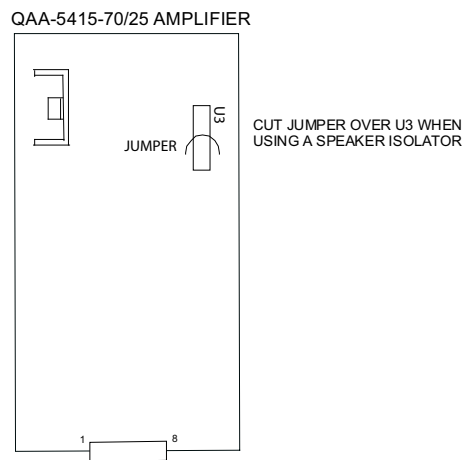


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Notes:

- 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 61 Using a Speaker Isolator with the QAA-5415-70 or QAA-5415-25 Amplifiers



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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 62 QAA-4CLA Class A Converter For QAA-5415-70/25 Amplifier

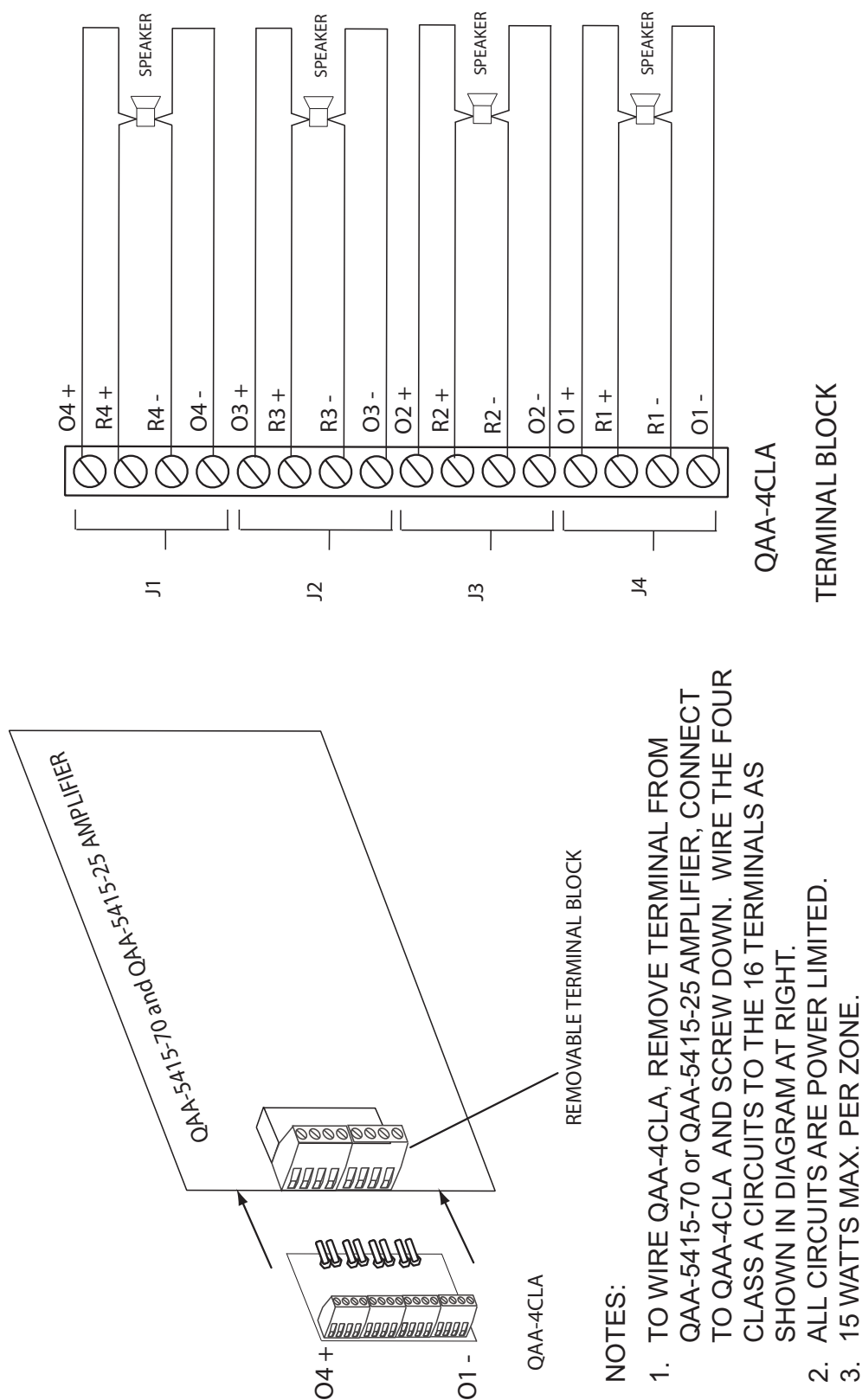
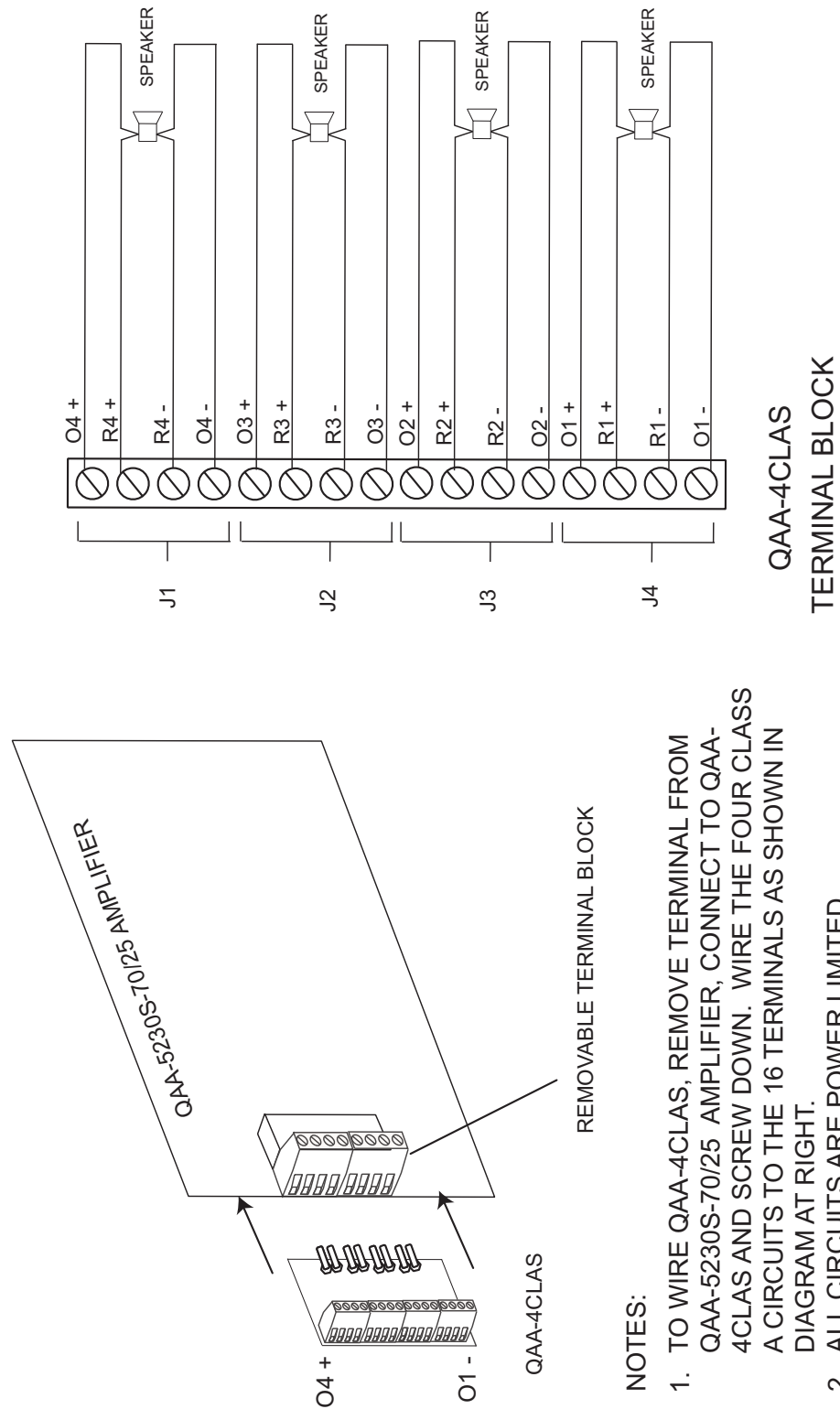


Figure 63 QAA-4CLAS Class A Converter For QAA-5230S-70/25 Amplifier



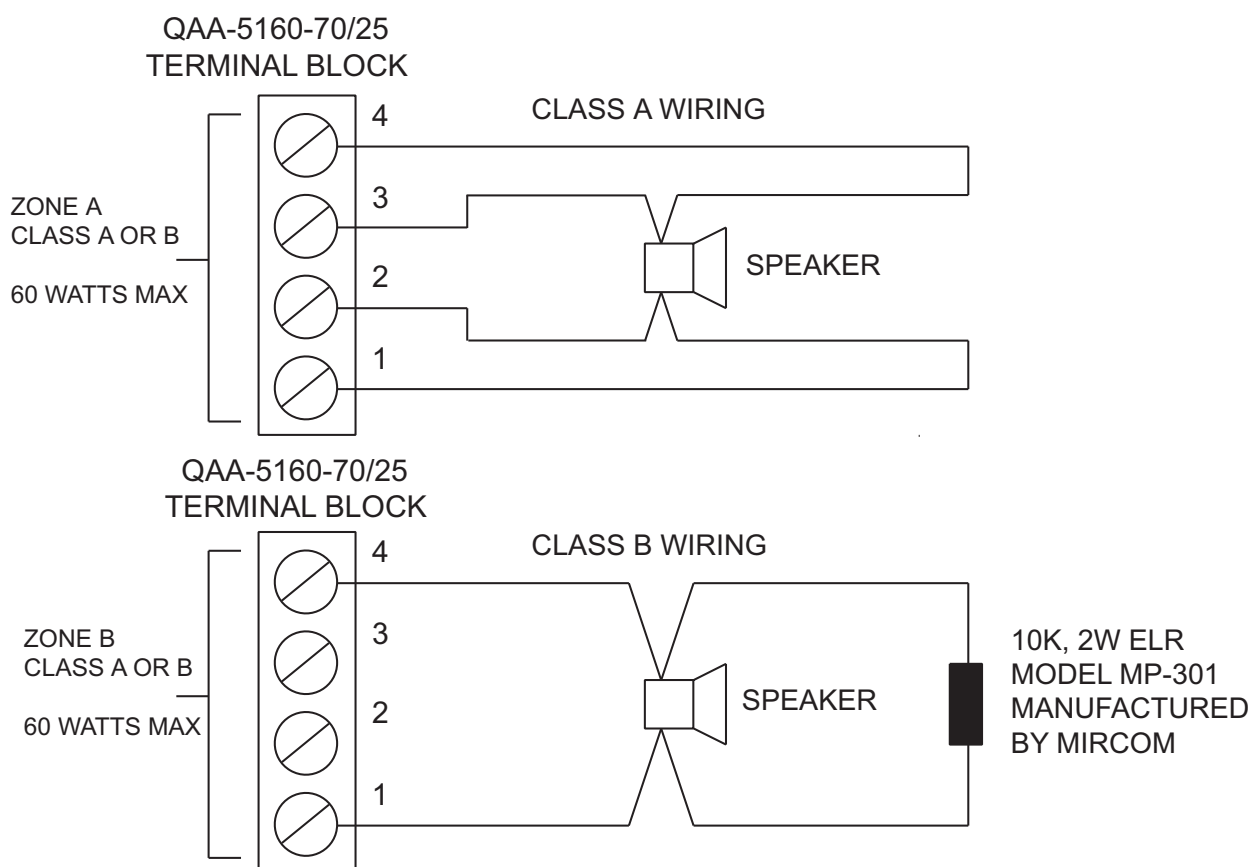
20.4 QAA-5160-70/25

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

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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 58).

Figure 64 QAA-5160-70/25 Wiring



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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 13 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:

For each speaker zone, select the total zone power.

Distance shown is calculated to the last speaker, based on the worst case with all speakers lumped at the end.

Calculation is based on a 1db power loss (20%) and a source of 70V or 25V.

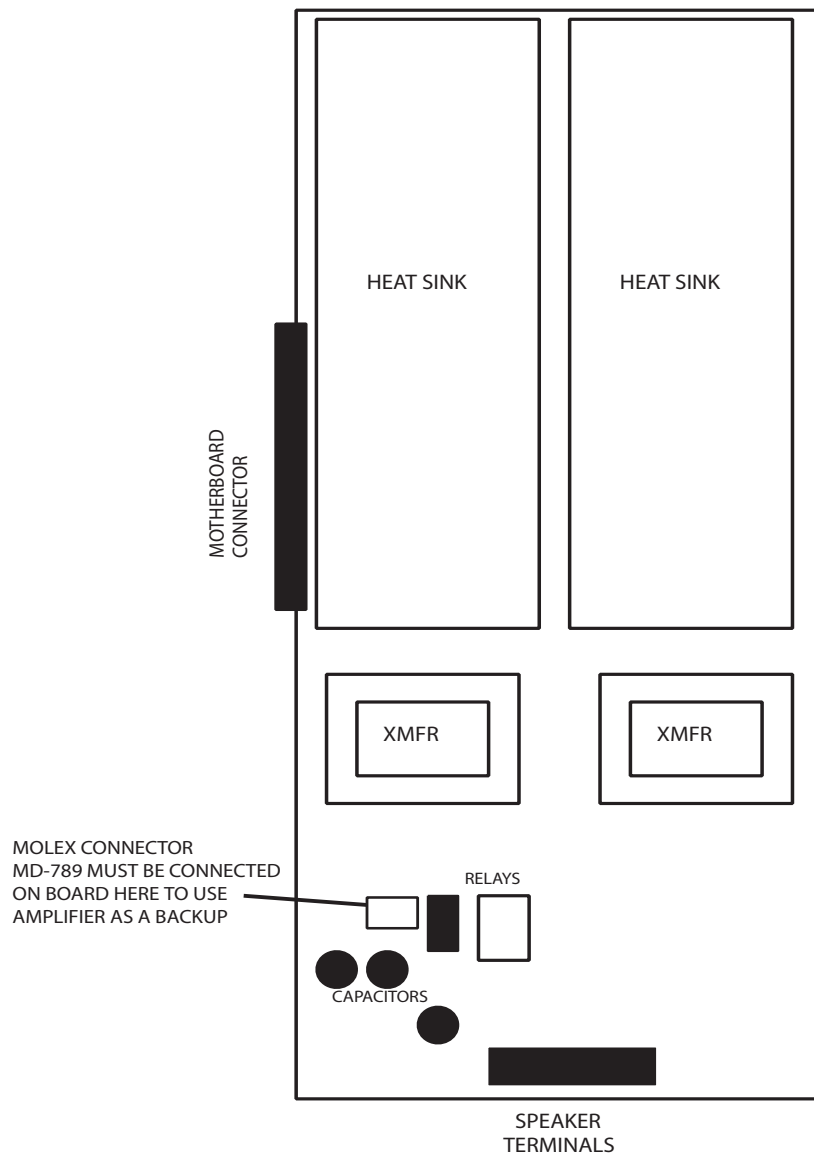
Table 14 Wiring Chart for 25V Speakers

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

20.5 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 65 QAA-5160-70/25 Amplifier (Backup Application)



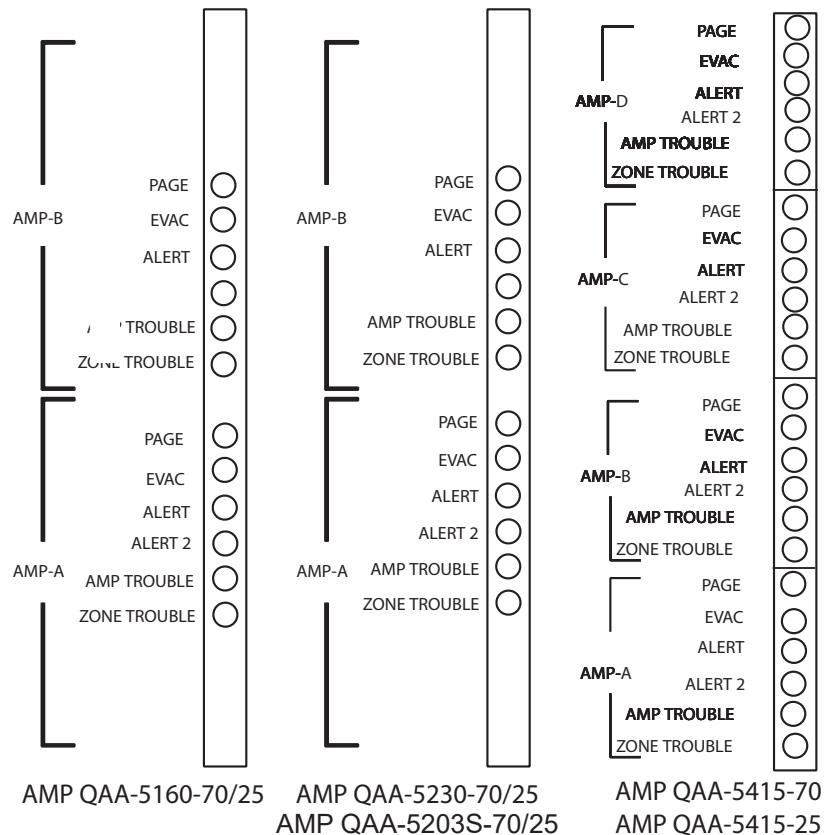
Any amplifier may be designated as the backup amplifier and this backup amplifier must have the MD-789 molex connector placed in the bottom left-hand corner of the board as shown in the adjacent figure. The QAA-5160-70/25 as backup amplifier is inserted into the motherboard. No connections are made to 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).

21.0 Amplifier Displays & Controls

Figure 66 Audio Cabinet Displays and Controls



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.



Notes:

- The QAA-5160-70/25 only has displays for "Amp-A", while the QAA-5230-70/25 & QAA-5203S-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.

22.0 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 52, 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.

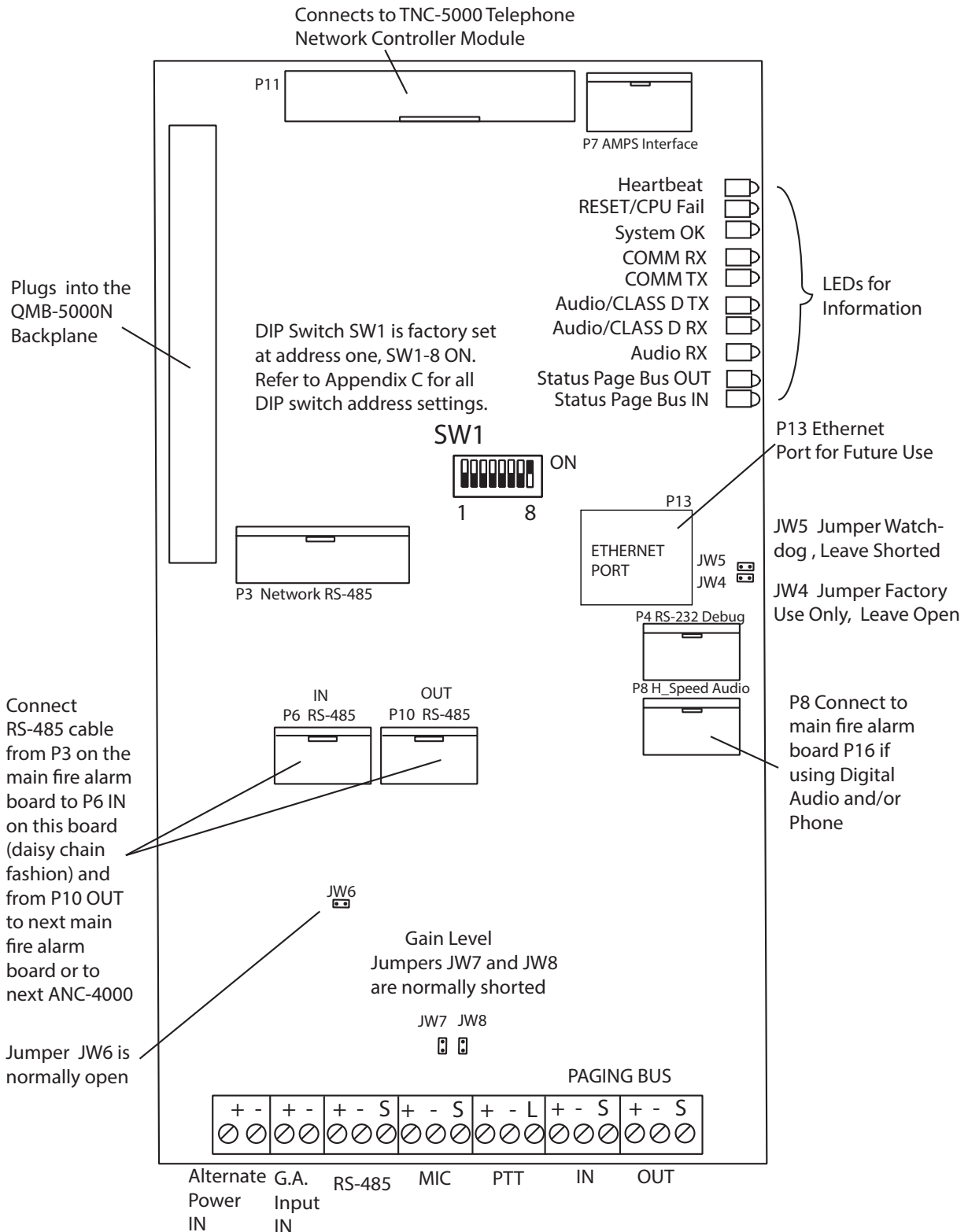
1. Check and secure all interconnection wiring cables.
2. Check and secure all interconnection wiring cables to the Fire Alarm Control Panel.
3. Check the A.C. power wiring for proper connection.
4. Check that the chassis is connected to earth ground.

23.0 Audio Configuration

The configuration of the FleX-Net™ is accomplished via the MSW-036 Personal Computer based Configurator Software.

24.0 ANC-4000 Audio Network Controller Module

Figure 67 ANC-4000 Audio Network Controller board



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

25.0 ANC-4000 Wiring

Figure 68 ANC-4000 Wiring Diagram

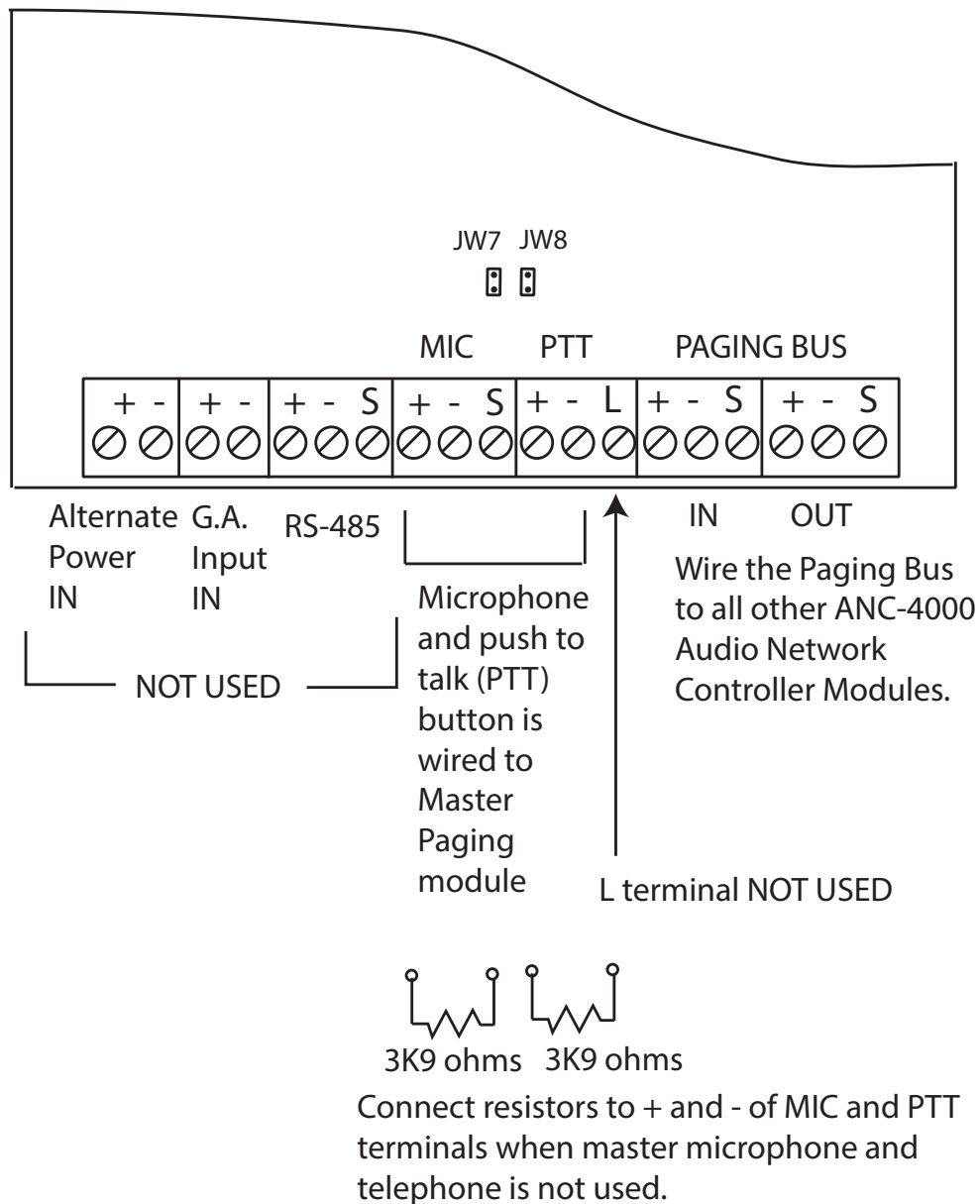
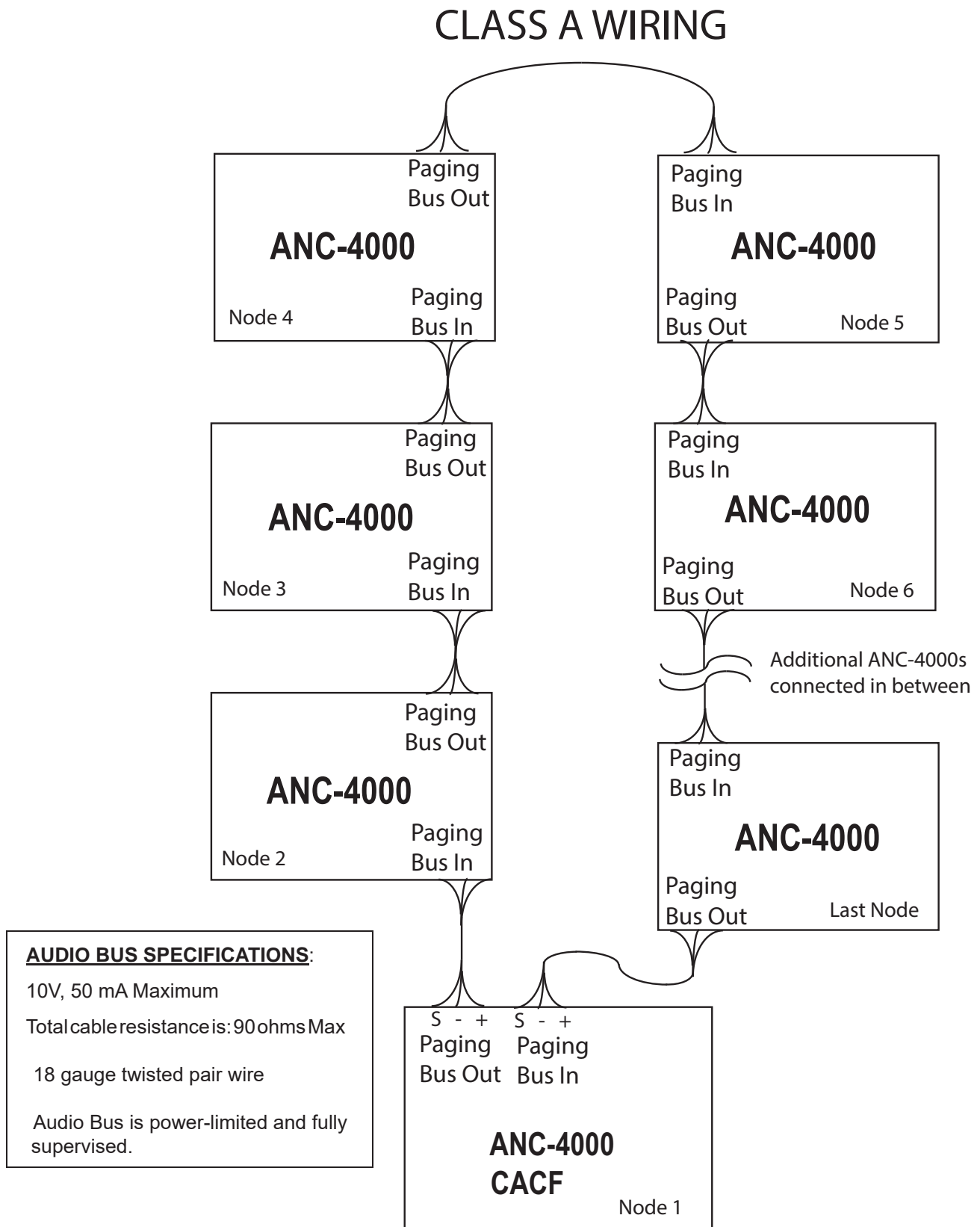


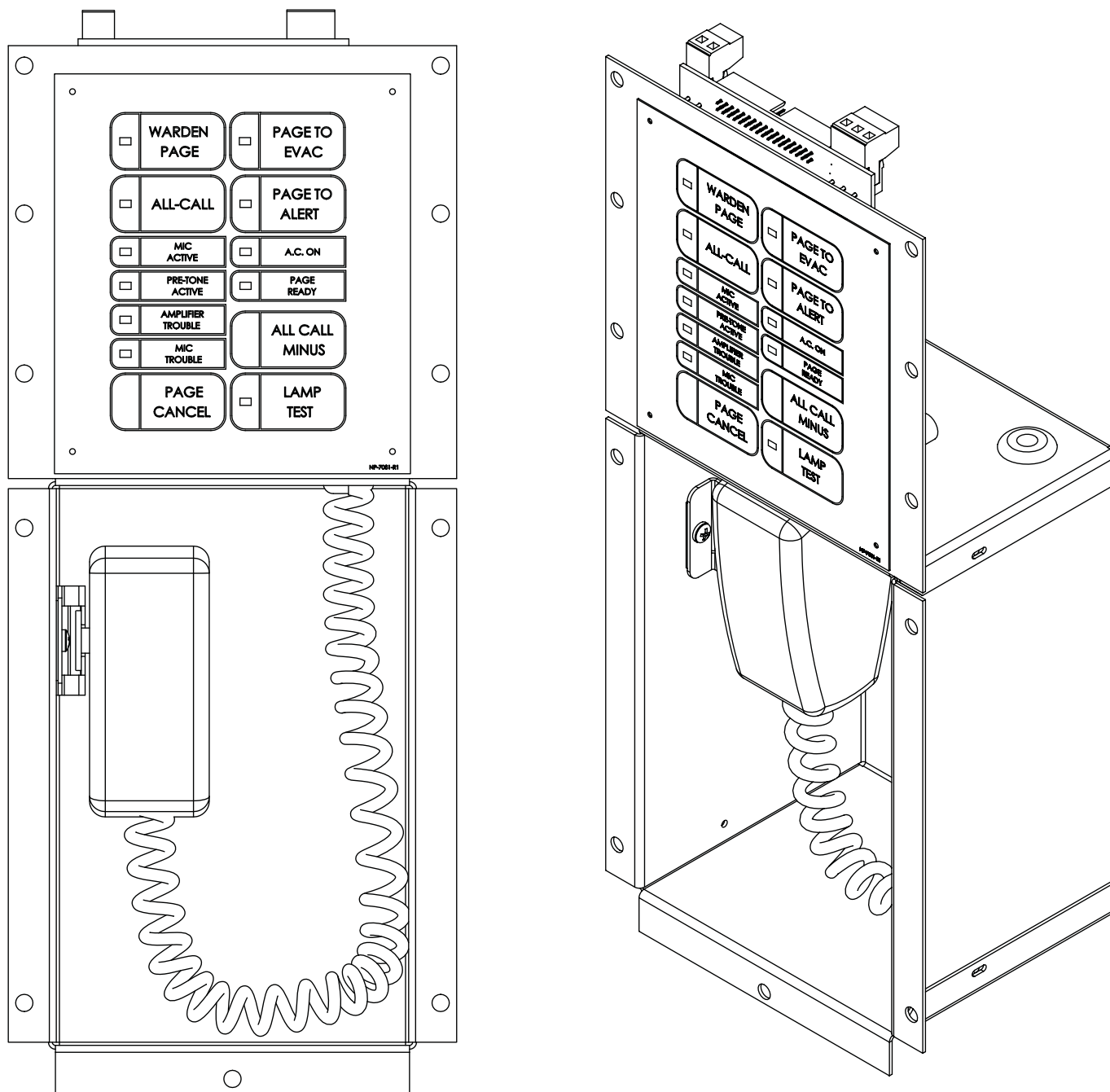
Figure 69 Audio Paging Bus Wiring



26.0 QMP-5101NV Vertical Paging Control Module

The QMP-5101NV Paging Module is a vertical paging unit which fits into the new BBX-FXMNS Enclosure. It mounts on the inside chassis (part of the BBX-FXMNS). Connections and terminal wiring are the same as for the QMP-5101N. Refer to Figure 72 for wiring instructions for both the QMP-5101NV and QMP-5101N paging control modules.

Figure 70 QMP-5101NV Vertical Paging Control Module



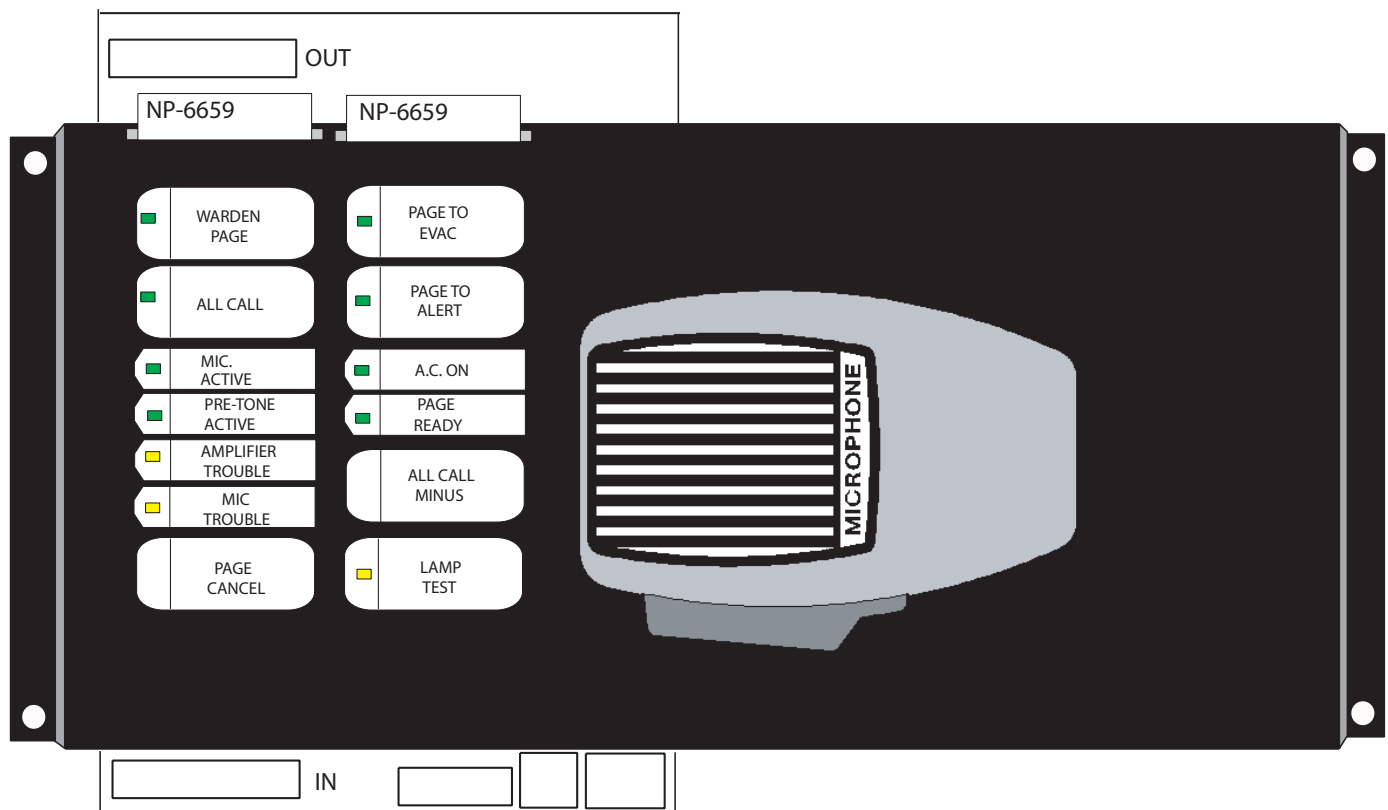
27.0 QMP-5101N Network Master Paging Control Module

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

The QMP-5101N Network Master Paging Control Module connects via a ribbon cable to the first QAZT-5348DS or QAZT-5302DS Zoned Selector Panel and to the previous display module. It also has wiring terminals for connection to the ANC-4000 Audio Network Controller Module in the cabinet

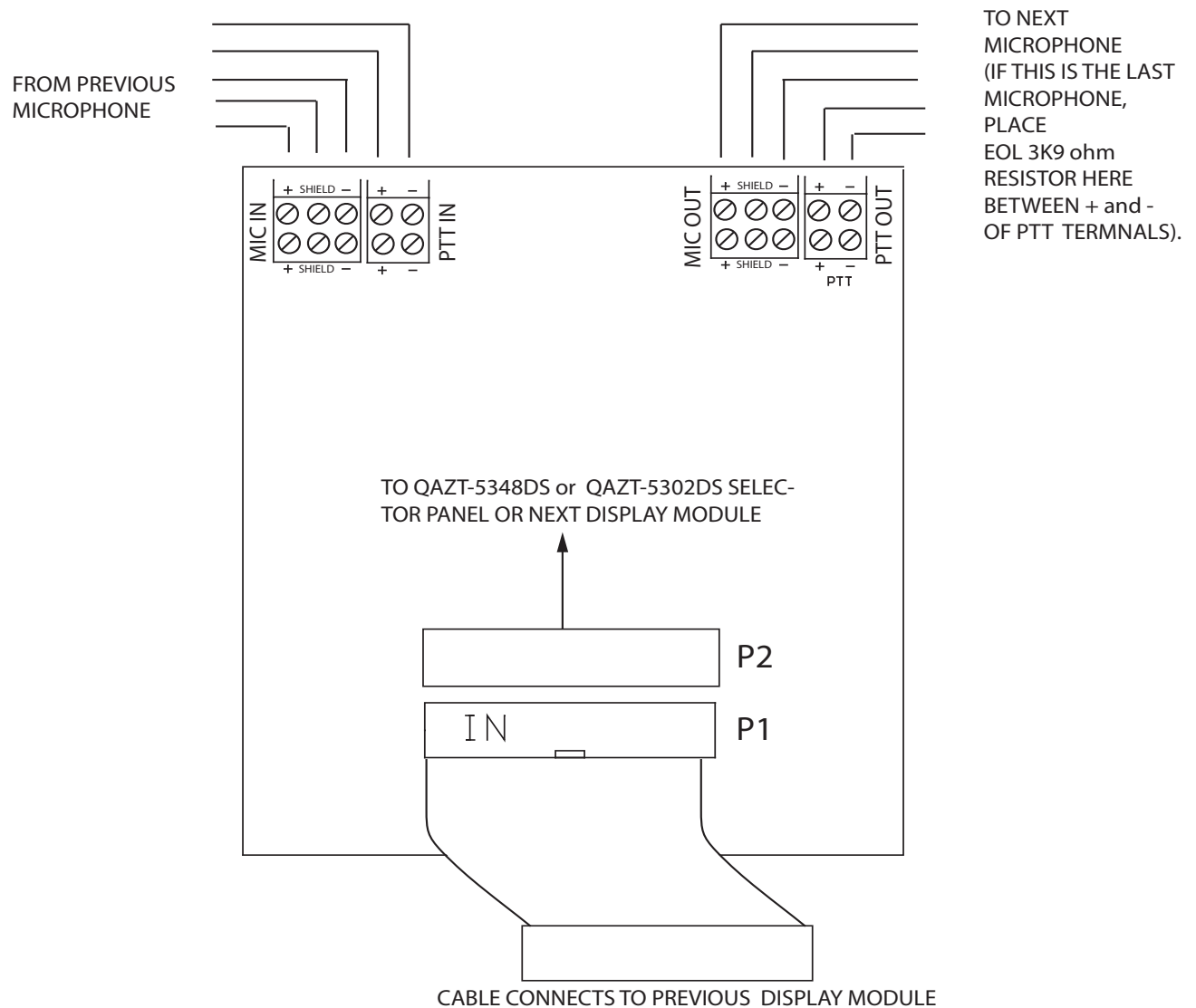
Slide-in labels NP-6659 are placed so that push buttons and LEDs are labelled as shown in Figure 71.

Figure 71 QMP-5101N Network Master Paging Control Module



Connect ribbon cable from P1 (IN) to previous display module. Connect P2 (OUT) to the QAZT-5348DS or QAZT-5302DS Zoned Selector Panel or next display module. Wire the positive and negative terminals and the microphone MIC positive, negative and shield to the ANC-4000 Audio Network Controller Module corresponding terminals.

Figure 72 QMP-5101NV and QMP-5101N Network Master Paging Control Module Connections and Terminal Blocks



The interface wiring between the QMP-5101NV/N and ANC-4000 is as follows:

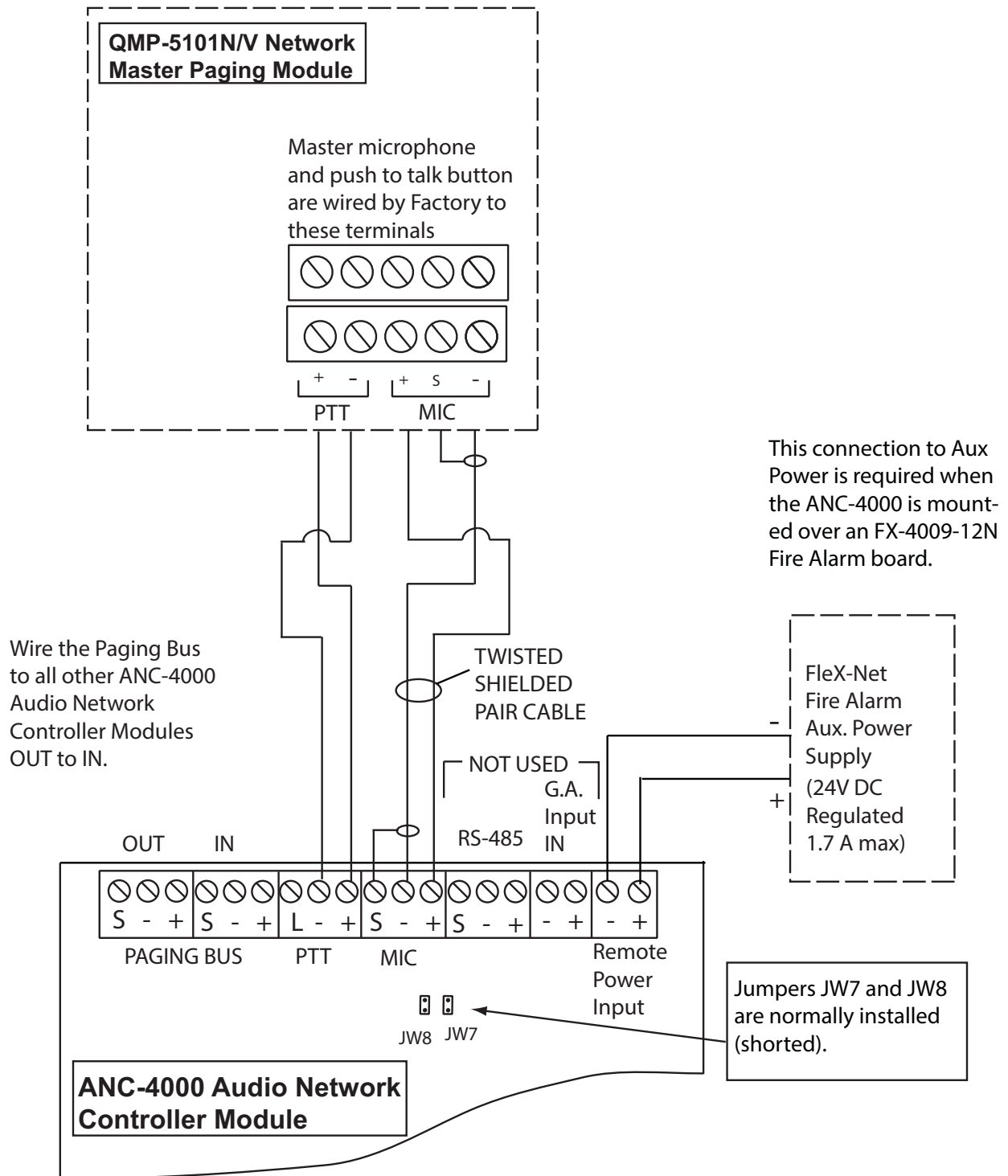
MIC+, MIC-, SHLD:	18-22 AWG Twisted Shielded Pair
PTT+, PTT-:	18-22 AWG Twisted Pair

The maximum wiring run from the QMP-5101NV/N and the ANC-4000 is 20 feet or 6 metres.

28.0

QMP-5101NV/N Network Paging Wiring

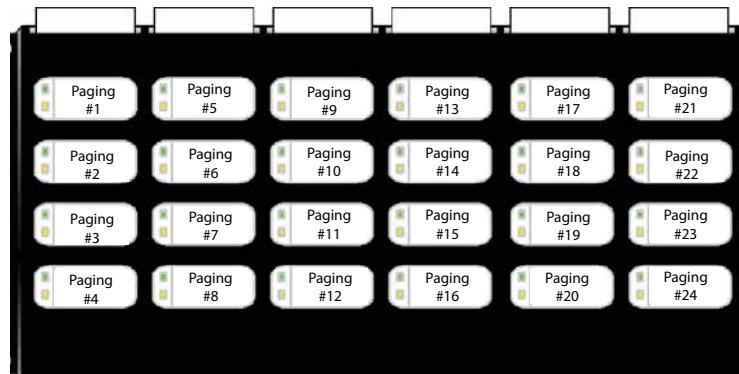
Figure 73 QMP-5101NV/N Network Master Paging Control Module Wiring to the ANC-4000 Audio Network Controller Module



29.0 QAZT-5348DS and QAZT-5302DS Zoned Paging Selector Panels

Each QAZT-5348DS annunciates and controls up to 48 audio zones. Each QAZT-5302DS 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.

Paging zone selection buttons toggle ON and OFF voice paging for that zone.



30.0 **Paging Operation**

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

30.1 **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.

MIC Active LED

Flashes green to indicate any activity on the paging bus (i.e. other microphone in use).
Illuminates steady green when associated microphone (at proximity of LED) is in use.

Pre-Tone Active LED

Steady green when paging and warden paging is active.

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.

30.2 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.

30.3 QAZT-5348DS and QAZT-5302DS 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.

30.4 QAZT-5348DS and QAZT-5302DS Pushbuttons

Page Button (if enabled)

Selects / deselects that zone for voice paging.

31.0 TNC-5000 Telephone Network Controller Module

31.1 Module Mounting Locations

The TNC-5000 Telephone Network Controller board can be mounted in two ways. The TNC-5000 Telephone Network Controller Board is mounted above (beside) the ANC-4000 Audio Network board, both are mounted on a metal backplate and the ANC-4000 plugs into slot 1 on the QMB-5000N audio backplane of the BBX-FXMNS, see Figure 74. The other position is over the ANC-4000 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 75

Figure 74 Mechanical Installation of the TNC-5000 Telephone Network Controller Board within the BBX-FXMNS

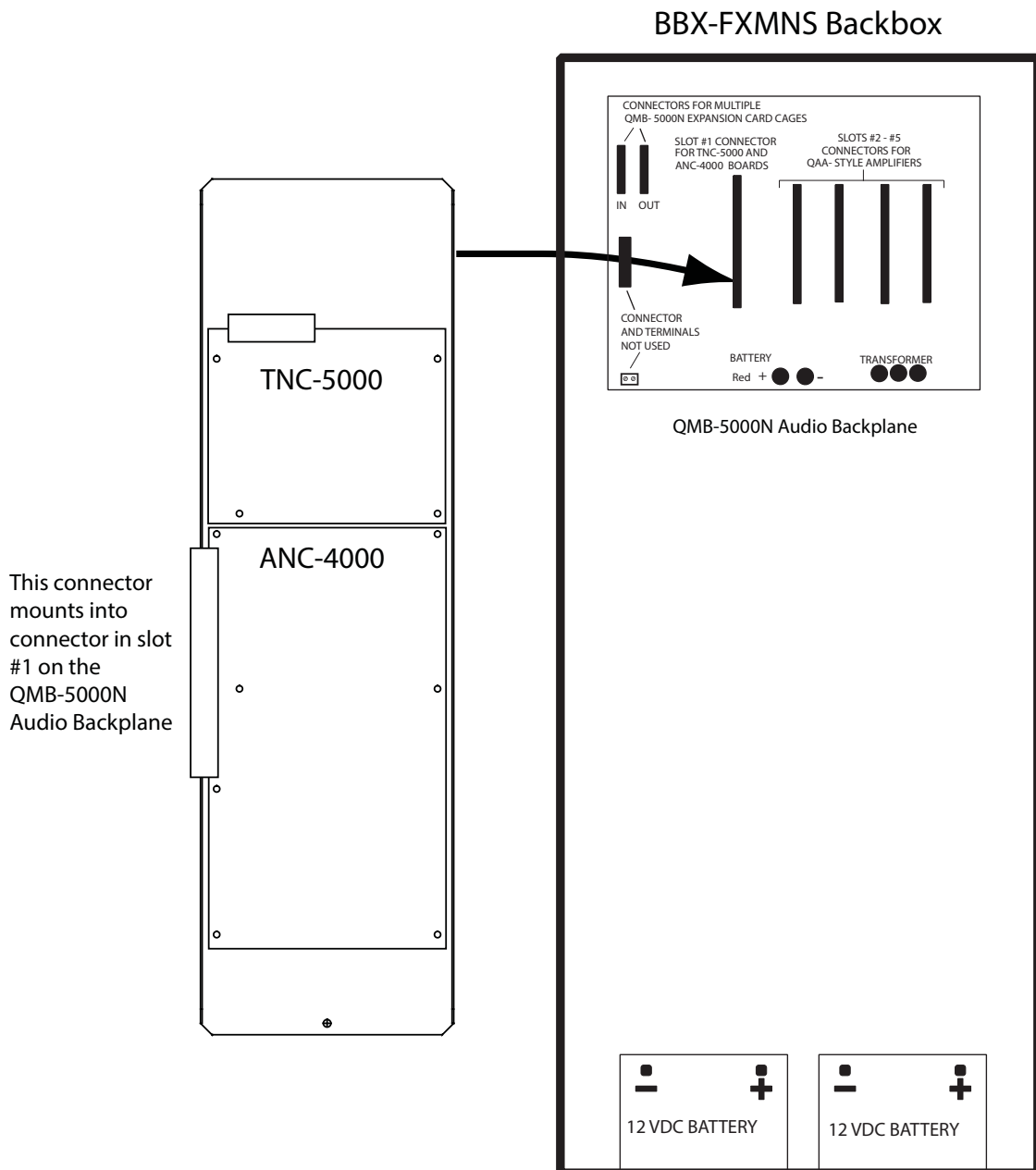
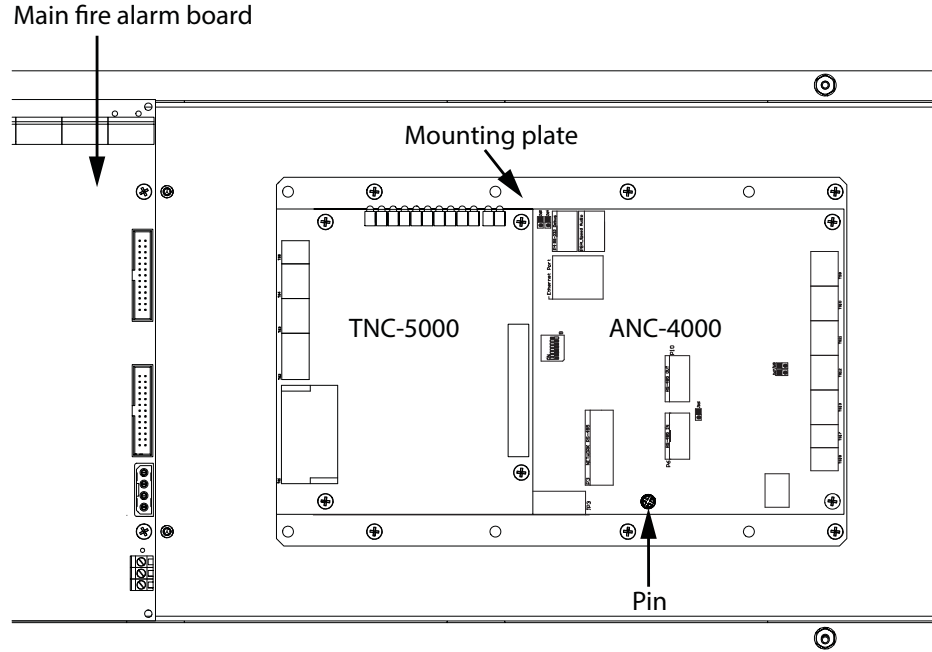


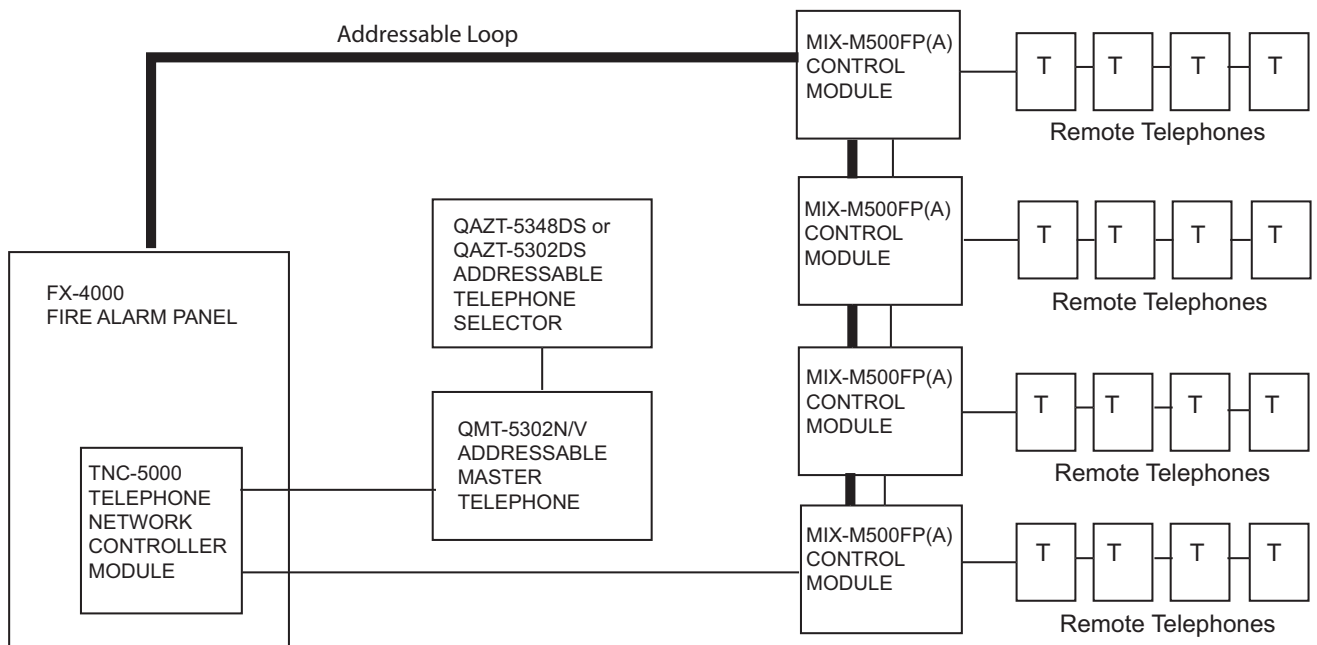
Figure 75 Mechanical Installation of the TNC-5000 within the BB-5008 and BB-5014



31.2 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-5348DS or QAZT-5302DS) are connected to the Master Telephone by cable only. The MIX-M500FP(A) Control Modules are connected to the addressable loop from the FX-4000 and to each other and the Master Telephone. Remote telephones are connected to the control modules.

Figure 76 Typical Addressable Telephone Set-up



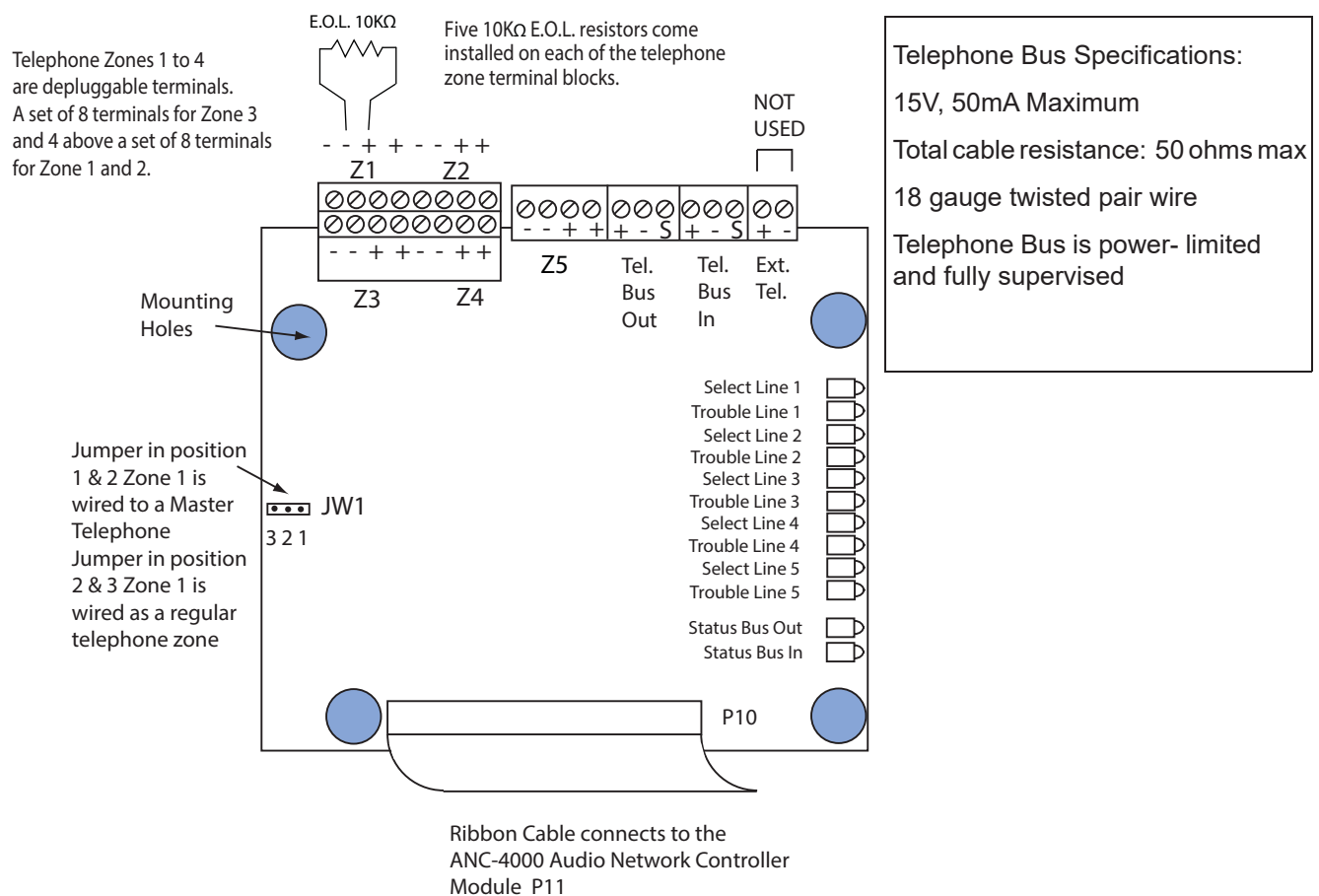
31.3 Connectors and Terminal Locations

Refer to Figure 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

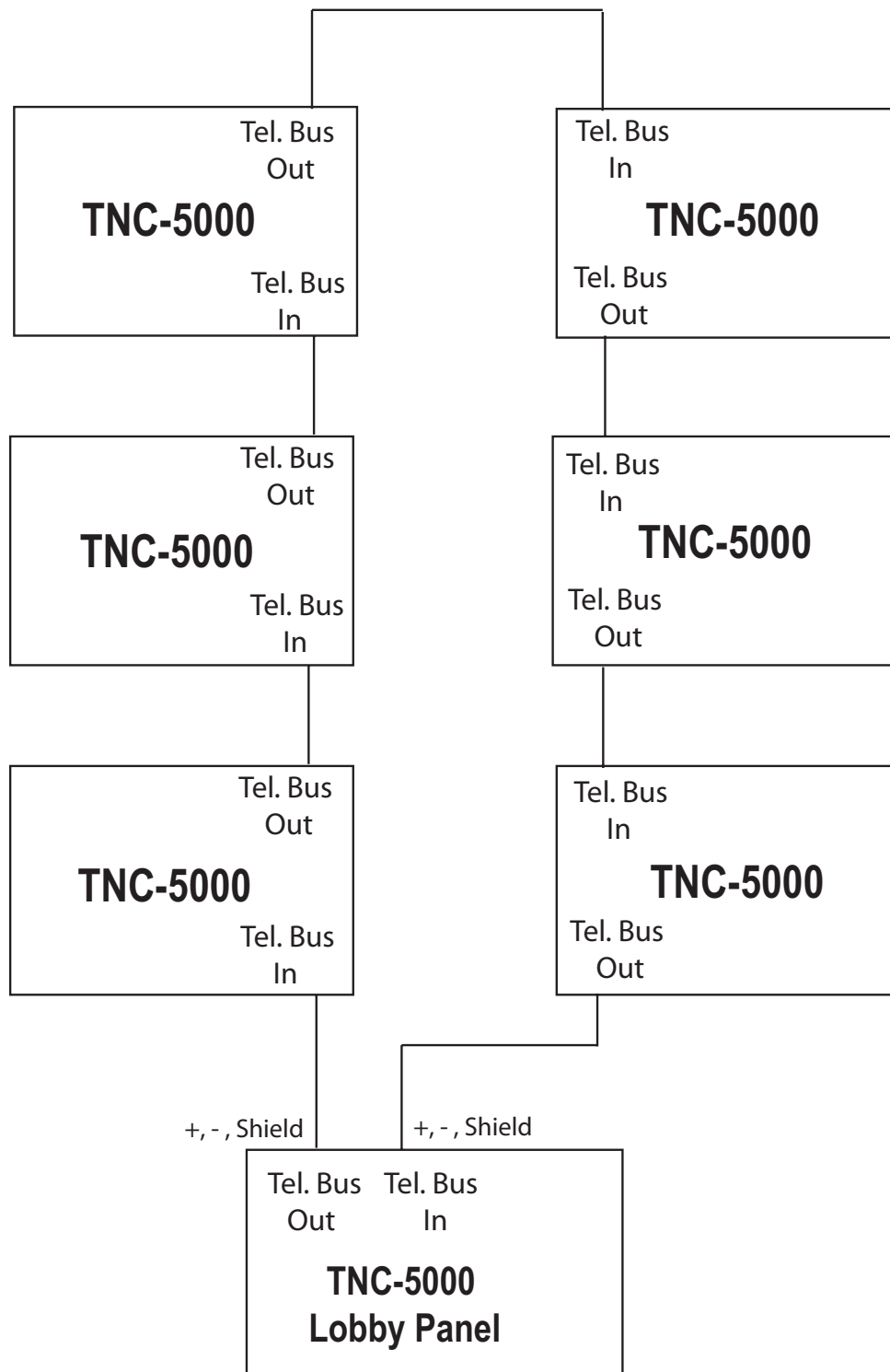
TNC-5000 Connector and Terminals	Connects to
P10 Cable	P11 on the ANC-4000 Audio Network Controller Module.
Z1 Terminals	These two terminals are wired to the Master Telephone if used, otherwise to any telephone zone.
Z2, Z3, Z4 and Z5 Terminals	These terminals are wired to telephone zones.
Telephone 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 77 TNC-5000 Telephone Network Controller Board Layout



31.4 TNC-5000 Telephone Wiring

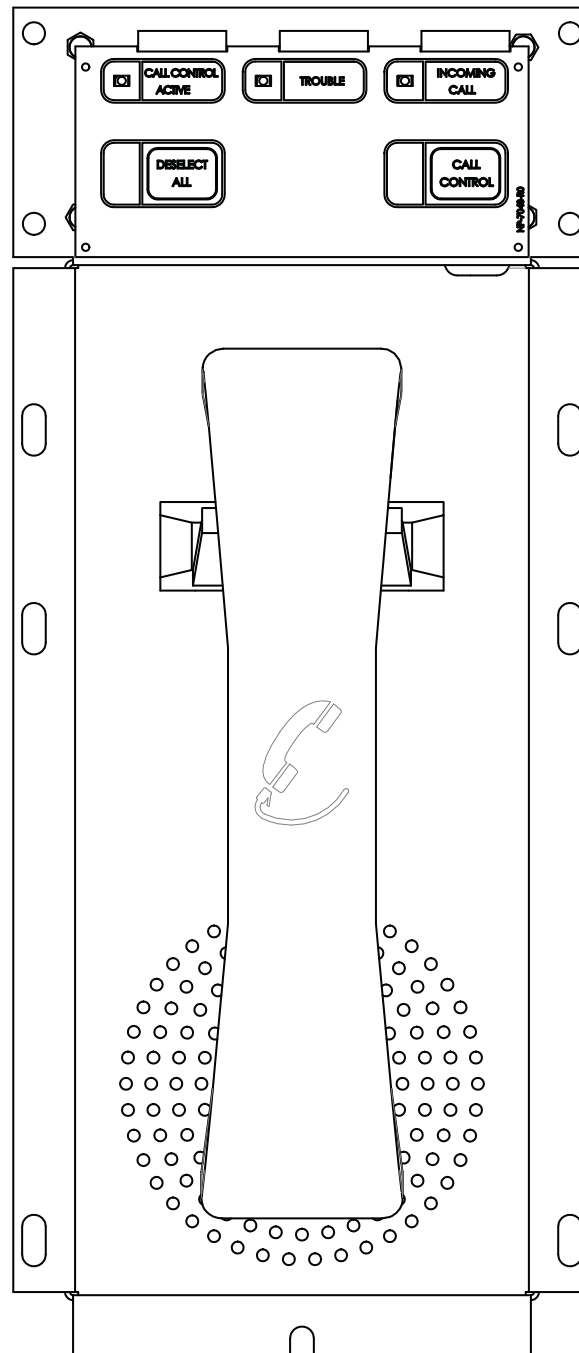
Figure 78 Telephone Bus Wiring Diagram



32.0 QMT-5302NV Vertical Master Telephone

The QMT-5302NV Vertical Master Telephone Module fits into the 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 shown in the following instructions.

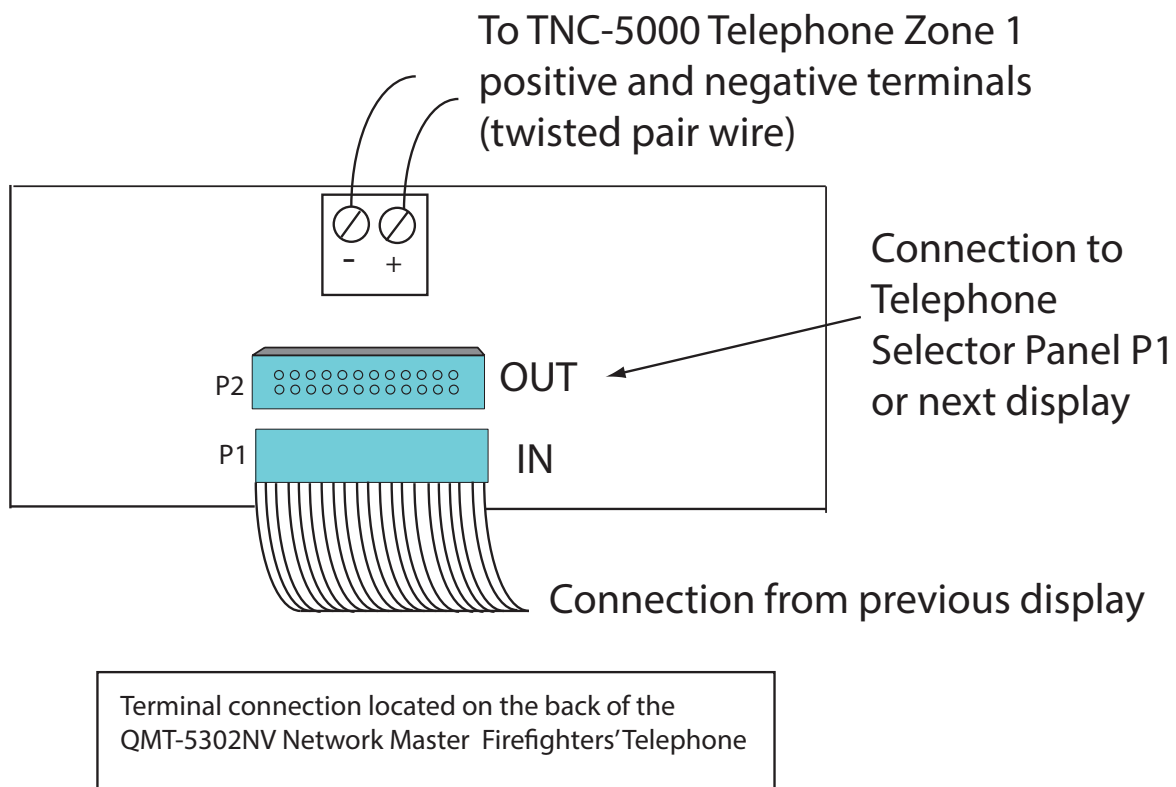
Figure 80 QMT-5302NV Master Firefighters' Telephone



32.1 QMT-5302NV Connections

The connection required on the QMT-5302NV telephone board is the ribbon cable from the previous display module to P1 or IN connector on the bottom center of the board and the OUT connection goes to the IN connector of the next display board.

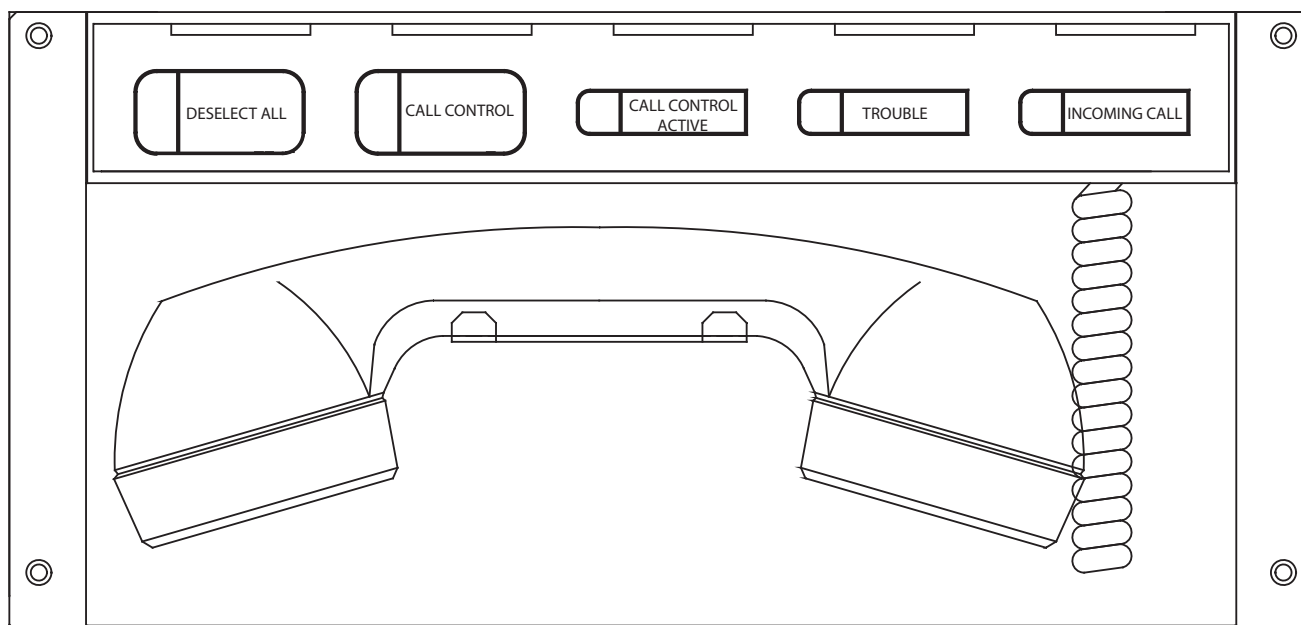
The master telephone positive and negative terminals (located on the back of the QMT-5302NV) connect to the TNC-5000 Zone 1 positive and negative terminals with twisted pair wires. Refer to Figure below for connector and terminal block locations of the QMT-5302NV.



33.0 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 81. The QAZT-5348DS or QAZT-5302DS Telephone Selector panels are used for selecting telephone zones (up to 48 or 24 zones per selector panel) and include blank labels for labelling the telephone zones.

Figure 81 QMT-5302N Master Firefighters' Telephone

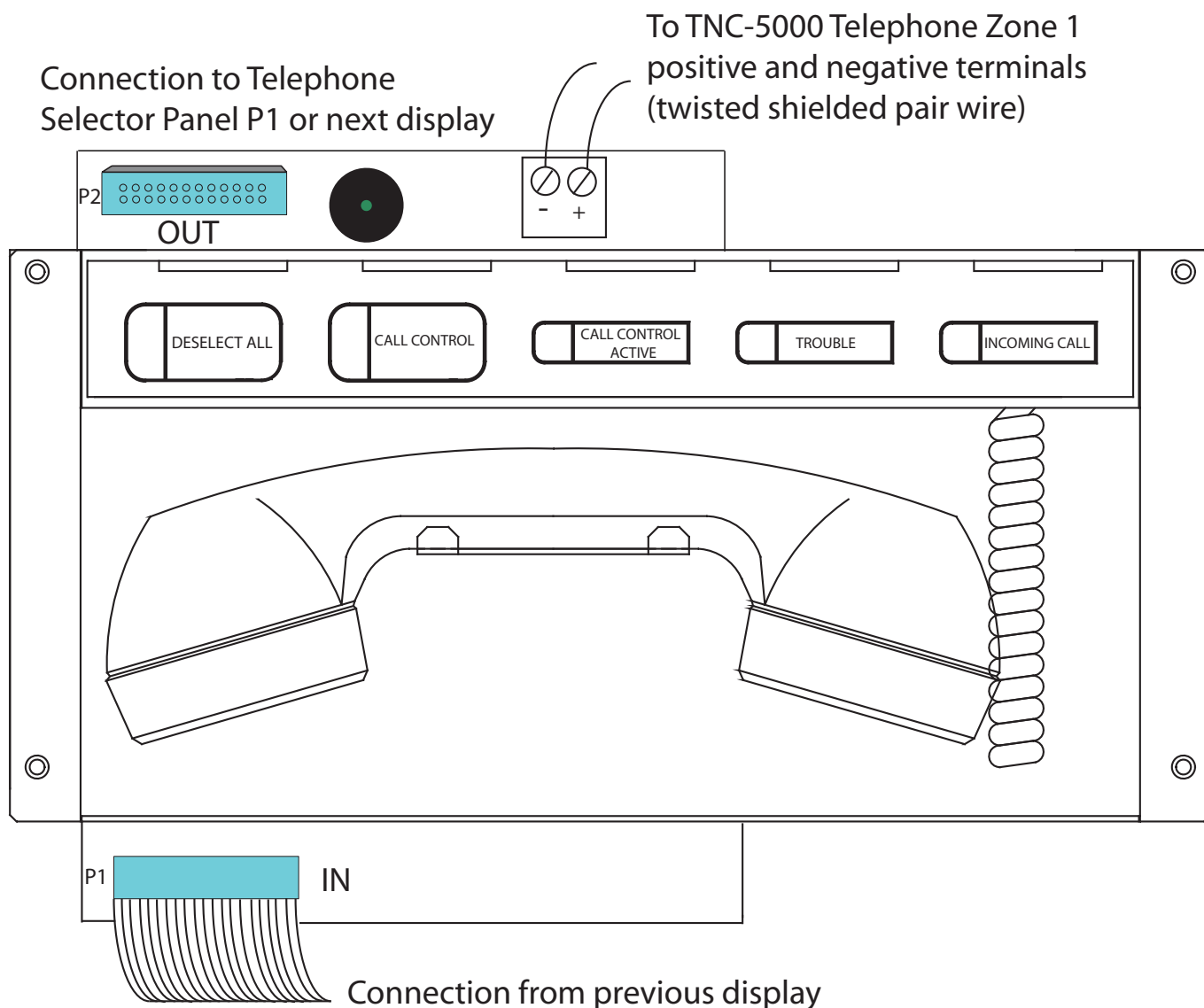


34.0 QMT-5302N Connections

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 82 below for connector and terminal block locations of the QMT-5302N.

Figure 82 QMT-5302N Cable Connection and Terminal Wiring



35.0

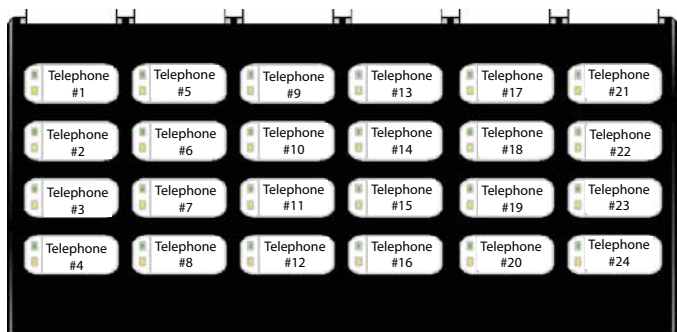
QAZT-5348DS and QAZT-5302DS Firefighters' Telephone Selector Panel

Figure 83 QAZT-5348DS and QAZT-5302DS Network Firefighters' Telephone Selector Panels

Each QAZT-5348DS annunciates and controls up to 48 telephone zones. Each QAZT-5302DS 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.



Telephone zone selection buttons toggle ON and OFF telephone communication for that zone



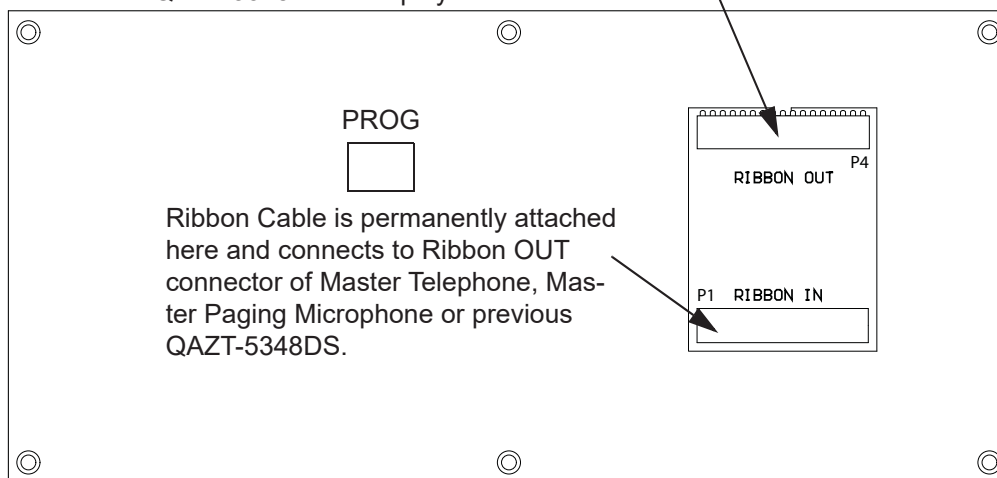
Note: Use configurator to set up the QAZT-5348DS and QAZT-5302DS Telephone Zone Selector Panels.

35.1 QAZT-5348DS Cable Connections

Connect the first QAZT-5348DS Network Firefighters' Telephone Selector panel to the master telephone by connecting the Ribbon In cable into P2 on the QMT-5302NV/N Master Telephone. Ribbon Out cable to the Ribbon In of the next QAZT-5348DS or P1 of the next display panel (up to six total). Refer to Figure 84.

Figure 84 QAZT-5348DS Telephone and/or Paging Selector Board

Ribbon Cable connects here on QAZT-5348DS and goes to the next QAZT-5348DS or display module Ribbon IN.



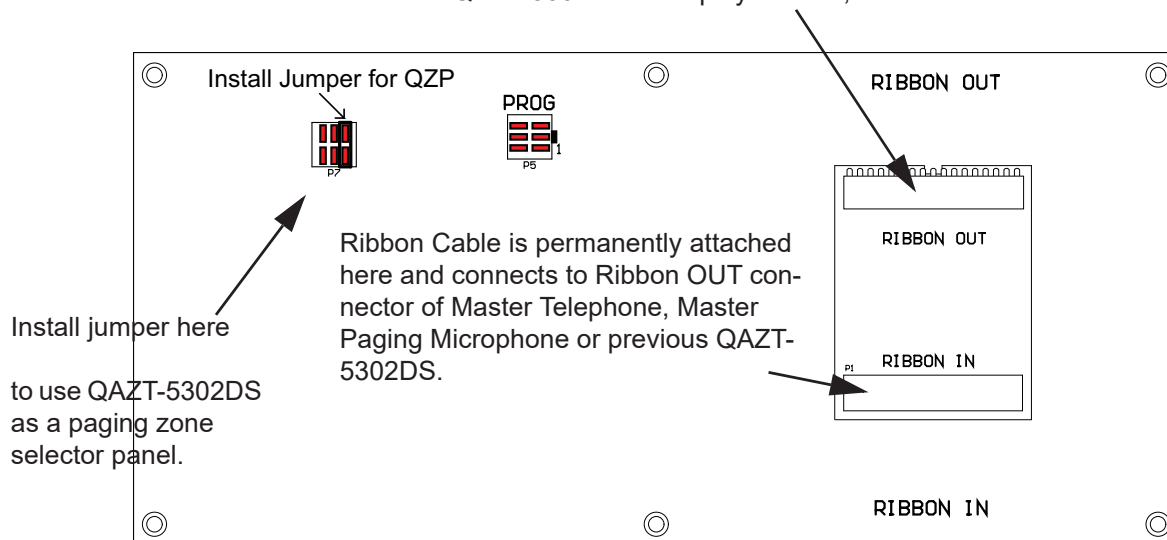
35.2 QAZT-5302DS Cable Connections

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-5302NV/N Master Telephone. Ribbon Out cable to the Ribbon In of the next QAZT-5302DS 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.

Figure 85 QAZT-5302DS Telephone and/ or Paging Selector Board

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



Note: All modules such as QMP-5101NV/N Network Master Paging Control Module, the QMT-5302NV/N Network Master Firefighters' Telephone Control Module, the IPS-4848DS, IPS-2424DS display module and the paging or telephone selector panel QAZT-5348DS, QAZT-5302DS are daisy chained together starting from the FX-4000N LCD display module, DSPL-420DS, DSPL-2440, RAXN-4000LCD or RAXN-4000LCDG. Total number of boards allowed in the daisy chain connection is 6 (12 frames).

36.0 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-5302DS) 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).

36.1 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.

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

Call Control

Pressing this pushbutton will connect this master telephone with master telephones as configured.

Deselect All

Pressing this pushbutton will disconnect all master telephone calls initiated at this node (Call Control minus).

36.3 QAZT-5348DS and QAZT-5302DS 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.

36.4 QAZT-5348DS and QAZT-5302DS 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.

37.0 Appendix A: Specifications

Main Fire Alarm Chassis (FX-4003-12N/-12NXT)	Main Fire Alarm Chassis (FX-4017-12N)
General One Analog Loop capable of monitoring 240 MGC MIX-4000 Series Sensor and Modules <i>Power limited:</i> 22 VDC, 400 mA max, max loop resistance 40 ohms 4 Class B or A Indicating Circuits; configurable as strobes or audibles. Terminals are labelled "IND". <i>Power limited:</i> 24 VDC Regulated, 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". <i>Power limited:</i> 24 VDC unfiltered, 1.7 A @ 49°C Resettable 4-Wire Smoke Supplies. Terminals are labelled "4-WIRE". <i>Power limited:</i> 22 VDC, 425 mA max., 5mV ripple One RS-485 Connection for Remote Annunciators or interface to Audio Systems. Terminals are labelled "RS485". <i>Power Limited</i> 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 <i>AC Line Voltage:</i> 120V 60Hz / 240V, 50Hz 4 Amps / 2 Amp (primary) <i>Power Supply ratings:</i> 12 Amps. max. (secondary) <i>For Indicating Circuits:</i> 24VDC unfiltered 10 Amps. max. <i>Battery:</i> 24VDC, Gel-Cell/Sealed Lead-Acid <i>Charging capability:</i> 17-65 AH batteries <i>Current Consumption:</i> standby: 310 mA alarm: 733 mA	Same as FX-4009-12N except: Larger Chassis has capacity for 3 display modules and 17 adder modules. Main Fire Alarm Chassis (FX-4000MNS) Same as FX-4003-12N except: Displays (incl LCD) and Controls for all Common Functions, and 16 Zone Displays are not included. Quad Intelligent Analog Loop Module (ALCN-960MISO/D) Quad Analog Loops with additional ALCN-960D daughter board capable of monitoring 960 MGC Sensors and Modules. <i>Power limited:</i> 22 VDC, 400 mA max, 10kHz frequency max loop resistance 40 ohms <i>Current Consumption:</i> standby: 200 mA alarm: 230 mA Quad Intelligent Analog Loop Module (ALCN-4792MISO/D) Quad Analog Loops with additional ALCN-792D daughter board capable of monitoring 636 AP Sensors and 636 AP Modules. <i>Power limited:</i> 22 VDC, 400 mA max, 10kHz frequency max loop resistance 40 ohms <i>Current Consumption:</i> standby: 130 mA alarm: 145 mA Detection Adder Module (DM-1008A) Eight supervised Class B or four Class A initiating circuits; fully configurable. Terminals are labelled "INI". Initiating circuits are Compatibility ID "A". <i>Current Consumption:</i> 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 indicating circuits; configurable as strobes or audibles. Terminals are labelled "IND". <i>Power Limited:</i> 24 VDC Regulated max. 1.7 amps @ 49C per circuit <i>Current Consumption:</i> 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) <i>Current Consumption:</i> standby: 25 mA alarm: 150 mA
Main Fire Alarm Chassis (FX-4009-12N)	Polarity Reversal and City Tie Module (PR-300)
Same as FX-4003-12N except: Larger Chassis has capacity for 2 display modules and 9 adder modules. Displays (incl LCD) and Controls for all Common Functions, and 16 Zone Displays are not included.	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) <i>Current Consumption:</i> standby: 35 mA alarm: 300 mA

FOM-2000-UM Fiber Optic Module	FNC-2000 Network Controller Module
<i>Current Consumption:</i> standby: 15 mA alarm: 15 mA	<i>Current Consumption:</i> standby: 190 mA alarm: 190 mA
ANC-4000 Audio Controller Module	RAXN-4000LCDG Annunciator
<i>Current Consumption:</i> standby: 255 mA alarm: 265 mA	24V DC nominal. Standby: 139 mA Max., All LED's "On": 164 mA Max
TNC-5000 Telephone Controller Module	RAXN-4000LCD Annunciator
<i>Current Consumption:</i> standby: 195 mA alarm: 215 mA	24V DC nominal, range of 20 to 39V DC. Standby: 139 mA Max., All LED's "On": 164 mA Max
Fan Damper Display Module (FDX-008W/FDX-008WKI)	Adder Annunciator Module RAX-1048TZDS
24V DC nominal, range of 20 to 39V DC. <i>Current Consumption:</i> standby: 15mA Max. alarm (all LEDs ON): 35mA Max.	48 Display Points (TZ version has 48 extra trouble display points). <i>Current Consumption:</i> 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
Selection Control Panel (FDS-008)	
24V DC nominal. <i>Current Consumption:</i> standby: 24mA Max. alarm (all LEDs ON): 112mA Max.	
Digital Communicator Module (UDACT-300A)	Programmable Input Switches Module (IPS-4848DS)
Transmit alarm, supervisory, and trouble to a central monitoring station. <i>Current Consumption:</i> standby: 45 mA alarm: 120 mA	<i>Current Consumption:</i> standby: 10 mA alarm (one zone active): 22 mA
DSPL-420 and DSPL-2440 Displays	Programmable Input Switches Module (IPS-2424DS)
<i>Current Consumption:</i> standby: 25mA and 35mA alarm: 25mA and 30mA	<i>Current Consumption:</i> standby: 5 mA alarm (one zone active): 22 mA
Compliance System Model: FleX-Net™ Series Fire Alarm/Alarm Control Panels FX-4003-12N, FX-4009-12N, FX-4017-12N, FX-4003-12NXT and FX-4000MNS. System Type: Local, auxiliary (using PR-300), remote protected premise station (using PR-300 or UDACT-300A), central station protected premises (using UDACT-300A), Proprietary System (PPU) and Smoke Control Type of Service: A, M, WF, SS, PPU, MNS Type of Signalling: Non-coded Applicable Standards: NFPA 70 and 72, UL-864 R10, UL 2572, ULC S-524, ULC S-527	

37.1 ULI/ULC Integrated Fire Alarm and Audio Panel Specifications



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

37.1.1 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)

37.1.2 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

37.1.3 Model FNC-2000 Fire Network Controller Module

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

37.1.4 Model ANC-4000 Audio Network Controller Module

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

37.1.5 Model TNC-5000 Telephone Network Controller Module

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

37.1.6 Model FOM-2000-UM Fiber Optics Module

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

37.1.7 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, ULC bandwidth from 400 to 4000 Hz
- Harmonic distortion less than 2.5% at 1 KHz
- Current consumption: *standby:* 55mA
alarm: 350mA, plus 65mA/Watt Speaker Power

37.1.8 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, ULC bandwidth from 400 to 4000 Hz
- Harmonic Distortion less than 2.5% at 1 KHz
- Current Consumption: *standby:* 55mA
alarm: 350mA, plus 65mA/Watt Speaker Power

37.1.9 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, ULC bandwidth from 400 to 4000 Hz
- Harmonic Distortion less than 2.5% at 1 KHz
- Current Consumption: *standby:* 55mA
alarm: 350mA, plus 65mA/Watt Speaker Power

37.1.10 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, ULC bandwidth from 400 to 4000 Hz
- Harmonic distortion less than 2.5% at 1 KHz
- Current consumption: *standby:* 55mA
alarm: 350mA, plus 75mA/watt speaker power

37.1.11 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, ULC bandwidth from 400 to 4000 Hz
- Harmonic distortion less than 2.5% at 1 KHz
- Current consumption: *standby:* 55mA
alarm: 350mA, plus 75mA/watt speaker power

37.1.12 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

37.1.13 Model QAZT-5348DS or QAZT-5302DS Paging Selector Panel

- Mounts in Mircom BB-1000, BB-5000 and BBX-FXMNS enclosures
- Connects to QMP-5101N or QMP-5101NV to provide 48 or 24 zones of paging control
- Up to one per QMP-5101N or QMP-5101NV
- Current Consumption: *standby:* 10mA/5mA
alarm: 20mA/15mA

37.1.14 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

37.1.15 Model QAZT-5348DS or QAZT-5302DS Telephone Selector Panel

- Mounts in Mircom BB-1000, BB-5000, FX-LOC, and BBX-FXMNS enclosures
- Connects to QMT-5302N to provide 48 or 24 firefighters' telephone zones
- Up to six selector panels per QMT-5302N or QMT-5302NV
- Unlimited handsets allowed per telephone circuit, supports up to 5 handsets active at the same time
- Current Consumption: *standby: 10mA/5mA*
alarm: 22mA/15mA

38.0

Appendix B: Power Supply and Battery Calculations

Power Requirements (All currents are in amperes)							
Model Number	Description	Qty		Standby	Total Standby	Alarm	Total Alarm
FX-4003-12N/12NXT	Main Chassis (12 Amp)		X	0.310	=	0.733	=
FX-4017-12N	Main Chassis (12 Amp)		X	0.310	=	0.733	=
FX-4009-12N	Large Main Chassis (12 Amp)		X	0.310	=	0.733	=
ALCN-960MISO and ALCN-960D	Quad Analog Loops		X	0.200	=	0.230	=
ALCN-4792MISO and ALCN-792D	Quad Analog Loops		X	0.130	=	0.145	=
FNC-2000	Fire Network Controller Module		X	0.190	=	0.190	=
ANC-4000	Audio Network Controller Module		X	0.255	=	0.265	=
TNC-5000	Telephone Network Controller Module		X	0.195	=	0.215	=
FOM-2000-UM	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-008W/WKI	Fan Damper Control Module		X	0.015	=	0.035	=
DSPL-420DS	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-1048TZDS	Adder Annunciator Chassis		X	0.022	=	1 zone active: 0.026 2 zone active: 0.030 3 zone active: 0.035 4 zone active: 0.039 48 zone active: 0.262	=
RAM-1032TZDS	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-4848DS/ IPS2424DS	Programmable Input Switches Module		X	0.010/0.005	=	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-4003-12N (-12NXT)**, **FX-4017-12N** or **FX-4009-12N** 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:

$$[(\text{STANDBY (A) } ______] \times [(24 \text{ or } 60 \text{ Hours } ______)] + [(\text{ALARM (B) } ______) \times [* \text{Alarm in Hr.} ______]] = (\text{C})$$

_____ AH

BATTERY SELECTION: Multiply (total from column **C**) by 1.25 to derate battery.

Batteries: BAT-12V18A (18AH) will fit in the BBX-1024DS
BAT-12V26A (26AH) will fit in the BBX-1072ARDS, BB-5008, or BB-5014
BAT-12V42A (42AH) will fit in the BC-160(R) battery cabinet

RAXN-4000LCD/RAXN-4000LCDG:

The RAXN-4000LCD 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-4000LCDG is similar to the RAXN-4000LCD 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-4000LCDG 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-895MP and LT-6033MP.

Annunciator Models:

- **RAXN-4000LCD or RAXN-4000LCDG** Main Annunciator Chassis with Common Indicators and Controls.
- **RAX-1048TZDS:** Adder Annunciator Chassis with 48 Circuit Capacity.
- **IPS-4848DS:** Programmable Input Switches module with 96 display points and 48 buttons.
- **IPS-2424DS:** Programmable Input Switches module with 48 display points and 24 buttons.

Enclosures for RAXN-4000LCD and RAXN-4000LCDG:

- **BB-1001D(R/S)** With capacity for one Annunciator Chassis.
- **BB-1002D(R/S)** With capacity for two Annunciator Chassis.
- **BB-1003D(R/S)** With capacity for three Annunciator Chassis.
- **BB-1008D(R/S)** With capacity for eight Annunciator Chassis.
- **BB-1012D(R/S)** With capacity for twelve Annunciator Chassis.
- **BB-1001WP(R)A** rated for outdoor environment, wet location with capacity for one Annunciator Chassis
- **BB-1002WP(R)A** rated for outdoor environment, wet location with capacity for two Annunciator Chassis.



Notes:

- **Material:** 18 G.A. cold roll steel (CRS)
- **Finish:** Backbox painted black, white painted door (standard), suffix "R" for red painted door or suffix "S" for stainless steel finish.

Appendix C: DIP Switch Settings

FX-400X-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	Leave in "OFF" position as Factory Set.	Leave in "OFF" position as Factory Set.
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		
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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		

ANC-4000 Board Address Setting (DIP SWITCH SW1)

ANC-4000	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
	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

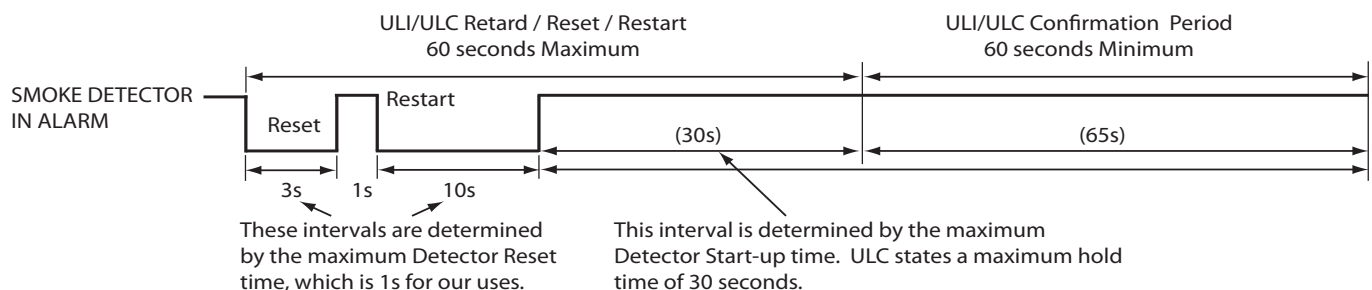
ALCN-960MISO/ALCN-4792MISO Loop Adder Module Address Setting (DIP SWITCH SW1)

ALCN-960MISO	ALCN-4792MISO	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
		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	

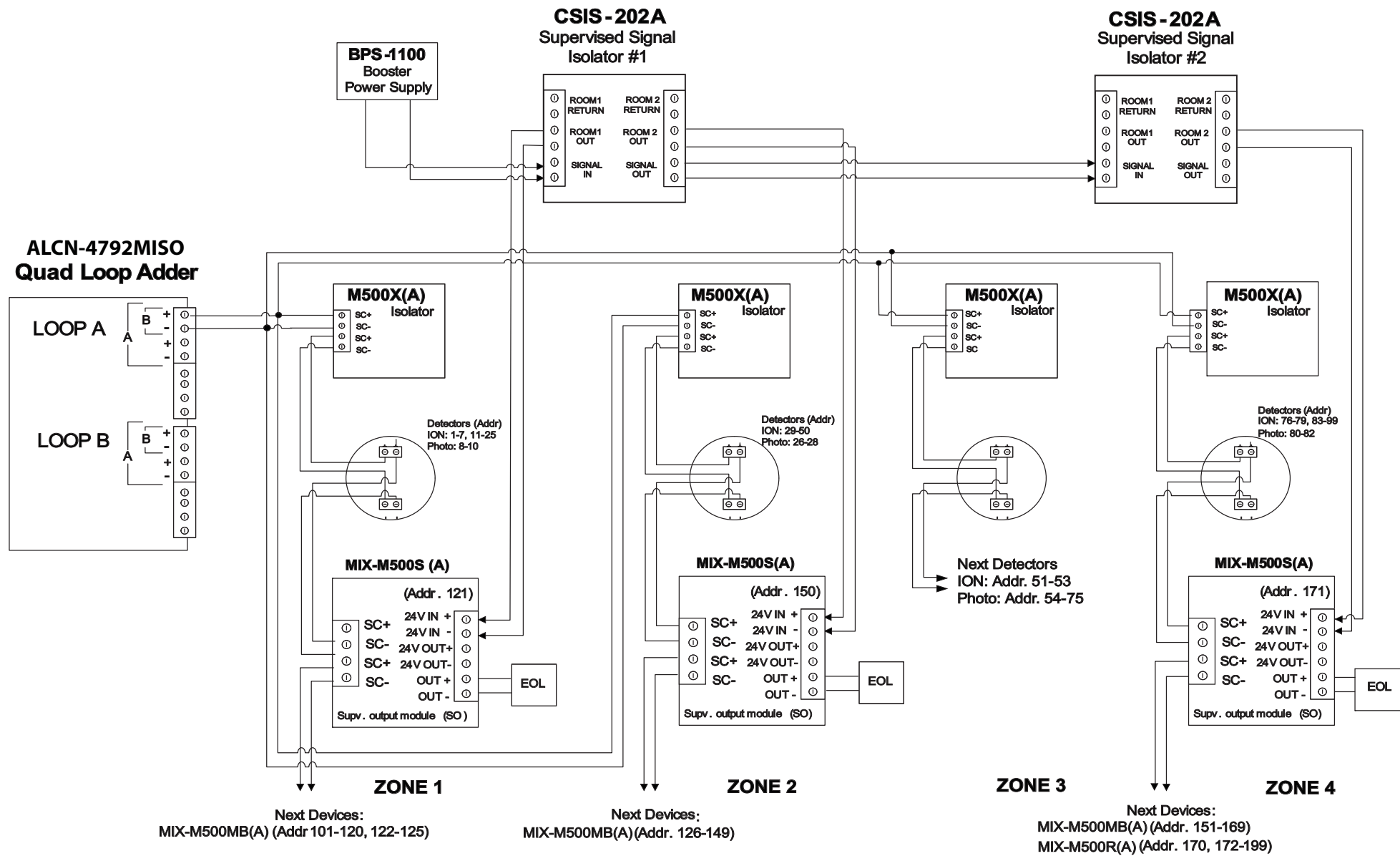
RAXN-4000LCD/RAXN-4000LCDG Remote Annunciator Address Setting (DIP SWITCH SW1)

RAXN-4000LCD(G)	ADDR	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
	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		

40.0 Appendix D: Alarm Verification Timing



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



42.0

Appendix F: Power Supply & Batteries for Audio

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 Appendix A page 133 for specifications.

Power Requirements (All currents are in amperes)

Model Number	Description	Qty		Standby (Amps)	Total Standby (Amps)	Alarm (Amps)	Total Alarm (Amps)
FX-4000MNS	Main Fire Alarm Board		X	0.310	=	0.733	=
ANC-4000	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-5348DS/ QAZT-5302DS	Paging/Telephone Zone Module		X	0.010/0.005	=	0.022/0.022	=
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:

$([\text{STANDBY (A)}] \times [(24 \text{ or } 60 \text{ Hours})]) + ([\text{ALARM (B)}] \times [* \text{Alarm in Hr.}]) = (\text{C})$
_____ AH

Battery Selection: Multiply answer above (C) by 1.25 to derate battery.

Batteries: BAT-12V26A (26AH), BAT-12V42A (42AH), and BAT-12V55A(55AH).

Above 42AH, 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.



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

43.0

Appendix G: FXMNS Used as a Mass Notification System (ACU)

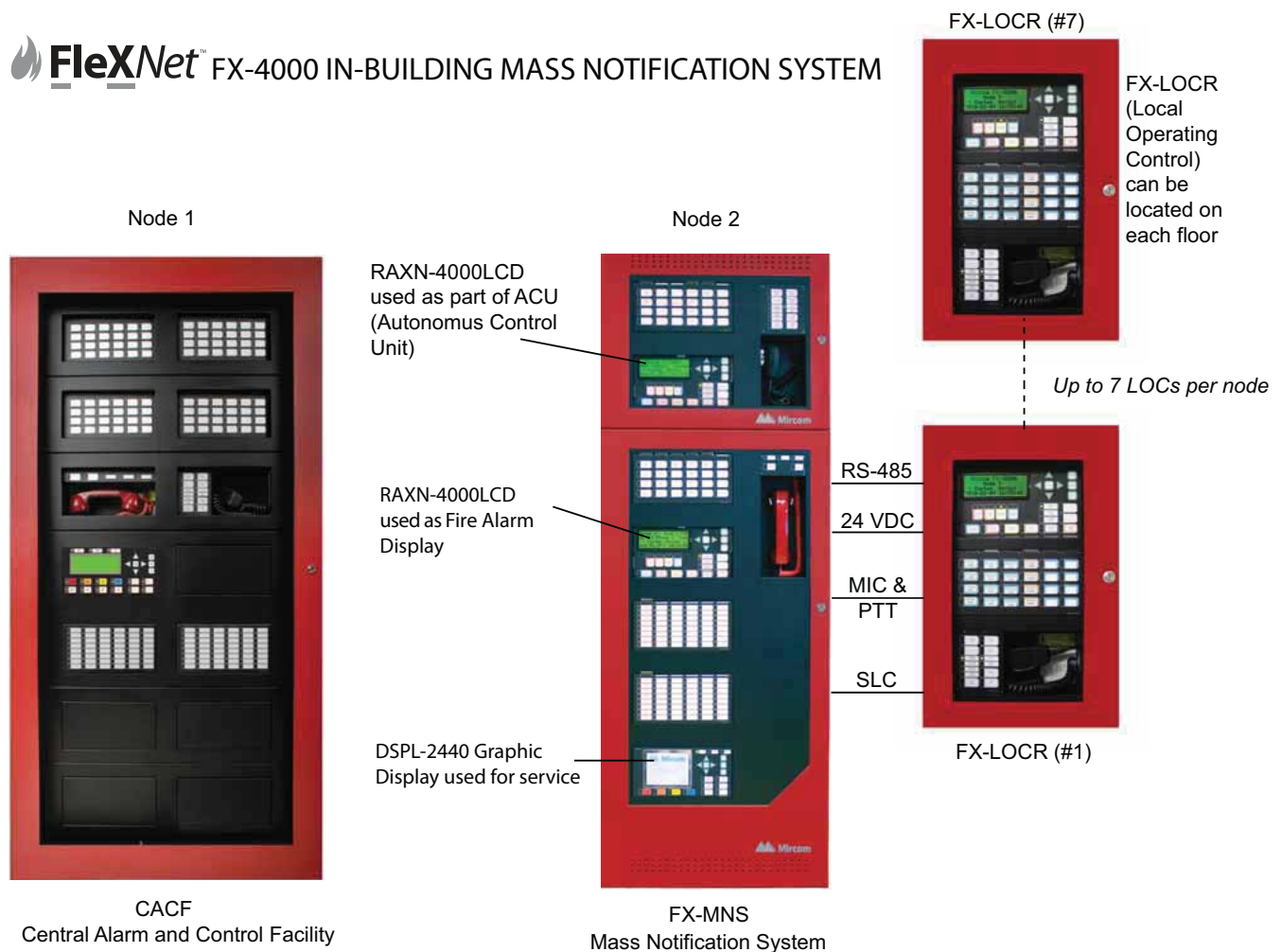
The MNS portion of a complete Mircom FleX-Net™ Network Fire Alarm system consists of a BBX-FXMNS Enclosure (see Node 2 in figure below). The BBX-FXMNS includes a RAXN-4000LCD Annunciator which is designated an ACU (Autonomous Control Unit) and a Master Microphone to provide emergency audio. Below the ACU is another RAXN-4000LCD which annunciates the fire alarm system along with a Master Telephone for emergency use. Below this is a display LCD such as the DSPL-420DS 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™ 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

FleXNet™ FX-4000 IN-BUILDING MASS NOTIFICATION SYSTEM

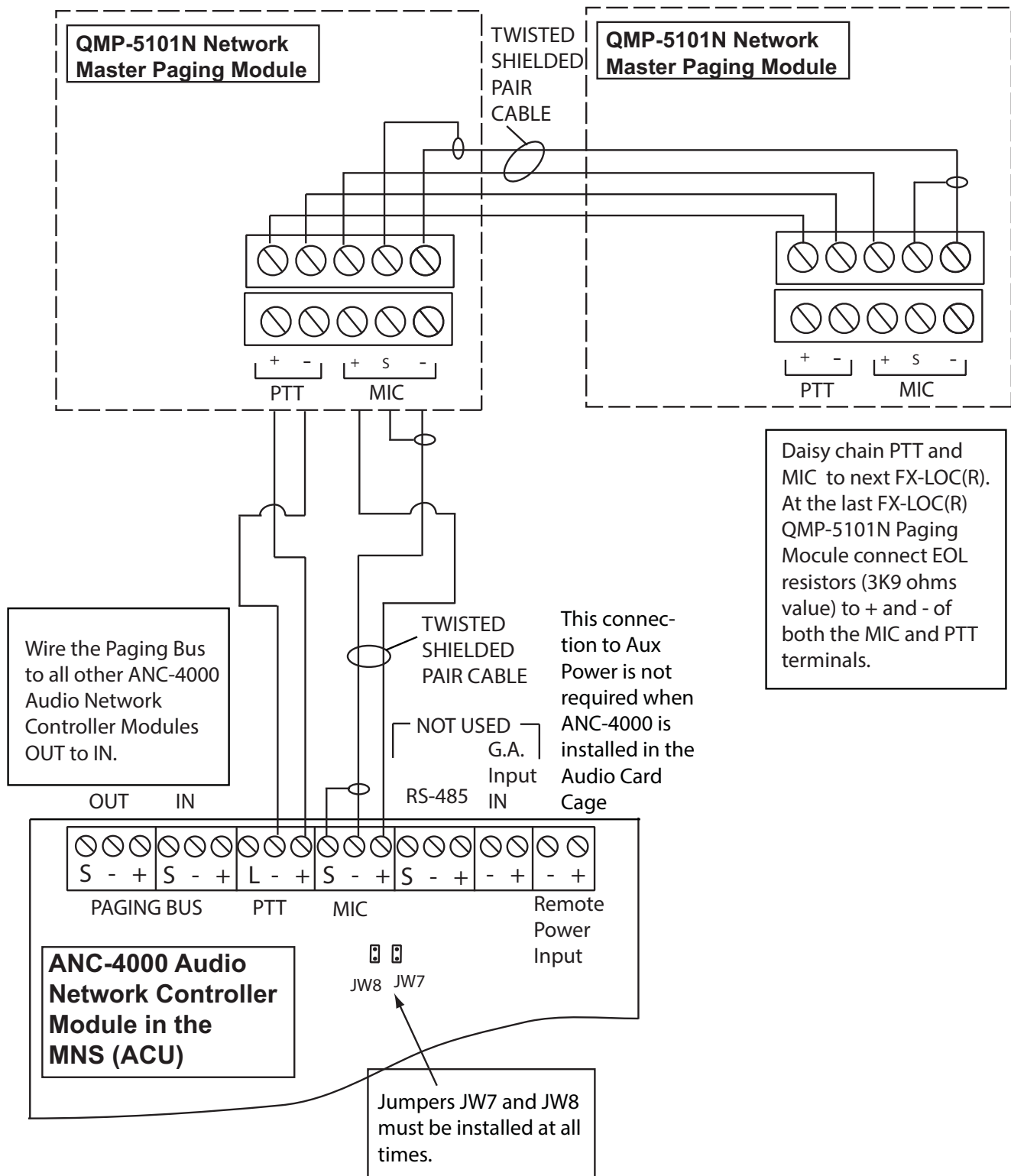


43.1 QMP-5101N Network Paging Wiring for Mass Notification

QMP-5101N Network Master Paging Control Module Wiring to the ANC-4000 Audio Network Controller Module

MNS - ACU

FX- LOC(R)



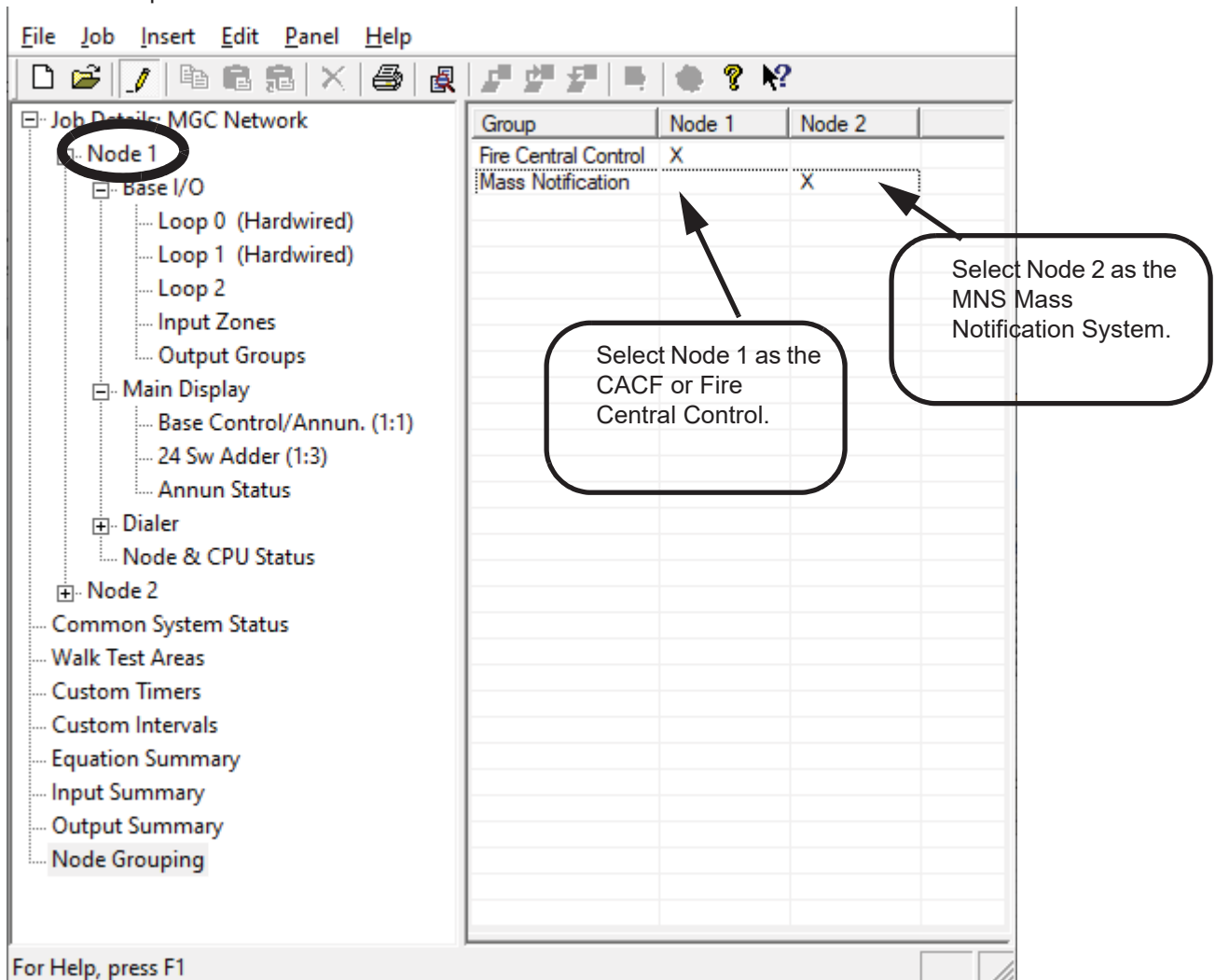
43.2 Configuration for Mass Notification

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 +19 percent above normal and -19 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 (Node 1) and MNS (Node 2) and two FX-LOC(R)s.

This screen capture shows selection of Node 1 as a Fire/Central Control



The screenshot displays the Mircom software interface. On the left, a tree view shows the system configuration. 'Node 1' is selected and circled. Below it, various components like 'Base I/O', 'Loop 0 (Hardwired)', 'Loop 1 (Hardwired)', 'Loop 2', 'Input Zones', 'Output Groups', 'Main Display', 'Base Control/Annun. (1:1)', '24 Sw Adder (1:3)', 'Annun Status', 'Dialer', and 'Node & CPU Status' are listed. On the right, a table shows the configuration for 'Node 1' and 'Node 2'. The 'Fire Central Control' group is selected for Node 1, and the 'Mass Notification' group is selected for Node 2. Callouts indicate the selection of Node 1 as the CACF or Fire Central Control and Node 2 as the MNS Mass Notification System.

Group	Node 1	Node 2
Fire Central Control	X	
Mass Notification		X

Select Node 1 as the CACF or Fire Central Control.

Select Node 2 as the MNS Mass Notification System.

For Help, press F1

This screen capture shows input zone priority settings for the Mass Notification Node 2

File Job Insert Edit Panel Help

Job Details: MGC Network

- Node 1
 - Base I/O
 - Loop 0 (Hardwired)
 - Loop 1 (Hardwired)
 - Loop 2
 - Input Zones
 - Output Groups
 - Main Display
 - Base Control/Annun. (1:1)
 - 24 Sw Adder (1:3)
 - Annun Status
 - Dialer
 - Node & CPU Status
- Node 2
 - Base I/O
 - Loop 0 (Hardwired)
 - Loop 1 (Hardwired)
 - Loop 2
 - Input Zones
 - Output Groups
 - Main Display
 - Node & CPU Status
- Common System Status
- Walk Test Areas
- Custom Timers
- Custom Intervals
- Equation Summary
- Input Summary
- Output Summary

Addr	Device	Type	SubType	Priority	F1	F3	F4	F5	Tag (Line1)	Tag (Line2)	Alten
1	Input Zone	Alarm	None	+5	ND						
2	Input Zone	Supv.	None	Normal	ND						
3	Input Zone	Trbl.	None	Normal	ND						
4	Input Zone	Mon.	None	Normal	ND						
5	Input Zone	Alarm	None	+1	ND						
6	Input Zone	Alarm	None	+2	ND						
7	Input Zone	Alarm	None	+3	ND						
8	Input Zone	Alarm	None	+4	ND						
9	Input Zone	Alarm	None	+5	ND						
10	Input Zone	Alarm	None	+6	ND						
11	Input Zone	Alarm	None	+7	ND						
12	Input Zone	Alarm	None	+8	ND						

Inputs | Signal | Relay | Display | Switches | UDACT Grp | Digitized Msgs | Advanced Logic

Type	Node	CPU	Lp	Addr	Device	Priority	F1	F2	F3	F4	Tag
Alarm Input	Node 2	0	2	101	Input Module						

43.3 FX-LOC(R) Active

As part of the Mass Notification requirements, an RAX-1048TZDS Zone Annunciator is part of the MNS. Configure one zone of the RAX-1048TZDS 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-1048TZDS** normally displays Initiating circuit status and trouble indication, the Flex-Net™ configuration must be used to configure each zone corresponding to a FX-LOC(R).

43.4 Reset

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

43.5 ACU Emergency Response Operation

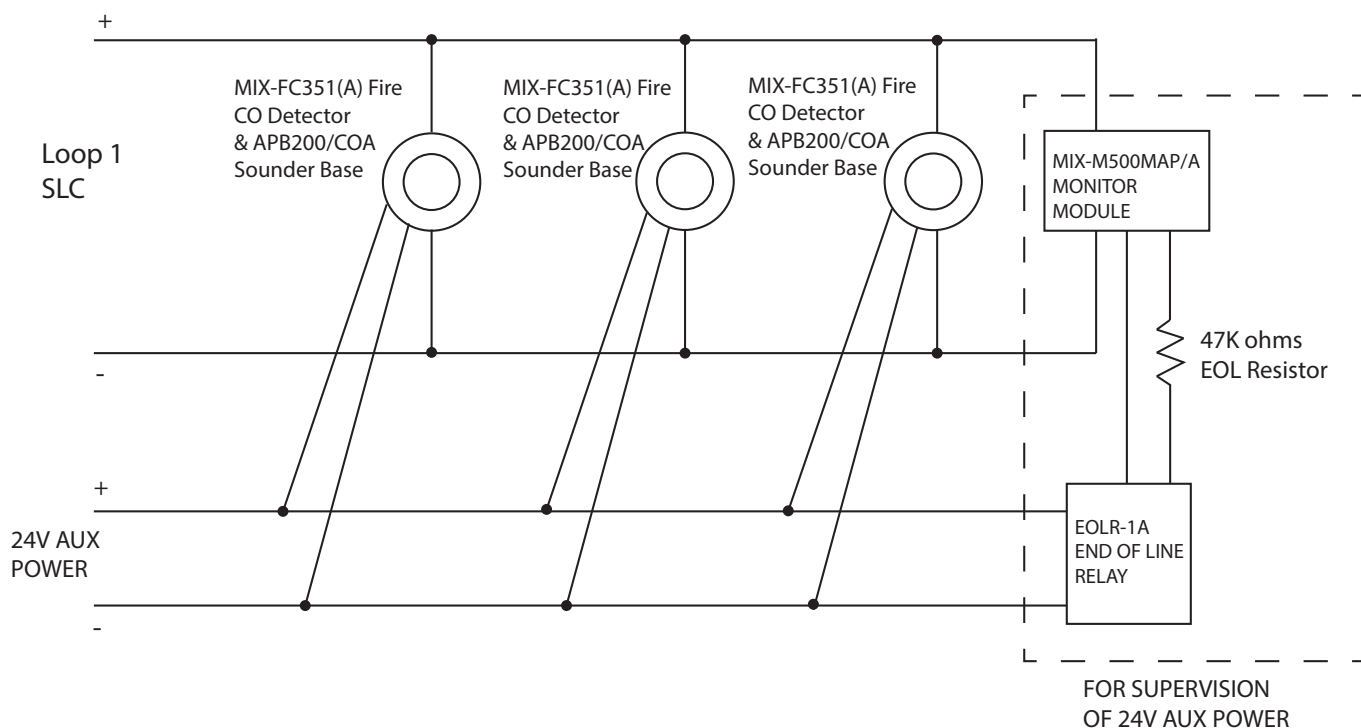
1. Access control of ACU.
2. ACU will notify in use via LED on **RAX-1048TZDS**.
3. Select areas to receive paging or digitized messages or use all call.
4. Page or send digitized message as necessary.

44.0 Appendix H: APB-200/COA Sounder Bases

The FleX-Net™ Network Fire Alarm system can accommodate up to 32 APB-200/COA sounder bases per panel (node). The sounder base audio is synchronized on the same loop basis.

Below is a wiring diagram for connecting the sounder bases to auxiliary power with supervision.

Figure 86 Sounder Base Wiring to Auxiliary Power Supply with Supervision (Class B)



The monitor module (shown in the diagram above) should be set up in the configurator to report as a trouble input with the message tag "Sounder Base Fault".

45.0

Appendix I: Label Requirements for Zone Identification

If individual zones are used for various applications, the labelling of these zones must be in accordance with ULC/CAN S527-11 Table 2; of which is partially included below:

LABEL DESIGNATIONS IN ENGLISH	DESCRIPTION OF FUNCTION
XXXa Alarm Signal Activation or XXXa Alarm Signal ON	Circuit Or Area Evacuation Manual Control
XXXa Alert Signal Activation or XXXa Alert Signal ON	Circuit Or Area Alert Manual Control
XXXa By-pass	Ancillary Bypass
XXXa ON	Ancillary Device Indication
XXXa OFF	Ancillary Device Indication
Building Safety or Bldg Safety	Common Indication Associated With Property And Building Safety
XXXb	Specific Indication Associated With Property And Building Safety
Emergency and building events	Common Indication Associated With Emergency And Building Events
XXXb	Specific Indication Associated With Emergency And Building Events
XXXb	Emergency Or Building Event Manual Control
XXXa Bypass	Bypass Output Function
Activate XXXa or equivalent followed by XXXa	Initiate Manual Control Function
Remote Connection Bypass or equivalent	Bypass Connection For Fire Service Response
Signal Circuit Trouble	Signal Circuit Fault Indication
Signal Silence Inhibit	Prevent Silence Of Signal For A Preset Time
Supervisory	Common Indication Associated With Supervisory Inputs
XXXa	Specific Indication Associated With Supervisory Input
Supervisory Signal Silence	Manual Signal Silence Control For Supervisory Signal
Telephone Call-in	Common Telephone Call-In Indication
XXXa Telephone Call-in	Specific Telephone Call-In Indication
XXXa Telephone Trouble	Telephone Circuit Fault Indication
XXXa Telephone Select	Telephone Circuit Manual Control
Trouble	Common Trouble Signal Indicator
XXXa Trouble	Specific, Circuit Or Area Trouble Signal Indicator
a replace XXX with location and/or device specific description.	
b such as alarms, life safety, supervisory, building safety and trouble	

46.0 Warranty and Warning Information

WARNING!

Please read this document **CAREFULLY**, as it contains important warnings, life-safety, and practical information about all products manufactured by the Mircom Group of Companies, including Mircom and Secutron branded products, which shall include without limitation all fire alarm, nurse call, building automation and access control and card access products (hereinafter individually or collectively, as applicable, referred to as “**Mircom System**”).

NOTE TO ALL READERS:

1. **Nature of Warnings.** The within warnings are communicated to the reader out of an abundance of caution and create no legal obligation for Mircom Group of Companies, whatsoever. Without limiting the generality of the foregoing, this document shall NOT be construed as in any way altering the rights and obligations of the parties, governed by the legal documents that apply in any given circumstance.
2. **Application.** The warnings contained in this document apply to all Mircom System and shall be read in conjunction with:
 - a. the product manual for the specific Mircom System that applies in given circumstances;
 - b. legal documents that apply to the purchase and sale of a Mircom System, which may include the company's standard terms and conditions and warranty statements;
 - c. other information about the Mircom System or the parties' rights and obligations as may be application to a given circumstance.
3. **Security and Insurance.** Regardless of its capabilities, no Mircom System is a substitute for property or life insurance. Nor is the system a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation. Building automation systems produced by the Mircom Group of Companies are not to be used as a fire, alarm, or life-safety system.

NOTE TO INSTALLERS:

All Mircom Systems have been carefully designed to be as effective as possible. However, there are circumstances where they may not provide protection. Some reasons for system failure include the following. As the only individual in contact with system users, please bring each item in this warning to the attention of the users of this Mircom 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:

4. **Inadequate Installation.** All Mircom Systems must be installed in accordance with all the applicable codes and standards in order to provide adequate protection. National standards require an inspection and approval to be conducted by the local authority having jurisdiction following the initial installation of the system and following any changes to the system. Such inspections ensure installation has been carried out properly.
5. **Inadequate Testing.** Most problems that would prevent an alarm a Mircom System from operating as intended can be discovered by regular testing and maintenance. The complete system should be tested by the local authority having jurisdiction 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.

NOTE TO USERS:

All Mircom Systems have been carefully designed to be as effective as possible. However, there are circumstances where they may not provide protection. Some reasons for system failure include the following. The end user can minimize the occurrence of any of the following by proper training, testing and maintenance of the Mircom Systems:

6. **Inadequate Testing and Maintenance.** It is imperative that the systems be periodically tested and subjected to preventative maintenance. Best practices and local authority having jurisdiction determine the frequency and type of testing that is required at a minimum. Mircom System may not function properly, and the occurrence of other system failures identified below may not be minimized, if the periodic testing and maintenance of Mircom Systems is not completed with diligence and as required.
7. **Improper 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. A Mircom System may not function as intended during an emergency situation where the user is unable to operate a panic or emergency switch by reason of permanent or temporary physical disability, inability to reach the device in time, unfamiliarity with the correct operation, or related circumstances.
8. **Insufficient Time.** There may be circumstances when a Mircom 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.
9. **Carelessness or Safety Hazards.** Moreover, 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 or children playing with matches or arson.
10. **Power Failure.** Some Mircom System components require adequate electrical power supply to operate. Examples include: smoke detectors, beacons, HVAC, and lighting controllers. 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 Mircom Systems or other electronic equipment. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.
11. **Battery Failure.** If the Mircom 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. Some Mircom Systems use replaceable batteries, which have a limited life-span. The expected battery life is variable and in part dependent on 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. Moreover, some Mircom Systems do not have a battery monitor that would alert the user in the event that the battery is nearing its end of life. Regular testing and replacements are vital for ensuring that the batteries function as expected, whether or not a device has a low-battery monitor.
12. **Physical Obstructions.** Motion sensors that are part of a Mircom System must be kept clear of any obstacles which impede the sensors' ability to detect movement. Signals being communicated by a Mircom System may not reach the receiver if an item (such as metal, water, or concrete) is placed on or near the radio path. Deliberate jamming or other inadvertent radio signal interference can also negatively affect system operation.

13. **Wireless Devices Placement Proximity.** Moreover all wireless devices must be a minimum and maximum distance away from large metal objects, such as refrigerators. You are required to consult the specific Mircom System manual and application guide for any maximum distances required between devices and suggested placement of wireless devices for optimal functioning.
14. **Failure to Trigger Sensors.** Moreover, Mircom Systems may fail to operate as intended if motion, heat, or smoke sensors are not triggered.
 - a. Sensors in a fire system may fail to be triggered when the fire is in a chimney, walls, roof, or on the other side of closed doors. Smoke and heat detectors may not detect smoke or heat from fires on another level of the residence or building. In this situation the control panel may not alert occupants of a fire.
 - b. Sensors in a nurse call system may fail to be triggered when movement is occurring outside of the motion sensors' range. For example, if movement is occurring on the other side of closed doors or on another level of the residence or building the motion detector may not be triggered. In this situation the central controller may not register an alarm signal.
15. **Interference with Audible Notification Appliances.** Audible notification appliances may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners, appliances, or passing traffic. Audible notification appliances, however loud, may not be heard by a hearing-impaired person.
16. **Other Impairments.** Alarm notification appliances such as sirens, bells, horns, or strobes may not warn or waken a sleeping occupant if there is an intervening wall or door. It is less likely that the occupants will be alerted or awakened when notification appliances are located on a different level of the residence or premise.
17. **Software Malfunction.** Most Mircom Systems contain software. No warranties are provided as to the software components of any products or stand-alone software products within a Mircom System. For a full statement of the warranties and exclusions and limitations of liability please refer to the company's standard Terms and Conditions and Warranties.
18. **Telephone Lines Malfunction.** Telephone service can cause system failure where telephone lines are relied upon by a Mircom System. Alarms and information coming from a Mircom System may not be transmitted if a phone line is out of service or busy for a certain period of time. Alarms and information may not be transmitted where telephone lines have been compromised by criminal tampering, local construction, storms or earthquakes.
19. **Component Failure.** Although every effort has been made to make this Mircom System as reliable as possible, the system may fail to function as intended due to the failure of a component.
20. **Integrated Products.** Mircom System might not function as intended if it is connected to a non-Mircom product or to a Mircom product that is deemed non-compatible with a particular Mircom System. A list of compatible products can be requested and obtained.

Warranty

Purchase of all Mircom products is governed by:

<https://www.mircom.com/product-warranty>

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<https://www.mircom.com/software-license-terms-and-conditions>



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