Manual

Advanced

AX-CTL-1L, 2 and 4

Axis AX

Intelligent Fire Alarm Control Panel

Installation & Operation Manual

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1 Introduction / Overview

1.1 Product Description

This manual covers the installation and operation of the AX-CTL-1L, AX-CTL-2 and AX-CTL-4 Intelligent Fire Alarm Control Panels, also referred to as; Axis^{AX} Intelligent Fire Alarm Control Panels or Axis^{AX} Panels.

The AX-CTL-1L is a single loop analog addressable intelligent fire alarm control panel with two notification appliance circuits.

The AX-CTL-2 is a two loop analog addressable intelligent fire alarm control panel with two notification appliance circuits.

The AX-CTL-4 is a four loop analog addressable intelligent fire alarm control panel with four notification appliance circuits.

Note: The AX-CTL-1L cannot support optional AX-PSU, AX-LPD or AX-NAC modules.

The AX-CTL-1L, AX-CTL-2 and AX-CTL-4 models are compatibility tested for use with the Advanced range of intelligent detectors and modules, refer to Section 1.2.2 SLC Devices for a full list of devices. Each SLC (Signaling Line Circuit) loop supports the connection of 126 devices in any combination of intelligent detectors and modules.

The AX-CTL-1L, AX-CTL-2 and AX-CTL-4 panels have resettable and non-resettable power outputs, each rated 0.5 Amp @ 24 VDC, for connection to four-wire conventional smoke detectors and ancillary devices. Each AX-CTL-1L, AX-CTL-2 and AX-CTL-4 contains three (3) field programmable Form C relay contacts, each rated 1 Amp @ 30 VDC, defaulted as a fail-safe trouble relay, alarm relay, and supervisory relay. In addition, Axis^{AX} fire alarm control panels support a USB serial port for direct PC connection to allow field configuration programming via Advanced PC-NeT software.

These Axis^{AX} Intelligent Fire Alarm Control Panels are compact, flexible and feature rich, providing ease of installation and operation and are based on well proven dual, flash based microprocessor technology with on-board Real Time Clocks.

The operating software features installer friendly "Auto-Learn" and "Loop Detection" facilities for uncomplicated, trouble-free, commissioning and troubleshooting. The Axis^{AX} Intelligent Fire Alarm Control Panels are fully field-programmable via the on-board alphanumeric graphical display and keypad or from a Windows™ based PC-NeT field configuration program.

1.2 System Components

1.2.1 Internal Peripherals

The following internal peripherals can be installed in an Axis^{AX} Intelligent Fire Alarm Control Panel:

		Document
AX-ACB	AC Board	682-033
AX-CTL-1PCB	One Loop Base Card PCB	682-034
AX-CTL-2PCB	Two Loop Base Card PCB	682-034
AX-LPD	SLC/NAC Expansion Module (cannot be used with AX-CTL-1PCB)	682-011
AX-NAC	NAC Expansion Module (cannot be used with AX-CTL-1PCB)	682-011
AX-PSU	Power Supply Expansion Module (cannot be used with AX-CTL-1PCB)	682-012
AX-DSP	Alphanumeric Graphical Display and Keyboard	682-035
D9068P	SIA and Contact ID Digital Dialer (requires AX-SEB)	682-200
AX-SEB	Serial Expansion Board (for use with D9068P)	682-200
AX-NET4	Network Interface Module, Style 4 (Class B)	682-013
AX-NET7	Network Interface Module, Style 7 (Class A)	682-013
AX-MOXA	Fiber Optic Converter Module for AX-NET4 or AX-NET7	682-260
AX-DCI	24 VDC Isolator Module for AX-MOXA	682-260
AX-RL8	Eight Relay Output Module	682-006
AX-RL4	Four Relay Output Module	682-026
AX-MDM	24 VDC Modem Card	682-024
AV-AMP-80	Audio Amplifier with Two 40 Watt Speaker Circuits	682-032
AV-ZS	Audio Zone Splitter Module	682-054
AX-PSU-6	6 Amp Power Supply Charger for AV-AMP-80 Amplifier	682-028
AX-012	Panel Strip Printer	682-022
AX-ASW-16	Switch Module with 16 Switches and 48 LEDs	682-020
AX-LED16	LED Annunciator Module, 16 Red and 16 Yellow	682-020
AX-LED32R	LED Annunciator Module, 32 Red	682-020
AX-LED32Y	LED Annunciator Module, 32 Yellow	682-020
AX-I/O-48	16 Switch Input and 48 LED Driver Outputs	682-020
AX-RL10	10-Way Relay Output Card (used with AX-I/O-48)	682-020
AX-CZM	Conventional Zone Module	682-040S/SA
AV-RMIC	All Call Remote Microphone (for single hardwired amplifier installation ONLY)	682-046

1.2.2 SLC Devices

		Document
AX-APS2-xx	Pull Station [Single, Dual Action and NYC options]	682-004
56000-005ADV	Polycarbonate Dual Action Pull Station	APD0519 A130107
58000-450ADV	Intelligent Heat Detector	39214-429
58000-550ADV	Intelligent Ionization Smoke Detector	39214-429
58000-650ADV	Intelligent Photoelectric Smoke Detector	39214-429
58000-750ADV	Intelligent Multi Sensor Detector	39214-429
55000-790ADV	Dual Switch Monitor Module	39214-432
55000-805ADV	Switch Monitor Module	39214-426
55000-806ADV	Priority Switch Monitor Module	39214-426
55000-859ADV	120V I/O Relay & Monitor Module	39214-631
55000-820ADV	I/O Relay Output & Switch Monitor Module	39214-427
55000-825ADV	NAC Output Module	39214-428
55000-863ADV	Relay Module	39214-425
55000-765ADV	Mini Monitor Module	39214-632
55000-830ADV	Mini Priority Switch Monitor Module	39214-426
55000-831ADV	Mini Switch Monitor Module	39214-426
AX-SL-DAA-N	Analog Addressable Duct Smoke Detector – ION – 2 Wire	APD0329
AX-SL-DAA-P	Analog Addressable Duct Smoke Detector – PHOTO – 2 Wire	APD0329
AX-SL-DA4R-N	Analog Addressable Duct Smoke Detector – ION – 4 Wire	AP-330
AX-SL-DA4R-P	Analog Addressable Duct Smoke Detector – PHOTO – 4 Wire	AP-330
55000-750ADV	Isolator Module (requires 45681-211ADS Isolator Mounting Base)	39214-424
45681-211ADS	Isolator Mounting Base for 55000-750ADV (fits 3" octagon electrical box)	39214-424
58000-011ADV	Enhanced Open Area Sounder/Beacon (Loop Powered) - Red	69214-690
58000-012ADV	Enhanced Open Area Sounder/Beacon (Loop Powered) - White	69214-690
55000-041ADV	Open Area Sounder (Loop Powered) - Red	39214-633
55000-042ADV	Open Area Sounder (Loop Powered) - White	39214-633
55000-877ADV	Loop Powered Beacon - Red	39214-635
55000-878ADV	Loop Powered Beacon – Clear with Red LED	39214-635
55000-879ADV	Loop Powered Beacon - Amber	39214-635
Bases		
45681-800ADV	Intelligent CO Detector Base with Sounder	APD0546 A140113
45681-250ADS	E-Z-Fit Low Profile Base (fits 4" square or octagon electrical box)	39214-429
45681-524ADS	Enhanced Sounder/Beacon Base (Loop Powered) – Red Beacon	39214-689
45681-527ADS	Enhanced Sounder/Beacon Base (Loop Powered) – Amber Beacon	39214-689
45681-526ADS	Sounder/Beacon Base (Loop Powered) – Red Beacon	39214-634
45681-525ADS	Sounder/Beacon Base (Loop Powered) – Amber Beacon	39214-634
45681-292ADS	White Cap (Low Profile) for Sounder/Beacon and CO Bases	39214-634

Bases Cont'd

45681-292ADS	White Cap (High Profile) for Sounder/Beacon and CO Bases	39214-634
45681-293ADS	Red Cap for Sounder/Beacon and CO Bases	39214-634
45681-210ADS	Standard Base (fits 3" octagon electrical box)	39214-429
45681-242ADS	Relay Base (fits 3" octagon electrical box)	39214-431
45681-321ADS	Isolating Base (fits 3" octagon electrical box)	39214-430
38531-830ADS 38531-829ADS	Adapter Kit (converts 3" octagon mounting bases to 4" square mounting) (38531-830ADS Mounting Bracket & 38531-829ADS Trim Ring)	n/a
MB-SDRT-AA	Intelligent 6", 4 – Wire, Temporal/Steady Signaling Sounder Base	APD0281

1.2.3   NAC Devices

NAC outputs are 24V DC Regulated. Any Listed Notification Appliance with compatible ratings may be installed, including previously installed devices in existing facilities.

Compatible Pre-Action/Deluge Releasing Solenoid

		Document
73218BN4UNLVNOC111C2	Solenoid, Parker Fluid Control	682-053

1.2.4   Network Devices

The following additional Ad-NET-PLuS network nodes can be added to the Axis^{AX} Intelligent Fire Alarm Control Panel:

		Document
AX-ANN-C	Remote Control Annunciator, Style 4 (Class B)	682-003
AX-ANN-C/ST7	Remote Control Annunciator, Style 7 (Class A)	682-003
AX-ANN-D	Remote Annunciator Only, Style 4 (Class B)	682-003
AX-ANN-D/ST7	Remote Annunciator Only, Style 7 (Class A)	682-003
AX-LAN	ipGateway, Style 4 (Class B)	682-250
AX-LAN/ST7	ipGateway, Style 7 (Class A)	682-250
AX-BMS	Building Management Ad-VIEW Graphics Interface, Style 4 (Class B)	680-199
AX-BMS/ST7	Building Management Ad-VIEW Graphics Interface, Style 7 (Class A)	680-199

1.3   Limitations of Fire Alarm Systems

An automatic fire alarm system can provide early warning and notification of the development of a fire. It can't, however, assure protection against loss of property or loss of life.

It is recommended that smoke and/or heat detectors and notification appliances be installed throughout the building in accordance with the requirements detailed in NFPA 72, local/state codes, and with the instructions supplied with the equipment.

The type(s) of detector employed and their physical location must be selected carefully to ensure that they detect the types of fire likely to occur in the protected area. Even so, a number of factors may prevent the necessary levels of combustion products from reaching the sensing chambers and thus the system may not indicate an alarm condition.

Heat detectors protect property, not life.

> *Installation of a fire alarm system may lower insurance rates, BUT it is not a substitute for fire insurance!*

Smoke detectors shall be installed in the same room(s) as the fire alarm control panel, any equipment used for transmission of the alarm condition, and in locations where power supplies are mounted. Otherwise, a developing fire may damage the system and its ability to report the fire alarm condition, refer to NFPA 72.

The system will not operate without power. Standby batteries shall be properly maintained and replaced regularly.

Regular maintenance will ensure that the system is operating at its optimum performance. Arrange a maintenance agreement with the manufacturer's local representative to ensure that the system is maintained by a professional fire alarm installer in accordance with National and any local/state codes. Maintain a written record of all inspections and maintenance performed.

1.4   General Installation Notes

WARNING: Disconnect all sources of power (AC and battery) before installing components or servicing the system.

DO NOT install/remove circuit cards while the fire alarm control panel is supplied with power (either AC or battery).

ENVIRONMENT: INSTALL the equipment in a clean, dry environment.

The equipment meets the requirements for operation at 32°F - 120°F (0°C - 49°C) and relative humidity of 85% RH. However, standby battery life is drastically reduced at higher temperatures. The recommended room temperature for installation is 60°F - 86°F (15°C - 27°C).

WIRING: CHECK that the installation wire sizes are adequate to deliver the required load current and maintain compatibility with the specific device operating voltages.

USE an anti-static wrist strap whenever handling circuit cards.

STORE circuit cards in static suppressive packaging.

CAUTION: Acceptance / Re-acceptance Tests

Following installation or after any system change (including changes to operating software or configuration settings) the system shall be tested in accordance with the requirements in NFPA 72 and any local/state codes.

All affected functions or devices shall be 100% tested. In addition, at least 10% of initiating devices not directly affected by the change shall also be tested.

Follow the recommendations of NFPA 72.

A secure dedicated ground connection is required. Although no system is immune to the effects of lightning strikes, a secure ground connection will reduce susceptibility. The use of overhead or outside aerial wiring is not recommended.

2   Agency Listings / Approvals / Requirements

2.1   ANSI/UL864

This product is listed for the following services and applications.

- Local
- Local & Shunt Trip
- Auxiliary
- Central Station (Requires DACT)

- Manual
- Automatic
- Waterflow
- Supervisory

This product must be installed, serviced and maintained in accordance with the following standards and any local / state codes.

NFPA 70 National Electrical Code
NFPA 72 National Fire Alarm Code

2.2   FCC

2.2.1   Emissions

WARNING: This equipment generates, uses, and can radiate radio frequency energy. If it is not installed in accordance with the instructions in this manual, it may cause interference to radio communications.

This equipment has been tested and found to be in compliance with the limits for a Class A computing device pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case, the user will be required to correct the interference at their expense.

3   Enclosure Installation and Inner Door Assembly

The AX-CTL-1L, AX-CTL-2 and AX-CTL-4 Intelligent Fire Alarm Control Panels are delivered fully assembled. Carefully unpack the system and check for shipping damage. Remove all circuit boards and mount the cabinet in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the panel. Locate the top of the cabinet approximately 5½ feet (1.7 m) above the floor with the hinge mounting on the left. Determine the number of conductors required for the devices and circuits to be installed. Sufficient knockouts are provided for wiring convenience in both the top and side walls of the back box. Select the appropriate knockout(s) and pull the required conductors into the back box, separating power limited from non-power limited conductors – refer to the recommended cable routing diagram Section 5. All wiring should be in accordance with National Electric Code (NEC), State and Local codes.

3.1   Enclosure Mounting and Dimensions

The AX-CTL-1L, AX-CTL-2 and AX-CTL-4 enclosure may be either surface or semi-flush mounted.

AX-01-BB: Back Box
AX-01-ID1:   Inner Door
AX-01-OD1: Outer Door
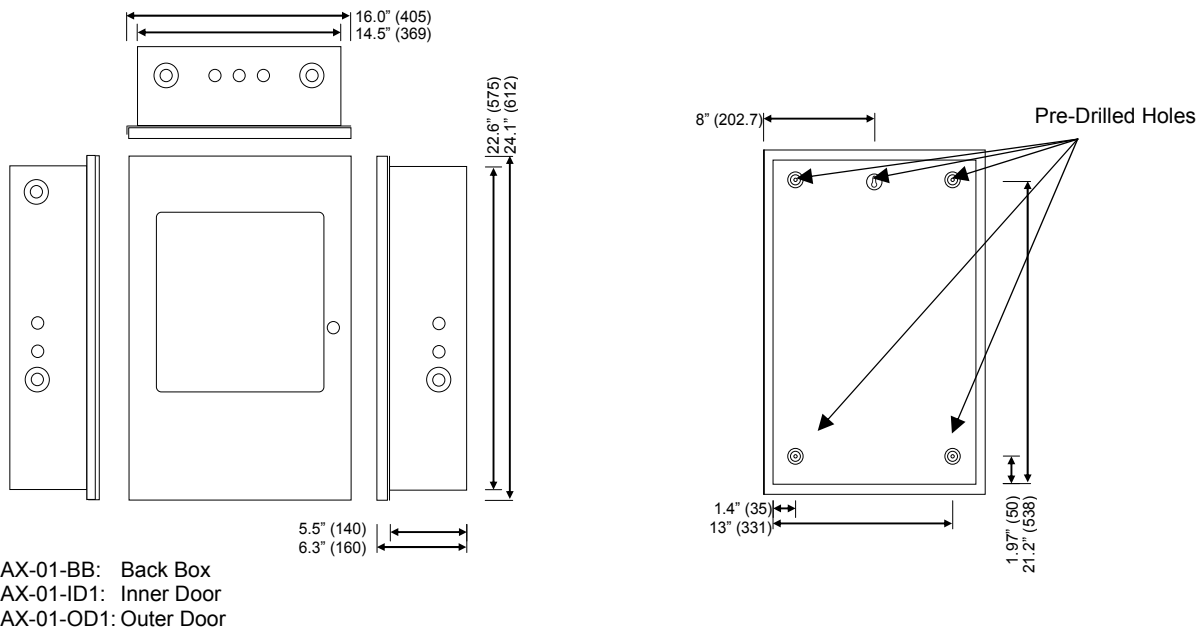
Figure 1 - AX-CTL-(x) Enclosure Dimensions

Note: The back box includes seven single knockouts (7/8"), and seven double knocks (7/8" or 1 ¾") two located on the bottom of the back box. Care should be taken when utilizing the inner 7/8" knockout of the 1 ¾" knockout to avoid knocking out the 1 ¾".

For surface mounting there are five pre-drilled holes located on the rear of the back box (see figure 1). The top center mounting hole is keyed for ease of mounting.

Place the back box on the wall and mark the top keyed mounting hole.
Drill the marked location and partially install the mounting screw in the wall.
Hang the cabinet on the mounting screw.
Level the cabinet and mark the remaining holes and then drill the holes.
Insert all screws and firmly tighten.

For semi flush mounting, in addition to the rear mounting holes, 1/8" knockouts are located on the sides and top of the back box for securing the enclosure to the wall studs.

3.2 Inner Door Assembly and Installation

The Axis^{AX} Intelligent Fire Alarm Control Panel is factory assembled with a 2x2 inner door (AX-01-ID1).

Note: Inner and outer doors are mounted to the back box with AX-HPINs.

The Axis^{AX} Intelligent Fire Alarm Control Panel inner door supports one (1) double aperture module and two (2) optional single aperture modules. The inner door is preassembled with; one AX-DSP alphanumeric graphic display, in the double aperture location and two AX-SAPs single aperture plates, in the single aperture locations (see figure 2).

Double Aperture

Single Aperture

3.2.1
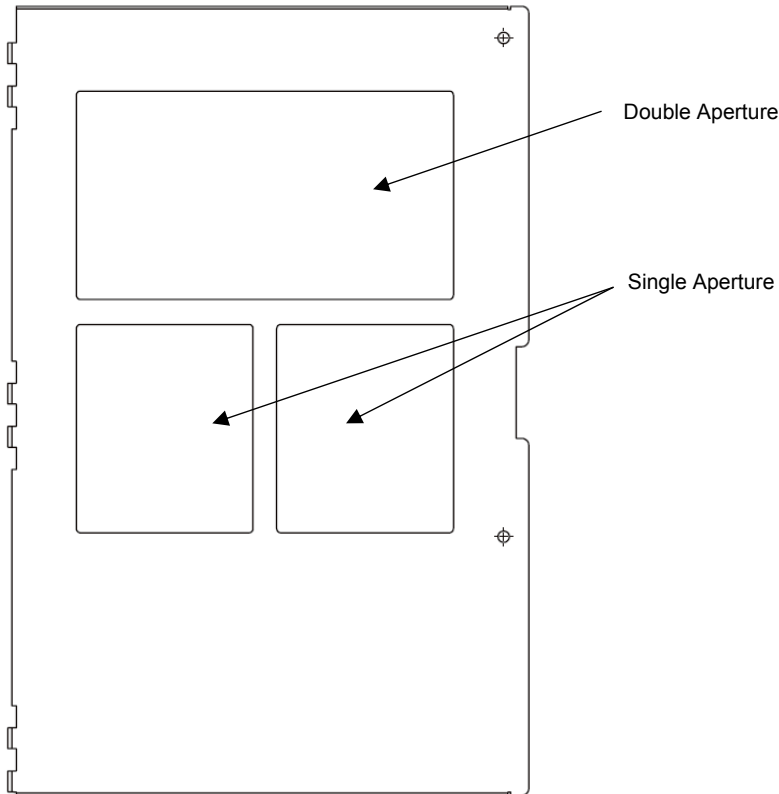
Figure 2 – AX-01-ID1 Inner Door

3.2.2 Inner Door Aperture Modules

Below is a list of inner door optional single aperture modules available for the Axis^{AX} Intelligent Fire Alarm Control Panel.

Single Aperture Modules (size; 6 ⅝"H x 5 ⅝"W):
1. AX-ASW-16 Switch/LED Module
2. AX-LED16 LED Annunciator Module, 16 Red and 16 Yellow
3. AX-LED32R LED Annunciator Module, 32 Red
4. AX-LED32Y Led Annunciator Module, 32 Yellow
5. AX-I/O-48 Switch and LED Driver
6. AX-012 Panel Strip Printer

3.2.2.1 Mounting Inner Door Aperture Modules

To install an aperture module onto the inner door of an Axis^{AX} Intelligent Fire Alarm Control Panel, simply remove the nuts and remove the single aperture plate.

Place the aperture module into the aperture location between the aperture screws and remount the removed the previously removed washers and nuts.

For individual aperture module wiring and information refer to the installation manual for the specific module installed.
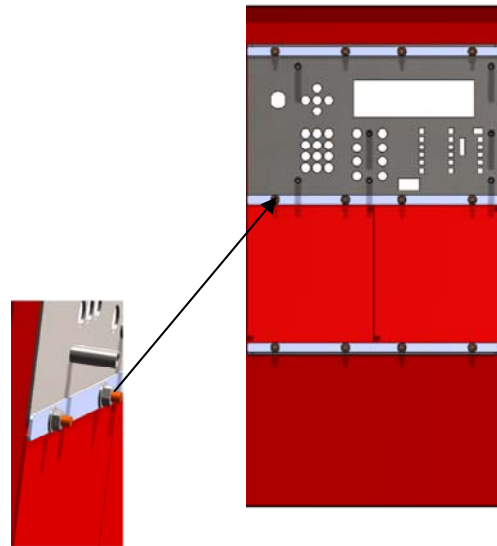
Figure 3– Aperture Installation

4   Circuit Card Installation and Electrical Specifications

Axis^{AX} Intelligent Fire Alarm Control Panels are shipped fully assembled and tested as one-loop (AX-CTL-1L), two-loop (AX-CTL-2) or four-loop (AX-CTL-4) intelligent fire alarm control panels. Additional circuit cards/modules for field expansion (present and future) are available and shipped in separate packing for protection. Prior to mounting the enclosure remove all pre-installed circuit cards.

ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE DEVICES

This equipment is constructed with static sensitive components. Observe anti-static precautions at all times when handling printed circuit boards. Wear an anti-static ground strap connected to panel enclosure earth ground.

CAUTION: Before installing or removing any printed circuit boards remove all sources of power (AC and battery).

4.1 AX-ACB AC Board

The AX-ACB AC board is the AC interface board for the Axis^{AX} Intelligent Fire Alarm Control Panel. The AX-ACB is pre-mounted to standoffs on the rear of the back box above the AX-CTL base card (see figure 4).
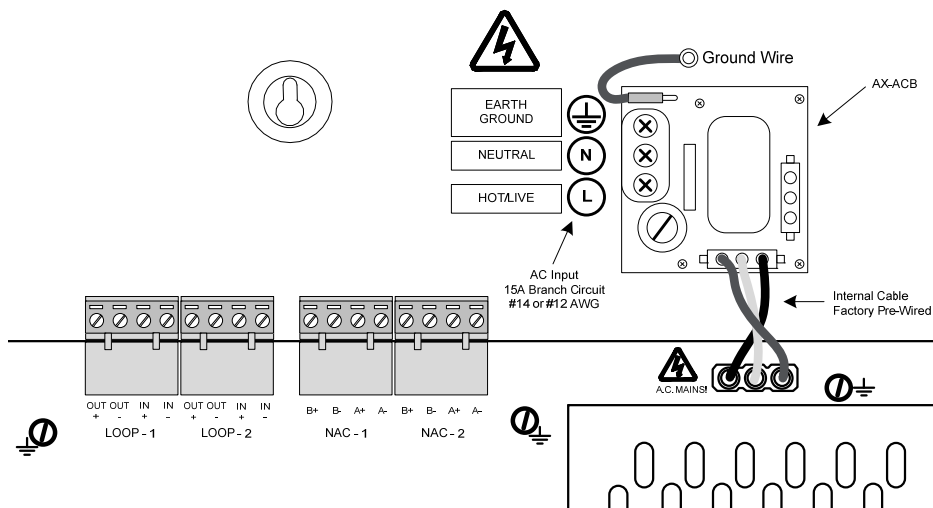
Figure 4 - AX-ACB AC Board

4.1.1 AX-ACB Electrical Specifications

AC Branch Circuit Ratings:
120V (1.4A [1 or 2 loop] / 2.8A [4 loop]) – 240V (0.7A [1 or 2 loop] / 1.4A [4 loop]) 50/60Hz
Brown-out – 98V nominal
15A Branch Circuit

Fuse: 5A, 250VAC Ceramic, Time Delay (size 5x20mm) (Advanced part number 620-003, Bussmann S505-5-R, Littelfuse 0215005.XP)

AC Wiring: #14 or #12 AWG, refer to NEC

Over-current protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) and/or local codes.

The panel must be connected to a solid earth ground. Use #14 AWG (2.00 mm^2) or larger wire with 600 volt insulation rating.

Must be earthed
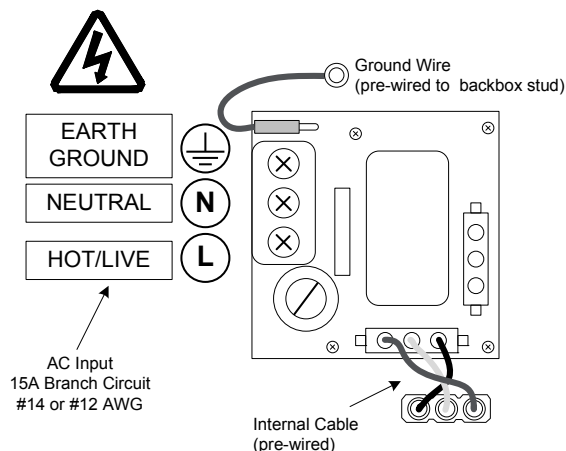
4.1.2 Replacing the AX-ACB AC Board

If replacing the AX-ACB AC board, remove power (AC and battery) from the system. Remove all Molex connector plugs and the green ground wire plug from the AX-ACB board. Remove the four (4) screws holding the AX-ACB board to the back box (see figure 4).

Place the new AX-ACB board over the four (4) mounting standoffs and secure with the four (4) removed screws. Replace the removed Molex connector cables and green ground wire plug, and reconnect AC and battery power.

Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

4.2   AX-CTL-1PCB One Loop or AX-CTL-2PCB Two Loop Base Card

The AX-CTL-1PCB one loop or AX-CTL-2PCB two loop, base card (referred to as AX-CTL base card) is the main board of the Axis^{AX} Intelligent Fire Alarm Control Panel and is pre-mounted to standoffs on the rear of the back box.

The AX-CTL base card is hung on five top-hat (screw-less) standoffs [✳] and secured with three (3) screws [p] (see figure 5). It is critical when replacing the base card that these screws are tightly secured as they are required for proper earth ground connection.

Failure to tighten screws will defeat the protection circuitry designed to protect the card from damage due to lightning and static electricity.
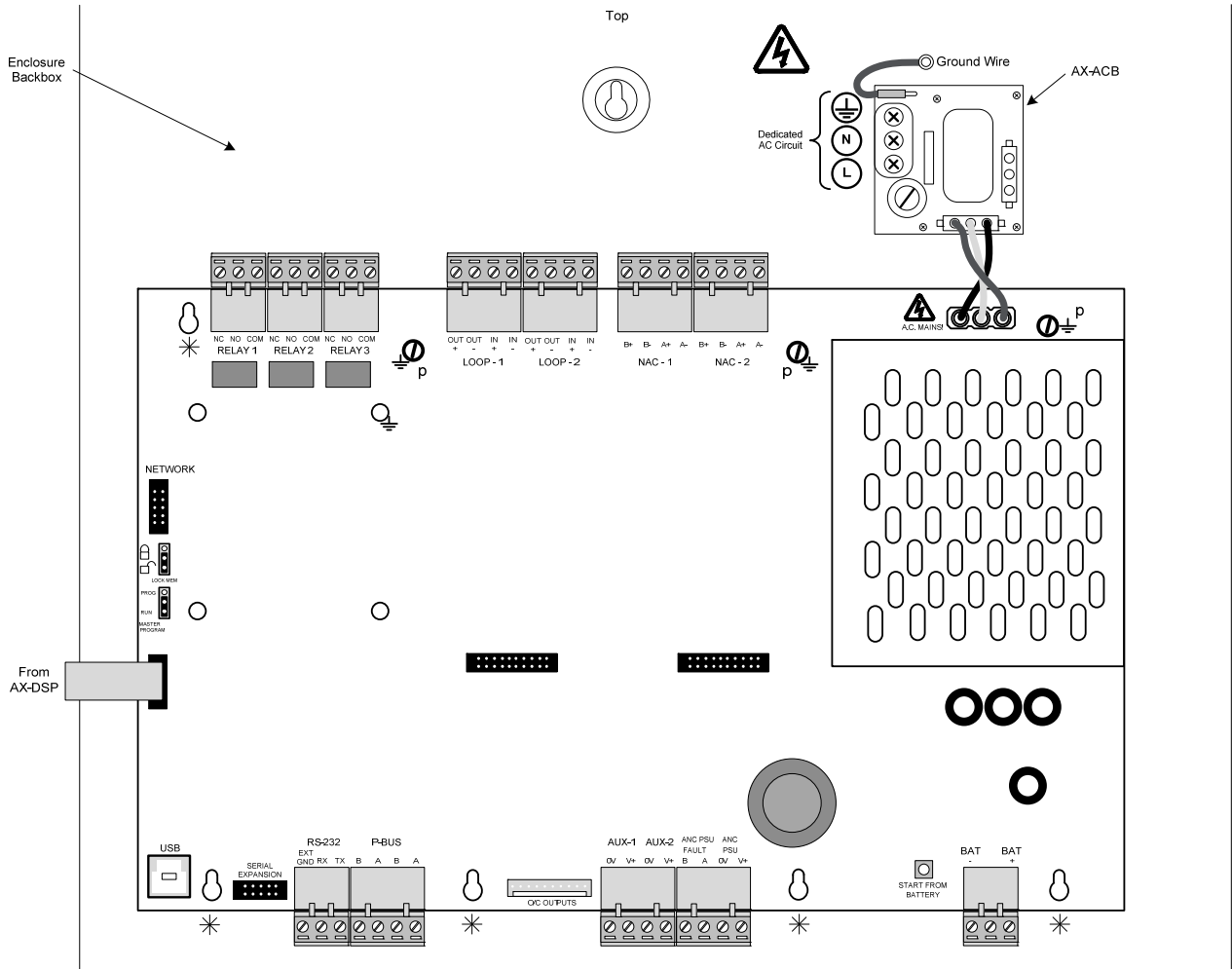
Figure 5 - AX-CTL (AX-CTL-1PCB / AX-CTL-2PCB) Base Card

4.2.1 AX-CTL Base Card Wiring

4.2.1.1 AX-CTL Base Card Battery Circuit

24 VDC Nominal

27.4V nominal charging voltage, 2.0A temperature compensated charging current. 0.83 manufacturer battery de-rating factor.

Minimum 7Ah, Maximum 48Ah batteries. SUPERVISED. NON-POWER LIMITED.

Battery link wire fuse:
Fuse: 10A, 250VAC Ceramic, Time Delay
        (size 5x20mm)
(Advanced part number 620-008, Bussmann S505-10-R, Littelfuse 0215010.XP)

Start the panel on AC power first then connect batteries. If AC power is not available the system can be started from the batteries, simply connect a fully charged set of batteries and press the "START FROM BATTERY" button.

The panel provides deep discharge protection. Battery power will be disconnected when voltage falls below 19V (nominal).

Note: If the batteries are disconnected the charger output is turned off.

Internal series resistance of the batteries is continuously checked. If the internal series resistance increases above 0.8Ω the panel will indicate a battery trouble condition.

4.2.1.2 AX-CTL SLC Circuits

The AX-CTL base card provides either one (AX-CTL-1PCB) or two (AX-CTL-2PCB) SLC circuits. The circuit ratings for each SLC are as follows:

24 VDC, 0.5A[1]
SUPERVISED. POWER LIMITED.

Class A, X (Style 7) or B

Minimum return voltage permitted is 17V.

Wire range – 22-12 AWG

Refer to Axis^AX Wiring Guide Section 9.
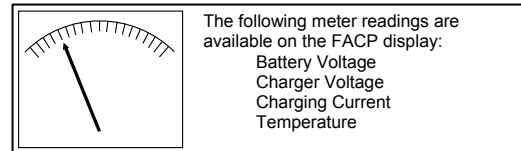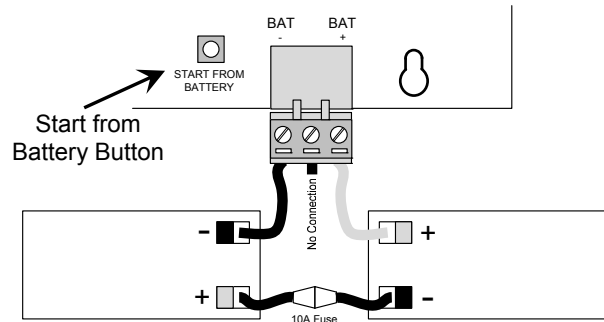
(Refer to Section 10.1.1)
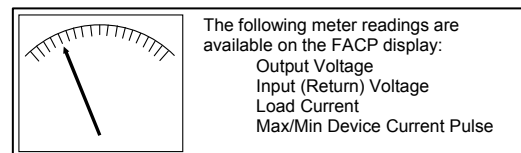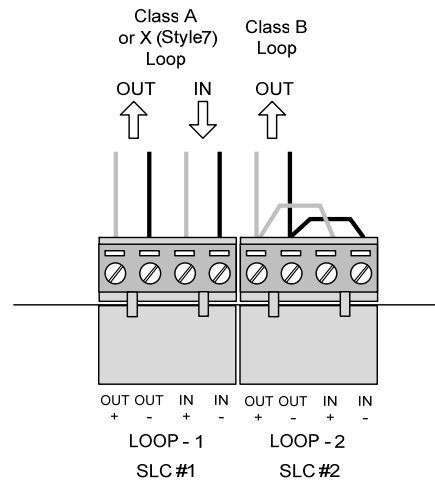
(Refer to Section 10.1.1)

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[1] TOTAL OUTPUT LOAD must not exceed panel supply rating – maximum 5A (10A if AX-PSU installed).
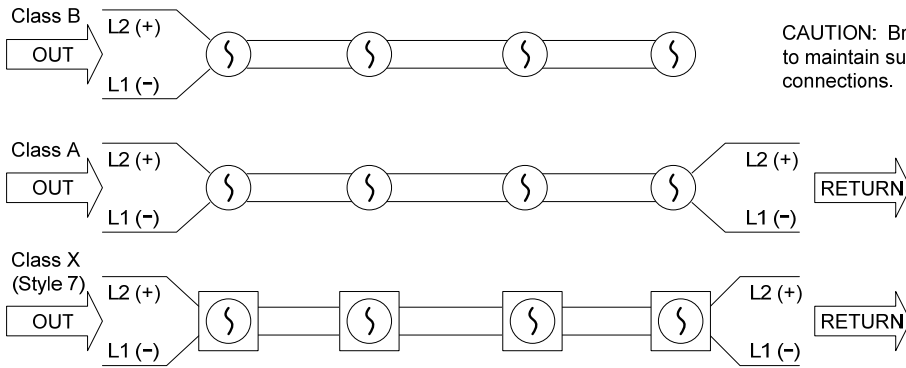
Class B
OUT
L2 (+)
L1 (−)

CAUTION: Break wiring run to maintain supervision of connections.

For Class X (Style 7), it is recommended that isolator modules or isolated bases are installed on zone boundaries or at each device. Refer to NFPA 72.

Class A
OUT
L2 (+)
L1 (−)
L2 (+)
L1 (−)
RETURN

Standard Base

Class X
(Style 7)
OUT
L2 (+)
L1 (−)
L2 (+)
L1 (−)
RETURN

Isolating Base or Isolator Module
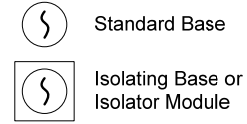
Note: During normal operation the panel will drive the SLC from the OUT connections, if a short circuit or open circuit condition is detected it will drive the SLC from both OUT and IN (RETURN) sides. During programming mode, the panel will drive the SLC from the OUT connections only to enable easier wiring trouble diagnosis.

4.2.1.3 SLC Peripheral Devices

Communications between the AX-CTL-1L, AX-CTL-2 and AX-CTL-4 AX-CTL base card and intelligent smoke detectors, addressable input devices and addressable output devices takes place through the Signaling Line Circuit (SLC), which can be wired NFPA Class A, X (Style 7) or B.

4.2.1.3.1 Intelligent Smoke Detectors

Intelligent Smoke Detectors offer a wide range of capabilities. Each detector provides dual-alarm LEDs for a complete 360^0 view of a devices status. In addition, the LEDs can be programmed to flash or not flash during quiescent mode.

Detectors are individually addressed through their associated base by a patented address ("XPerT") card. The address is set by removing "pips" on the XPerT card according to the chart below, which is supplied with each detector base (see figure 6). Once the address is set on the XPerT card, it is slid into the detector base and locked in place.

Note: Addressing the detector at the base rather than internally to the detector minimizes errors associated with detector removal and maintenance.

XPerT Card
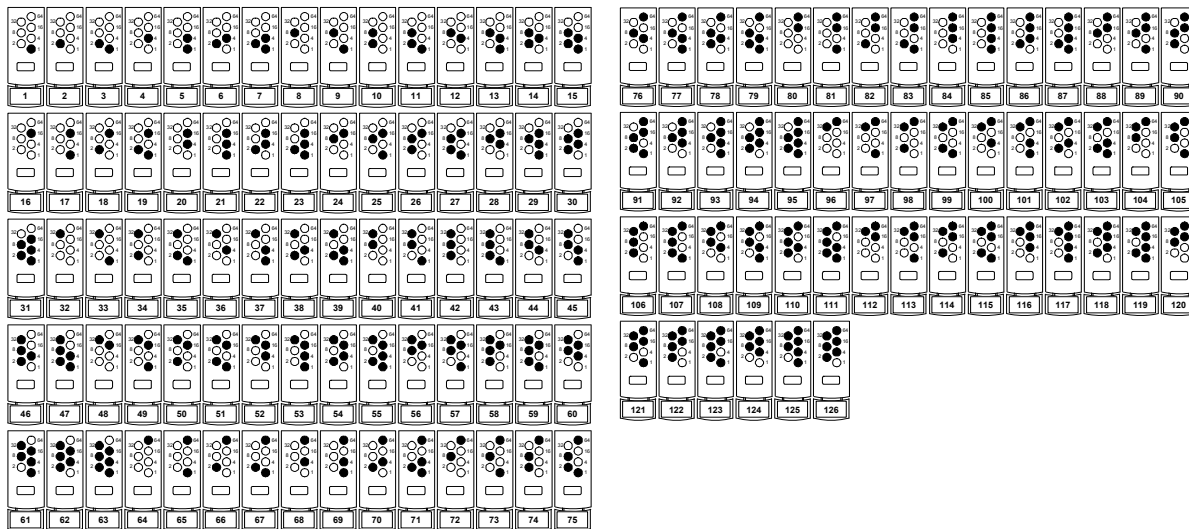
Figure 6 - XPerT Card Programming

Designed to adapt to changing environments and protect against unwanted false alarms, the response characteristics of each detector is set to comply with the stringent requirements of UL and NFPA 72.

Each detector is continuously monitored and tested for proper sensitivity and operation. If a problem is detected with either the device's sensitivity or its operation, a trouble or maintenance signal is reported back to the fire alarm control panel.

Detectors will compensate for any sensitivity drift of the initial programmed response/sensitivity value due to environmental contamination and/or dust buildup. Each detector maintains its initially set sensitivity at a constant level even when the chamber is severely contaminated. When compensation levels exceed normal values, a maintenance signal (dirty detector) signal is generated.

The intelligent detector is capable of being field programmed for one of five response/sensitivity modes (*see below*). Response modes correspond to unique response behaviors of a detector and the type of environment it is protecting, which can be broadly related to the characteristics of a fire. The detector response modes relate to different combinations of smoke sensitivity characteristics and programmable assessment times. Response mode 1 is more sensitive than response mode 5. Detectors set to response mode 1 would be more suitable for environments in which sources of unwanted alarms are rare (i.e.: clean rooms and computer rooms). Response mode 5 set detectors would be suitable for more dusty or harsh environments (i.e.: boiler rooms, loading dock areas). Response mode 3 (default programmed) would be the mid-sensitivity level used for most normal applications. Response mode setting and hysteresis of the individual detectors are stored within the detector's memory. The storing of this critical information in the detector rather in the fire alarm control panel software allows the detector to maintain its programmed response settings and compensated values even when power is removed from the detector. If the detector is powered down or inadvertently placed in another location, the detector response mode and clean values are not lost.

	Clean Room, Computer Room					Hotel Room, Apartment					Office, Hospital Ward, Factory, Light Industry					Warehouse, Restaurant					Loading Dock, Parking Garage					Kitchen, Laundry (enclosed and ventilated)					Boiler Room				
Mode	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Photoelectric	✓							✓	✓	✓			✓	✓	✓			✓						✓										✓	✓
Ionization								✓	✓	✓			✓	✓	✓			✓	✓																
Multi-Sensor	✓							✓	✓				✓	✓			✓	✓	✓	✓		✓	✓	✓	✓							✓			
Heat																✓	✓				✓	✓						✓	✓	✓		✓			✓

1, 2, 3, 4, 5 = Response/Sensitivity Modes
✓ = Mode Suitable for Installation

Photoelectric Detector		
Response Mode	Sensitivity Characteristics	Programmable Assessment Time
1	1.7 %/ft	5 sec
2	1.7 %/ft	30 sec
3	2.3 %/ft	5 sec
4	2.3 %/ft	30 sec
5	2.9 %/ft	5 sec

Multi-Sensor Detector			
Response Mode	Smoke Sensitivity Characteristics	Temperature Sensitivity	Programmable Assessment Time
1	1.7 %/ft	High	0-20 sec
2	2.3 %/ft	None	0-30 sec
3	2.7 %/ft	Medium	0-20 sec
4	3.3 %/ft	Medium	0-20 sec
5	None	135^0F	0-30 sec

Ionization Detector		
Response Mode	Sensitivity Characteristics	Programmable Assessment Time
1	.60 %/ft	5 sec
2	.60 %/ft	30 sec
3	.65 %/ft	5 sec
4	.65 %/ft	30 sec
5	.70 %/ft	5 sec

Heat Detector			
Response Mode	UL521 Temperature Rating (^{0}F)	Sensitivity Characteristics	Spacing
1	135^0 Ordinary	Static/Rate-of-Rise	70 ft
2	150^0 Ordinary	Static/Rate-of-Rise	70 ft
3	150^0 Ordinary	Static	70 ft
4	200^0 Intermediate	Static/Rate-of-Rise	70 ft
5	200^0 Intermediate	Static	70 ft

If an intelligent device is in alarm the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 will perform multiple assessments of the alarming device to ensure that the alarm condition from the device is valid. The value of the assessment time can be programmed by the installer during installation. Programmable assessment time fields range from 0 to a maximum of 10 seconds (0 to 20/30 seconds for Multi-Sensor detectors) from the first report of an alarm condition to the final validated (assessed) alarm condition. Refer to Front Panel Programming Manual or PC-NeT Field Configuration Manual for further explanation.

Note: Programmed default values for assessment time:
Detectors: Default 5 seconds. Maximum 10 seconds.
Input Modules: Default 0 seconds. Maximum 10 seconds.

USE CAUTION WHEN
SELECTING SAMPLING VALUE

When an intelligent device enters an alarm condition the analog value of the device can be viewed by the panel's graphical display. Analog values for alarm are set at a value of 55. A pre-alarm value of 45 is set as a default for all intelligent devices; this field is programmable and can be set at a lower or higher level. Refer to Front Panel Programming Manual or PC-NeT Field Configuration Manual for further explanation.

If an intelligent device falls below a minimum analog value the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card will enter a trouble/fault warning (i.e.: "Device Dirty) condition for that specific device. In addition, a device trouble condition (non device dirty) value is normally set at a value of 8 with a programmable range of 4-20.

In addition to all of the programmable capabilities of the intelligent devices, each device can also be setup for Special Sensitivity Mode (SSM) operation. In this mode of operation devices can be set to perform different functionality based on time-of-day/day-of-week (refer to Front Panel Programming Manual or PC-NeT Field Configuration Manual for further explanation). The AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card supports 10 independent, 7-day time clocks.

Another feature of the detector, in conjunction with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card, is its ability to sub-address detector base ancillary functions. Each detector is capable of incorporating, based on optional base utilization, a remote LED and/or relay. When these options are utilized, the user is capable of sub-addressing each of these options (remote LED and/or relay) to activate independently of the associated detector.

Detector Functions:
The fire alarm control panel supervises the connection to each intelligent detection device. The following statuses are monitored and reported as trouble conditions at the panel.

Maintenance Alert (Device Dirty):   Indicates that a detector has reached its limit of compensation in its chamber sensitivity due to environment contamination. It is now in a state where further contamination could mean the device is susceptible to false alarms.

Device Type Supervision: If an incorrect intelligent device type is replaced in a detector base.

Device Added: If the panel finds a device at an address where no device previously existed.

4.2.1.3.1.1   Detector Bases

4.2.1.3.1.1.1   Intelligent CO Detector and Sounder Base

The Intelligent CO Detector and Sounder Base (MB-CSHFAA, 45681-800ADV) is an analog/addressable combination carbon monoxide (CO) detector and sounder base for use on and AX-CTL base card Signaling Line Circuit (SLC).

As a combination unit, each Intelligent CO Detector and Sounder Base can support an additional Axis^{AX} intelligent detector (smoke, heat, or multi-sensor). In addition, if the addition intelligent detector is not installed the Intelligent CO Detector and Sounder Base can accommodate a blank cover (low profile [45681-292] or high profile [45681-380] format).

The CO sensor is an electrochemical sensor that is able to detect three levels of carbon monoxide and has a life of six years.

Program Mode	Carbon Monoxide Levels (PPM) (Applicable National Standard)	Alarm Response Time (Time Weighted Average)
3	70 parts per million (UL 2075 / 2034)	Within 4 hours
	150 parts per million (UL 2075 / 2034)	Within 50 minutes
	400 parts per million (UL 2075 / 2034)	Within 15 minutes

The CO sensor is fully supervised and provides a signal for field replacement, once it has reached its end of life cycle. The Intelligent CO Detector is individually addressed utilizing segments 1-7 of an integral DIP switch.

In addition to the Axis^{AX} fire alarm control panel providing an automatic daily test of the Intelligent CO Detector, the CO detector can be manually tested locally, via an on-board test button, by spraying CO test gas through its outer edge opening, or by manually initiating a test command from the Axis^{AX} fire alarm control panel.

The built-in Sounder Base is capable of providing a temporal 3 (sub-addressed controlled via the optional intelligent detector), in the event of an alarm event, or temporal 4 (sub-addressed controlled via the CO detector). If both temporal signals are activated the temporal 3 alarm signal has the highest priority. The built-in Sounder Base requires a separate regulated 24 VDC supply whether from an Axis^{AX} notification appliance circuit (NAC) or from a listed, supervised, power supply. Synchronization of multiple sounder bases is possible with the use of an optional MB-SDRT-M synchronization module.

Note: The Intelligent CO Detector and Sounder Base can be configured for "Standalone Detection Only" (SLC wiring only, no 24 VDC). In this mode of operation, the CO Detector and the additional optional intelligent detector will be monitored via the Signaling Line Circuit (SLC). However, as there is no 24 VDC wiring the Sounder Base temporal tones will be inoperable. The built-in Sounder Base <u>will not</u> function in "Standalone Detection Only" mode.

As previously stated the Intelligent CO Detector and Sounder Base can support an additional Axis^{AX} intelligent detector, this detector is individually addressed via the Sounder Base by a patented address ("XPerT") card. The address is quickly and easily set by removing "pips" on the XPerT card according to a chart supplied with each Intelligent CO Detector and Sounder Base.

The Intelligent CO Detector and Sounder Base is designed as a 6" diameter base which can mounted to a standard 4" octagonal or 4" square electrical box.

4.2.1.3.1.1.1.1 Intelligent CO Detector and Sounder Base Wiring

From
Axis^AX
Fire Alarm
Panel NAC

+ In Standby (– In Alarm)

– In Standby (+ In Alarm)

L1 L2

NAC

GND + –
ALARM

To next device, EOI
resistor, or FACP
Class A circuit

To Next Device
(or back to FACP
SLC for Class A or
X (Style 7) circuit

SLC –
+

Axis^AX
Fire Alarm
Control Panel
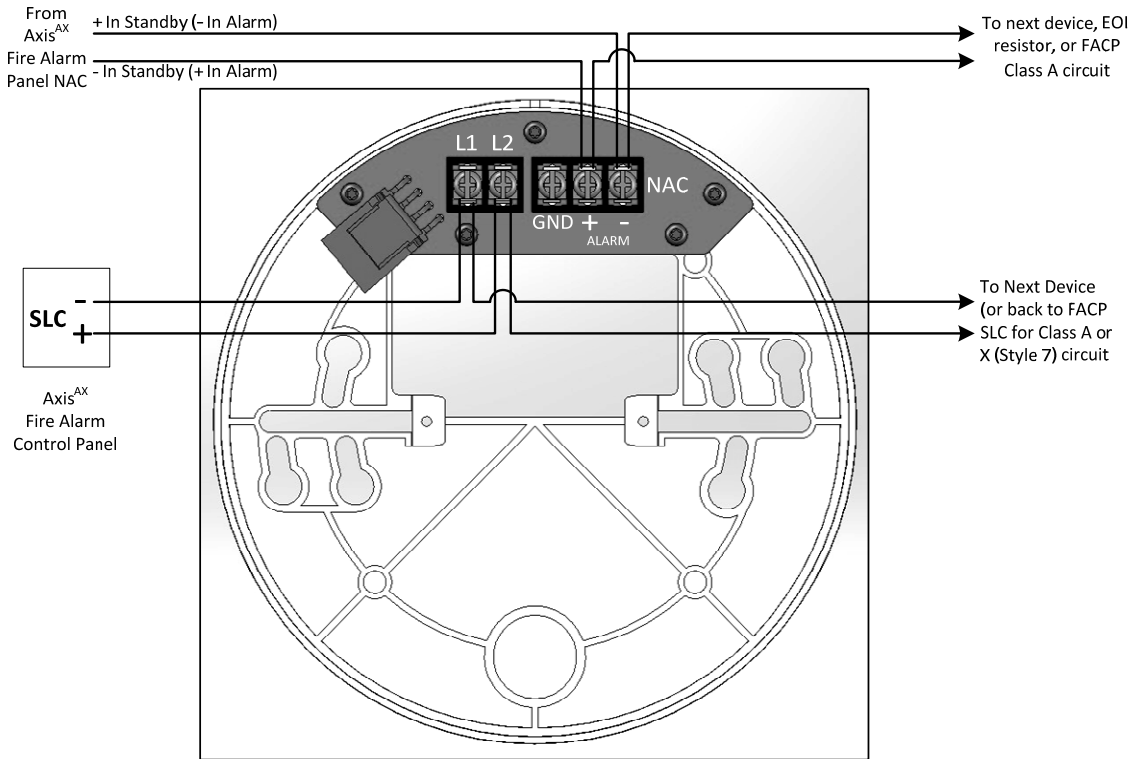
4.2.1.3.1.1.2 *E-Z Fit Detector Base Wiring (6")*

Optional
Remote LED

+R

–R

L1

L2

From
Axis^AX
SLC

–
+

To Next
Axis^AX
Peripheral

–
+
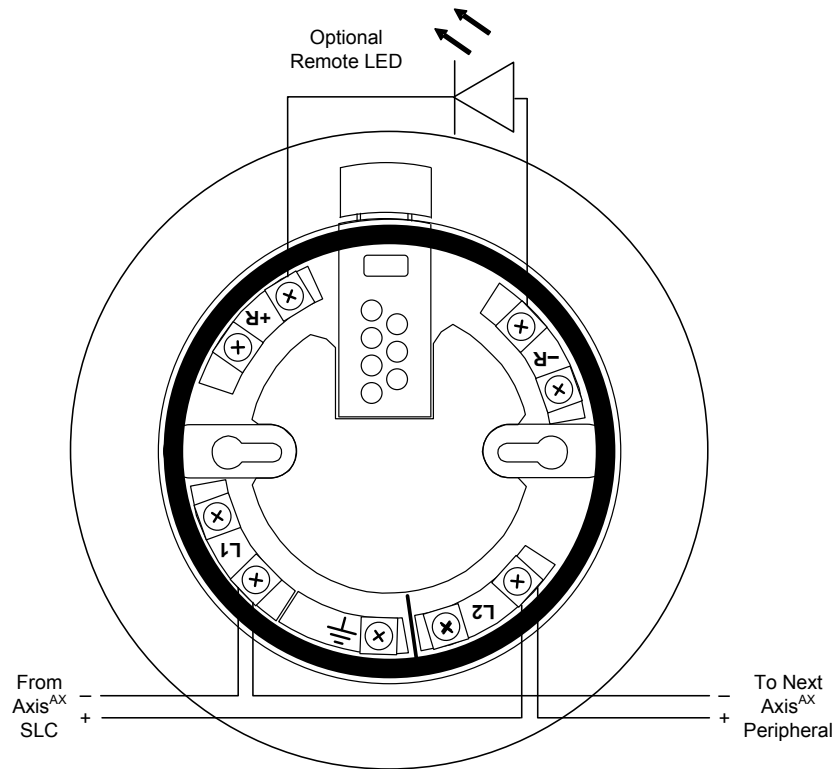
4.2.2.1.1.1.3 Relay Detector Base Wiring (4")

Optional
Remote LED

N/O
COM
N/C

From
Axis^{AX}
SLC

To Next
Axis^{AX}
Peripheral
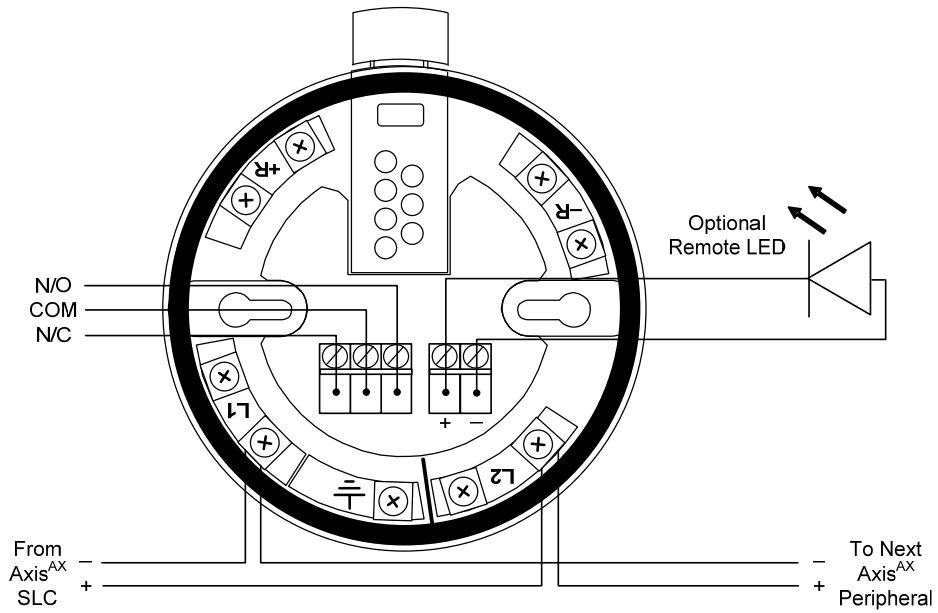
4.2.1.3.1.1.4 Isolator Detector Base Wiring (4")

Optional
Remote LED

From
Axis^{AX}
SLC

OUT   IN

To Next
Axis^{AX}
Peripheral
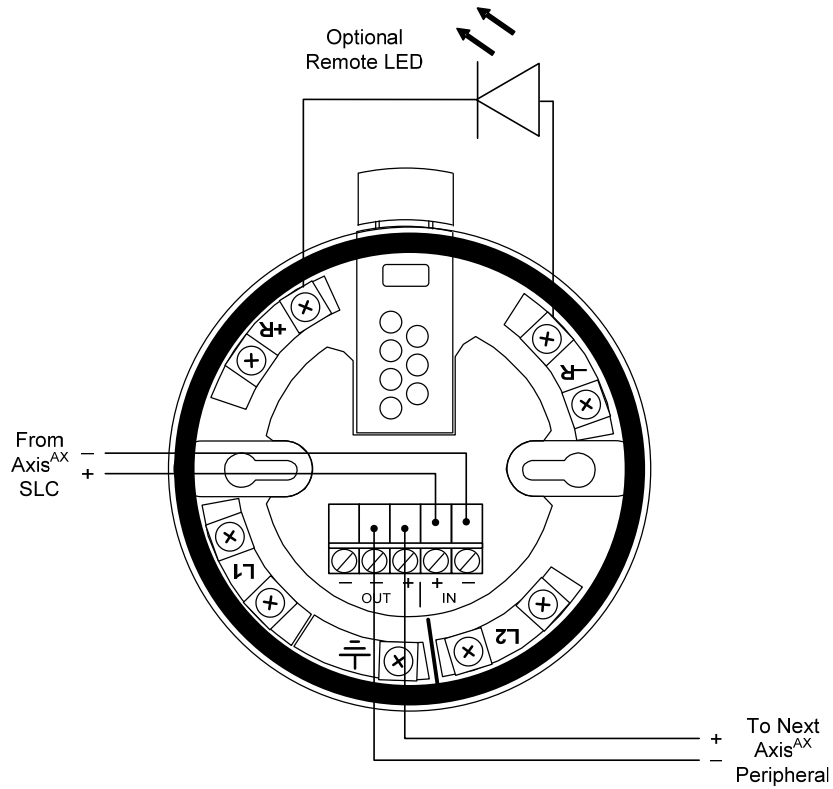
4.2.1.3.1.1.5   Loop Powered Sounder/Beacon Base Wiring (6")

Optional
Remote LED

Address & Tone
Setting

Volume Control
Low - High

R+

R−

Group Address
Setting

L1

L2

From
Axis^{AX}
SLC

To Next
Axis^{AX}
Peripheral
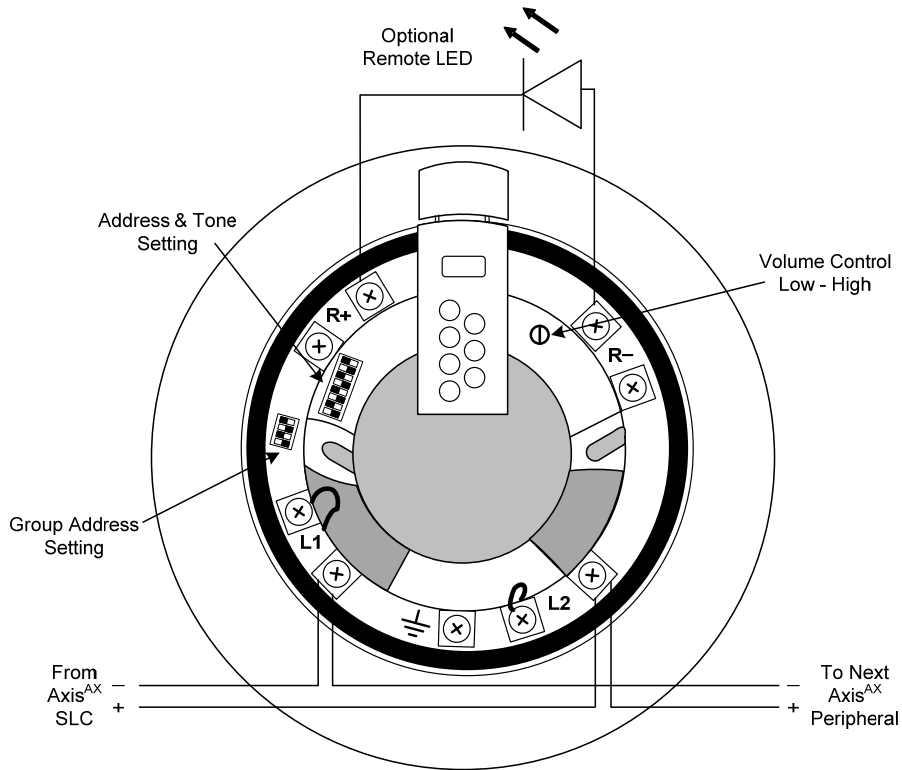
4.2.1.3.1.1.6   Enhanced Loop Powered Sounder/Beacon Base Wiring

Optional
Remote LED

Address
Setting

R+

R−

L1

L2

From
Axis^{AX}
SLC

To Next
Axis^{AX}
Peripheral
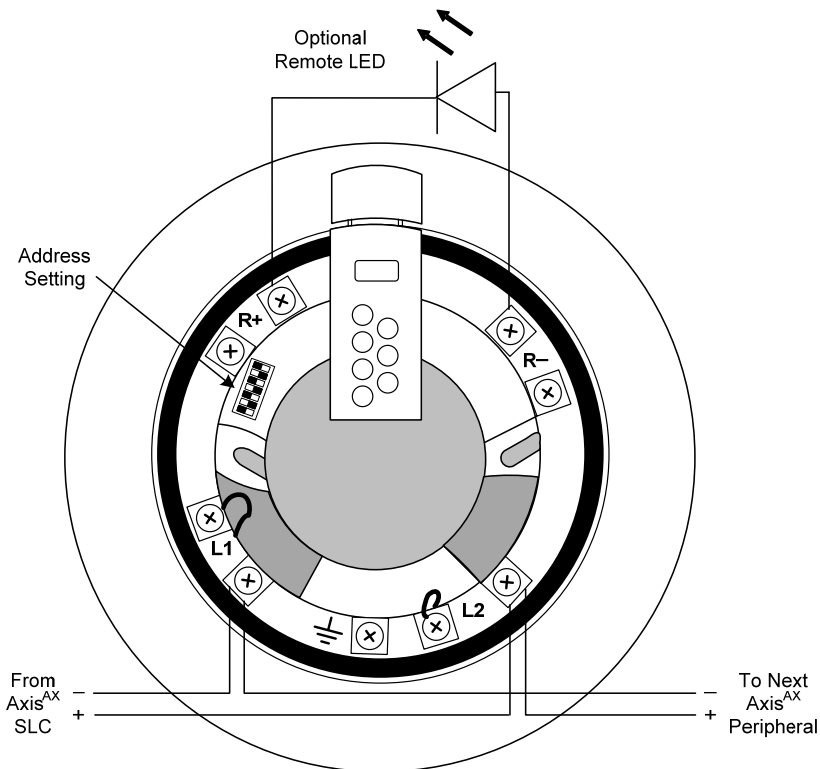
4.2.1.3.1.2 *Isolator Base (4") for use with 55000-750ADV Isolator*

From
Axis^{AX}   +
SLC

– To Next
Axis^{AX}
+ Peripheral

L2
OUT
L1
N
L1

From
Axis^{AX}   –
SLC
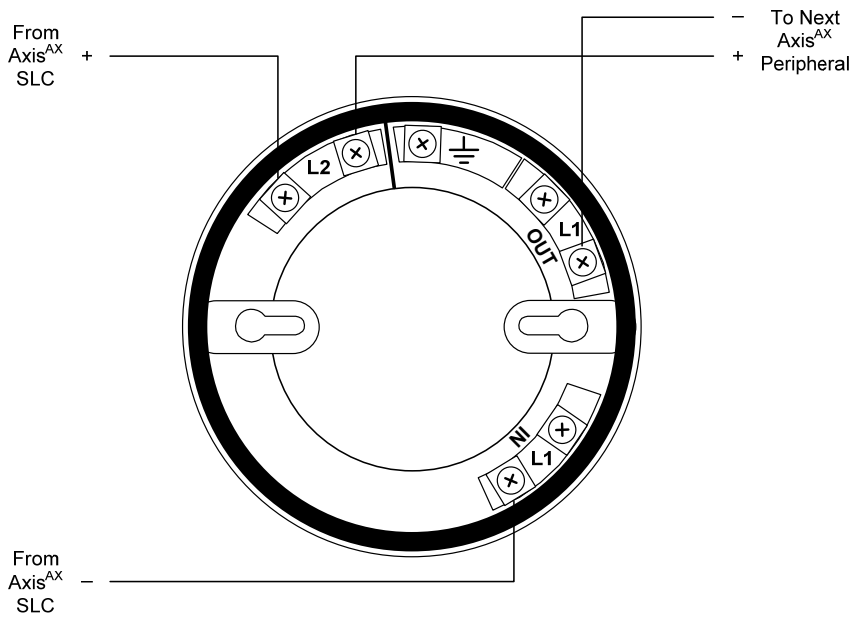
4.2.1.3.1.3 *6" Mounting Base Adapter Kit – Mounting Plate & Trim Ring*
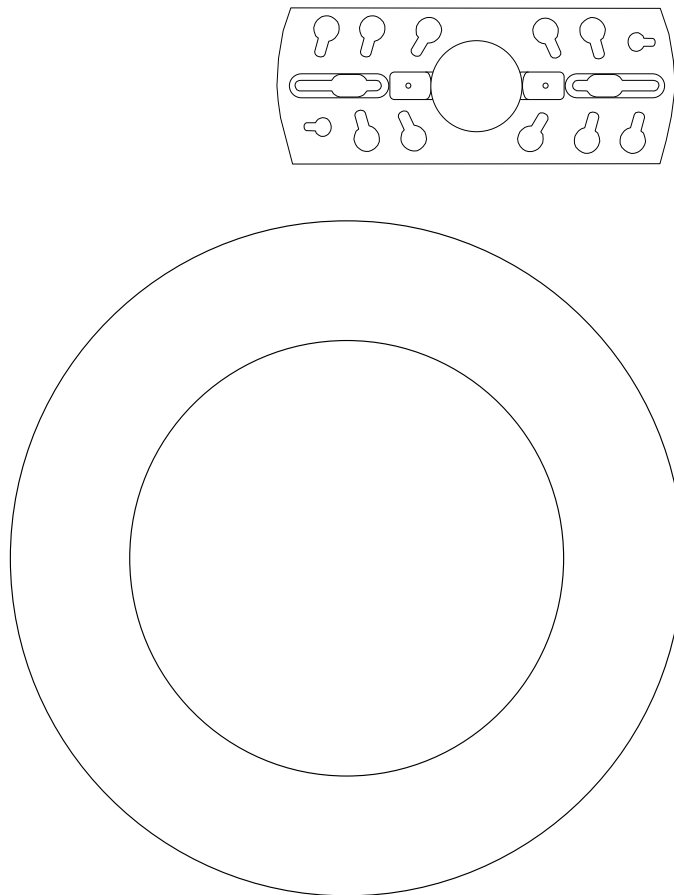
4.2.1.3.1.4   Open Area Sounders
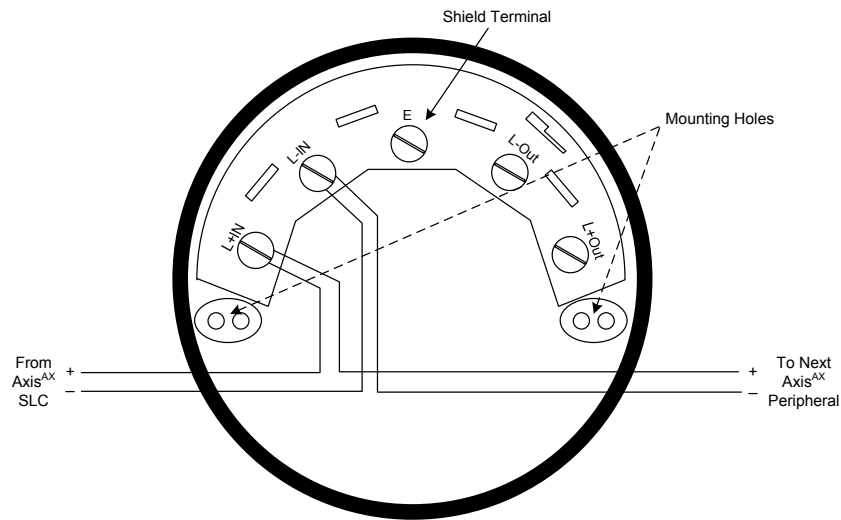
4.2.1.3.1.5   Intelligent Manual Pull Stations

4.2.1.3.1.5.1   Single and Dual Action AX-APS2

The Intelligent Manual Pull Stations (AX-APS2-xx) consists of a family of versatile, low profile, high quality addressable manual pull stations. Easily recognizable during a fire situation, the AX-APS2-xx stations are constructed of rugged die-cast metal for long life and reliability, with a high gloss red finish and raised white "FIRE" lettering.

The AX-APS2-xx stations are ANSI/UL 38 Listed and have been found to be in compliance with the latest requirements of the Americans with Disabilities Act (ADA). Activation of the pull station meets the requirements for five pound maximum pull force, and the single hand activation.

Each AX-APS2-xx station is equipped with a jumper selectable status LED, when the jumper is in the ON position the LED will flash each time the device is polled. In addition the LED will illuminate steady when the device is in alarm.

Each AX-APS2-xx station also contains a separate Form C relay contact, which transfers on the stations activation. This Form C relay contact can be utilized for special application functions (i.e.: controlling a light above the pull station to indicate activation, closing a door next to the pull station, etc.).
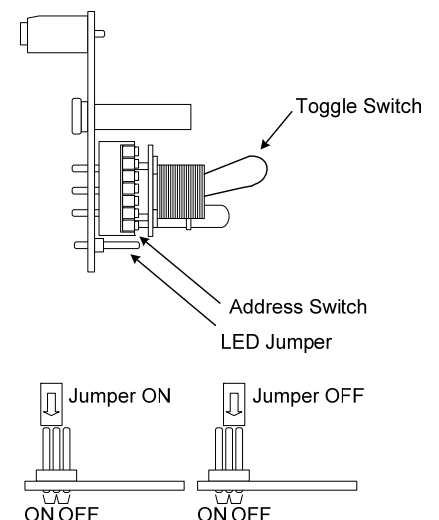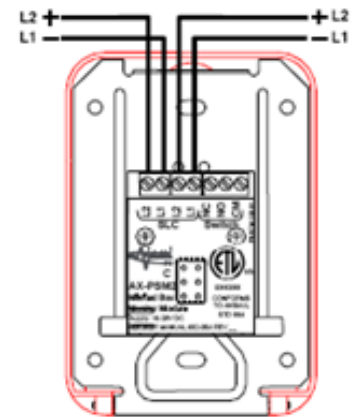
Available in either single (AX-APS2-F1) or dual (AX-APS2-F2) action configuration, the AX-APS2-xx stations are designed to prevent false alarms when bumped, jarred or shaken. The dual action AX-APS2-F2 further deters malicious false alarms by requiring a two-process function for activation; first push the "PUSH" bar inwards which then allows the "PULL" bar to be grasped and pulled outward.

Optional surface back boxes are available for indoor applications.

The Intelligent Manual Pull Stations are available in a variety of colors to meet various special application requirements. Colored stations do not include the raised white "FIRE" labeling, but are capable of accommodating labels for Alert, Alarm, Exit, Evac, etc. identification. Special applications can include; weather alert, door release, medical emergency, fire suppression activation and others.

4.2.1.3.1.5.2 Dual Action Polycarbonate 56000-005ADV

The Intelligent Dual Action Polycarbonate Pull Stations (56000-005ADV) are low profile, high quality addressable manual pull stations. Easily recognizable during a fire situation, the 56000-005ADV station is constructed of rugged polycarbonate for long life and reliability, with a red finish and raised white "FIRE" lettering. A red LED visible through the face of the station flashes during polling and turns on steady in alarm. Each station includes a key-lock for resetting (CAT B / CAT 30) which is common with the Axis^{AX} fire alarm control panel.
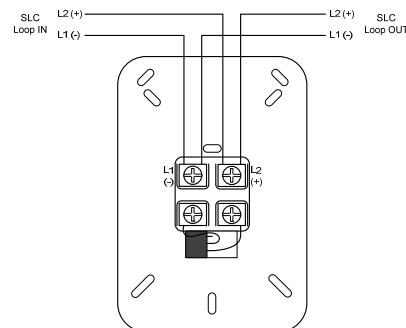
The 56000-005ADV stations are UL 38 Listed, meet the ADAAG controls and operating guidelines, and the ADA requirements for five pound maximum activation force.

The 56000-005ADV, Intelligent Dual Action Polycarbonate Pull Station, can be mounted semi-flush onto a standard single-gang electrical outlet box. If installations require surface mounting, an optional polycarbonate surface back box (56000-006ADV) is available.

4.2.1.3.1.6 Intelligent Modules

Intelligent Modules offer a wide range of input and output capabilities. The communications is a digital protocol that provides a high degree of immunity to transient noise and interference. The protocol also provides a mechanism for a device to place an alarm flag on the communications data stream, providing a fast response (priority - refer to specific module options) so that the alarm condition is registered within 2 seconds.

As with Intelligent Smoke Detectors, any Intelligent Module can be allocated to SLC addresses 1 – 126. The analog values returned by the devices are 4 (Trouble), 16 (Normal) and 64 (Alarm).

Each Intelligent Module; Inputs, Outputs and Pull Stations are individually addressed using a DIP switch. Opposite is an example of a programming DIP switch for address 42, below is a chart giving the settings for each address. In DIP switch packages containing eight (8) switches, the eighth switch is for classification of wiring type [Class A or Class B] (see figure 7).
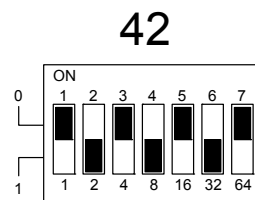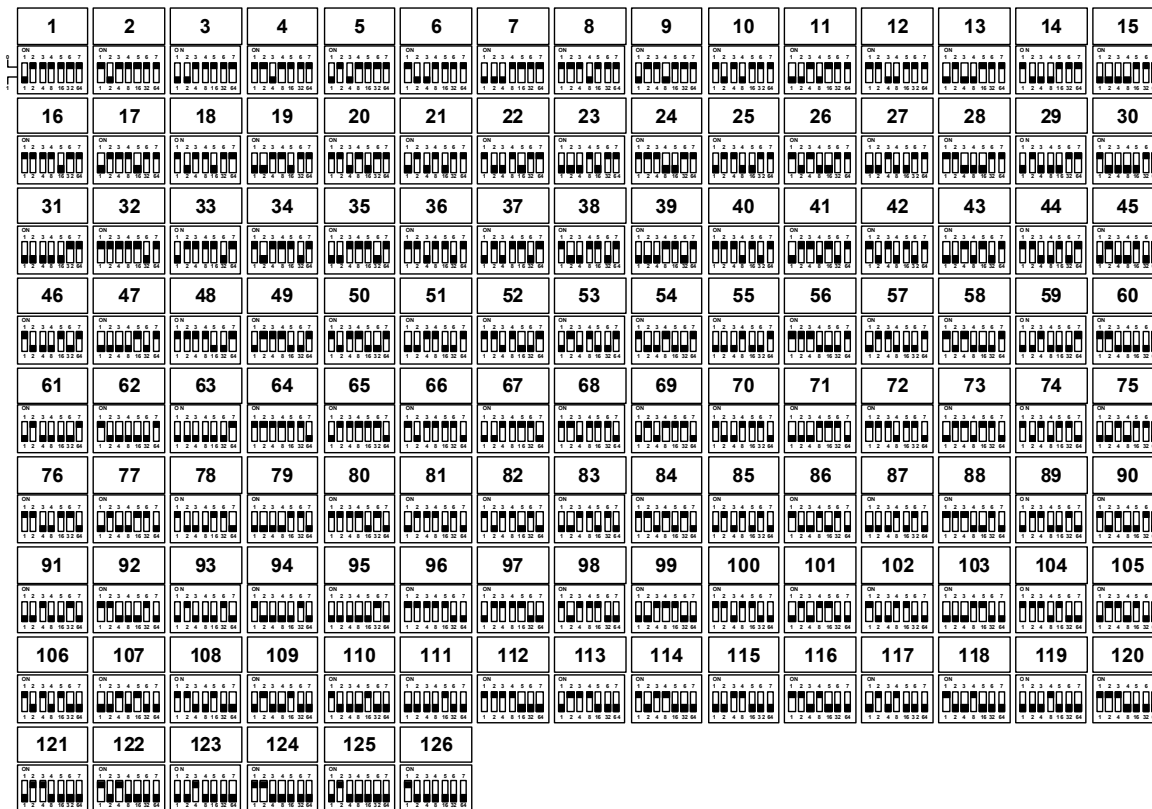
Figure 7 - DIP Switch Programming

4.2.1.3.1.6.1   *Intelligent Monitor and Priority Monitor Modules*

Available in various configurations, compact package (mini), 4" electrical box mount and with or without priority interrupt, the intelligent monitor modules offer unique fire alarm industry features that simplify installations and provide superior flexibility. Designed for installation on the SLC (signaling line circuit), each intelligent monitor module provides an addressable interface for a single contact device or group of contact devices connected via an initiating device circuit (IDC). With the flexibility of the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card, contact devices can be normally open (N.O.) or normally closed (N.C.) dry contacts. Contact devices range from heat detectors, linear heat detectors, 4-wire conventional smoke detectors, waterflow switches, tamper switches, manual pull stations, switch input points for control, etc.

Mini Monitor Module - 55000-765ADV

The 55000-765ADV Mini Monitor Module can either fit inside the device being monitored, or can be placed in an electrical box in the vicinity of the device being monitored. The Mini Monitor Module's initiating device circuit (IDC) is capable of being wired Class B to the monitored contact device(s). An integral eight position programming DIP switch must be set for device addressing and priority interrupt feature. Each 55000-765ADV Mini Monitor Module incorporates a red status LED which flashes when the device is polled. In addition, an optional remote LED output is available for alarm status indication. Mini Monitor Modules can monitor any number of contact devices, however it is recommended not to mix alarm, supervisory, or security contacts on the same monitoring module circuit (see figure 8).

Note: The 55000-765DV Mini Monitor Module is a DIN rail mount designed module, which allows multiples to be mounted via a DIN rail track within a common enclosure.
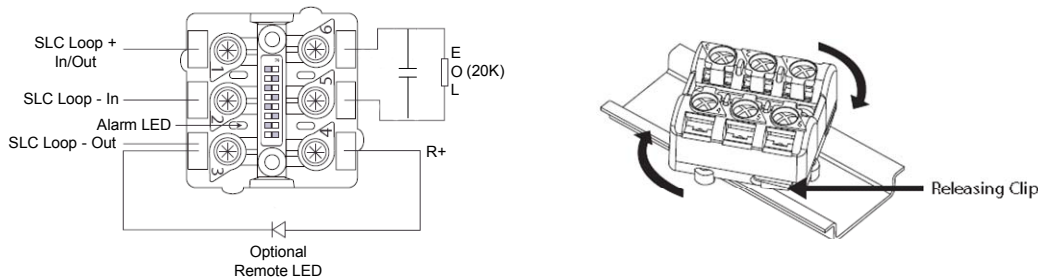
Figure 8 - 55000-765ADV Wiring & Optional Mounting

Mini Switch Monitor Module - 55000-831ADV

Designed with flying leads for field wiring, the 55000-831ADV Mini Switch Monitor Module can either fit inside the device being monitored or can be placed in an electrical box in the vicinity of the device being monitored. Based on installation requirements, the Mini Switch Monitor Module's initiating device circuit (IDC) is capable of being wired Class A or B to the monitored contact device(s). An integral eight position programming DIP switch must be set for device addressing and wiring classification definition. Each 55000-831ADV Mini Switch Monitor Module incorporates a red status LED which flashes when the device is polled. Mini Switch Monitor Modules can monitor any number of contact devices, however it is recommended not to mix alarm, supervisory, or security contacts on the same monitoring module circuit (see figure 9).

Mini Priority Switch Monitor Module - 55000-830ADV

The 55000-830ADV Mini Priority Switch Monitor Module is identical to the 55000-831ADV Mini Switch Monitor Module with the exception of a priority interrupt feature. The priority interrupt provides the fastest response possible to the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card. When the priority interrupt device is in an active state, the monitor's priority interrupt bypasses the normal SLC communications process, and immediately allows the device to communicate with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card. The Mini Priority Switch Monitor Module is utilized to monitor highly critical contact devices such as manual pull stations (see figure 9).
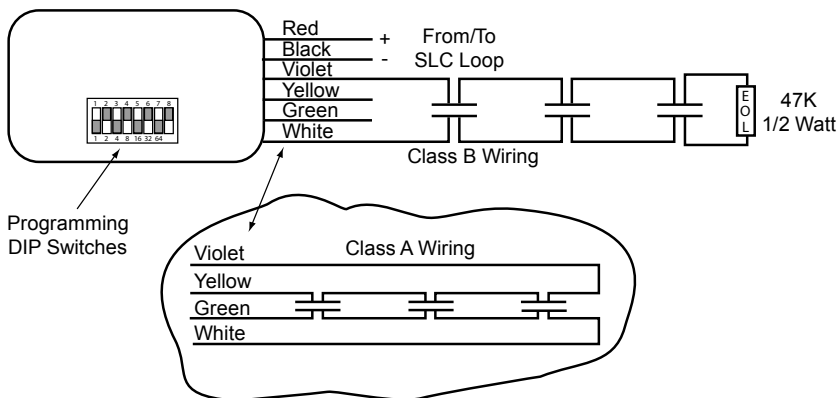
Figure 9 - 55000-831ADV and 55000-830ADV Wiring

Switch Monitor Module - 55000-805ADV

The 55000-805ADV Switch Monitor Module is designed to mount to the front of a 4" square or 2- gang electrical box. Based on installation requirements, the Switch Monitor Module's initiating device circuit (IDC) is capable of being wired Class A or B to the monitored contact device(s). An integral eight position programming DIP switch provides programming of device address and wiring classification definition. Each 55000-805ADV Switch Monitor Module incorporates a red status LED which flashes when the device is polled. Switch Monitors can monitor any number of contact devices, however it is recommended not to mix alarm, supervisory, or security contacts on the same monitoring module circuit (see figure 10).

Priority Switch Monitor Module - 55000-806ADV

The 55000-806ADV Priority Switch Monitor Module is identical to the 55000-805ADV, Switch Monitor Module, with the exception of a priority interrupt feature. The priority interrupt provides the fastest response possible to the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card. When the priority interrupt device is in an active state, the monitor's priority interrupt bypasses the normal SLC communications process, and immediately allows the device to communicate with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card. The Priority Switch Monitor Module is utilized to monitor highly critical contact devices such as manual pull stations (see Figure 10).
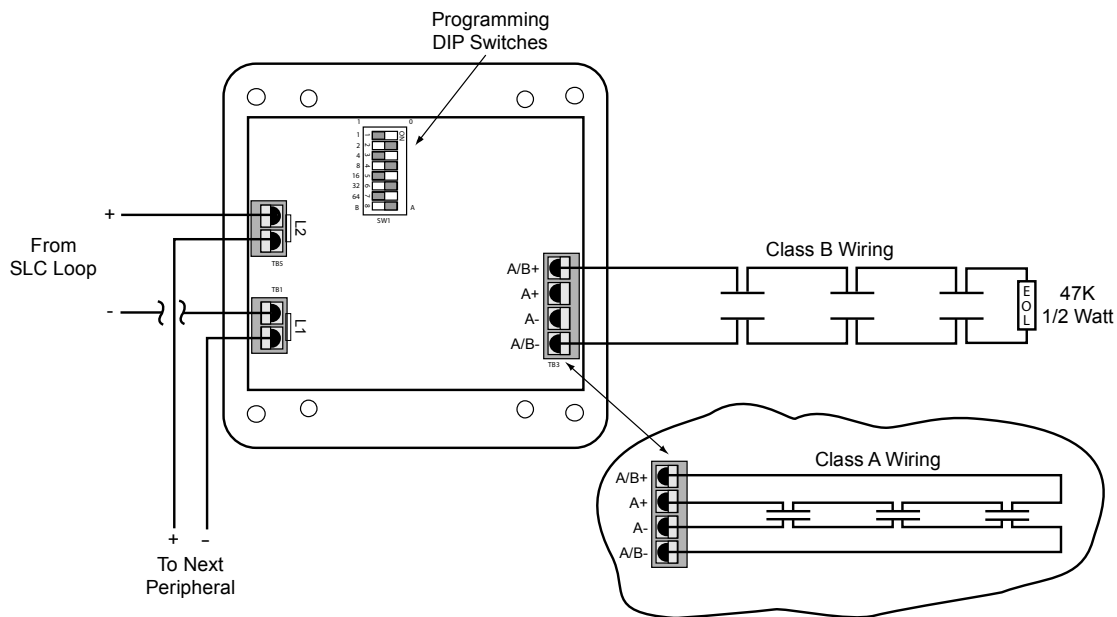
Figure 10 - 55000-805ADV and 55000-806ADV Wiring

Dual Switch Monitor Module - 55000-790ADV

The 55000-790ADV Dual Switch Monitor Module is an addressable module for use with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel. The Dual Switch Monitor Module incorporates two (2) independent, individually programmable, initiating device circuits (IDC), providing cost-effective solutions in areas requiring multiple addresses within the same location. Each initiating device circuit is separately addressed and can be wired Class A or B. A typical application for the Dual Switch Monitor Module would be the individual monitoring of waterflow and tamper switches located at a sprinkler system riser.

Incorporated with each individual IDC circuit is a built-in priority interrupt feature which allows rapid response capabilities from highly critical contact devices (e.g., manual pull stations, etc.). Two (2) eight position programming DIP switches are provided on each Dual Switch Monitor Module for IDC circuit addressing and wiring classification definition. The 55000-790ADV mounts to the front of a standard 4" square or 2-gang electrical outlet box. Displayed on the front of each 55000-790ADV is two (2) red status LEDs which flash when the individual address is polled and illuminate steady when the IDC circuit is active (see figure 11).
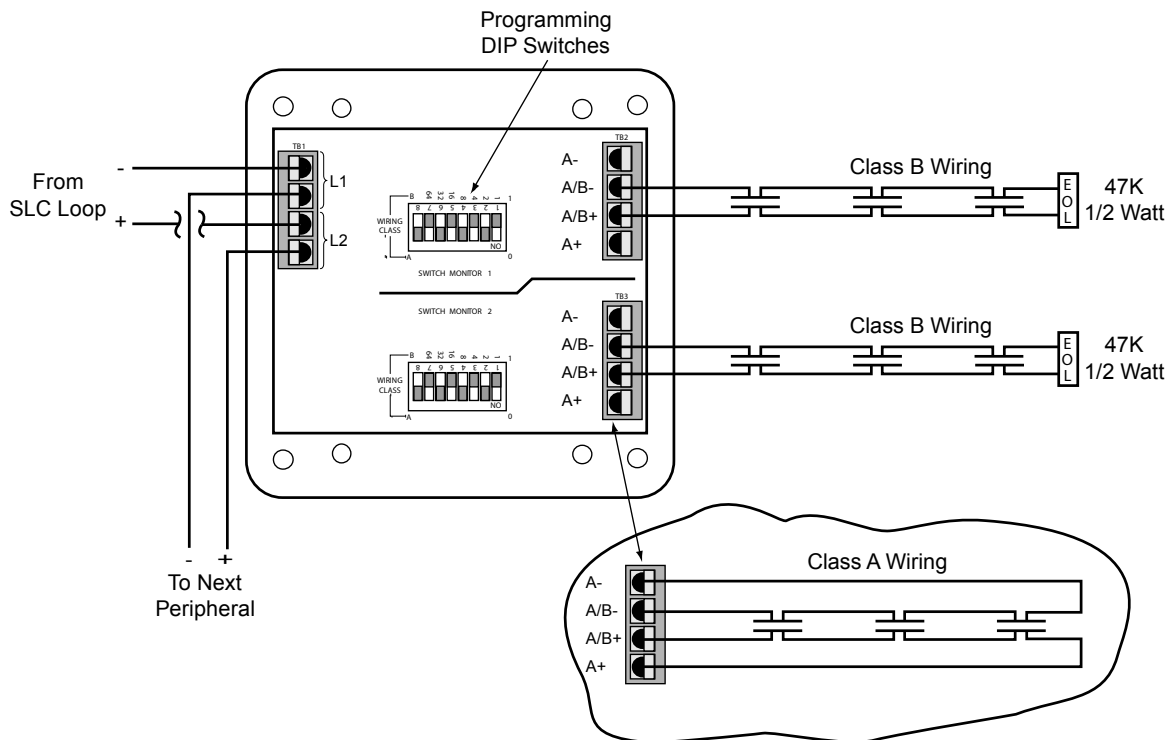
Figure 11 - 55000-790ADV Wiring

4.2.1.3.1.6.2   Intelligent Input/Output Modules

I/O Relay Output & Switch Monitor Module - 55000-820ADV

The 55000-820ADV I/O Relay Output & Switch Monitor Module is an application specific addressable module for use with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card. Each 55000-820ADV is SLC loop powered eliminating the need for additional field wiring and external power supplies. Designed for installation on the SLC (signaling line circuit) the I/O Relay Output & Switch Monitor Module provides a single initiating device circuit (IDC) input, an independently controlled Form-C relay contact output, and an unmonitored optically isolated voltage input. The I/O Relay Output & Switch Monitor Module utilizes Advances' unique sub-addressing for both the independently controlled relay and the optically isolated voltage input. By sub-addressing 55000-820ADV's modules, system point capacities are expanded with installation, programming, and commissioning time minimized. The 55000-820ADV mounts to the front of a standard 4" square or 2-gang electrical outlet box. Displayed on the front of each 55000-820ADV is a single red status LED which flashes when the device is polled (see figure 12).
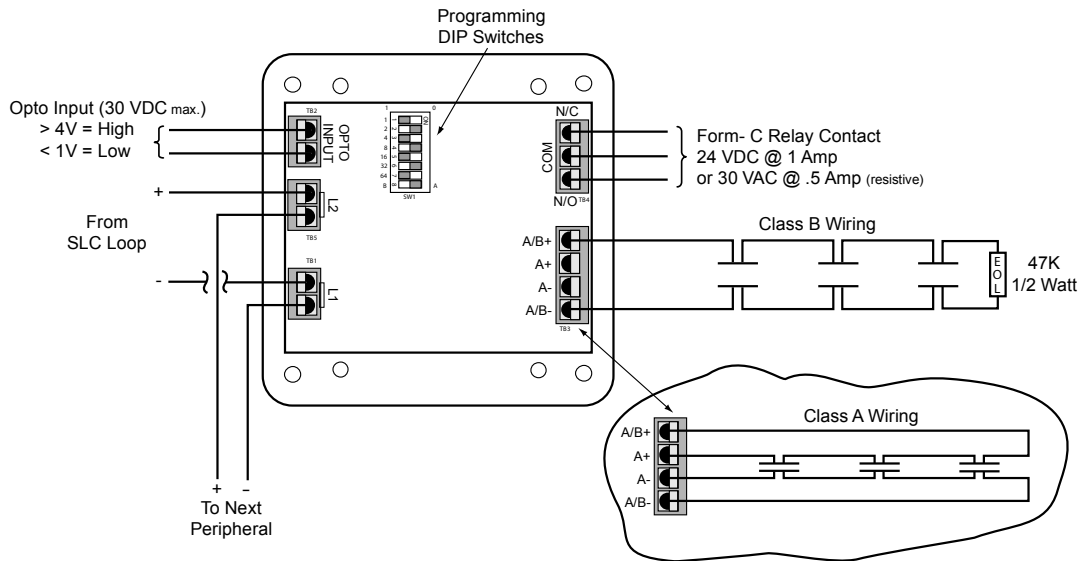
Figure 12 - 55000-820ADV Wiring

120V I/O Relay & Monitor Module - 55000-859ADV

The 55000-859ADV 120V I/O Relay & Monitor Module is an addressable 120 VAC relay switching module for application specific functions for the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card. Each 55000-859ADV is SLC loop powered eliminating the need for additional field wiring and external power supplies. Designed for installation on the SLC (signaling line circuit) the 120V I/O Relay & Monitor Module provides a single initiating device circuit (IDC) input and an independently controlled 120 VAC Form-C relay contact output. The 120V I/O Relay & Monitor Module utilizes Advances' sub-addressing for the independently controlled relay contact. By sub-addressing 55000-859ADV's modules, system point capacities are expanded with installation, programming, and commissioning time minimized. The 55000-859ADV mounts to the front of a standard 4" square or 2-gang electrical outlet box. Displayed on the front of each 55000-859ADV is a single red status LED which flashes when the device is polled (see figure 13).
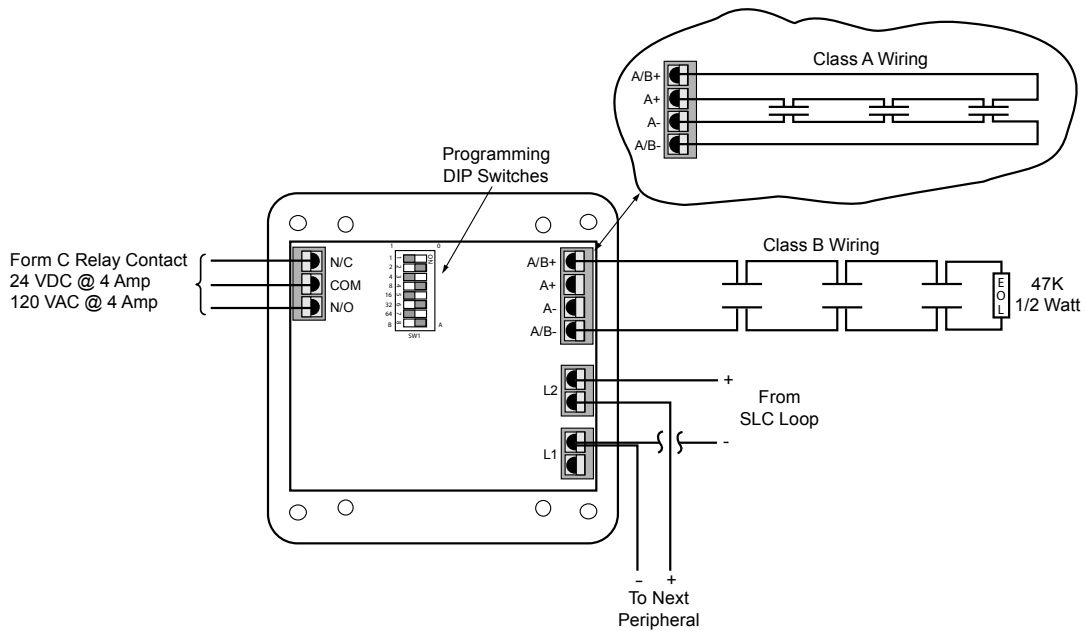
Figure 13 - 55000-859ADV Wiring

Notification Appliance Circuit (NAC) Module - 55000-825ADV

The 55000-825ADV Notification Appliance Circuit (NAC) Module is an addressable module for use with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card. Each module incorporates an independent, individually programmable, notification appliance circuit (NAC), providing cost-effective solutions in areas requiring multiple notification appliance circuits. Each 55000-825ADV allows switching of an external power supply, such as a 24 VDC regulated power source or audio amplifier to a group of notification appliances.

The 55000-825ADV notification appliance circuit can be wired either Class A or B. Each module also supervises the wiring for opens, shorts and grounds and reports this status back to the intelligent fire alarm control panel. Typical input power to the 55000-825ADV would be from the main fire alarm control panel, a power supply booster or an amplifier.

To increase the already rapid response activation of the 55000-825ADV, each module can be set to a group address, allowing all 55000-825ADV's assigned to a common group address to be activated from a single command poll from the intelligent fire alarm control panel.

An eight position programming DIP switch is provided on each 55000-825ADV module for NAC Module addressing and wiring classification definition. In additional, a four position programming DIP switch is provided for group addressing (see figure 14 and 15).

The 55000-825ADV mounts to the front of a standard 4" square or 2-gang electrical outlet box. Displayed on the front of each 55000-825ADV is a single red status LED which flashes when the device is polled.

Compatible with the Axis^AX Dynamix I/O Relationship Programming, the 55000-825ADV module can be individually assigned to activate from any input zone or address. In addition, the 55000-825ADV can be programmed to various output relationships, timing functions, gated functions, etc. to perform project specific control operations.
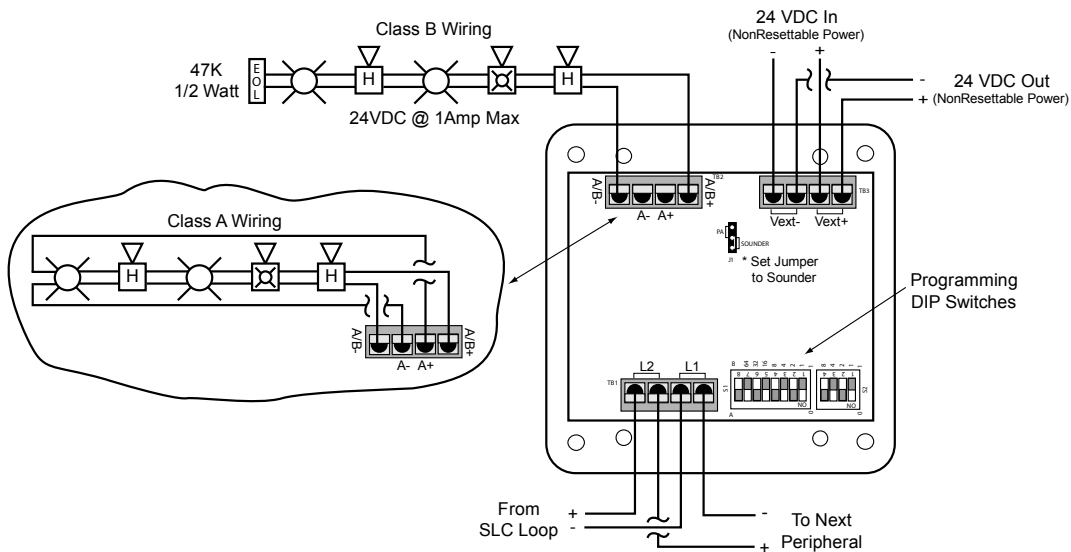
Figure 14 - 55000-825ADV Notification Appliance Circuit Wiring
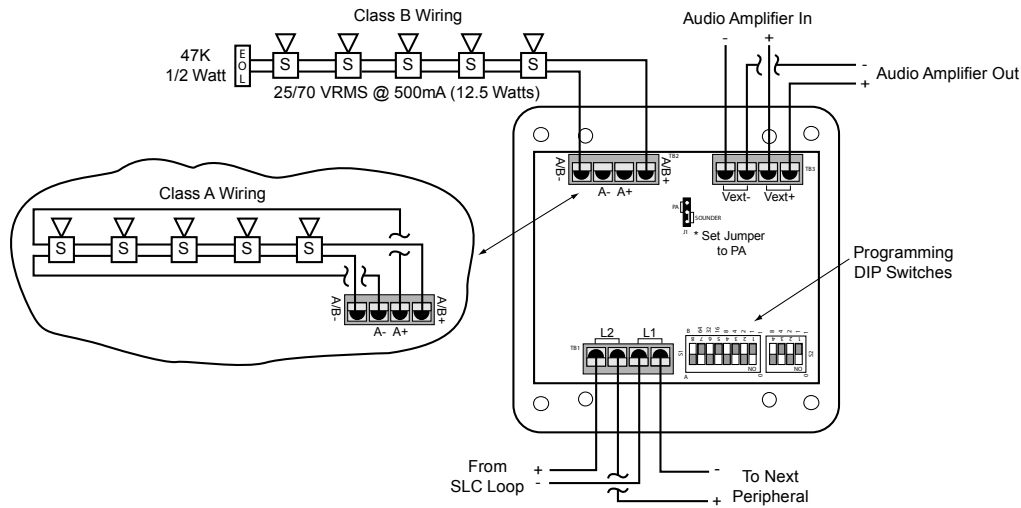
Figure 15 - 55000-825ADV Speaker Circuit Wiring

Relay Module - 55000-863ADV

The 55000-863ADV Relay Module is an application specific addressable module for use with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-CTL base card. Each 55000-863ADV Relay Module is SLC loop powered eliminating the need for additional field wiring and external power supplies.

Designed for installation on the SLC (signaling line circuit), the Relay Module provides two isolated Form C relay contacts for controlling a variety of auxiliary control functions, such as elevators, HVAC, door holders, dampers, control equipment, etc. (see figure 16).

The Relay Module mounts to the front of a standard 4" square or 2-gang electrical outlet box and has a status LED which flashes when the device is polled.

Compatible with the Axis^{AX} Dynamix I/O Relationship Programming, the Relay Module's Form C outputs can be assigned to any input or output relationship, output group, timing function, gated function, etc. to enhance project specific control operations. Relay ratings of each Form C contact is 24 VDC @ 2 Amp (resistive) or 30 VAC @ .5 Amps (resistive).
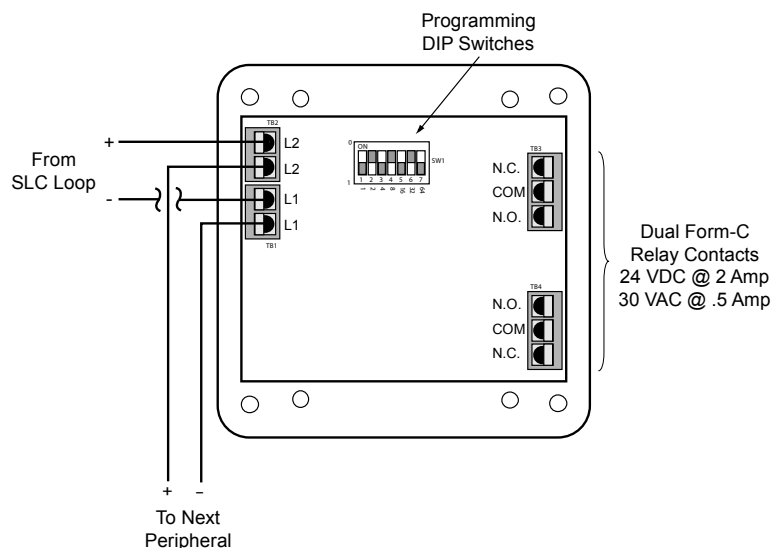
Figure 16 - 55000-863ADV Wiring

4.2.1.4 AX-CTL Notification Appliance Circuits

The AX-CTL base card provides two notification appliance circuits (NAC). In addition, two additional notification appliance circuits can be added to the AX-CTL-2PCB by adding the optional AX-LPD or AX-NAC plug-in card.

Note: The AX-CTL-1PCB one loop base card cannot support the AX-LPD or AX-NAC option modules.

Each notification appliance circuit is capable of supporting synchronized or non-synchronized strobes/signal patterns. Synchronization programming is done in the PC-NeT 6.48 or higher or via the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 AX-DSP display keypad. In addition to the synchronization programming, silenceable or non-silenceable strobe programming is available.

Synchronization protocols include:
   Gentex®
   Potter/Amseco®
   Wheelock®
   System Sensor®

The circuit ratings for each notification appliance circuit are as follows:
REGULATED 24 VDC @ 2.0A[2]
SUPERVISED. POWER LIMITED.

Class A or B
Class B EOL (End-of-Line) Resistor 10KΩ

Minimum return voltage permitted is 16V.
Wire range – 22-12 AWG

Maximum line impedance at 2.0A is 1.5Ω.

Maximum voltage drop across installation wiring is 3.0V at battery voltage of 20.4V.

Calculate the maximum line impedance and conductor size required for the actual load current applied.

Refer to Axis^{AX} Wiring Guide Section 9.

The default operation of each notification appliance circuit is non-synchronized, turn ON steady for any alarm condition and turn off when silenced or reset. If non-silenceable synchronization strobes are programmed, strobes will continue to flash after signal silence. The notification appliance circuit outputs can also be configured to accommodate silenceable synchronized strobes.

Note: Notification appliance circuits can be utilized as a door holder or other 24 VDC output by setting the notification appliance circuit to a "Not Alarm" Logic Statement. This programming allows the notification appliance circuit to be active (24 VDC) during a non-alarm and off during alarm.

---

[2] TOTAL OUTPUT LOAD must not exceed panel supply rating – maximum 4A.

Class B — OUT — End-of-Line 10KΩ

Class A — OUT — RETURN

CAUTION: Break wiring run to maintain supervision of connections.

Devices must be polarized.
Polarity is shown in the alarm (active) condition.

The default operation of each notification appliance circuit is non-synchronized, turn ON steady for any alarm condition and turn off when silenced or reset.   If non-silenceable synchronization strobes are programmed, strobes will continue to flash after signal silence. The notification appliance circuit outputs can also be configured to accommodate silenceable synchronized strobes.

Note: Notification appliance circuits can be utilized as a door holder or other 24 VDC output by setting the notification appliance circuit to a "Not Alarm" Logic Statement. This programming allows the notification appliance circuit to be active (24 VDC) during a non-alarm and off during alarm.

4.2.1.5   AX-CTL Relay Contacts

The AX-CTL provides three programmable Form C relay contacts.

The contact ratings for each relay are as follows:
30 VDC/VAC @ 1.0A, PF=1 (resistive)
POWER LIMITED – Connect to power limited circuits only.

Default operation is indicated below however, each relay contact is field programmable.

RELAY 1: FIRE
RELAY 2: TROUBLE
RELAY 3: SUPERVISORY

The trouble relay contact is defaulted to normally active (inverted) for fail-safe operation. The relay transfers on any trouble condition including loss of AC/DC power.

Wire range – 22-12 AWG

Note: Any relay of an AX-CTL fire alarm control panel can be setup as a pulsed output and be synchronized across the entire network.

Common
Normal Closed
Normal Open

Common
Normal Closed
Normal Open

Common
Normal Closed
Normal Open

NC NO COM   NC NO COM   NC NO COM
RELAY 1   RELAY 2   RELAY 3
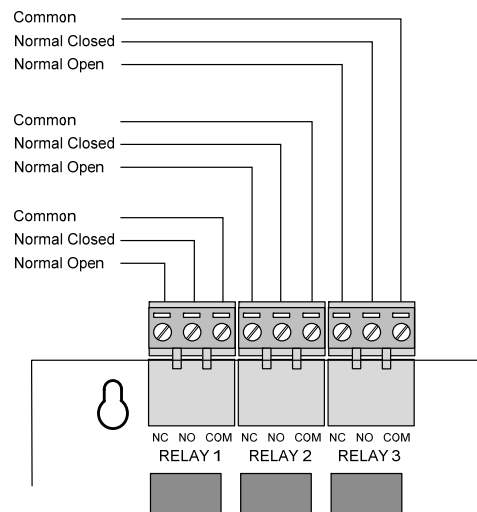
4.2.1.6 AX-CTL Peripheral Bus (P-BUS) Network

The AX-CTL provides a PBUS (peripheral bus [RS485]) network for the connection of devices such as AX-RL4, AX-ASW-16, AX-LED16RY, AX-LED32R AX-LED32Y, AX-I/O-48, AV-AMP-80 and AX-CZM modules.

The PBUS ratings are as follows:
CCITT RS-485 (network) – Class B
EOL (End-of-Line) Filtering Resistor 150Ω
SUPERVISED. POWER LIMITED.

Maximum line impedance 50Ω

Wire range – 22-12 AWG

Refer to Axis^AX Wiring Guide Section 9

4.2.1.7 AX-CTL USB Port

The AX-CTL provides a USB port for PC-NeT upload/download programming of the system.

RS-232   P-BUS

A
To P-BUS Modules
B

A 150Ω end-of-line resistor must be installed at the end of the P-BUS circuit

USB   SERIAL EXPANSION

USB Programming Port
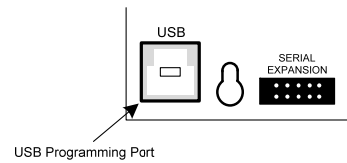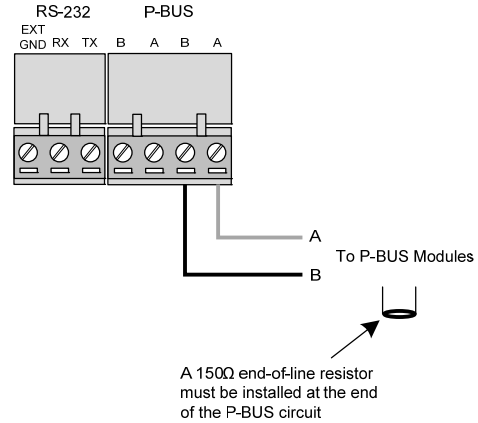
4.2.1.8 AX-CTL RS-232 Port

The AX-CTL provides an RS-232 port for programming and connection of ancillary reporting devices (i.e. printer, CRT, etc.)

The RS-232 port ratings are as follows:
CCITT RS-232 – Style 4
SUPERVISED. POWER LIMITED.

Wire range – 22-12 AWG

Refer to Axis^AX Wiring Guide Section 9.

Baud Rate: 9600
Parity: None
Date Bits: 8
Stop Bits: 1

Note: If a D9068P digital dialer is utilized, this RS-232 output cannot be used, as it is dedicated to D9068P communications via the Advanced AX-SEB serial interface.

RS-232   P-BUS

GRD
RX
TX

Circuit is powered by an isolated supply and is optically isolated.

May be connected to a printer, computer or other compatibale ancillary device.
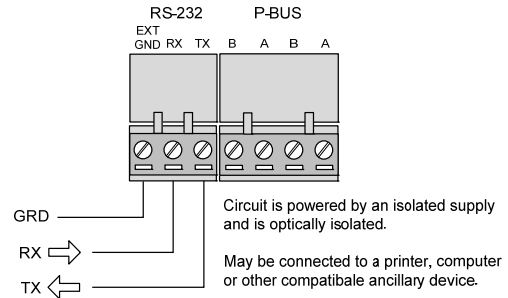
4.2.1.8.1 RS-232 Pin-Out

RS-232 Pin Assignments

RS-232 to AX-CTL

EXT GND
RX
TX
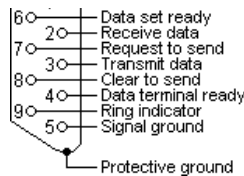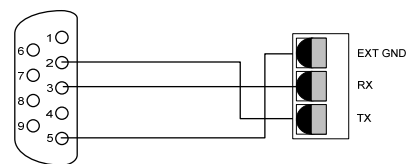
4.2.1.9   AX-CTL Ancillary Contact Monitoring Input

AX-CTL provides an ancillary contact monitoring input which allows the AX-CTL to monitor any normally closed contact for supervision. If the contact opens a trouble/fault is generated by the AX-CTL. This input is normally utilized for AX-PSU and in a hardwired audio amplifier installation for the AX-PSU-6 and AV-AMP-80 trouble/fault monitoring. This input can also be utilized for any trouble/fault monitoring.

Note: The AX-CTL-1PCB one loop base card cannot support the AX-PSU option module.

Normally Closed Contact
Monitoring Input

4.2.1.10 AX-CTL-2PCB Ancillary AX-PSU DC Power Input

The AX-CTL-2PCB provides an ancillary AX-PSU DC power input which allows an additional 5 Amp, 24 VDC power to be supplied to the AX-CTL-2PCB base card. This additional power is specifically for notification appliance circuit power requirements when the AX-LPD or AX-NAC modules are utilized. When utilizing the AX-PSU auxiliary power supply separate batteries are not required.

Note: The AX-CTL-1PCB, one loop base card, cannot support the AX-PSU, AX-LPD or AX-NAC option modules.

Nominal 27.4 VDC, temperature compensated to track main panel DC supply.

By adding an optional AX-PSU power supply additional power is available for the NAC-3 and NAC-4 circuits of the AX-LPD or AX-NAC module.

A Molex cable assembly from the AX-ACB provides AC power to the AX-PSU Auxiliary Power Supply.

AX-PSU
Power / Monitoring

AX-PSU

4.2.1.11 AX-CTL AUX Supply Outputs

The AX-CTL provides two 24 VDC power outputs, one resettable and one non-resettable.

The power output ratings are as follows:
SPECIAL APPLICATION CIRCUITS
18.0 – 28.0 VDC @ 0.5A[3] (each)
SUPERVISED, POWER LIMITED.

AUX #1:   4-wire smoke detector power or other similar application. Power turns off for 10-15 seconds on reset.
AUX #2:   24 VDC (nominal) power output for internal peripheral cards or external equipment.

Wire range – 22-12 AWG

Note: Use appropriately sized wire for the current load to ensure device compatibility.

+ Non- Resettable
_ .5A @ 24 VDC

+ Resettable
_ .5A @ 24 VDC
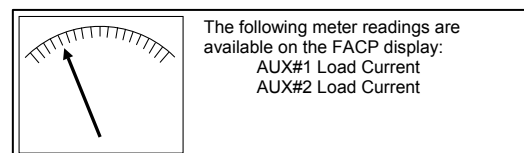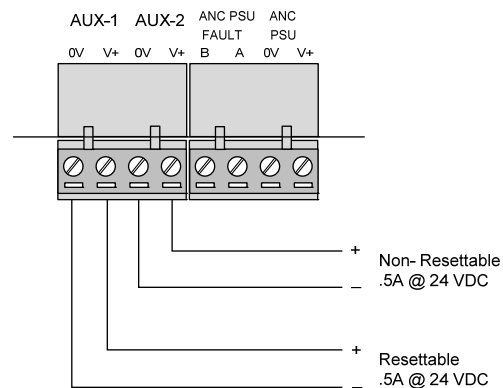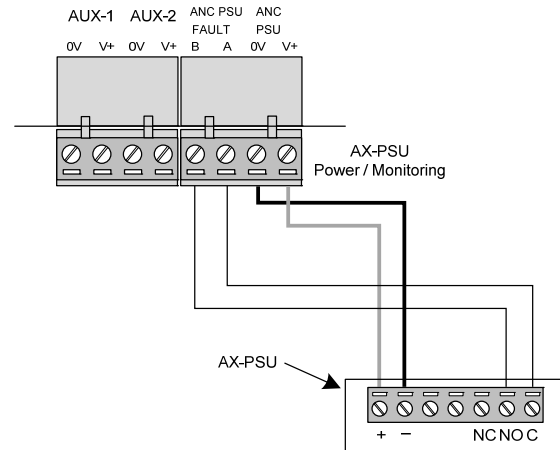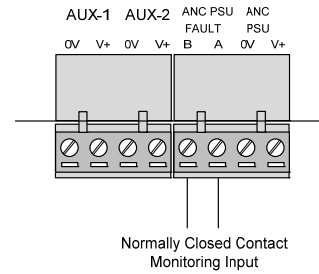
The following meter readings are available on the FACP display:
AUX#1 Load Current
AUX#2 Load Current

(Refer to Section 10.1.1)

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[3] TOTAL OUTPUT LOAD must not exceed panel supply rating – maximum 5A (10A if AX-PSU installed).

4.2.2   Replacing the AX-CTL Base Card

If replacing the AX-CTL base card, remove power (AC and battery) from the system. Remove all field wiring terminal blocks from the AX-CTL and disconnect the Molex connector cable originating from the AX-ACB board. Disconnect the flat ribbon cable attached to the AX-DSP, Alphanumeric Graphical Display, and remove the three (3) screws [p] securing the AX-CTL to the back box. Carefully slide the AX-CTL up and off of the five top-hat (screw-less [*]) standoffs (see figure 17).

Carefully slide the new AX-CTL over the five top-hat (screw- less [*]) standoffs, and insert/tighten the previously removed three (3) screws [p]. Reconnect the removed Molex connector cable originating from the AX-ACB board, plug in the flat ribbon cable attached to AX-DSP display, and reinstall all removed field wiring terminal blocks. Reconnect AC and battery power.

Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.
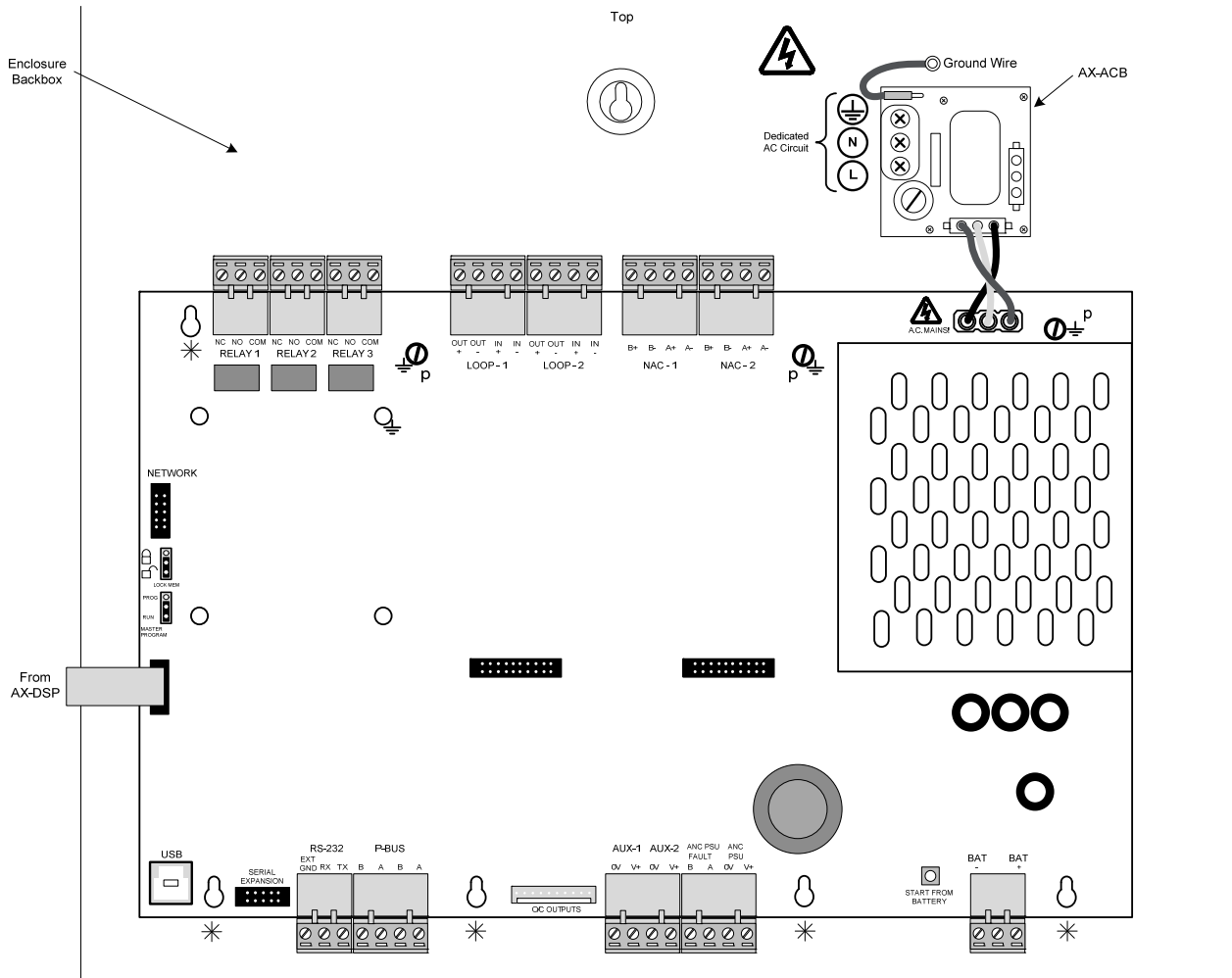
Figure 17 - AX-CTL Base Card

4.3 AX-DSP Alphanumeric Graphical Display

The AX-DSP Alphanumeric Graphical Display is the colorized human interface for status and control of an AX-CTL-1V, AX-CTL-2V or AX-CTL-4V (see figure 18). In addition, the AX-DSP has three (3) buttons and six (6) LEDs that can be customized to meet specific installation requirements. Customized buttons and LEDs have easy slide-in labels to accommodate the defining of these programmable control and status points (see figure 19).

Figure 18 - AX-DSP Alphanumeric Graphic Display

To AX-CTL Base Card Socket PL2

If utilizing field programmable Function LEDs, create a new custom label and replace existing slide-in label.
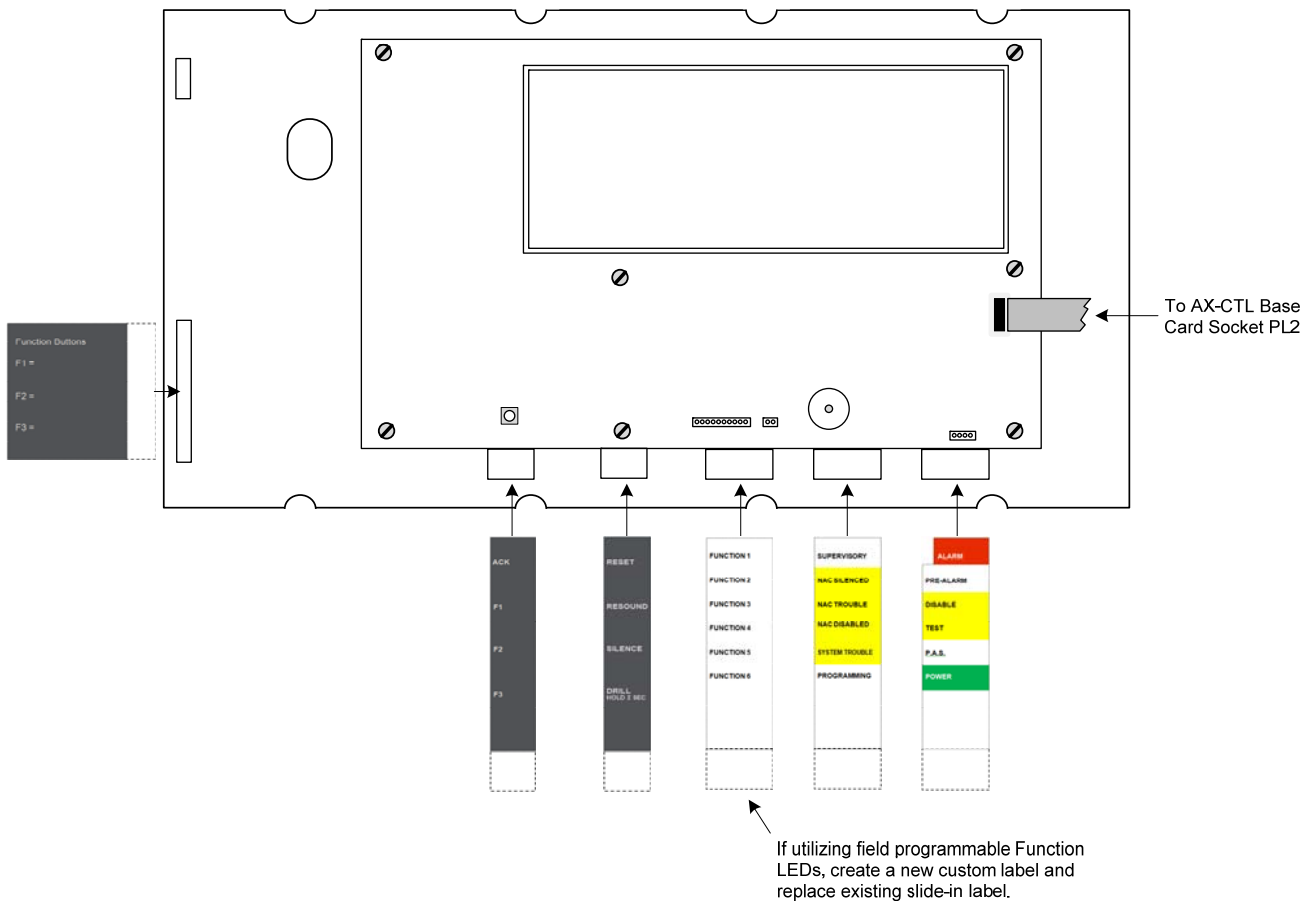
Figure 19 – Slide-in AX-DSP Labels

4.3.1 Installing the AX-DSP Alphanumeric Graphical Display

The AX-DSP alphanumeric graphical display is mounted in the double aperture of the AX-CTL-1V, AX-CTL-2V and AX-CTL-4V inner door.
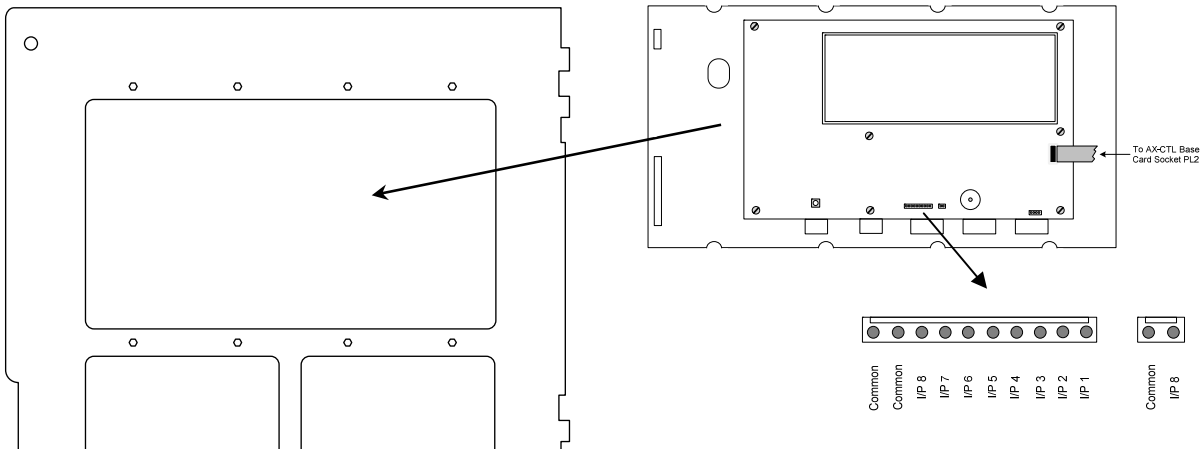
Figure 20 - AX-DSP Installation and Inputs

4.3.2 AX-DSP Alphanumeric Graphical Display Inputs

On the back of the AX-DSP alphanumeric graphical display is a 10-pin and 2-pin (duplicated common and input 8) header, providing eight (8) programmable switch inputs, which can be utilized for special application monitoring and control functions. Switch inputs can be programmed to monitor normally open or normal closed contacts depending upon installation need (see figure 20).

4.3.3 Replacing the AX-DSP Alphanumeric Graphical Display

If replacing the AX-DSP alphanumeric graphical display remove power (AC and battery) from the system.

Unplug the flat ribbon cable attached to the AX-CTL base card and remove the seven (7) screws holding the AX-DSP alphanumeric graphical display to its front metal faceplate (see figure 20).

Slide-in any customized labels and secure the new AX-DSP to the metal faceplate on the rear of the inner door using the seven (7) removed screws. Plug the flat ribbon cable attached to the AX-DSP alphanumeric graphical display into the designated connector on the AX-CTL base card and reconnect AC and battery power.

4.4 AV-AMP-80 Audio Amplifier Module

A AV-AMP-80 audio amplifier module with associated AX-PSU-6 power supply charger module can be added to any Axis[AX] Intelligent Fire Alarm Control Panel to create an audio signaling or remote audio booster panel [hardwired or PBUS (RS485)]. The AV-AMP-80 gets mounted below the AX-CTL base card on the left side of the back box (see figure 21).

Refer to Axis[AX] Wiring Guide Section 9.

Note: If utilizing an AV-AMP-80 audio amplifier module with an Axis[AX] Intelligent Fire Alarm Control Panel (non "V") it is for audio signaling and remote audio booster operation only. Non "V" panels do not support the AV-MIC microphone assembly. In addition, when an AV-AMP-80 audio amplifier module and AX-PSU-6, power supply charger module are utilized, the Axis[AX] Intelligent Fire Alarm Control Panel cannot support an AX-PSU expansion power supply. As previously indicated, the AX-CTL-1L cannot support an AX-PSU, AX-LPD or AX-NAC option module; however, it can support an AV-AMP-80 audio amplifier module and AX-PSU-6 power supply charger module.
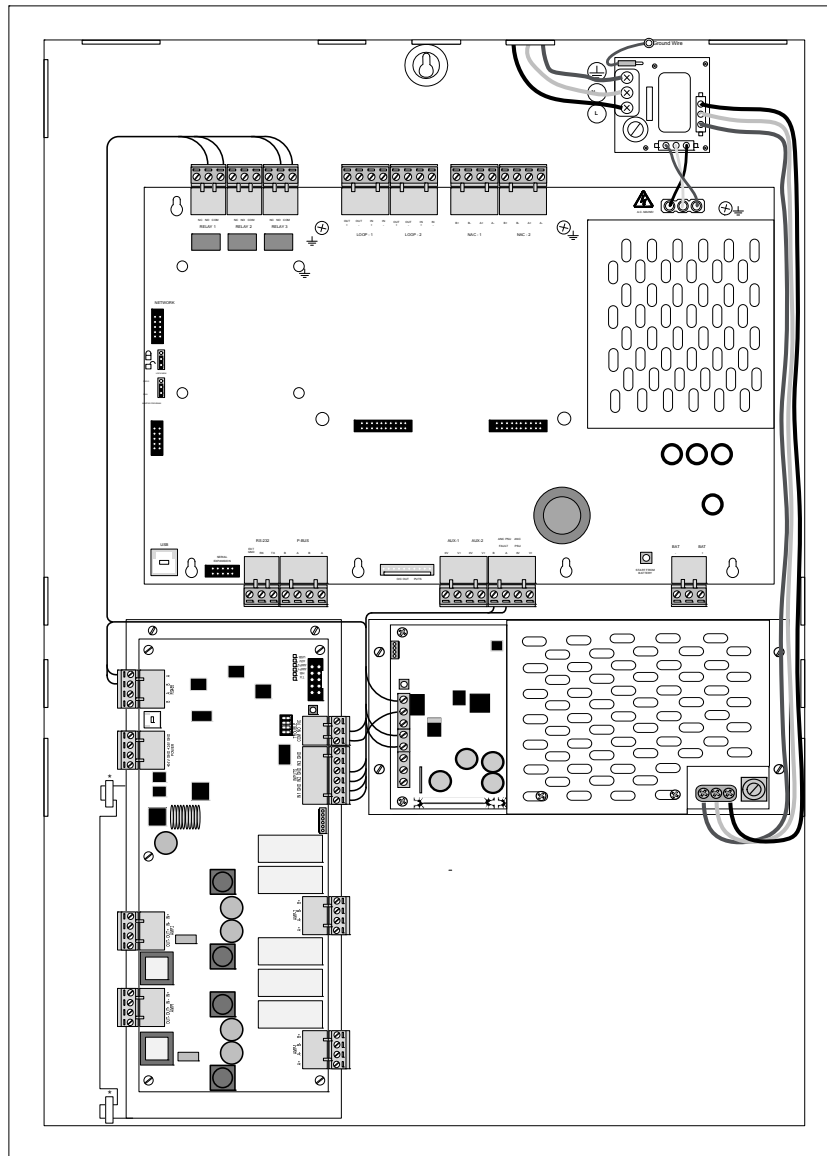
Figure 21 – Optional AV-AMP-80 and AX-PSU-6

4.4.1 Hardwired Amplifier

If configured as a hardwired (non PBUS) amplifier each of the AV-AMP-80 amplifiers (two per AV-AMP-80) is activated whenever one of the AV-AMP-80 trigger inputs (trigger input 1, 2 or 3) is activated (see figure 22):

Trigger input 1 when activated not only turns on both amplifiers (audio notification appliance circuits) it also activates programmed message/tone #1, and plays this message over the audio notification appliance circuits. Trigger input 1 has a higher priority than trigger input 2. If both trigger inputs are active at the same time, programmed message/tone #1 will be broadcasted.

Trigger input 2 when activated plays message/tone #2 on both amplifiers (audio notification appliance circuits).

Trigger input 3 sets the AV-AMP-80 to "booster mode" which allows any external audio signal (25vrms) to be broadcasted out of one or both of the AV-AMP-80 amplifiers (based on wiring). This trigger input has the highest priority, if both trigger input 1 and 2 are active during a trigger input 3 activation amplifiers will broadcast the external audio input signal. This is how live voice communications is broadcasted through the amplifier. By activating trigger input 3 on the AV-AMP-80 amplifier, microphone communications from an Axis[AX] audio panel can be rebroadcasted out of the amplifier.

Note: Trigger input 3 must be activated for microphone audio input booster paging of the amplifier.

Designed into the AV-AMP-80 is a dedicated Form "C" trouble relay contact which transfers on any amplifier and/or audio notification appliance circuit trouble/failure. In a hardwired AV-AMP-80 amplifier installation, this trouble/fault relay contact must be monitored by the fire alarm control panel.

Note: When utilizing the optional AV-AMP-80 audio amplifier and associated AX-PSU-6 power supply charger in a hardwired audio installation, the trouble relay contacts of both modules must be monitored by the fire alarm control panel. This monitoring can be done via the AX-CTL ancillary contact monitoring input.

Not Used

Wire to Dedicated AX-PSU-6 24VDC (terminals 0V and +V0)

Microphone Bus EOL (end-of-line) (If no remote microphone, no connection is required.)

Microphone Bus Input (If no remote microphone, no connection is required.)

Form "C" Trouble Contact

Trigger Input 3

Trigger Input 2

Trigger Input 1

Microphone Supervision Plug

Class B Wiring

4.7K EOL

Class A Wiring
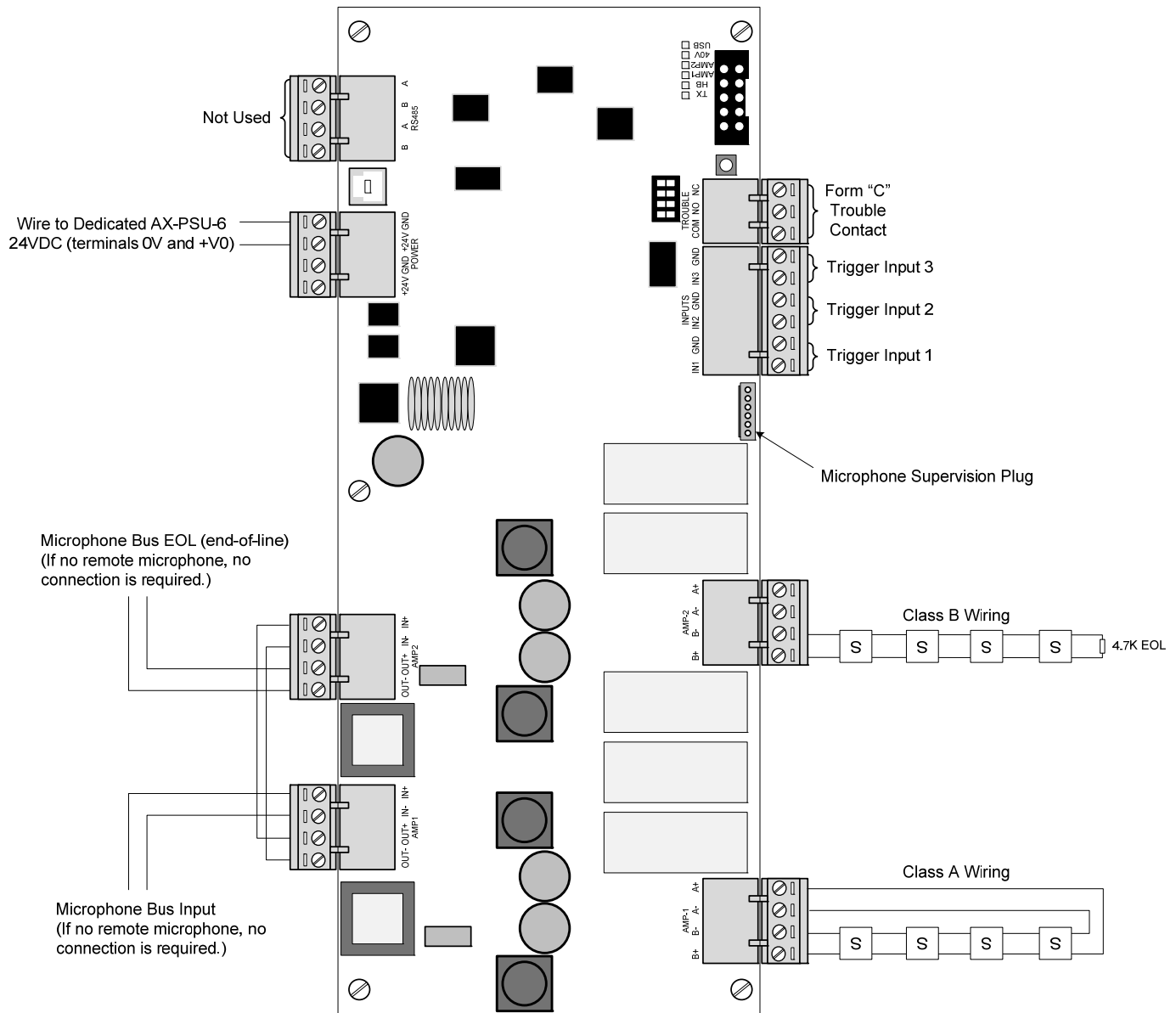
Figure 22 – Hardwired AV-AMP-80 Amplifier

4.4.2 PBUS (RS485) Amplifier

When configured as a PBUS (RS485) amplifier the AX-CTL-1L, AX-CTL-2 and AX-CTL-4 intelligent fire alarm control panel's optional amplifier would be programmed as a PBUS (RS485) floor [area] (see figure 23). Floor (area) amplifiers can support up to sixteen (16) field programmable messages (refer to Axis^{AX} AV-AMP Audio Message Programming Manual regarding message programming) which can be tailored to meet specific installation messaging demands; such as alarms, alerts, warnings, mass notification and other event messaging requirements. Messages can be automatically activated (with programmable prioritization) or manually activated based on installation needs. Identical messages played simultaneously throughout a facility via multiple AV-AMP-80 floor (area) amplifiers can be programmed for complete synchronization, avoiding any broadcasting message confusion. In addition, multiple synchronized messages can be broadcasted when installation demands require this functionality (i.e.: alarm message to fire floor, floor above and below, alert message to the remainder of the facility).
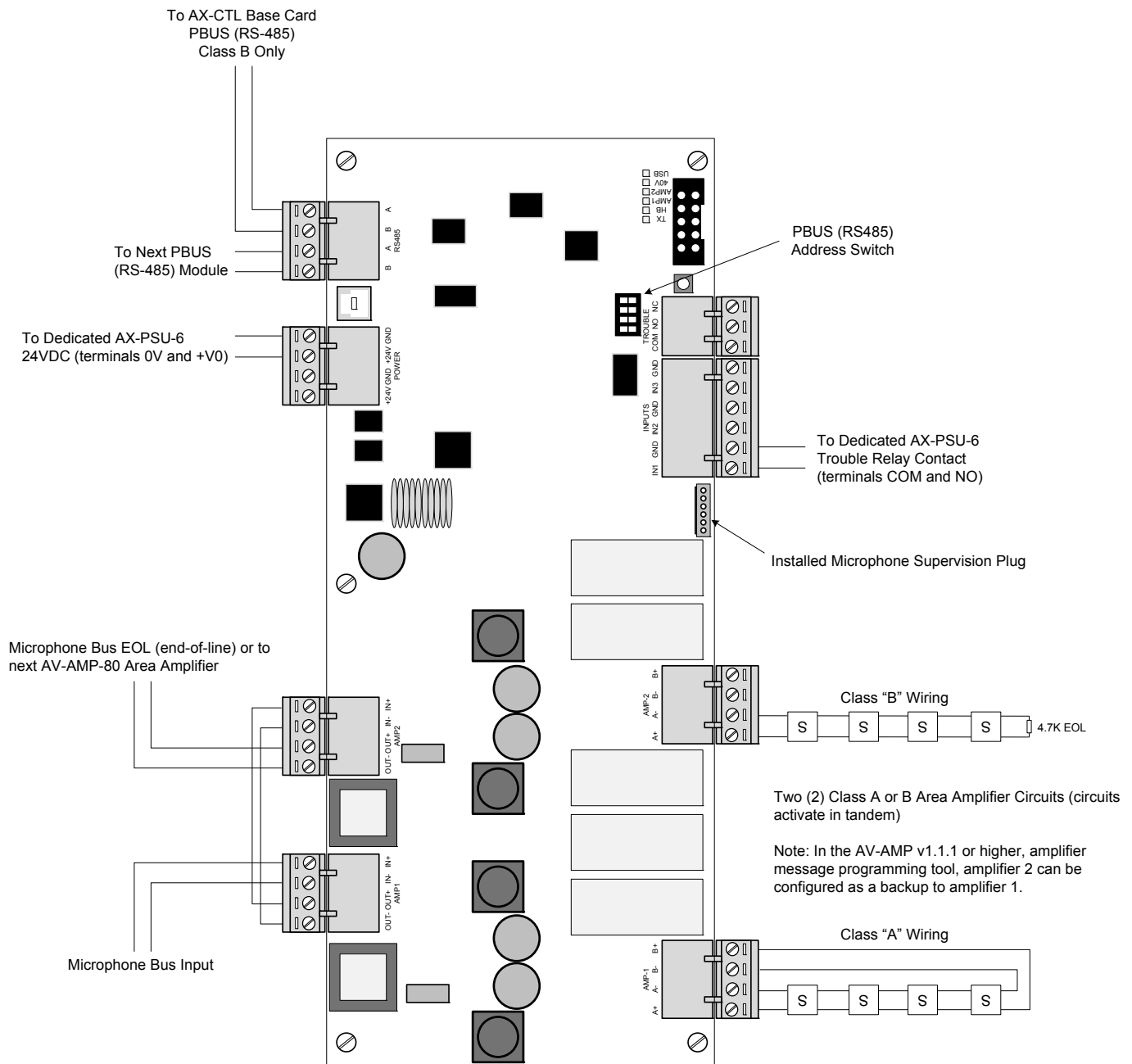
Figure 23 – Floor (Area) AV-AMP-80 Amplifier

4.4.3 Installing the AV-AMP-80 Audio Amplifier Module

The AV-AMP-80 audio amplifier module provides digital audio capabilities for the Axis^{AX} Intelligent Fire Alarm Control Panel. It requires separate 24 VDC originating from an AX-PSU-6 power supply charger. As previously indicated the AV-AMP-80 audio amplifier module is mounted below the AX-CTL base card on the left side of the back box (see figure 21).

To install the AV-AMP-80 audio amplifier module slide the AV-AMP-80 mounting plate tabs under the two (2) tabs located on the lower left side of the back box below the AX-CTL base card. Secure the top end of the AV-AMP-80 mounting plate to the back box standoffs with the provided two (2) screws (see figures 24).

Note: The AV-AMP-80 is pre-assembled on a mounting plate, do not remove from the mounting plate as this is part of the assembly and is required for heat sinking the AV-AMP-80. If replacing, the new AV-AMP-80 will be supplied pre-assembled to a mounting plate.
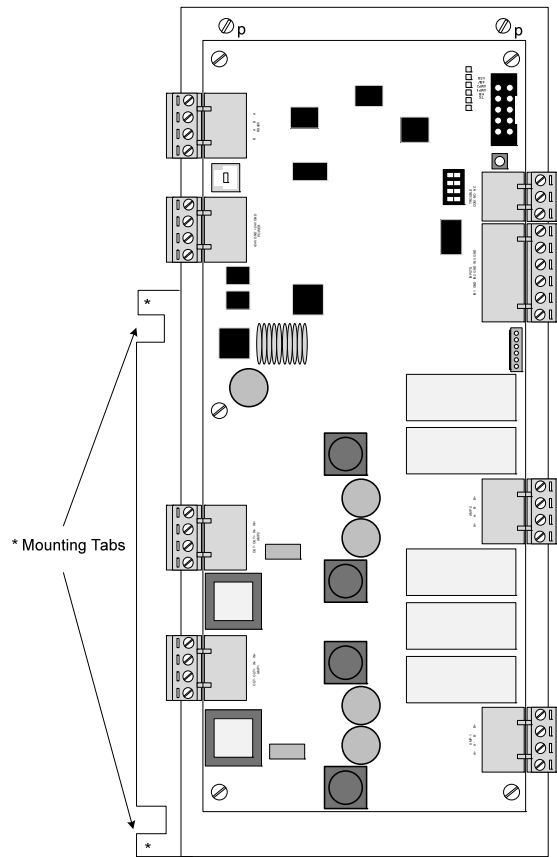
Figure 24 - AV-AMP-80 Audio Amplifier Module Mounting

4.4.4 Replacing the AV-AMP-80 Audio Amplifier Module

If replacing an AV-AMP-80 audio amplifier module, remove power (AC and battery) from the system. When replacing the amplifier remove the amplifier and its attached mounting plate from the enclosure and replace with a new amplifier mounted to its own mounting plate.

Note: The AV-AMP-80 audio amplifier module is preassembled to a mounting plate which is utilized for heat sinking the AV-AMP-80 amplifier. This plate must remain assembled to the amplifier. The new AV-AMP-80 audio amplifier module will be assembled with its own mounting plate.

Remove all field wiring terminal blocks from the audio amplifier module. Remove the two (2) screws [p] from the audio amplifier assembly's mounting plate. Carefully slide the audio amplifier assembly from under the back box mounting tabs [*] located on the left side of the audio amplifier mounting plate (see figure 24).

Carefully slide the new audio amplifier assembly into the back box mounting tabs [*] and reinsert / tighten the previously removed two (2) screws [p]. It is critical that these screws be tightly secured as they are required for proper earth ground connection. Reinstall all removed field wiring terminal blocks from the audio amplifier module and reconnect AC and battery power to the system.

Failure to tighten screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

4.5 AV-ZS Audio Zone Splitter Module

The AX-CTL-1L, AX-CTL-2 or AX-CTL-4 optional AV-AMP-80 audio amplifier is capable of accommodating an AV-ZS, audio zone splitter module.

The AV-ZS audio zone splitter module is designed to take one or both AV-AMP-80 amplifiers (audio notification appliance circuits) and split these into additional audio notification appliance circuits, each capable of delivering 20 Watts per circuit. If splitting two (2) AV-AMP-80 amplifiers (audio notification appliance circuits), each amplifier is split into two (2) audio notification appliance circuits. If splitting one AV-AMP-80 amplifier (audio notification appliance circuit), the amplifier is split into four (4) audio notification appliance circuits.

4.5.1 Installing an AV-ZS Module

The AV-ZS audio zone splitter module is supplied with three (3) metal hexagon spacers and one (1) nylon spacer. Remove the three (3) lower screws securing the AV-AMP-80 module to its mounting plate and install the three (3) provided metal hexagon spacers. Install the provided nylon spacer into the fourth mounting hole on the AV-ZS module as indicated in figure 25.

Mount the AV-ZS audio zone splitter module above the AV-AMP-80 audio amplifier module to the three (3) previously installed metal hexagon spacers and secure with the previously removed screws (see figure 25).

Failure to tighten screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.
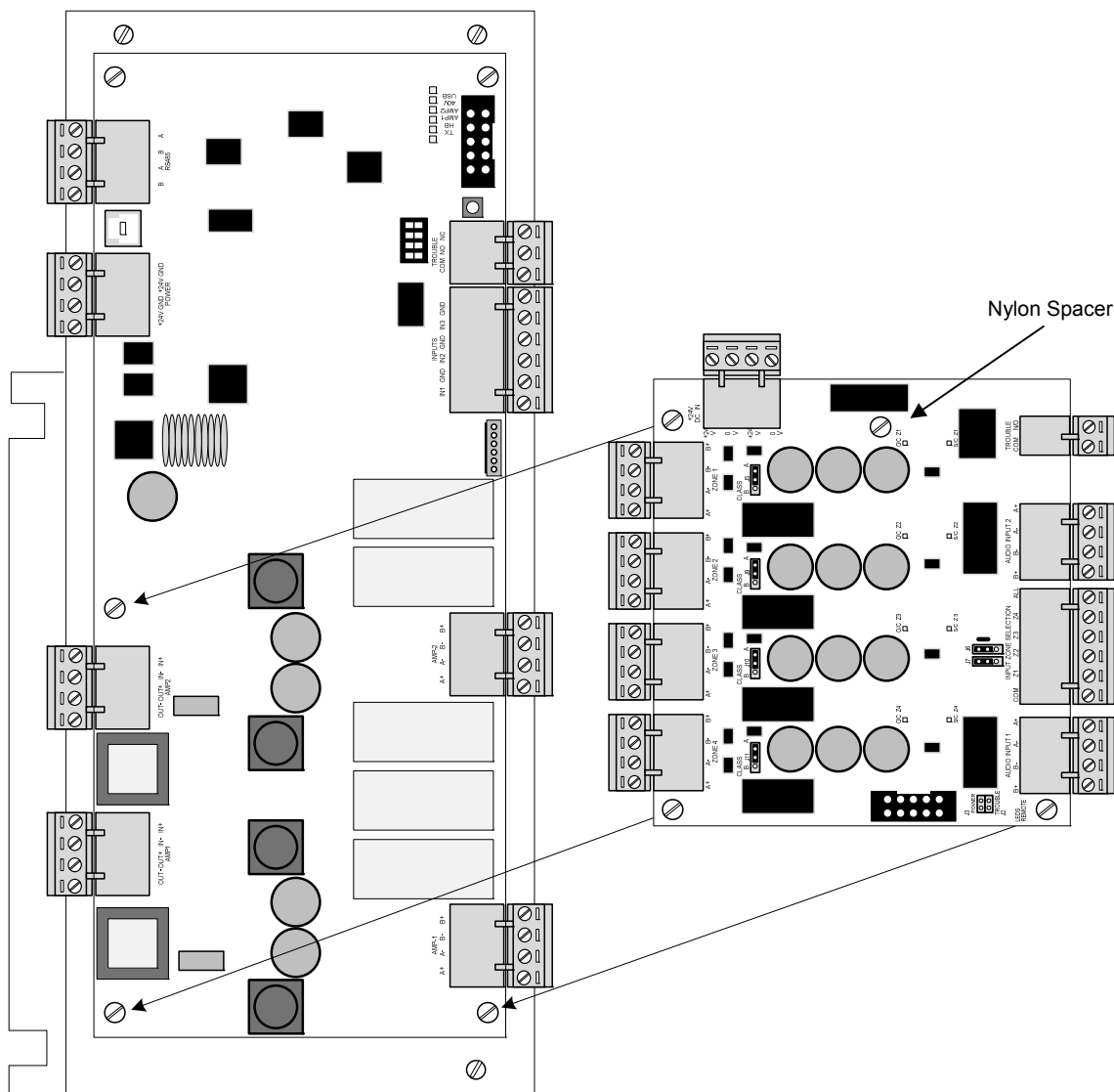
Figure 25 – AV-ZS to AV-AMP-80 Mounting

4.5.2 AV-ZS Wiring

Wire 24 VDC (from AV-AMP-80 power output terminals) to the power input terminals of the AV-ZS audio zone splitter module. Wire one or both AV-AMP-80 amplifiers (audio notification appliance circuits) to the Audio Input 1 and Audio Input 2 terminals of the AV-ZS module and set jumpers J6 and J7 to their appropriate position [1 audio input or 2] (see figure 26).

Refer to Axis[AX] Wiring Guide Section 9.

Note: The AV-ZS audio zone splitter module reports status open circuit, short circuit and grounds via the associated AV-AMP-80 amplifier (audio notification appliance circuit). In addition, a fail-safe trouble relay contact is available which opens on any splitter audio notification appliance circuit trouble condition or on loss of 24 VDC input power, this trouble relay contact can be monitored for individual AV-ZS trouble indication (see figure 26).
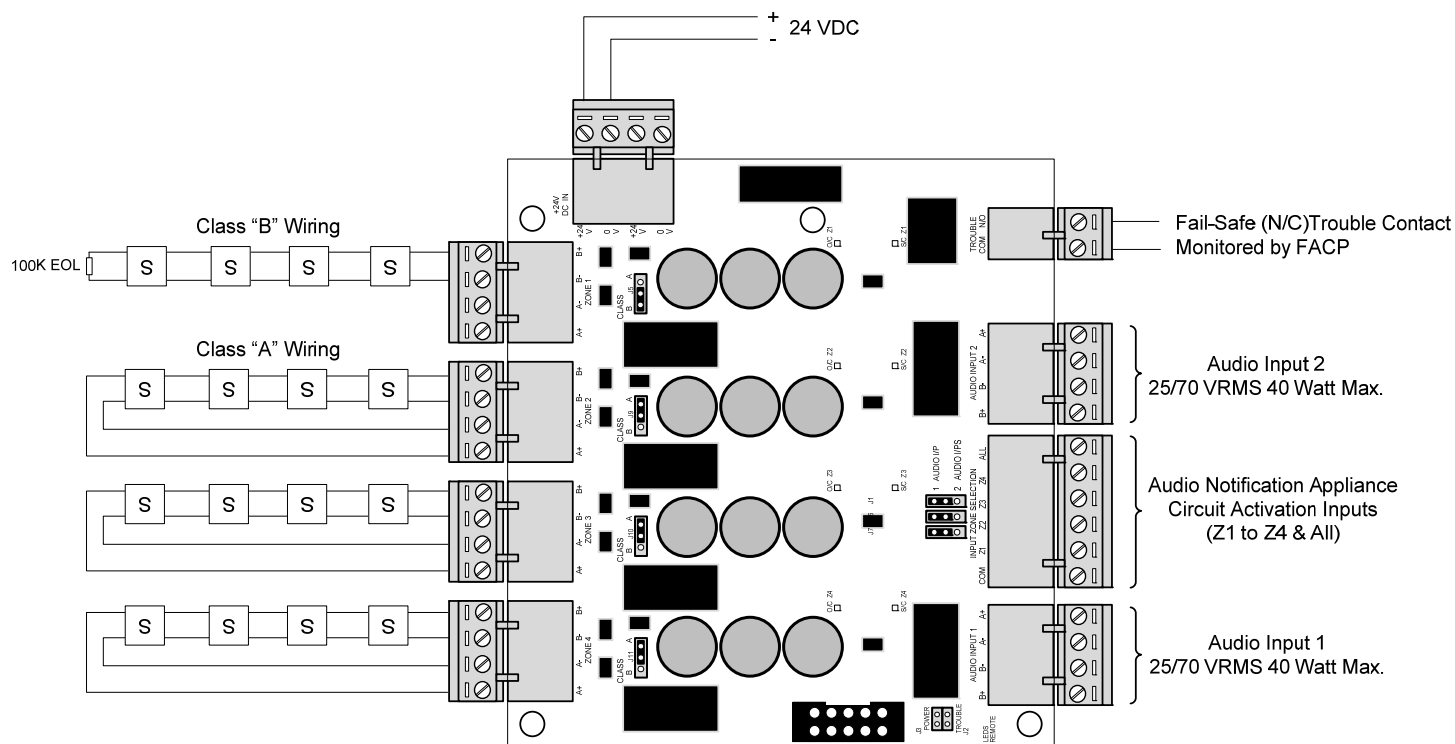
Figure 26 –AV-ZS Audio Zone Splitter Module

Note: Speaker circuit activation is unsupervised; wiring must be within 20 feet of the activation relay contact. When the AV-ZS module is utilized with a PBUS (RS485) AV-AMP-80 amplifier, the "All" audio notification appliance circuit activation input is constantly activate, thereby allowing for audio control via PBUS (RS485) activation of the two (2) onboard AV-AMP-80 amplifiers. For additional information regarding the installation and operation of the AV-ZS audio zone splitter module, refer to AV-ZS Audio Zone Splitter Module Installation Instructions.

4.5.3 Replacing an AV-ZS Module

If replacing an AV-ZS audio zone splitter module, remove power (AC and battery) from the system. Remove all field wiring terminal blocks from the AV-ZS module and remove the three (3) screws securing the module to the AV-AMP-80 amplifier. Place the new AV-ZS module over the metal hexagon spacers and reinsert and tighten the previously removed three (3) screws. It is critical that these screws be tightly secured as they are required for proper earth ground connection. Reinstall all removed field wiring terminal blocks from the AV-ZS module and reconnect AC and battery power to the system (see figure 26).

Failure to tighten screws will defeat the protection circuitry designed to protect the modules/cards from damage due to lightning and static electricity.

4.6   AX-PSU-6 Power Supply Charger

The AX-PSU-6 power supply charger is the power supply charger for the AV-AMP-80 amplifier. In addition, the AX-PSU-6 can be utilized as an additional power supply charger for other Axis[AX] installation power supply charger requirements (i.e. power for AX-CZM conventional zone module, etc.).

Note: If an AX-PSU-6 power supply charger is utilized, the Axis[AX] Intelligent Fire Alarm Control Panel cannot support an AX-PSU auxiliary power supply.

4.6.1   Installing the AX-PSU-6 Power Supply Charger

The AX-PSU-6 power supply charger mounts below the AX-CTL base card on the right side of the (see figures 27).

To install the AX-PSU-6 power supply charger place the module over the four (4) standoffs located on the right side of the back box below the AX-CTL base card and secure with the four (4) screws provided with the AX-PSU-6 module (see figure 27). It is critical that these screws be tightly secured as they are required for proper earth ground connection.

Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.
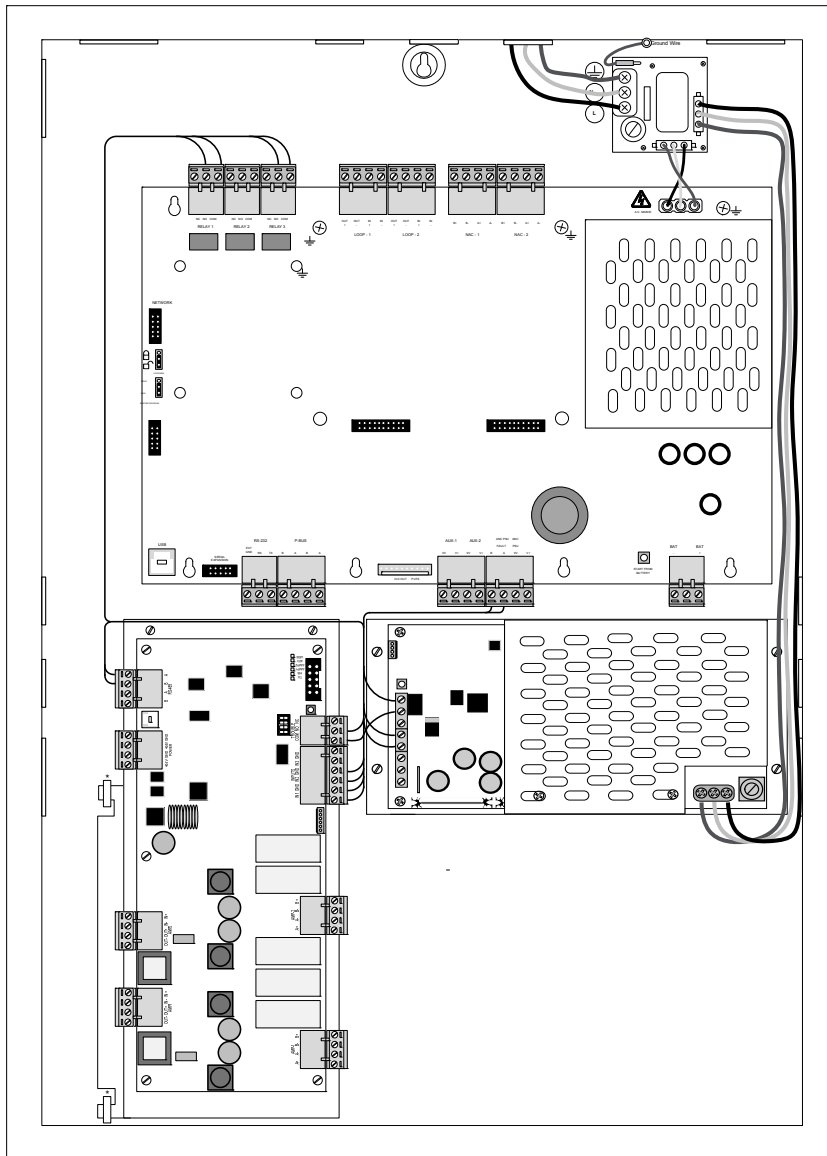
Figure 27 –AX-PSU-6 Power Supply Charger Module Mounting

4.6.2   AX-PSU-6 Power Supply Charger Wiring

The AX-PSU-6 provides a maximum of 6.5 Amps for powering and battery charging capabilities to meet installation backup requirements.

AX-PSU-6 ratings are as follows:

- 120-240 VAC (3A) 50/60Hz
- 98 VAC Brown-out
- 24 VDC @ 6.5 Amp (POWER LIMITED)
  - Peak for 15 minutes
  - 5 Amp continuous
- 2 Amp maximum charge capacity
  - 45 Ah batteries maximum
  - Deducted from overall available power
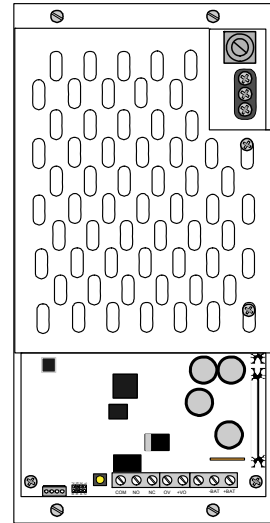
4.6.2.1   AX-PSU-6 AC Wiring

AC Branch Circuit Ratings:
120V – 240V (3A) 50/60Hz
Brown-out – 98V nominal

15A Branch Circuit

Fuse: 5A, 250VAC Ceramic, Time Delay
        (size 5x20mm)
(Advanced part number 620-003, Bussmann S505-5-R, Littelfuse 0215005.XP)

AC Wiring: #14 or #12 AWG, refer to NEC

Over-current protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) and/or local codes.

Must be earthed

The panel must be connected to a solid earth ground. Use #14 AWG (2.00 mm^2) or larger wire with 600 volt insulation rating.

A Molex cable assembly from the AX-ACB provides AC power to the AX-PSU-6 power supply charger via three (3) flying wire leads.
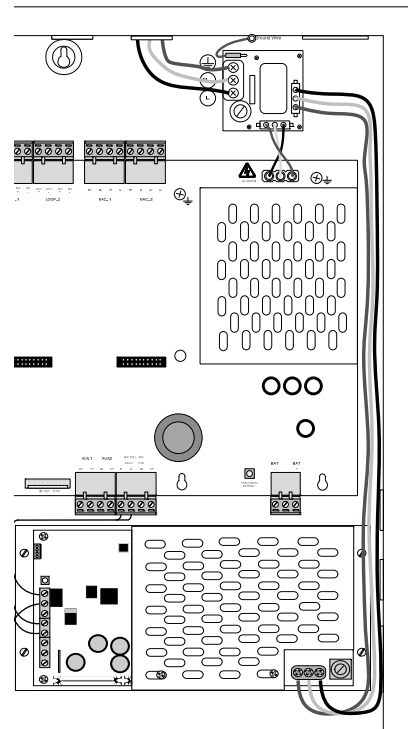
4.6.2.2   AX-PSU-6 Battery Connections

AX-PSU-6 Battery Charger:
- Supervised charger 2.0A (Maximum 45Ah).
- NON-POWER LIMITED
- Charging voltage 27.4 VDC typical, temperature compensated.

Start the AX-PSU-6 power supply charger on AC power first then connect the batteries.

If AC power is not available, the AX-PSU-6 can be started directly from the batteries. Connect a fully charged set of batteries and press the "START FROM BATTERY" push button.

The battery charger provides deep discharge protection. Battery power will be disconnected when voltage falls below 19V (nominal).

Note: If the batteries are disconnected the charger output is turned off.

Internal series resistance of the batteries is continuously checked. If the internal series resistance increases above 0.8Ω then the AX-PSU-6 will indicate a trouble condition.

Start from Battery Button

Batteries require Mounting in separate enclosure
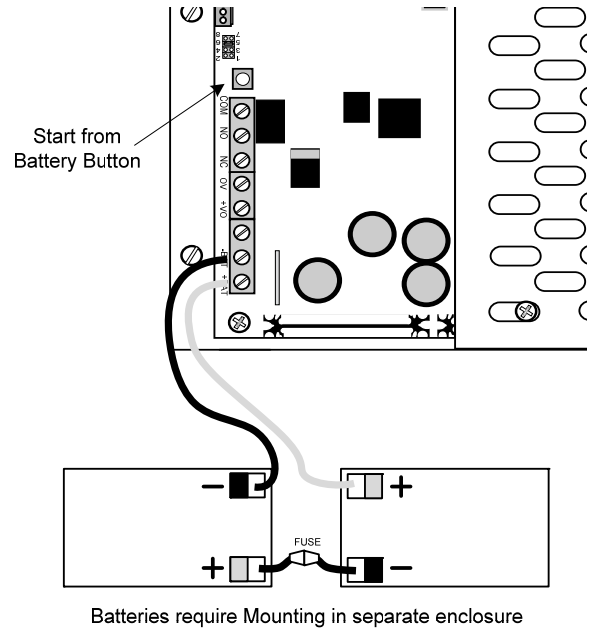
4.6.2.3   AX-PSU-6 24 VDC and Trouble/Fault Contact Wiring

The AX-PSU-6 24 VDC power output terminals 0V and +V0 get connected to the power input terminals +24V and GND on the AV-AMP-80 audio amplifier module.

POWER LIMITED

The AX-PSU-6 Form C power supply trouble/fault relay contact is a fail-safe relay which transfers on loss of power or any other power supply trouble condition. This trouble/fault relay contact must be monitored by the intelligent fire alarm control panel.

UNSUPERVISED, POWER LIMITED

Note: The AX-PSU-6 power supply trouble/fault relay contact, in addition to the trouble relay contact located on the AV-AMP-80 audio amplifier module must be monitored by the intelligent fire alarm control panel.

Trouble Relay
Contact (fail-safe)
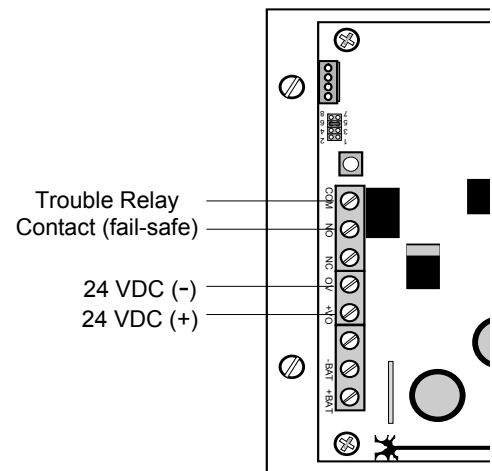
24 VDC (-)
24 VDC (+)

4.6.3   Replacing the AX-PSU-6 Power Supply Charger

If replacing the AX-PSU-6 power supply charger remove power (AC and battery) from the system. Remove the AC, battery, 24 VDC output and relay trouble contact wiring from the AX-PSU-6. Remove the four (4) screws [p] securing the AX-PSU-6 to the back box and remove the AX-PSU-6 (see figure 28). Position the new AX-PSU-6 module onto the back box standoffs and secure with the four (4) removed screws [p]. Replace the removed AC, battery, 24 VDC output and relay trouble contact wiring and reconnect AC and battery power to the system.

Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

Mounting Screws
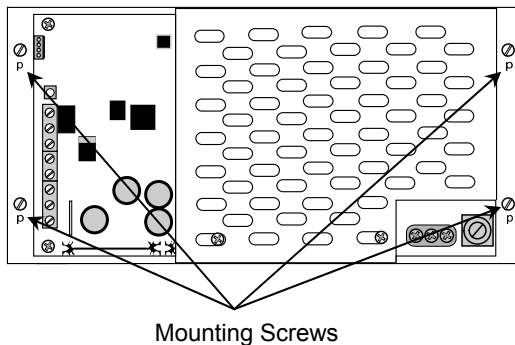
Figure 28 - AX-PSU-6 Power Supply Charger Module

4.7   AX-LPD or AX-NAC Module (available for AX-CTL-2PCB two loop base card only)

The AX-LPD and AX-NAC modules are expansion modules for the AX-CTL-2PCB base card. The AX-LPD is an SLC/NAC expansion module providing two (2) SLC loops and two (2) notification appliance circuits. The AX-NAC is a NAC expansion module providing two (2) notification appliance circuits.

4.7.1   Installing the AX-LPD or AX-NAC Module

Note: The AX-CTL-1PCB one loop base card cannot support the AX-LPD or AX-NAC option modules. In addition, when utilizing an AX-LPD or AX-NAC option module an AX-PSU power supply may be required if notification appliance circuit power requirements indicate a need for additional power.

The AX-LPD and AX-NAC modules are supplied with four (4) metal hexagon spacers [h] and four (4) screws [p]. Insert and tighten the four (4) metal hexagon spacers [h] to the AX-CTL base card (see figure 29).

Position the module onto the metal hexagon spacers, while plugging the module into the two (2) 20-pin connectors on the AX-CTL base card and secure with the four (4) supplied screws [p] (see figure 29). It is critical that these screws are tightly secured as the two top screws are required for the earth ground connection to the AX-LPD or AX-NAC module.

Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.
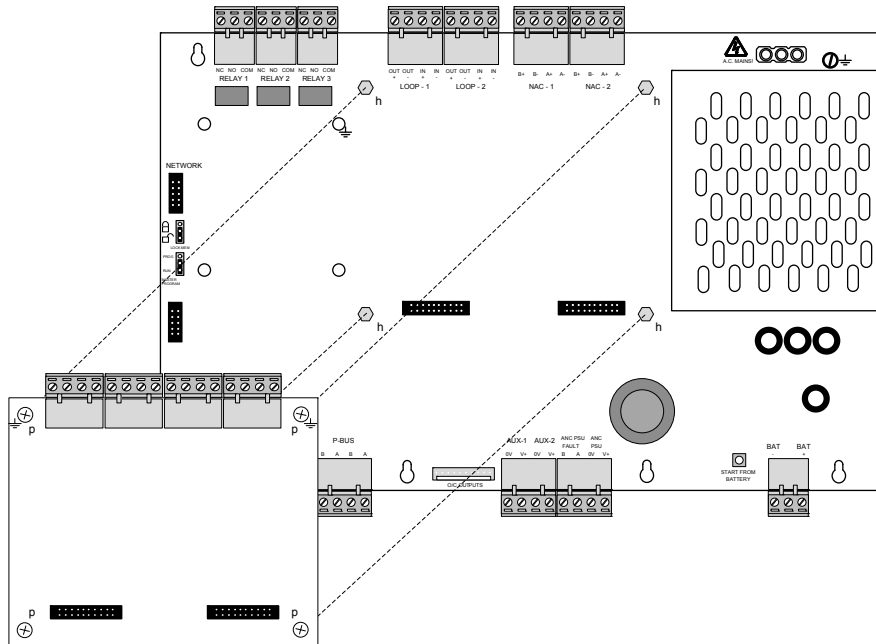
Figure 29 - AX-LPD or AX-NAC Module Mounting to AX-CTL-2PCB

4.7.2 AX-LPD SLC Circuit Wiring

The AX-LPD module provides two additional SLC loops to the AX-CTL-2PCB base card.

24V DC, 0.5A[4]

SUPERVISED, POWER LIMITED.

Class A, X (Style 7) or B

Minimum return voltage permitted is 17V.

Wire range – 22-12 AWG

Refer to Axis^{AX} Wiring Guide Section 9
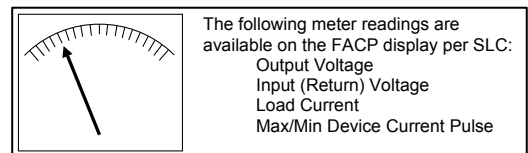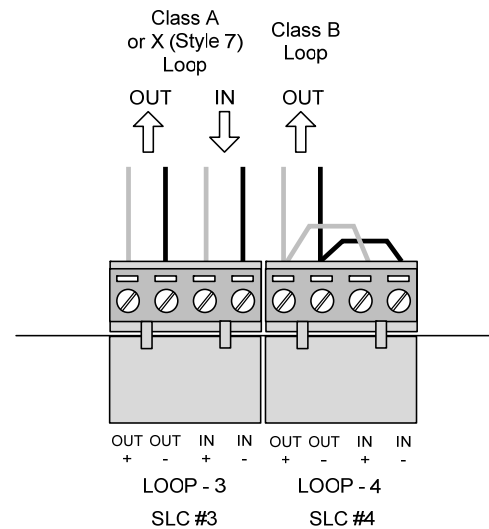
(Refer to Section 10.1.1)

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[4] TOTAL OUTPUT LOAD must not exceed panel supply rating – maximum 5A.

4.7.3 AX-LPD and AX-NAC Notification Appliance Circuit Wiring

The AX-LPD and AX-NAC modules provide two additional notification appliance circuits to the AX-CTL-2PCB base card.

REGULATED 24V DC, 2.0A[5]

SUPERVISED, POWER LIMITED.

Class A or B
Class B EOL (End-of-Line) Resistor 10KΩ

Minimum return voltage permitted is 16V.

Wire range – 22-12 AWG

Maximum line impedance at 2.0A is 1.5Ω.

Maximum voltage drop across installation wiring is 3.0V at battery voltage of 20.4V.

Calculate the maximum line impedance and conductor size required for the actual load current applied.

Refer to Axis[AX] Wiring Guide Section 9

Class A   Class B
                 EOL 10K

OUT   IN   OUT

B+   B-   A+   A-   B+   B-   A+   A-

NAC - 3   NAC – 4

The following meter readings are available on the FACP display per NAC:
    Output Voltage
    Input (Return) Voltage
    Load Current
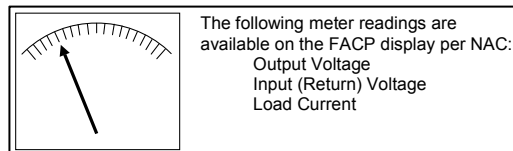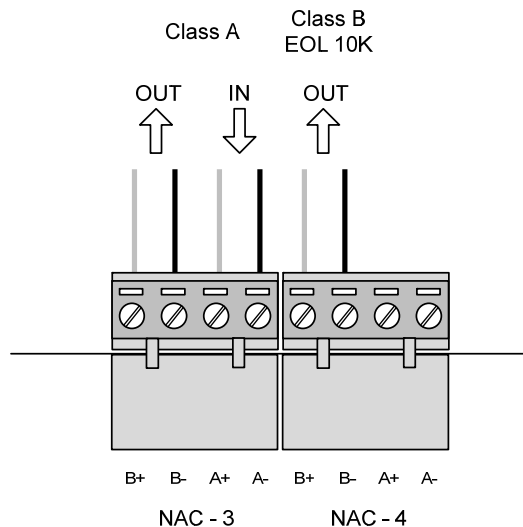
(Refer to Section 10.1.1)

4.7.4 Replacing the AX-LPD or AX-NAC Module

Note: The AX-CTL-1PCB one loop base card cannot support the AX-LPD or AX-NAC option modules. In addition, when utilizing an AX-LPD or AX-NAC option module an AX-PSU power supply may be required if notification appliance circuit power requirements indicate a need for additional power.

Remove power (AC and battery) from the system. Remove all field wiring terminal blocks from the AX-LPD or AX-NAC module. Remove the four (4) screws securing the module to the AX-CTL base card and remove the module. Position the new module onto the metal hexagon spacers, while plugging the module into the two (2) 20-pin connectors on the AX-CTL base card and secure with the four (4) removed screws (see figure 29). It is critical that these screws are tightly secured as the two top screws are required for the earth ground connection to the AX-LPD or AX-NAC module.

Failure to tighten screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

4.8 AX-NET4 or AX-NET7 Network Module

The AX-NET4 and AX-NET7 modules are network modules (CCITT RS-485) utilized for connecting Axis[AX] fire alarm control panels to the Advanced AD-NeT-PluS network. The Advanced AD-NeT-PluS network can support Axis[AX] fire alarm control panels, remote annunciators with/without control, AX-LAN (ipGateway) and other network nodes.

The AX-NET4 module is utilized with a Class B AD-NeT-PluS network, while the AX-NET7 is utilized with a Class X (Class A, Style 7) AD-NeT-PluS network.

---

[5] TOTAL OUTPUT LOAD must not exceed panel supply rating – maximum 4A.

AX-NET4: Class B AD-NeT-PluS network:
- 32 Network Nodes (requires 150Ω filtering resistor at the beginning and at the end of the network)
- Maximum Cable Length 5000ft

AX-NET7: Class X (Class A, Style 7) AD-NeT-PluS network:
- 200 Network Nodes
- Maximum Cable Length between Nodes 5000ft
- Maximum Overall Cable Length 66000ft

Cable wiring must be minimum twisted shielded pair 18AWG to 20AWG. Connect the shield to the designated terminal block positions only.

Refer to Axis^{AX} Wiring Guide Section 9.

Note: Optional AX-MOXA Fiber Optic Converter Modules are available for converting AX-NET4 or AX-NET7 copper wiring to fiber optic.
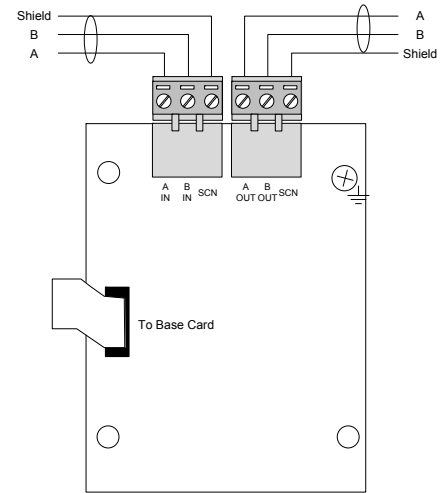
4.8.1   Installing the AX-NET4 or AX-NET7 Module

Note: All Axis^{AX} fire alarm control panels can support networking capabilities.

The AX-NET4 and AX-NET7 modules are supplied with one metal hexagon spacer/screw and three (3) nylon spacers (see figure 30).Install the metal hexagon spacer [h] and three (3) supplied nylon spacers [n]. Plug the flat ribbon cable of the AX-NET4/AX-NET7 into the dedicated network connector on the AX-CTL base card. Position the module onto the three (3) nylon spacers and snap in place. Secure the module in place by screwing the supplied screw [p] into the metal hexagon spacer (see figure 30). It is critical that this screw is tightly secured as the screw is required for the earth ground connection to the AX-NET4/AX-NET7 module.
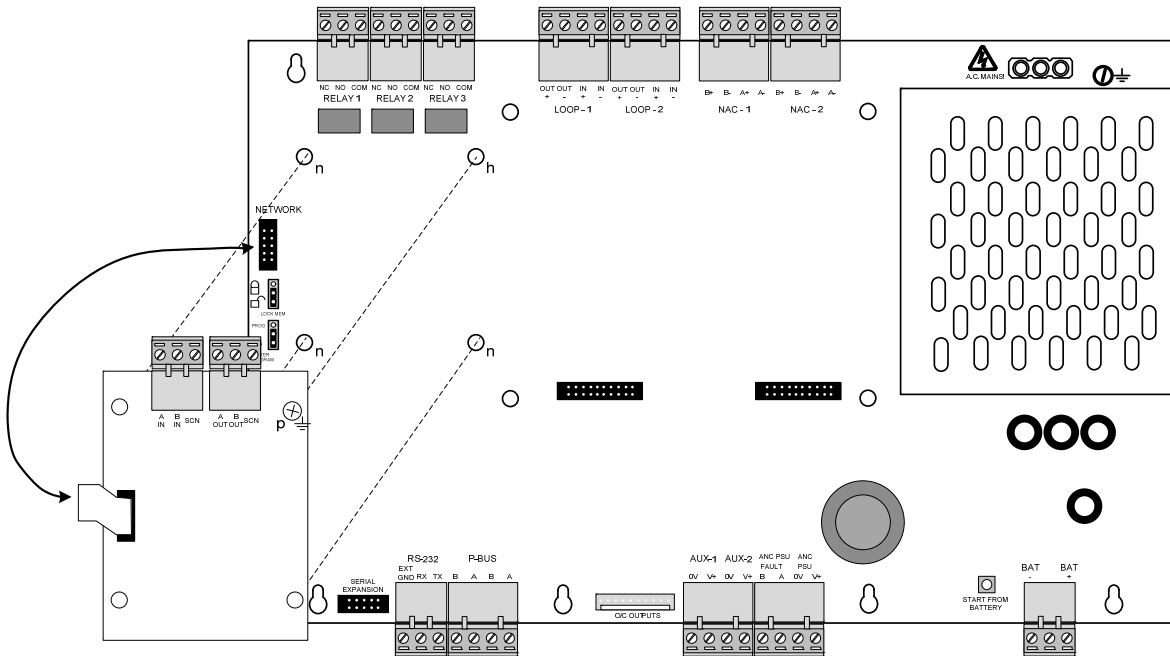
Figure 30 - AX-NET4 or AX-NET7 Installation

4.8.2   AX-NET4 or AX-NET7 Module Wiring

Each AX-NET4/AX-NET7 module has independent connectors for the outgoing and incoming network wiring. Utilizing twisted shielded cable, connect from the "OUT" terminal on the first panel, to the "IN" terminal on the next panel, as follows:
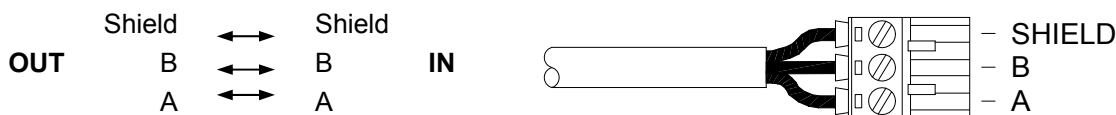
4.8.2.1   AD-NeT-PluS Class B Wiring

The "IN" terminals on the first node and the "OUT" terminals on the last node are not used. Connect an end of line filtering resistor (150Ω) between A and B on the unused terminal blocks.

Maximum overall cable length is 5000ft (1500m) using recommended cables.
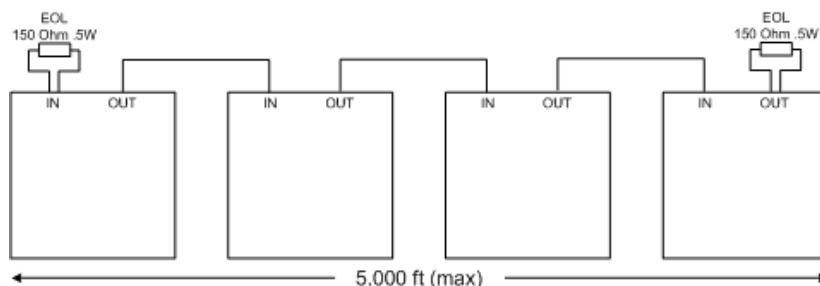
4.8.2.2   AD-NeT-PluS Class A Wiring
When utilized all network nodes must be installed with Class X (Class A, Style 7) type adaptor card.
Install a cable from the last node "OUT" terminals back to the first node "IN" terminals to form a loop "ring".

Maximum cable length between nodes is 5000ft (1500m) using recommended cables.
Maximum overall cable length is 66000ft (20000m) using recommended cables.
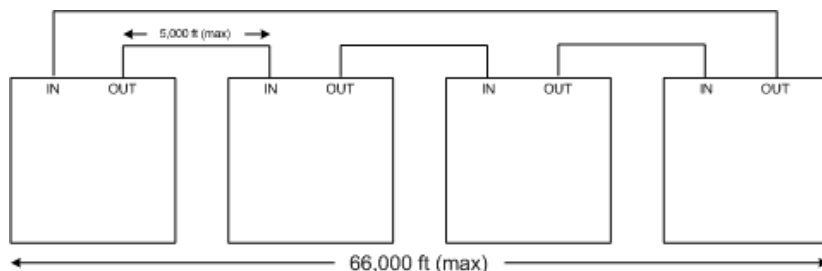
4.8.3   Replacing the AX-NET4 or AX-NET7 Module

Remove power (AC and battery) from the system. Remove the screw [p] securing the module to the AX-CTL base card and snap the module free from the nylon spacers [n]. Unplug the flat ribbon cable connected to the network connector on the AX-CTL base card. Plug the flat ribbon cable of the new module into the dedicated network connector on the base card. Position the module onto the three (3) nylon spacers and snap in place. Secure the module in place by screwing the removed screw [p] into the metal hexagon spacer [h] (see figure 30). It is critical that this screw is tightly secured, as the screw is required for the earth ground connection to the AX-NET4/AX-NET7 module. Reconnect AC and battery power to the system.

Failure to tighten the screw will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

4.9   Digital Alarm Communicator - Interfacing to a D9068P and D9068E (DACT)

There are two (2) ways to interface an AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel's AX-CTL base card to a Bosch D9068 Digital Alarm Communicator for Central Station connection. The first method is simply dry contact input point monitoring (D9068E) for alarm, trouble, supervisory and if required low battery. The second method is via serial communications with the AX-CTL base card (D9068P). The serial communications method (D9068P) allows for device reporting (Contact-ID by point), Network node and zone reporting (Contact-ID) and zone and device reporting (SIA-300). Refer to D9068P installation and operation manual for detailed DACT programming information.

When monitoring the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel via simple dry contacts, the D9068E DACT can be mounted either within the enclosure or within its own enclosure that the D9068 is shipped in.

When monitoring the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel serial communications, the D9068P is mounted within the in the enclosure on its side wall (see figure 31).

4.9.1   D9068P Serial Communications DACT Interfacing

When the D9068P serial communications DACT is used with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel's AX-CTL base card an Advanced AX-SEB serial expansion board is required. The AX-SEB serial expansion board plugs into the AX-CTL base card serial expansion port and provides RS-232 communications and power to the D9068P. The AX-CTL base card serial expansion port shares the same processor access as the USB programming port and RS-232 printer output terminals. When utilizing the AX-SEB serial expansion board, the AX-CTL base card USB port and RS-232 printer output terminals are inoperable. The AX-SEB serial expansion board has a jumper that allows for the disconnection of communications with the D9068P so that the AX-CTL base card can be programmed or integrated with the Advanced' service tool.

Note: When not programming the AX-CTL base card, the AX-SEB jumper must be set in the DACT "ON" position. When programming the AX-CTL via USB port or RS-232 printer output terminals the jumper must be placed in the DACT "OFF" position and upon completion of programming returned to the DACT "ON" position.

In order for the D9068P to function correctly via the AX-CTL base card serial expansion board, the AX-CTL base card must be configured for the correct D9068P DACT communications protocol (Contact-ID by Point, Contact-ID or SIA-300)

Note: All D9068P DACT programming (i.e. communications protocol, primary and secondary phone numbers, etc.) must be done with a DACT-PRG (Bosch – FMR-DACT-KEYPAD) programming LCD and keypad. To program the D9068P the DACT-PRG LCD keypad must be plugged into the AX-SEB serial expansion board (see figure 32).
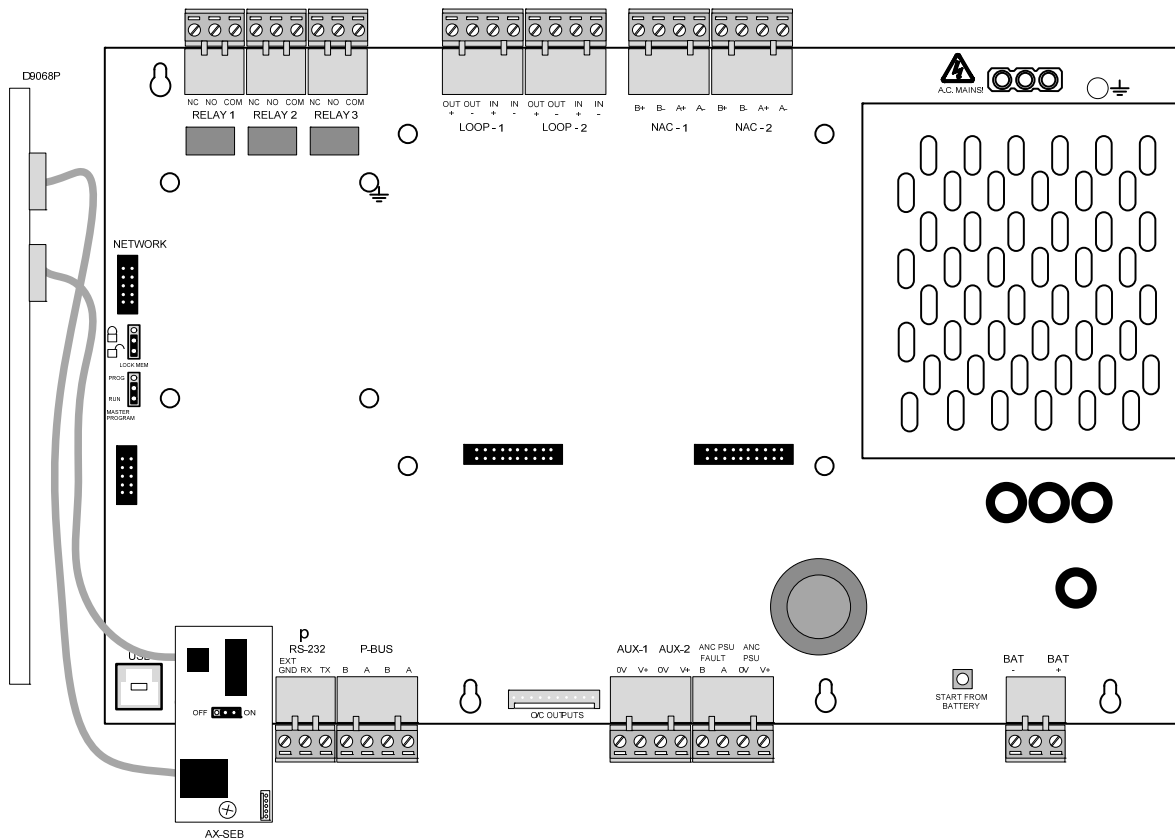
Figure 31 - D9068P Connection

4.9.1.1   Installing the AX-SEB Serial Expansion Board and D9068P Bosch DACT

Install the round spacer supplied with the AX-SEB board onto the threaded standoff of the back box below the ten-pin serial expansion socket located on the bottom left corner of the AX-CTL base card (see figure 26).

The AX-SEB comes with two ribbon cables (one 6 pin and one 5 pin) these cables are for connecting the AX-SEB to the D9068P DACT.

Connect the 6 pin ribbon cable to PL4, located on the back side of the AX-SEB. Connect the 5 pin ribbon cable to PL2, located on the back side of the AX-SEB (see figure 26).
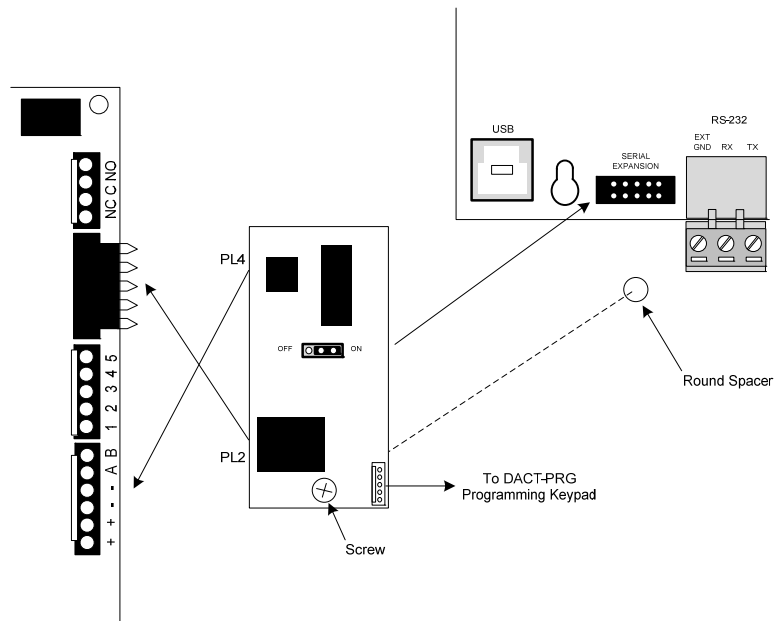
Figure 32 - AX-SEB to D9068P Wiring

Plug the AX-SEB, Serial Expansion Board, into the expansion socket and install/tighten the supplied screw to the round spacer (see figure 32).

Plug the 6 pin ribbon cable coming from the AX-SEB (PL4) into the RS-232/power input connection on the D9068P. Plug the 5 pin ribbon cable coming from the AX-SEB (PL2) into the DACT-PRG keypad input connection on the D9068P, this connection allows the DACT-PRG to be connected to the AX-SEB board for D9068P programming (see figure 32)

The D9068P is mounted on the left sidewall of the enclosure back box. On the upper left sidewall of the back box are three (3) PC board push snap-on standoffs [p] and one (1) screw standoff. Push the D9068P onto the three (3) push snap-on standoffs [p]. Utilizing the provided screw, secure the D9068P to the screw standoff [s] (see figure 33).
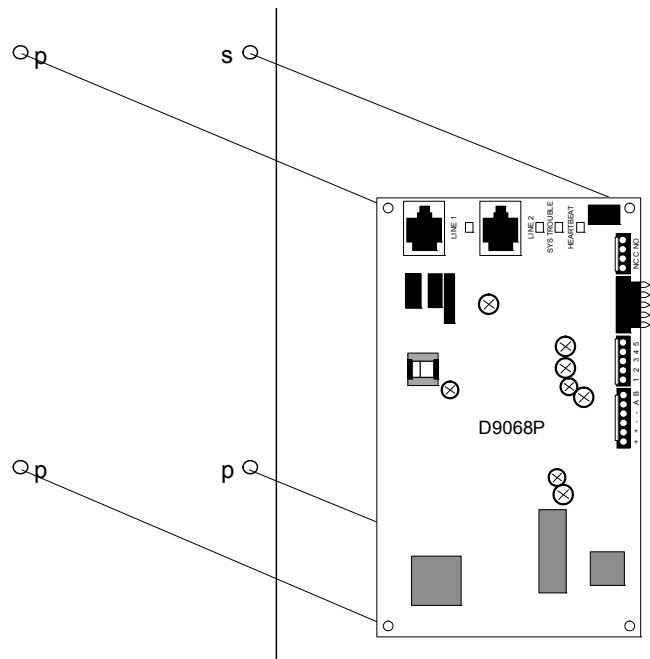
Figure 33 - D9068P Mounting

4.9.2 Relay Contact Interfacing to a Bosch D9068E DACT

When monitoring the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel via simple dry contacts, a D9068E DACT is required. The D9068E comes in its own enclosure that can be mounted adjacent to the fire alarm control panel. In addition, the D9068E module can be removed from the enclosure and installed within the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 enclosure. Below is a wiring diagram for interfacing a D9068E relay contact DACT.
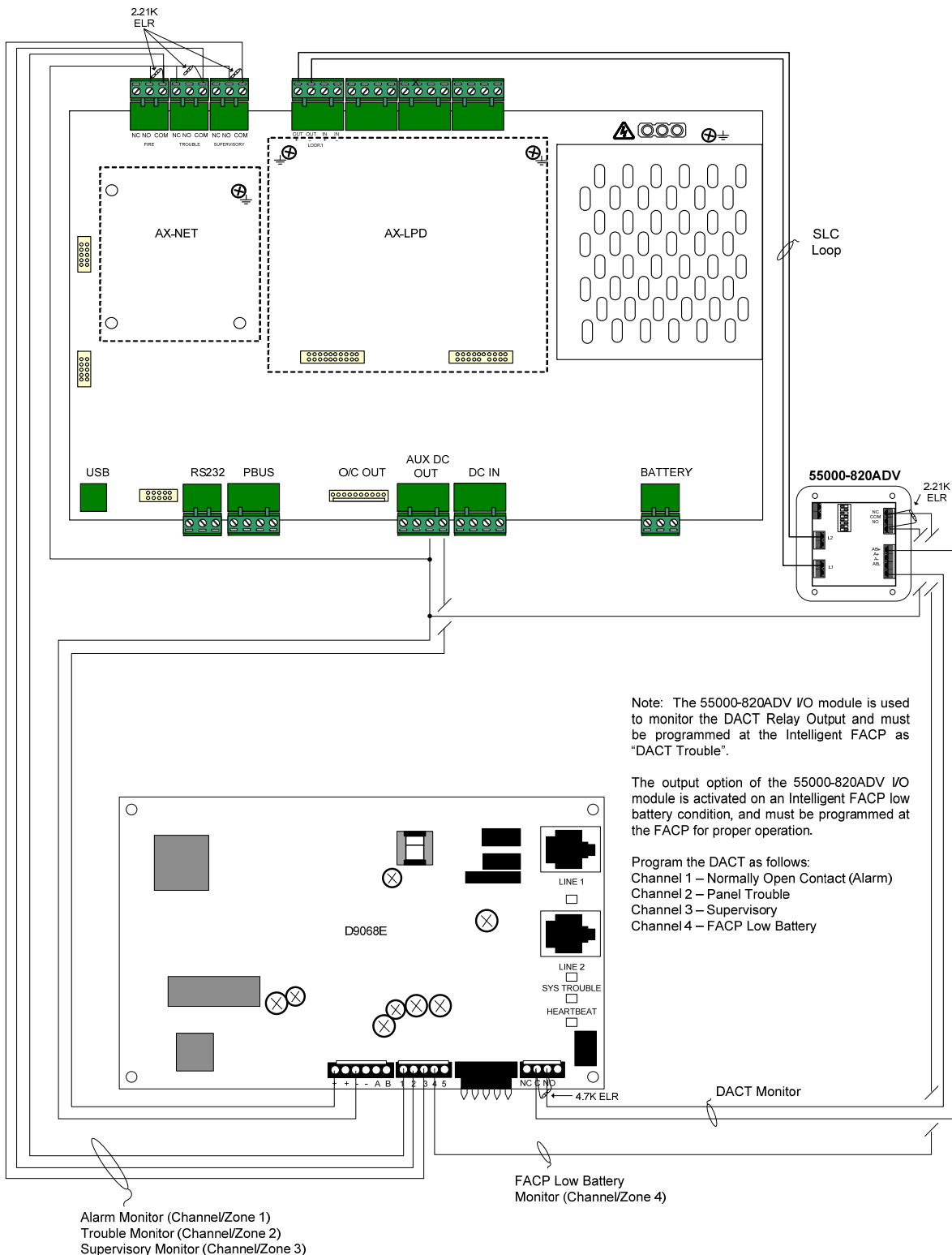
Figure 34 - D9068E Relay Contact DACT Wiring

4.10 Interfacing to a Standalone Digital Alarm Communicator

The following is an example of the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel interfaced to a FireLite Model 411UDAC for Central Station connection (see figure 35).

Note: Though the interface to a Model 411UDAC is shown, the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel can be interfaced to any LISTED standalone DACT.

Note: The 55000-820ADV I/O module is used to monitor the 411UDAC Relay Output (optional 411RK Relay Kit required), and must be programmed at the Ax Intelligent FACP as "DACT Trouble".

The output option of the 55000-820 I/O module is activated on an AX-CTL low battery condition, and must be programmed at the FACP for proper operation.

Program the 411UDAC as follows:
Channel 1 – Normally Open Contact Device (Alarm)
Channel 2 – Host Panel Trouble
Channel 3 – Supervisory
Channel 4 – FACP Low Battery

The 411UDAC must be programmed as a Slave Communicator (programming address 64 set to "2").

Figure 35 - Standalone DACT Interface

4.11 Auxiliary - Reverse Polarity Signaling

The following is a wiring diagram utilizing a NAC circuit or 55000-825ADV addressable NAC module for reverse polarity signaling to a remote location (see figure 36).

Note: A "Not" statement will need to be created for the trouble contact activation, so that an alarm condition has a higher priority than a trouble condition (consult factory).

Line Reversal Remote Signaling
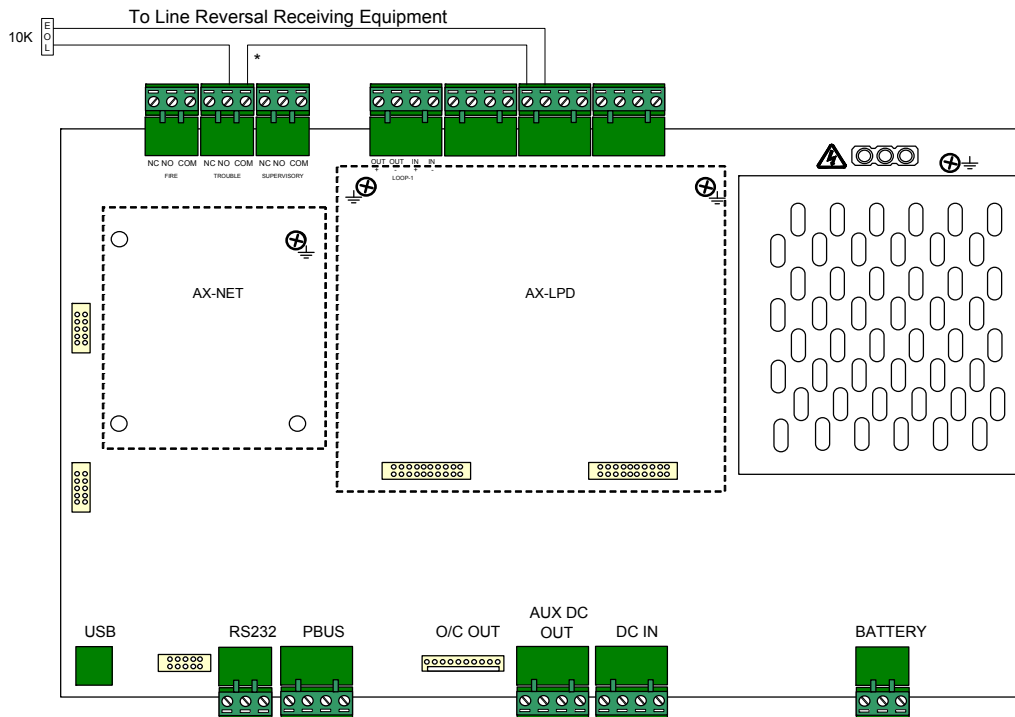
* If trouble reporting is required , run A/B+ thru either the Base Card trouble relay or thru an addressable relay programmed as inverted, trouble activation.
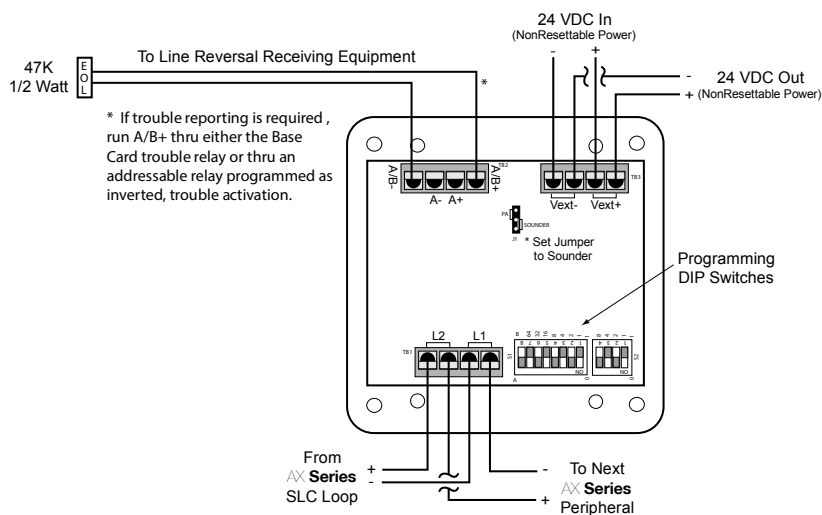
Figure 36 - Reverse Polarity Wiring

4.12   Switch LED Modules

Switch LED modules are PBUS (RS485) field configurable switch input and LED status indicator modules for use with the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel AX-CTL base card. There are five (5) types of switch LED modules (AX-ASW-16, AX-I/O-48, AX-LED16RY, AX-LED32R and AX-LED32Y) available based on installation requirements. Any combination of sixteen (16) switch LED modules can be connected to a single AX-CTL base card peripheral bus (PBUS).

AX-ASW-16	Switch LED Module, incorporating 16 switches and 48 LEDs
AX-I/O-48	Switch LED Driver Module, incorporating 16 switch inputs and 48 LED Drive Outputs
AX-LED16RY	LED Module, incorporating 16 red and 16 yellow LEDs
AX-LED32R	LED Module, incorporating 32 red LEDs
AX-LED32Y	LED Module, incorporating 32 yellow LEDs

Note: Any combination of sixteen (16) switch LED modules (AX-ASW-16, AX-I/O-48, AX-LED16RY, AX-LED32R and AX-LED32Y) can be connected to an AX-CTL base card.

Switch LED modules are extremely flexible and easy to configure/program. Switches can be programmed to bypass (disable/enable) points, zones, and/or groups. They can also be programmed to turn On/Off relay points, NAC circuits, city connections, or they can be configured to provide complete HOA (Hand-Off-Auto) control functionality. When utilized with the PBUS (RS485) AV-AMP-80 audio amplifier, switches can be configured for all call, selective zone/area paging, individual message selection, etc. LEDs can be programmed for a number of different status indications by points, zones and/or groups within the system, including alarm, supervisory, trouble, switch active, relay active, etc. In addition, the LEDs can be programmed for primary and secondary status events, along with flash rates based on last known status/event (i.e.: off, on steady, 1/2 or 1 second flash). Easy slide-in label pockets are provided on all switch LED modules, with the exception of the AX-I/O-48, allowing switches and LEDs to have customized labeling based on installation usage.

For programming and configuration of switch LED modules refer to 682-020 Switch LED Modules Installation Instructions.

4.12.1 Switch LED Module Installation

Switch LED modules can mount in any available single aperture location on an AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel inner door.

Note: There are other remote enclosure options available for mounting switch LED modules, refer to 682-020 Switch LED Modules Installation Instructions.

To install a switch LED module determine which row you're installing the module on and remove the single aperture blank plate nuts and washers. Remove the blank plate and install the switch LED module between the aperture screws and secure with the previously removed washers and nuts (see figure 37).
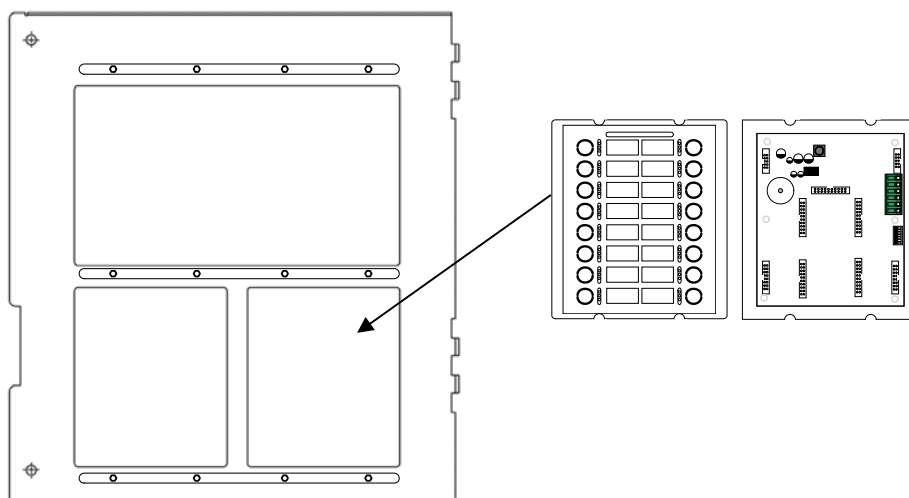
Figure 37 - Switch/LED Module Installation

4.12.2 Addressing Switch LED Modules

Each switch LED module must be connected to the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel's AX-CTL base card P-BUS (RS485). As the switch LED modules reside on the AX-CTL PBUS (RS485), each module must be configured with a unique address (see figure 38). The address setting corresponds to PBUS programming criteria utilized within the Advanced PC-NeT field configuration program.

As previously stated, up to sixteen (16) switch LED modules (any combination) can be connected to a single AX-CTL base card peripheral bus (PBUS).
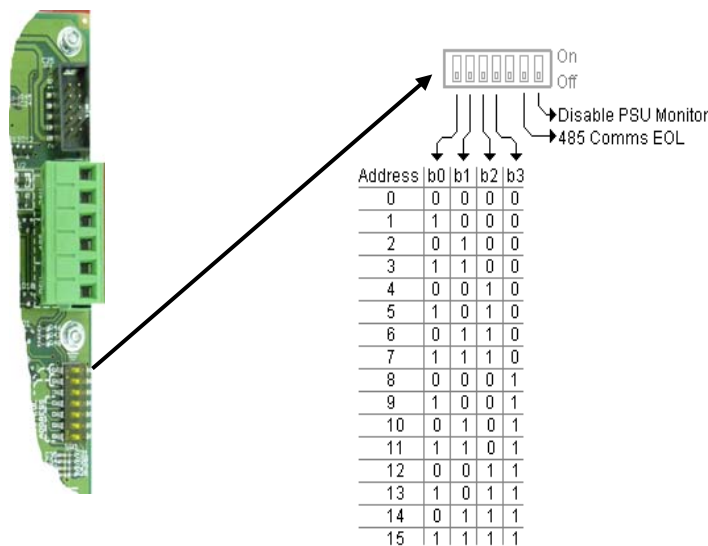
Figure 38 – Switch LED Module Addressing

4.12.3 Switch LED Module Wiring

As previously indicated, each switch LED module requires connection to the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel's AX-CTL base card P-BUS (RS485). In addition, each switch LED module requires 24VDC filtered and regulated power.

4.12.3.1 24VDC Wiring
24 VDC power for switch LED modules can come from any fire alarm listed 24 VDC filtered and regulated power supply (AX-CTL AUX [non resettable] power, AX-PSU-6, AX-PSN or other fire alarm listed power supply). Wire 24 VDC filter regulated power to terminals + and – of the switch LED module (see figure 39).

Refer to Axis^{AX} Wiring Guide Section **Error! Reference source not found.**.

Note: The Switch LED Module is capable of monitoring a remote listed 24 VDC filtered regulated power supply for trouble conditions. Wire the trouble N/O contact (fail-safe [closed unless trouble]) to PSU monitoring terminals of the switch LED module (see figure 39) and confirm DIP switch 7 "Disable PSU Monitoring" of the Switch LED Module is set to the "OFF" position (see figure 38).

4.12.3.2 PBUS (RS485) Wiring
Connect the PBUS (RS485) terminals A and B of the AX-CTL base card to the 485 (PBUS) A and B input terminals of the switch LED module (see figure 39). If this is the last module connected to the AX-CTL PBUS (RS485), set DIP switch 6 "485 Comms EOL" on the Switch LED Module to the "ON" position (see figure 38).

Refer to Axis^{AX} Wiring Guide Section 9.

Note: When utilizing multiple switch LED module's on the same inner door row, 24 VDC power and the PBUS (485) wiring can be daisy chained from the first switch LED module to the next (see figure 40).
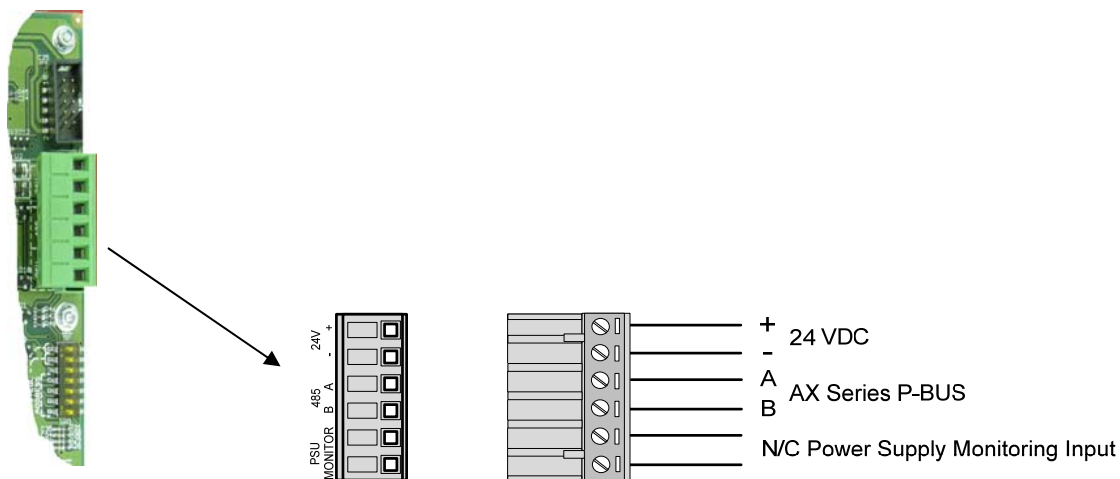
Figure 39 – Switch LED Module Wiring
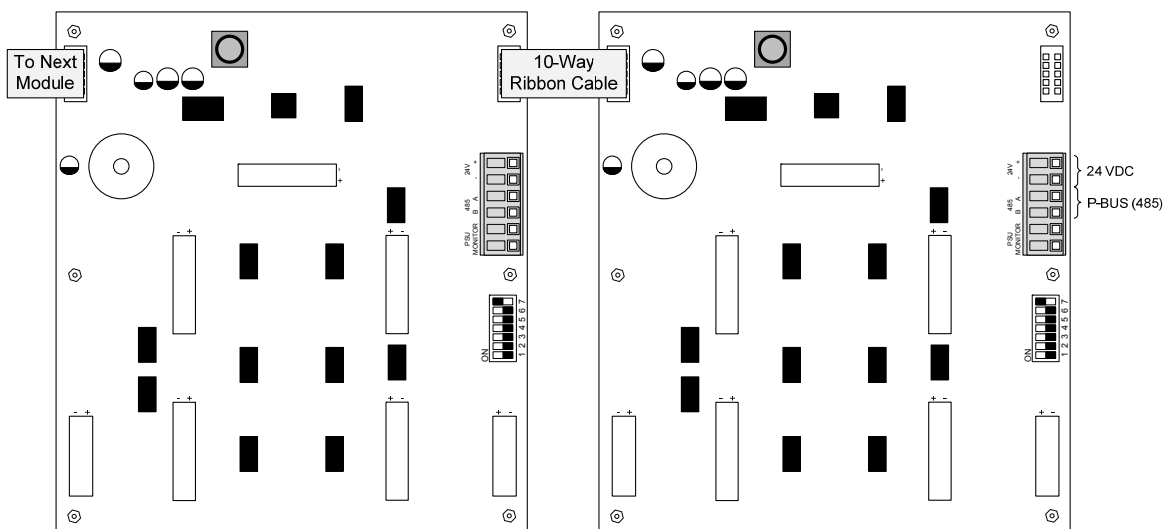
Figure 40 – Switch LED Module Daisy Chain Wiring

4.12.4 Replacing the Switch LED Module

Remove AC and DC power. Unplug the terminal block and/or 10-way IDC ribbon cables attached to the switch LED module. Remove the nuts and washers holding the switch LED module to the inner door. Remove the switch LED module and replace with the new switch LED module between the aperture screws and secure with the removed nuts and washers. Replace the unplugged terminal block and/or 10-way IDC ribbon cables. Reconnect removed AC and DC power.

4.13 AX-CTY Module

The AX-CTY is a module that provides the connection of an Axis^{AX} fire alarm control panel to a Local Energy Masterbox.

4.13.1 Adding and Replacing the AX-CTY Module

The AX-CTY module connects to any dedicated Class B notification appliance circuit (AX-CTL, AX-LPD, AX-NAC circuit or SLC addressable NAC module).

Note: The AX-CTY module and an addressable 55000-825ADV NAC module can be installed together in a standard electrical box.

Wire the Red (+) and Black (-) wire leads of the AX-CTY module to a dedicated Class B notification appliance circuit. Wire the two (2) White wire leads to the trip coil of the Local Energy Master Box.

To Dedicated Non-Silenceable
Notification Appliance Circuit
(-) (+)

Red
Black
White
White

MB

AX-CTY
City Tie Module

Local Energy
Master Box
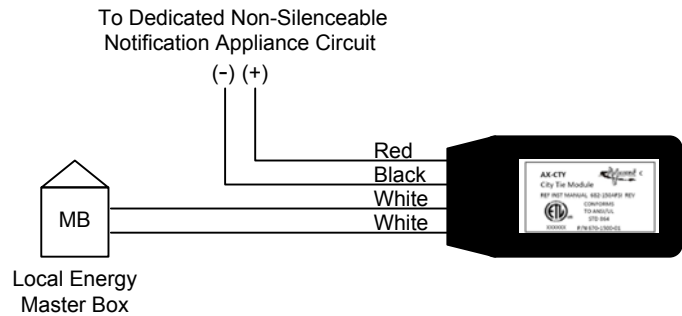
If replacing an AX-CTY module, simply disconnect the field wiring from the AX-CTY wire leads and reconnect the field wiring to the new AX-CTY module wire leads.

Note: The NAC circuit end-of-line (EOL) is not utilized when using the AX-CTY module, retain the unused EOL for possible future troubleshooting.

4.14 AX-PSU Power Supply Expansion Module

The AX-PSU power supply expansion module is an optional expansion power supply for the AX-CTL-2PCB base card that provides additional power for the AX-LPD or AX-NAC module notification appliance circuits.

Note: The AX-CTL-1L cannot support the AX-PSU expansion power supply.

4.14.1 Adding or Replacing the AX-PSU Module

If adding an AX-PSU module, mount the AX-PSU to the back box standoffs located on the right side of the back box below the AX-CTL base card utilizing the four (4) screws provided with the module. Refer to the adjacent diagram regarding mounting and cabling.

Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

Connect one end of the double-ended Molex connector provided with the AX-PSU into the AX-ACB board and connect the other end of the double-ended Molex connector into the AX-PSU.

It is recommended to use tie-wraps to secure the AC cabling to the enclosure back box.

Note: The AX-PSU is used as an expansion power supply for the Axis^{AX} Intelligent Fire Alarm Control Panel, ensure that the jumper located on the AX-PSU is configured for PSU ONLY mode or the AX-PSU module will report a trouble condition.

PSU ONLY

PSU + CHARGER

Install the jumper in the
PSU ONLY location. The
unit ships with the jumper
pre-installed in this
location.

Remote LED
Connections
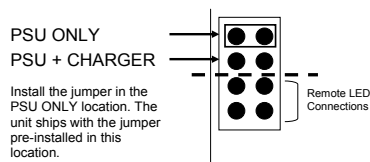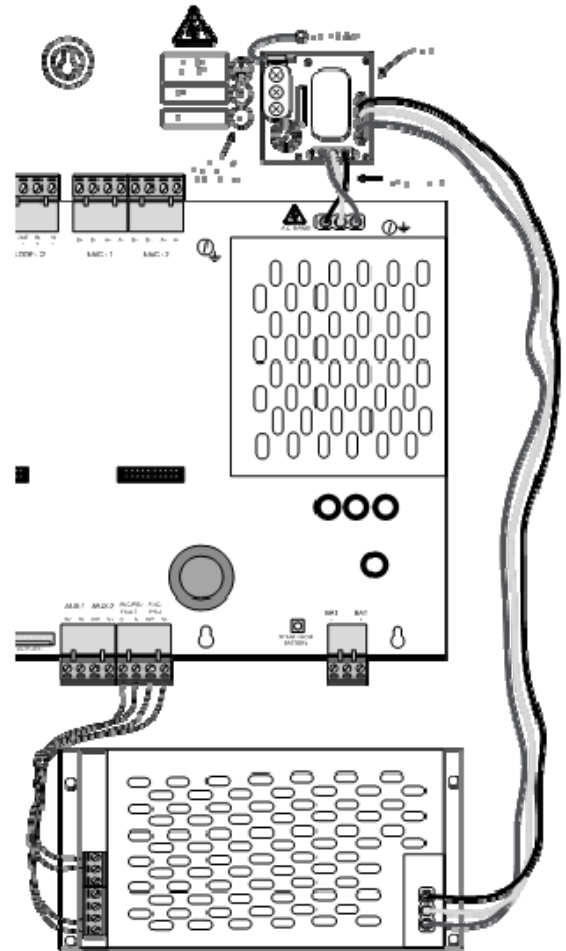
4.14.1.1 AX-PSU DC Wiring

The AX-PSU is a 27.4 VDC temperature compensated power supply designed to track the AX-CTL DC supply.

The power from the AX-PSU is used to supply additional power to the NAC-3 and NAC-4 notification appliance circuits in lieu of power being drawn from the AX-CTL base card. A cable is supplied with the AX-PSU for connection to the AX-CTL base card, interfacing the DC power and fault monitoring (see adjacent drawing).

If replacing the AX-PSU, Remove AC and DC power. Remove the AC power lead and the wiring interfacing the AX-PSU to the AX-CTL base card. Remove the four (4) screws securing the AX-PSU to the back box and remove. Position the new AX-PSU onto the back box standoffs and secure with the four (4) removed screws. Rewire the removed AX-CTL base card interface wiring and reconnect AC power lead.
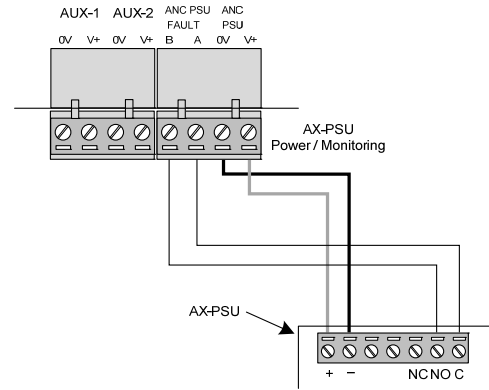
Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

4.15 AX-RL8 Eight Relay Output Module

The AX-RL8 eight relay output module is an eight (8) point relay module that connects directly to the AX-CTL base card.

Note: If an AX-RL4, AV-AMP-80 or AX-CZM module is installed in the Axis^{AX} enclosure an AX-RL8 eight relay output module cannot be added.

4.15.1 Adding or Replacing an AX-RL8 Module

If adding an AX-RL8 module, mount the AX-RL8 to the standoffs in the position shown to the right and secure using the four (4) supplied screws.

Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

Connect the AX-RL8 to the AX-CTL base card "O/C OUTPUT" header with the supplied flat ribbon cable (the cable is polarized to ensure correct orientation).

If replacing the AX-RL8 module, remove AC and DC power. Remove the three (3) pluggable terminal blocks and the flat ribbon cable originating from the "O/C OUTPUT" of the AX-CTL base card. Remove the four (4) screws holding the module to the back box. Position the new module onto the back box standoffs and secure with the four (4) removed screws. Reconnect the three (3) removed pluggable terminal blocks and the flat ribbon cable originating from the "O/C OUTPUT" of the AX-CTL base card.
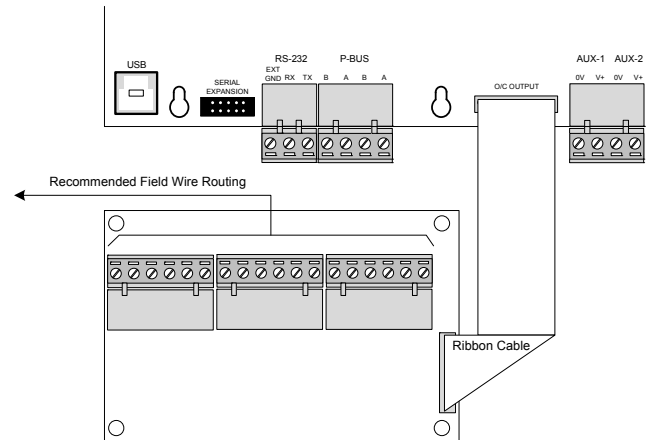
Failure to tighten the screws will defeat the protection circuitry designed to protect the module from damage due to lightning and static electricity.

4.15.2 AX-RL8 Output Wiring

Relays 1 and 2 are Form C relays. Relays 3 thru 8 are Form A, but can be programmed inverted.

All outputs are field programmable (default setting is set to activate on common alarm).

30 VDC/AC @ 1.0A, PF=1 (resistive)

POWER LIMITED – Connect to power limited circuits only.

Wire range – 22-12 AWG
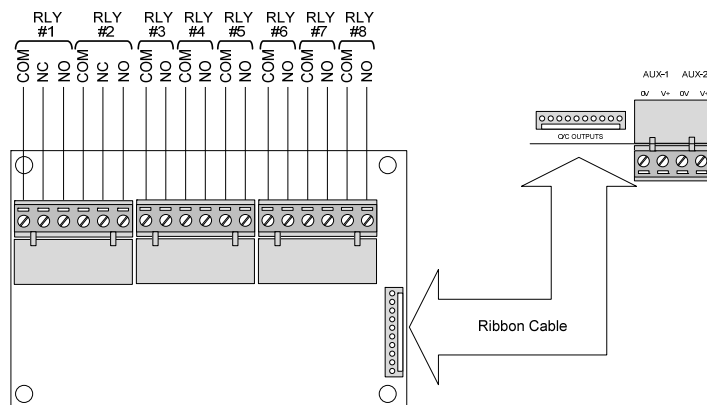
4.16   AX-RL4 Four Point Relay Output Module

The AX-RL4 four point relay output module is an optional PBUS (RS485) module for use the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel's AX-CTL base card. The AX-RL4 provides four (4) fully field programmable Form "C" relay contacts for project specific control functions. The AX-RL4 is listed to switch DC or AC voltage and up to sixteen (16) AX-RL4 modules can be connected to a single AX-CTL base card providing a maximum of 64 relay outputs.

The AX-RL4 can either mount onto the four (4) standoffs located on the left-hand side of the Axis[AX] enclosure below the AX-CTL base card (see figure 41) or within an AXM-009 enclosure (see figure 42).

Note: If an AX-RL8, AV-AMP-80 or AX-CZM module is installed in the Axis[AX] Intelligent Fire Alarm Control Panel an AX-RL4 module cannot be added. However, the AX-RL4 module can be mounted remotely in an AXM-009 or AX-GCAB enclosure.

Refer to AX-RL4 Installation Manual for detailed information regarding installation.
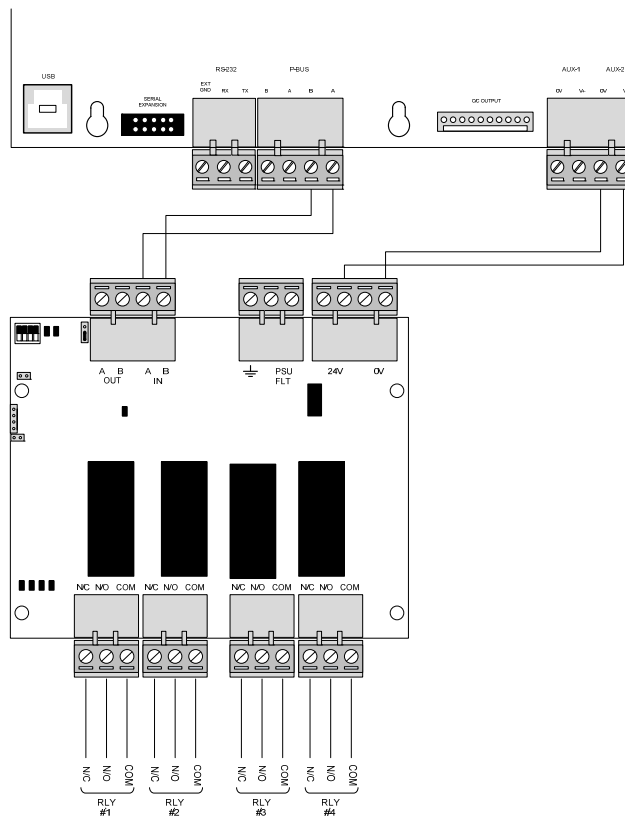
Figure 41 - AX-RL4 Axis[AX] Enclosure Mounting
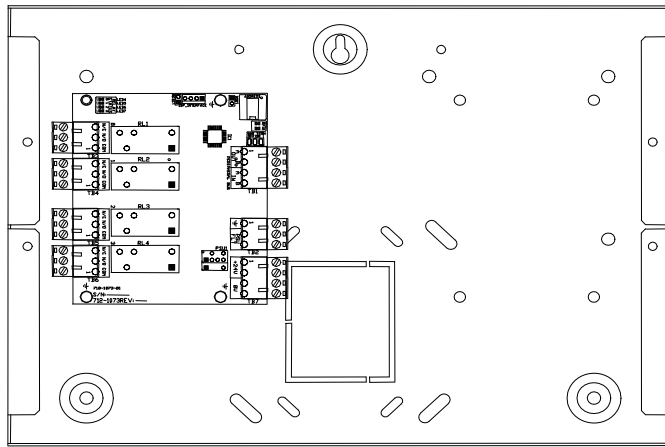
Figure 42 – AX-RL4 AXM-009 Enclosure Mounting

Note: Two (2) AX-RL4 modules can be mounted in an AXM-009 enclosure.

4.17 AX-CZM Conventional Zone Module

The AX-CZM is an Advanced conventional zone module that can be monitored and controlled by an Axis^{AX} fire alarm control panel (see figure 43). The AX-CZM conventional zone module provides monitoring for up to eight (8) Class B conventional zones, with programmable end-of-line, or four (4) Class A conventional zones. In addition, each AX-CZM module has three (3) field programmable Form C relay contacts defaulted to activate on common alarm. Up to sixteen (16) AX-CZM modules can be supported by a single Axis^{AX} fire alarm control panel. By supporting sixteen (16) AX-CZM modules, an Axis^{AX} fire alarm control panel can accommodate up to 128 Class B (64 Class A) conventional zones and 48 (Form C) field programmable relay contact outputs.

The AX-CZM module mounts within an AXM-009 (see figure 44).

Refer to AX-CZM Installation Manual for detailed information regarding installation.
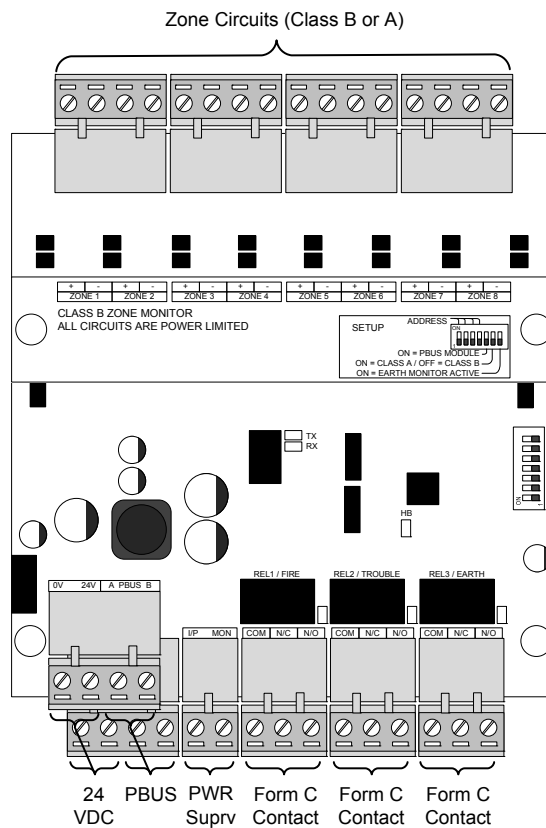
Figure 43 - AX-CZM Module
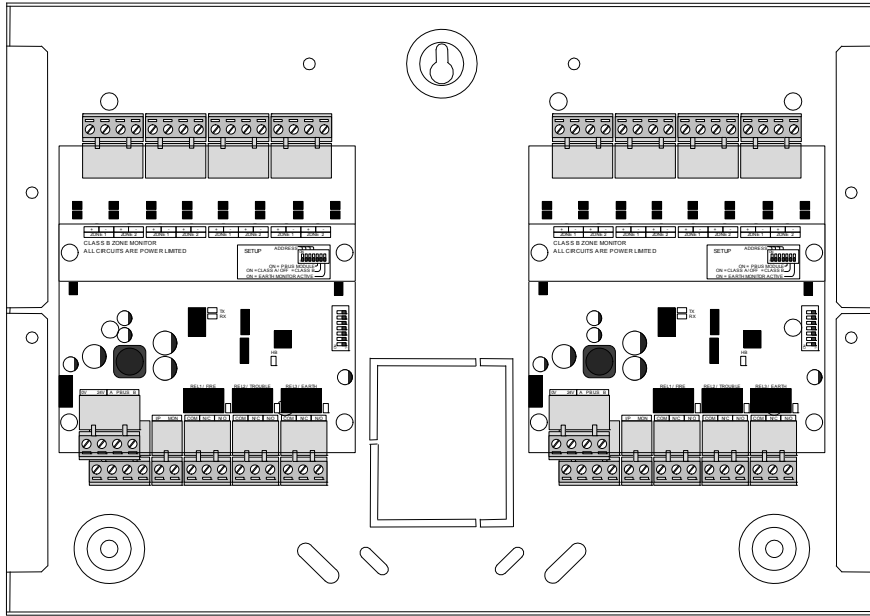
Figure 44 – AX-CZM AXM-009 Enclosure Mounting

Refer to Axis^{AX} Wiring Guide Section 9.

Note: Two (2) AX-CZM modules can be mounted in an AXM-009 enclosure.

4.18 AX-012 Panel Strip Printer

The AX-012 panel strip printer is an on-board thermal strip printer for use with the Axis^{AX} fire alarm control panel. The AX-012 can be configured to provide automatic or on demand printing of Axis^{AX} fire alarm control panel history event logs and system status events. In addition, when installed on an Axis^{AX} networked system, automatic printing of alarms and other events can be printed from anywhere on the network, unless the panel containing the strip printer is programmed not to show the specific network event(s).

The AX-012 panel strip printer mounts in any available single aperture location on the Axis^{AX} fire alarm control panel inner door, although it's normally installed on the left side of the second row (see figure 45).
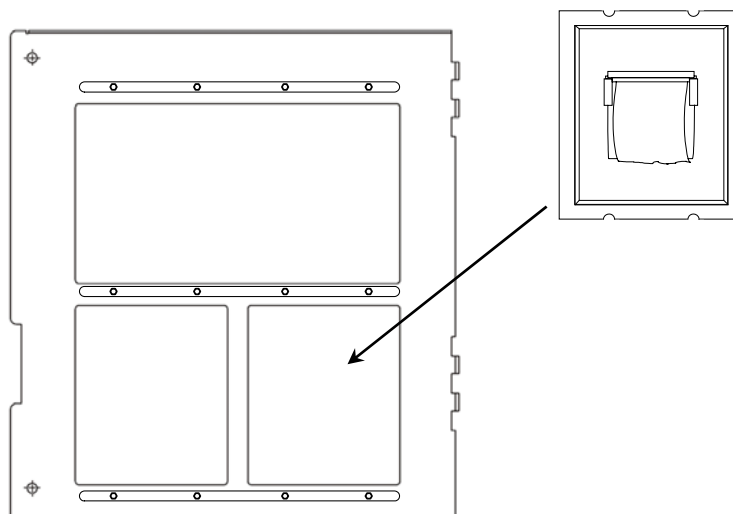
Figure 45 - AX-012 Panel Printer

Refer to AX-012 Panel Printer Installation Manual for detailed information regarding installation.

4.18.1 AX-012 Panel Printer Programming

Refer to Printer Menu section of this manual.

4.19   AX-MDM 24 VDC Modem Module

The AX-MDM 24 VDC modem module provides remote telephone dial-in access to an AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel's AX-CTL base card. This access allows qualified/trained Advanced' technicians' remote access, through the Advanced Axis^{AX} terminal dial-up program, to monitor, maintain and perform service of a single Axis^{AX} fire alarm control panel.

The AX-MDM can either mount onto the four (4) standoffs located on the left-hand side of the Axis^{AX} enclosure below the AX-CTL base card or within an AXM-009 enclosure.

Note: If an AX-RL8, AX-RL4, AV-AMP-80 or AX-CZM module is installed in the Axis^{AX} Intelligent Fire Alarm Control Panel an AX-MDM module cannot be added. However, the AX-MDM module can be mounted remotely in an AXM-009 or AX-GCAB enclosure.

5 Recommended Cable Routing

Power limited and non-power limited circuit wiring must remain separate in the fire alarm system enclosure. All power limited circuit wiring must remain at least 0.25" (6.35 mm) away from any non-power limited circuit wiring. Furthermore, all power limited and non-power limited circuit wiring must enter and exit the enclosure through different knockouts and/or conduits (see figure 46).

Below is a typical diagram for the Axis^AX; AX-CTL-1L, AX-CTL-2 and AX-CTL-4 to meet the above mentioned power limited wiring requirements:
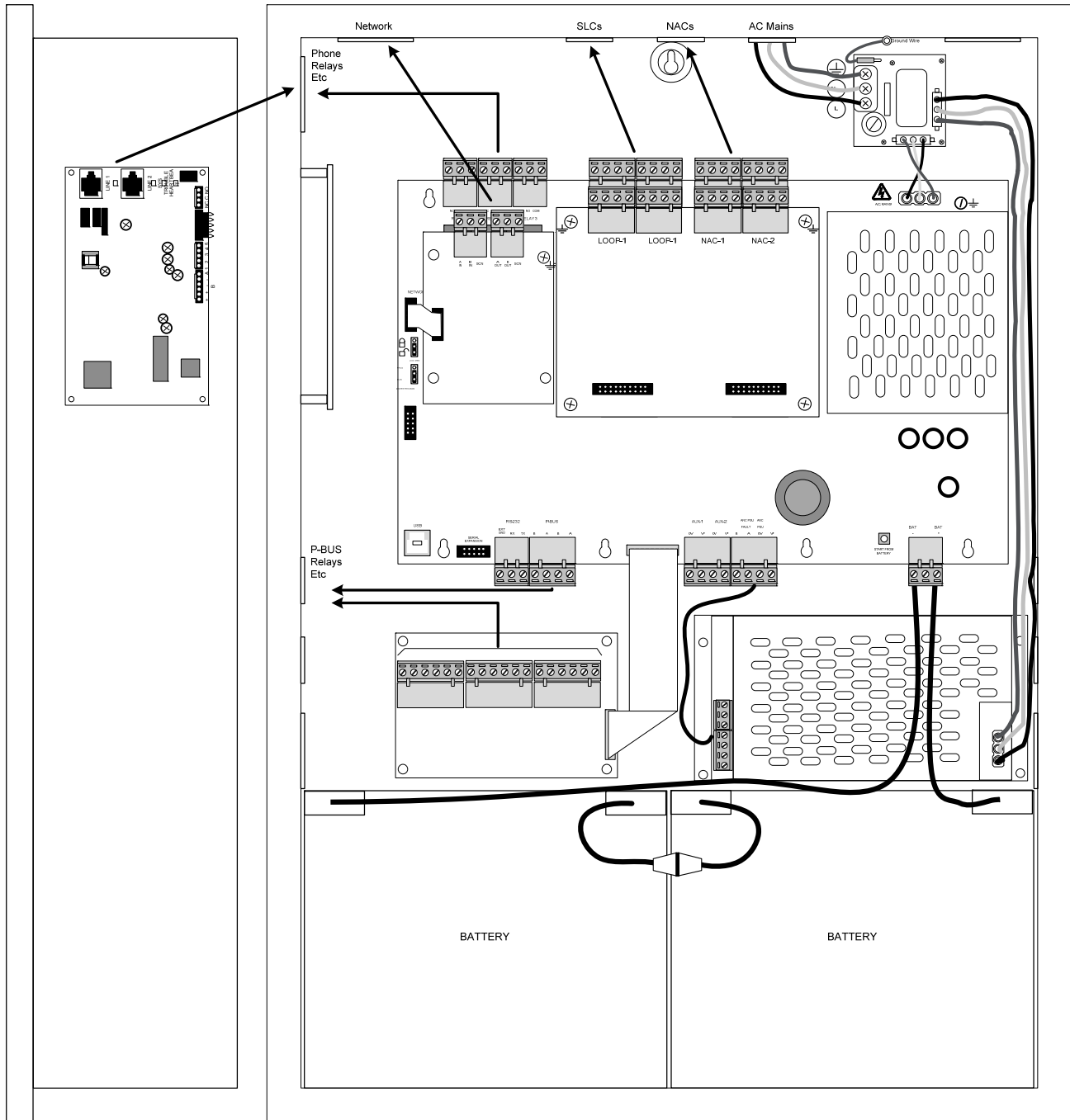
Figure 46 - AX-CTL-1L, AX-CTL-2 or AX-CTL-4 Cable Routing

6   Loading Calculations

6.1   Panel Loading

The total AX-CTL base card load must not exceed the rating of the AX-CTL power supply. The AX-CTL power supply can deliver 5A total load maximum (battery charging is disabled during alarm).

When the optional AX-PSU expansion power supply is used to supplement the AX-CTL base card power supply (AX-CTL-2PCB two loop and four only) an additional 4A of load current for NAC #3 and NAC #4 is available.

Note: The AX-CTL-1PCB one loop base card cannot support the optional AX-PSU expansion power supply module.

The AX-CTL base card loading includes the AX-CTL (195mA for a one or two SLC loop system and 260mA for a four SLC loop system), any power required for additional option modules and all external power required for the SLC, NAC and AUX circuits.

Note: The AX-DSP alphanumeric graphic display backlight is turned off during AC power failure (after 60 seconds). It turns on in Alarm or if a panel button is activated.

6.1.1 AX-CTL One Loop Battery Calculation

Equipment	Quiescent Load			Alarm Load		
	I (A)	x	Total	I (A)	x	Total
AX-CTL (One Loop)	0.110	1.0	= 0.110	0.195	1.0	= 0.195
Sensor / SLC Current[6] SLC #1		1.1[7]	=		1.1	=
AX-NET4 or AX-NET7 Network Card	0.062	1.0	=	0.062	1.0	=
AX-ANN-C (D) – Style 4 or 7	0.078	1 to (x)[8]	=	0.140	1 to (x)	=
D9068P	0.109	1.0	=	0.125	1.0	=
AX-RL8	0.000	1.0	=	0.065	1.0	=
Switch LED Module	0.011	1 to 16[9, 10]	=	0.060[9,10]	1 to 16	=
AX-RL10	0.000	1.0	=	0.065	1.0	=
AX-MDM (100mA Active)	0.020	1.0	=	0.020	1.0	=
AX-CTY (no substantial current draw)	0.000	1.0	=	0.000	1.0	=
AX-LAN ipGateway (Style 4)	0.070	1.0	=	0.070	1.0	=
AX-LAN/ST7 ipGateway (Style 7)	0.110	1.0	=	0.110	1.0	=
AX-RL4	0.020	1 to 16[11]	=	0.100[11]	1 to 16	=
AX-CZM	0.120	1.0	=	0.300	1.0	=
AX-012	0.020	1.0	=	0.025	1.0	=
AUX #1 Supply Output[12]		1.0	=		1.0	=
AUX #2 Supply Output[12]		1.0	=		1.0	=
NAC Output 1[13]					1.0	=
NAC Output 2[13]					1.0	=
Total	ΣQuiescent Load		=	ΣAlarm Load		=
	x 24 hr or 60 hr		Ah	x 0.0833[14] hr		Ah
	Total Quiescent Current		Ah	Total Alarm Current		Ah
	Total Load (Quiescent + Alarm)					Ah
	Total Load x 1.2 (battery de-rating factor)					Ah

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[6] Maximum 0.5A load per SLC. Refer to the technical information for each device to calculate the load on the loop for both the quiescent condition and fire alarm condition for all loop devices. By default, a maximum of 5 detector LED indicators will be turned on in an alarm condition. (This number can be changed via the PC-NeT Field Configuration Programming Tool).

[7] The calculated loop loading must be multiplied by a factor of 1.1 to account for the efficiency of the SLC loop DC/DC converters which maintain a constant voltage output on the SLC loops even when the system is on battery back-up.

[8] The AX-ANN is an Axis^{AX} networked remote annunciator, number of annunciators is based on network nodes available.

[9] 16 Switch LED Modules can be installed on an AX-CTL system.

[10] Current draws shown for Switch LED Module is for all LEDs active, typical draw is 11mA all LEDs off, 50 mA all LEDs on.

[11] 16 AX-RL4 modules can be installed on an AX-CTL system current draw shown is for all relays active in alarm.

[12] Maximum 0.5A load per AUX. Calculate the required load for each auxiliary output in both the quiescent and alarm conditions. Refer to the technical information for each device that is to be powered from the panel AUX Output to determine the overall AUX loading currents. The sum of all these additional currents should be entered in these fields.

[13] Maximum 2.0A load per notification appliance circuit.

[14] 5 minutes in alarm, change to .166 for 10 minutes in alarm.

6.1.2 AX-CTL Two Loop Battery Calculation

Equipment	Quiescent Load			Alarm Load		
	I (A)	x	Total	I (A)	x	Total
AX-CTL (Two Loop)	0.110	1.0	= 0.110	0.195	1.0	= 0.195
Sensor / SLC Current[15] SLC #1		1.1[16]	=		1.1	=
SLC #2		1.1[16]	=		1.1	=
AX-NET4 or AX-NET7 Network Card	0.062	1.0	=	0.062	1.0	=
AX-ANN-C (D) – Style 4 or 7	0.078	1 to (x)[17]	=	0.140	1 to (x)	=
D9068P	0.109	1.0	=	0.125	1.0	=
AX-RL8	0.000	1.0	=	0.065	1.0	=
Switch LED Module	0.011	1 to 16[18,19]	=	0.060[18,19]	1 to 16	=
AX-RL10	0.000	1.0	=	0.065	1 to 16	=
AX-MDM (100mA Active)	0.020	1.0	=	0.020	1.0	=
AX-CTY (no substantial current draw)	0.000	1.0	=	0.000	1.0	=
AX-LAN ipGateway (Style 4)	0.070	1.0	=	0.070	1.0	=
AX-LAN/ST7 ipGateway (Style 7)	0.110	1.0	=	0.110	1.0	=
AX-RL4	0.020	1 to 16[20]	=	0.100[20]	1 to 16	=
AX-CZM	0.120	1.0	=	0.300	1.0	=
AX-012	0.020	1.0	=	0.025	1.0	=
AUX #1 Supply Output[21]		1.0	=			
AUX #2 Supply Output[21]		1.0	=		1.0	=
NAC Output 1[22]					1.0	=
NAC Output 2[22]					1.0	=
Total	ΣQuiescent Load		=	ΣAlarm Load		=
	x 24 hr or 60 hr		Ah	x 0.0833[23] hr		Ah
	Total Quiescent Current		Ah	Total Alarm Current		Ah
	Total Load (Quiescent + Alarm)					Ah
	Total Load x 1.2 (battery de-rating factor)					Ah

---

[15] Maximum 0.5A load per SLC. Refer to the technical information for each device to calculate the load on the loop for both the quiescent condition and fire alarm condition for all loop devices. By default, a maximum of 5 detector LED indicators will be turned on in an alarm condition. (This number can be changed via the PC-NeT Field Configuration Programming Tool).
[16] The calculated loop loading must be multiplied by a factor of 1.1 to account for the efficiency of the SLC loop DC/DC converters which maintain a constant voltage output on the SLC loops even when the system is on battery back-up.
[17] The AX-ANN is an Axis[AX] networked remote annunciator, number of annunciators is based on network nodes available.
[18] 16 Switch LED Modules can be installed on an AX-CTL system.
[19] Current draws shown for Switch LED Module is for all LEDs active, typical draw is 11mA all LEDs off, 50 mA all LEDs on.
[20] 16 AX-RL4 modules can be installed on an AX –CTL system current draw shown is for all relays active in alarm.
[21] Maximum 0.5A load per AUX. Calculate the required load for each auxiliary output in both the quiescent and alarm conditions. Refer to the technical information for each device that is to be powered from the panel AUX Output to determine the overall AUX loading currents. The sum of all these additional currents should be entered in these fields.
[22] Maximum 2.0A load per notification appliance circuit.
[23] 5 minutes in alarm, change to .166 for 10 minutes in alarm.

6.1.3 AX-CTL Four Loop Battery Calculation

Equipment		I (A)	x	Total	I (A)	x	Total
		Quiescent Load			**Alarm Load**		
AX-CTL (Four Loop)		0.175	1.0	= 0.175	0.260	1.0	= 0.260
Sensor / SLC Current[24]	SLC #1		1.1[25]	=		1.1	=
	SLC #2		1.1[25]	=		1.1	=
	SLC #3		1.1[25]	=		1.1	=
	SLC #4		1.1[25]	=		1.1	=
AX-NET4 or AX-NET7 Network Card		0.062	1.0	=	0.062	1.0	=
AX-ANN-C (D) – Style 4 or 7		0.078	1 to (x)[26]	=	0.140	1 to (x)	=
D9068P		0.109	1.0	=	0.125	1.0	=
AX-RL8		0.000	1.0	=	0.065	1.0	=
Switch LED Module		0.011	1 to 16[27,28]	=	0.060[27,28]	1 to 16	=
AX-RL10		0.000	1.0	=	0.065	1 to 16	=
AX-CTY (no substantial current draw)		0.000	1.0	=	0.000	1.0	=
AX-LAN ipGateway (Style 4)		0.070	1.0	=	0.070	1.0	=
AX-LAN/ST7 ipGateway (Style 7)		0.110	1.0	=	0.110	1.0	=
AX-RL4		0.020	1 to 16[29]	=	0.100[29]	1 to 16	=
AX-CZM		0.120	1.0	=	0.300	1.0	=
AX-012		0.020	1.0	=	0.025	1.0	=
AUX #1 Supply Output[30]			1.0	=		1.0	=
AUX #2 Supply Output[30]			1.0	=		1.0	=
NAC Output 1[31]						1.0	=
NAC Output 2[31]						1.0	=
NAC Output 3[31]						1.0	=
NAC Output 4[31]						1.0	=
Total		**ΣQuiescent Load**	**=**		**ΣAlarm Load**	**=**	
		x 24 hr or 60 hr	**Ah**		**x 0.0833[32] hr**		
		Total Quiescent Current	**Ah**		**Total Alarm Current**		**Ah**
				Total Load (Quiescent + Alarm)			**Ah**
				Total Load x 1.20 (battery de-rating factor)			**Ah**

---

[24] Maximum 0.5A load per SLC. Refer to the technical information for each device to calculate the load on the loop for both the quiescent condition and fire alarm condition for all loop devices. By default, a maximum of 5 detector LED indicators will be turned on in a fire alarm condition. (This number can be changed via the PC Programming Tool).

[25] The calculated loop loading must be multiplied by a factor of 1.1 to account for the efficiency of the SLC loop DC/DC converters which maintain a constant voltage output on the SLC loops even when the system is on battery back-up.

[26] The AX-ANN is an Axis[AX] networked remote annunciator, number of annunciators is based on network nodes available.

[27] 16 Switch LED Modules can be installed on an AX-CTL system.

[28] Current draws shown for Switch LED Module is for all LEDs active, typical draw is 11mA all LEDs off, 50 mA all LEDs on.

[29] 16 AX-RL4 modules can be installed on an AX –CTL system current draw shown is for all relays active in alarm.

[30] Maximum 0.5A load per AUX. Calculate the required load for each auxiliary output in both the quiescent and alarm conditions. Refer to the technical information for each device that is to be powered from the panel AUX Output to determine the overall AUX loading currents. The sum of all these additional currents should be entered in these fields.

[31] Maximum 2.0A load per notification appliance circuit.

[32] 5 minutes in alarm, change to .166 for 10 minutes in alarm.

6.1.4 AV-AMP-80 Battery Calculations

Equipment	Quiescent Load			Alarm Load		
	I (A)	x	Total	I (A)	x	Total
AV-AMP-80	0.035	1.0	= 0.035	0.220	1.0	= 0.220
Amplifier 1[33]					1.0	=
Amplifier 2[33]					1.0	=
Total	ΣQuiescent Load		=	ΣAlarm Load		=
	x 24 hr or 60 hr		Ah	x 0.0833[34] hr		
	Total Quiescent Current		Ah	Total Alarm Current		Ah
	Total Load (Quiescent + Alarm)					Ah
	Total Load x 1.20 (battery de-rating factor)					**Ah**

Converting Watts to Amps:

Utilizing Ohm's Law (Amps = Watts / Volts), convert amplifier wattage to amperes.

        i.e.: maximum load per amplifier 40 Watts

                Amps = 40w / 24vdc

                Amps = 1.66666666 (1.7)

---

[33] Add total speaker circuit load of each amplifier, 40 watts maximum per amplifier.
[34] 5 minutes in alarm, change to .166 for 10 minutes in alarm.

7   Operation

7.1   User Controls and Indications
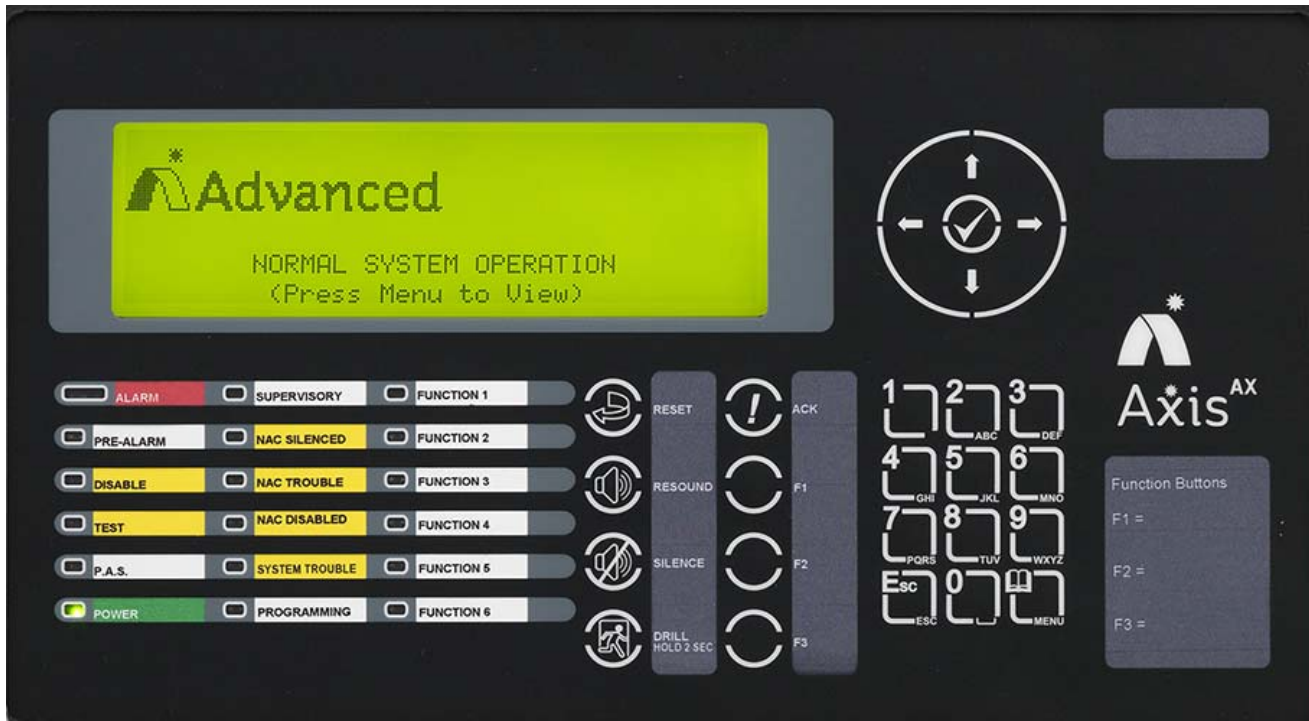
7.1.1   Control Keys

RESET
Press to reset the panel from a latched alarm (or other programmed latched input i.e. latching trouble or supervisory condition) or press to deactivate a Drill condition.

ACKNOWLEDGE
Press to acknowledge an alarm, supervisory and/or trouble condition. LED indications on the panel change from flashing to steady and zone/device display removes the word "New".
Note: All current conditions are simultaneously acknowledged "Global Acknowledgement".

RESOUND ALARMS
Press to reactivate any silenced notification appliances connected to system NAC circuits or any output module of an SLC circuit programmed as "Silenceable".

SILENCE ALARMS
Press to silence active notification appliances connected to system NAC circuits or any output module of an SLC circuit programmed as "Silenceable".

DRILL (HOLD 2 SECONDS)
Press and hold for 2 seconds to activate a Drill condition. All notification appliance circuits programmed to activate on Drill will be activated. Press and hold for 2 seconds to deactivate a drill condition.

FUNCTION KEYS F1, F2, F3
Programmable control buttons.

7.1.2   Navigation Keys
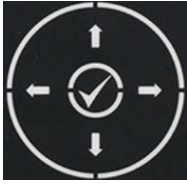
UP, DOWN, LEFT and RIGHT arrow keys are used to scroll through multiple status events, device details, and to navigate through the various displays and menus.

Check Mark (✔) "Enter" key confirms entry of numeric or letter information. In addition, confirms selection of menu options and changes some of the configuration options. It is also utilized to view detailed information regarding events.

7.1.3   Number Keys

NUMBER keys are used during menu operations to enter numbers. During specific programming options these are also used for alphabet entry.

ESC key is used to exit a menu.

MENU key is used anytime to display or return to the menu options.

7.1.4   LED Indications

ALARM	Red	Flashes whenever an alarm condition has occurred. Turns steady when ACK is pressed. (Only turns off when RESET is pressed).
PRE-ALARM	Yellow	Flashes to indicate that a detector has sensed the early signs consistent with an alarm condition. The levels of smoke or heat are not yet confirmed as an alarm. Turns steady when ACK is pressed. The indication automatically turns off when the condition is no longer present or when the levels change from pre-alarm to alarm.
DISABLE	Yellow	Turns on steady whenever a part of the system (zone, output, and/or individual point) has been disabled. Turns off when all disabled conditions have been re-enabled.
TEST	Yellow	Turns on steady whenever a zone(s) or device(s) is in a walk test state. Turns off when the test condition has been cancelled.
P.A.S.	Yellow	Turns on when a POSITIVE ALARM SEQUENCE feature is utilized. Alarm outputs activated from P.A.S. configured devices will be delayed. The delay can be extended for a further period by pressing the ACK button. NFPA maximum delay time periods are Stage 1 time = 15 seconds, Stage 2 time = 180 seconds (programmable).
POWER	Green	On steady when AC Power is available. Flashes when AC Power lost. Off when not powered.
SUPERVISORY	Yellow	Flashes whenever a supervisory condition has occurred. Turns steady when ACK is pressed. The indication automatically turns off (unless a latching Supervisory event) when the condition is no longer present.
NAC SILENCED	Yellow	Turns on steady when the SILENCE key is pressed and silenceable notification appliance circuit outputs are turned off. Turns off when RESOUND or another zone or device enters an alarm condition causing the reactivation of the silenced outputs.
NAC TROUBLE	Yellow	Flashes whenever there is a trouble condition with one or more NAC circuits, including SLC NAC modules (System Trouble LED will also be activated). Turns steady when ACK is pressed. The indication automatically turns off when the trouble condition is no longer present.
NAC DISABLED	Yellow	Turns on steady whenever one or more notification appliance circuits have been disabled, including SLC NAC modules. Turns off when all disabled notification appliance circuits have been re-enabled.
SYSTEM TROUBLE	Yellow	Flashes whenever there is a trouble condition. Turns steady when ACK is pressed. The indication automatically turns off when the condition is no longer present.
PROGRAMMING	Yellow	Turns on steady whenever the panel is in programming mode, System trouble contact will also be activated. Turns off when the panel is returned to normal operation.
FUNCTION 1	Red	Configurable LED. Default is not used.
FUNCTION 2-5	Yellow	Configurable LEDs. Default is not used.

7.2 LCD Indications

```
┌─────────────────────────────────────────────────┐
│  ╱▲                              1:05 PM          │
│ ▟█▙ Advanced                 JUN 29 2014          │
│                                                    │
│                                                    │
│              NORMAL PANEL OPERATION                │
│               (Press Menu to View)                 │
└─────────────────────────────────────────────────┘
```
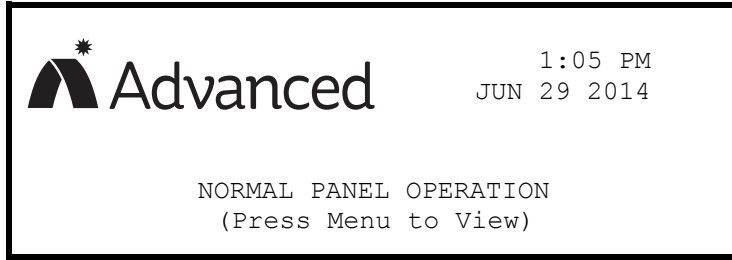
The LCD provides detailed information on the operational status of the panel.
The normal standby state is shown above.

Information is shown on the display in the following priority order:

♦ Fire Alarms[1]
♦ MNS (Mass Notification) [1]
♦ Pre-Alarms[1]
♦ Supervisory Events[2]
♦ Trouble Events[3]
♦ Other Events including Disable, Test and Warning Conditions[4]

Priority order is in accordance with Clause 6.8.4.7
[1] Signals associated with life safety
[2] Signals associated with property protection
[3] Trouble signals associated with life safety and/or property protection
[4] All other signals
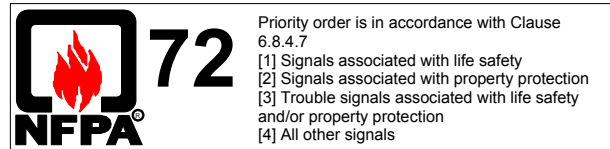
During an alarm condition, pre-alarms, warnings, troubles, and other non-alarm events are suppressed, with the exception of MNS (Mass Notification) and Supervisory, from the graphical LCD display. These events can be viewed at anytime by accessing the navigation keys and the display's menu/view functions.

7.2.1 Fire Alarm Condition

To minimize confusion and only provide pertinent information during emergency situations, the AX-CTL-1L, AX-CTL-2 and AX-CTL-4 intelligent fire alarm control panels when in alarm only display alarm and if applicable mass notification and supervisory events. The display also provides a tally of these three (3) events. All other non-emergency events such as troubles, disabled zones/points, etc. are suppressed. These events however, can be viewed at anytime by accessing the panel menu and selecting the view button.

There are a number of different display messages that are displayed on the AX-DSP alphanumeric graphic display during an alarm, depending upon whether the event is acknowledged or unacknowledged and whether mass notification and/or supervisory events are present.

7.2.1.1 Unacknowledged and Acknowledged Alarms with and without MNS or Supervisory Events

When the system registers an alarm event, the alarm LED will flash, the internal buzzer will sound (continuously), and the display will indicate "NEW ALARM IN ZONE xxxx" (unacknowledged event). In addition, the zone in alarm message (32 characters), the device in alarm message (26 characters) and the type of device for the specific zone/device in alarm will be displayed. The bottom line of the display will be highlighted and will indicate a tally of the number of alarms, mass notification and supervisory events. Also, the notification appliances, relays and other outputs, depending upon programming options selected by the installer will activate.

During an alarm event, the display will only indicate the first alarm and a tally of any additional alarms, mass notification and supervisory events. If multiple alarm, mass notification and supervisory events are present the additional events may be viewed by scrolling (Scroll ↓) through the display. The (Scroll ↓) feature is only active when multiple viewable events are present.

Example of an unacknowledged alarm event:

```
      NEW ALARM IN ZONE 0001          < New unacknowledged alarm message
First Floor                           < Zone alarm text (32 Characters)
Front Lobby Exit        [PULL STATION] < Device text (26 Characters) & type of device


    (Press → for device details)      < Further device details
 ALARMS: 1    MNS: 0    SUPERVISORY: 0 < # Alarms, # MNS and # Supervisory events
```

Example of unacknowledged multiple alarms, MNS and supervisory events:

```
      NEW ALARM IN ZONE 0001  (Scroll ↓) < 1st New alarm message, w/Scroll active
First Floor                           < Zone alarm text (32 Characters)
Front Lobby Exit        [PULL STATION] < Device text (26 Characters) & type of device


    (Press → for device details)      < Further device details
 ALARMS: 2    MNS: 1    SUPERVISORY: 1 < # Alarms, # MNS and # Supervisory events
```

Pressing the "ACK" button will acknowledge the alarm condition(s). This changes the red Alarm LED to steady, the internal buzzer silences, and the display will show "ALARM IN ZONE xxxx" (acknowledged event) with zone/device messages for the specific device in alarm.

Note: The AX-CTL-1L, AX-CTL-2 and AX-CTL-4 intelligent fire alarm control panel acknowledges on a "Global" basis; all active events are acknowledged with the single activation of the acknowledge button.

After acknowledgement the display will indicate the first alarm, and a tally of any additional alarms, mass notification and supervisory events. To view additional alarm, mass notification and supervisory events the user must scroll (Scroll ↓) through the display. Displayed events are based on system priority, and the order in which the panel received the individual event (i.e.: alarms are listed before mass notification and supervisory, and each are labeled; 1st Alarm, 2nd Alarm, 3rd Alarm, 4th Alarm, 1st MNS, 2nd MNS, 1st Supervisory, 2nd Supervisory, etc.).

Note: The (Scroll ↓) feature is only active when multiple viewable events are present. When utilizing the scroll buttons, if the buttons are not activated for approximately 15 seconds, the display will revert back to the 1st Alarm message.

Example of acknowledged single alarm event:

```
      ALARM IN ZONE 0001              < Acknowledged alarm message
First Floor                           < Zone alarm text (32 Characters)
Front Lobby Exit        [PULL STATION] < Device text (26 Characters) / type of device


    (Press → for device details)      < Further device details
 ALARMS: 2    MNS: 1    SUPERVISORY: 1 < # Alarms # MNS and # Supervisory events
```

Example of acknowledged multiple alarm, MNS and supervisory events:

```
     1st ALARM IN ZONE 0001   (Scroll ↓) < 1st alarm message, w/scroll active
First Floor                           < Zone alarm text (32 Characters)
Front Lobby Exit        [PULL STATION] < Device text (26 Characters) / type of device


    (Press → for device details)      < Further device details
 ALARMS: 2    MNS: 1    SUPERVISORY: 1 < # Alarms # MNS and # Supervisory events
```

If a new alarm, mass notification or supervisory event occurs after previously acknowledged alarm, mass notification and/or supervisory events, the alarm, if programmed MNS, or supervisory LED will flash, the internal buzzer will sound (continuously for alarm, or pulsed for mass notification and supervisory), and the alarm, mass notification and/or supervisory tally will increase. The display however will not advance to the new event instead the display will continue showing the 1st Alarm, as this is the highest priority and is required by NFPA 72. The new event may be acknowledged by simply pressing the "ACK" button and may be viewed by utilizing the scroll (Scroll ↓) button.

Note: If a supervisory event occurs without an alarm or mass notification event refer to Section 7.2.2 Non-Alarm Conditions.

7.2.1.2   Alarm Condition - Silence, Resound and Reset
Pressing the "SILENCE" button will silence the notification appliance circuits programmed as silenceable (default setting all NAC circuits, including NAC outputs located on SLC circuits).

Pressing the "RESOUND" button after the activation of the "SILENCE" button will reactivate the previously silenced notification appliance circuits.

Pressing the "RESET" button will clear the alarm condition or any active programmed latching mass notification supervisory or trouble condition thereby restoring the panel to normal operation.

7.2.2   Non-Alarm, Non-MNS Conditions

7.2.2.1   Unacknowledged and Acknowledged Non-Alarm, Non-MNS Events
When the system registers a non-alarm or non-MNS event (pre-alarm, warning, supervisory, and/or trouble condition), the event LED will flash, the internal buzzer will sound (pulsing), and the display will indicate "NEW xxxxxx (event type), ZONE xxxx" (unacknowledged assigned zone number), the zone event message (32 characters), the device event message (26 characters) and the type of device for the specific event. The bottom line of the display will be highlighted and will indicate a tally of the number of events active (Warnings, Supervisory, Disables and Troubles), prior to the event being acknowledged.

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Priority order is in accordance with Clause 6.8.4.7
[1] Signals associated with life safety
[2] Signals associated with property protection
[3] Trouble signals associated with life safety and/or property protection
[4] All other signals
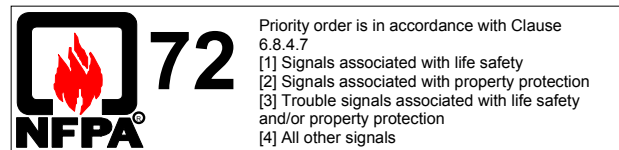
Example of an unacknowledged pre-alarm event:

```
   NEW PRE_ALARM        ZONE 0005
First Floor
Electrical Closet Rm 101   [MULTI.SENSOR]


     (Press →  for device details)
 WRNs: 0  SUPRVs: 0  DISBLs: 0  TRBLs: 0
```

< New pre-alarm message (unacknowledged)

< Zone pre-alarm text (32 Characters)
< Device text (26 Characters) / type of device

< Further device details
< # Warnings, Supervisory, Disables and Troubles

Example of an unacknowledged warning event (system drill):

```
    NEW WARNING    ZONE 0701
Fire Alarm Control Panel
Drill Switch              [SWITCH      ]


     (Press →  for device details)
 WRNs: 1  SUPRVs: 0  DISBLs: 0  TRBLs: 0
```

< New warning message (unacknowledged)

< Zone warning text (32 Characters)
< Device text (26 Characters) / type of device

< Further device details
< # Warnings, Supervisory, Disables and Troubles

Example of an unacknowledged supervisory event, when no alarms or mass notification events are present (refer to Fire Alarm Condition, for displaying supervisory events with alarms or mass notification events present on the system):

```
  NEW SUPERVISORY      ZONE 0020          < New supervisory message (unacknowledged)
Electrical Room                           < Zone supervisory text (32 Characters)
Sprinkler System Riser     [SWITCH(MON.)] < Device text (26 Characters) / type of device


    (Press  →  for device details)       < Further device details
 WRNs: 0  SUPRVs: 1  DISBLs: 0  TRBLs: 0  < # Warnings, Supervisory, Disables and
                                            Troubles
```

Example of an unacknowledged trouble event:

```
      NEW TROUBLE    ZONE 0010            < New trouble message (unacknowledged)
First Floor West Wing                     < Zone trouble text (32 Characters)
Conference Room            [PHOTO SMOKE ] < Device text (26 Characters) / type of device

DEVICE MISSING                            < Type of Trouble
    (Press  →  for device details)        < Further device details
 WRNs: 0  SUPRVs: 0  DISBLs: 0  TRBLs: 1  < # Warnings, Supervisory, Disables and
                                            Troubles
```

Example of multiple unacknowledged events:

```
  NEW SUPERVISORY     ZONE 0020 (Scroll ↓) < New supervisory message, w/scroll active
Electrical Room                           < Zone supervisory text (32 Characters)
Sprinkler System Riser     [SWITCH(MON.)] < Device text (26 Characters) / type of device


    (Press  →  for device details)        < Further device details
 WRNs: 0  SUPRVs: 1  DISBLs: 0   TRBLs: 2 < # Warnings, Supervisory, Disables and
                                            Troubles
```

During unacknowledged, non-alarm and non-MNS events, the display only indicates the highest priority event and a tally of any additional events. The additional events may be viewed by scrolling (Scroll ↓) through the display. The scroll (Scroll ↓) feature is only active when multiple unacknowledged viewable events are present.

Pressing the "ACK" button will acknowledge the event condition(s). This changes the event LED (pre-alarm, supervisory, disable, system trouble) to steady, the internal buzzer will silence, and the display will show "Off-Normal State: Total". Off-normal state totals are listed in order of system priority; Pre-Alarms, Warnings, Supervisory, Troubles and Disabled. Off-normal state totals are only displayed if an active event within that priority is present on the system.

Note: The AX-CTL-1L, AX-CTL-2 and AX-CTL-4 intelligent fire alarm control panel acknowledges on a "Global" basis; all events are acknowledged with the single activation of the acknowledge button.

Example of acknowledged non-alarm events (no pre-alarm events present on the system):

```
  [Off-Normal State  : Total] (Scroll ↓) < Off-Normal line, w/scroll
                                            (Scroll shown only with multiple events)

           WARNINGS    : 1
           SUPERVISORY : 1                < Off-Normal type and event total
           TROUBLES    : 2                  Only active off-normal events are displayed
           DISABLED    : 4                  (i.e.: Pre-Alarms not displayed)
      (Press  ✔  to select)               < More info pertaining to highlighted event
```

7.2.2.2   Disabled Condition

If any zones, input devices or output devices have been disabled, the DISABLE LED and if programmed via the PC-NeT the TROUBLE LED will illuminate. In addition, the NAC DISABLE LED will illuminate if one or more notification appliance circuits or NAC SLC devices have been disabled. The display will indicate "NEW DISABLED ZONE xxxx" and the zone and device messages will be displayed. In addition, the lower half of the display will indicate the quantity of disabled devices (i.e. DISBLs: x"). To view all disabled devices simply scroll through the list utilizing the navigation down arrow button.

Unacknowledged Zone Disablement with Multiple Devices:

```
     NEW DISABLED   ZONE 0001 (Scroll ↓)
FIRST FLOOR
MAIN LOBBY EXIT              [PULL STATION]

     (Press →  for device details)
 WRNs: 0   SUPRVs: 0 DISBLs: 3   TRBLs: 0
```
< New unacknowledged Disabled message
< Disabled zone text(32 Characters)
< Disabled device text (26 Characters) / type of device
< Further device details
< # Warnings, Supervisory, Disables and Troubles

Unacknowledged Device Disablement:

```
      NEW DISABLED    ZONE 0001
FIRST FLOOR
MAIN LOBBY EXIT              [PULL STATION]

     (Press →  for device details)
 WRNs: 0   SUPRVs: 0 DISBLs: 1   TRBLs: 0
```
< New unacknowledged Disabled message
< Disabled zone text(32 Characters)
< Disabled device text (26 Characters) / type of device
< Further device details
< # Warnings, Supervisory, Disables and Troubles

Acknowledged Disablements:

```
[Off-Normal State    : Total]

          DISABLED     :  3


        (Press ✔ to select)
```
< Off-Normal line

< Off-Normal type and event total
Only active off-normal events are displayed

< More info pertaining to highlighted event

When the disabled conditions are removed the appropriate indications are cleared. When all disabled conditions are removed, the DISABLE Indicator is also turned off and the display will revert to Normal System, if no other off normal condition is present on the system.

To obtain detailed information about the disabled device, press the right arrow (➜) button on the keypad navigation

```
     NEW DISABLED   ZONE 0001 (Scroll ↓)
FIRST FLOOR
MAIN LOBBY EXIT              [PULL STATION]
               NODE 1
JAN 30 2014  11:00 AM   SLC 1 Adr 001.0
 WRNs: 0   SUPRVs: 0 DISBLs: 3   TRBLs: 0
```
< New unacknowledged Disabled message
< Disabled zone text(32 Characters)
< Disabled device text (26 Characters) / type of device
< Node # of device location
< Disabled device details
< # Warnings, Supervisory, Disables and Troubles

7.3 Obtaining Detailed Device Information During Events

When any event message display indicates `(Press → for device details)`, pressing the right arrow (➜) button on the keypad navigation keys will allow the user to view further detailed information about the event/device.

Example of an event message display prior to device details lookup:

```
          ALARM IN ZONE 0001         < Alarm message
First Floor                          < Zone alarm text (32 Characters)
Front Lobby Exit        [PULL STATION]  < Device text (26 Characters) / type of device


    (Press →  for device details)    < Further device details
 ALARMS: 2     MNS: 0    SUPERVISORY: 0  < # Alarms $ MNS and # Supervisory events
```

Example of a device details display:

```
          ALARM IN ZONE 0001         < Alarm message
First Floor                          < Zone alarm text (32 Characters)
Front Lobby Exit        [PULL STATION]  < Device text (26 Characters) / type of device

             NODE 1                  < Node # of device location
JAN 30 2014   9:42 AM   SLC 1  Adr 001.0  < Alarm device details
 ALARMS: 2     MNS: 1    SUPERVISORY: 1  < # Alarms # MNS and # Supervisory events
```

The above device details display indicates that Node 1, SLC loop 1, device address 001.0 alarmed on Jan. 30, 2014 at 9:42 AM. After approximately 15 seconds this display will revert back to the original alarm display.

When the "Off-Normal State: Total" display indicates `(Press ✔ to select)`, pressing the check mark (✔) button on the keypad navigation keys, will allow the user to view further detailed information about the specific off-normal event highlighted. Pressing the down arrow (↓) button on the keypad navigation keys, will allow the user to scroll (Scroll ↓) to other off-normal event types and obtain further detailed information pertaining to its events by pressing the check mark (✔) button, on the keypad navigation keys.

Example of "Off-Normal State: Total" display prior to selecting event detail information:

```
  [Off-Normal State   : Total] (Scroll ↓)  < Off-Normal line, w/scroll


          SUPERVISORY : 1          < Off-Normal event type and total events
          TROUBLES    : 2           (Only active off-normal events are displayed)

     (Press ✔  to select)          < Detailed info pertaining to the highlighted
                                      event
```

Example of detailed information pertaining to a specific off-normal event:

```
    SUPERVISORY     ZONE 0001        < Supervisory message
Electrical Room                      < Zone supervisory text (32 Characters)
Sprinkler System Riser    [SWITCH(MON.)]  < Device text (26 Characters) / type of device


    (Press →  for device details)    < Further device details
```

If the display indicates `(Press → for device details)`, pressing the right arrow (➜) button on the keypad navigation keys, will allow the user to view further device details about the event/device.

Example of a device detailed display pertaining to a specific off-normal event:

```
     SUPERVISORY     ZONE 0001        < Supervisory message
Electrical Room                       < Zone supervisory text (32 Characters)
Sprinkler System Riser    [SWITCH(MON.)]  < Device text (26 Characters) / type of device

              NODE 1                  < Node # of device location
JAN 30 2014   10:20 AM   SLC 1  Adr 005.0  < Supervisory device details
```

7.4 Performing a Fire Drill

Pressing and holding the "Drill" button for 2 seconds will activate a fire drill. The internal buzzer will sound (pulsing), and the display will indicate "NEW WARNING ZONE 0701" (unacknowledged event) and the zone/device messages programmed by the installer for the drill button event (0701 is the zone allocated to the AX-CTL base card). The bottom line of the display will be highlighted and will indicate a tally of the number of events active (Warnings, Supervisory, Disabled and Troubles) prior to the event being acknowledged. In most cases, no other events will be present on the system so the bottom highlighted display will only indicate one warning.

Example of unacknowledged fire drill (warning) event:

```
     NEW WARNING    ZONE 0701         < New warning message (unacknowledged)
Fire Alarm Control Panel              < Zone text (32 Characters)
Drill Switch             [SWITCH    ]  < Device text (26 Characters) / type of device


    (Press →  for device details)     < Further device details
 WRNs: 1  SUPRVs: 0  DISBLs: 0  TRBLs: 0  < # Warnings, Supervisory, Disables and
                                        Troubles
```

By pressing the right arrow (➜) button on the keypad navigation keys, the user can view further detailed information about the drill activation.

Example of device detailed display pertaining to a specific off-normal event:

```
     NEW WARNING    ZONE 0701         < New warning message (unacknowledged)
Fire Alarm Control Panel              < Zone text (32 Characters)
Drill Switch             [SWITCH    ]  < Device text (26 Characters) / type of device

              NODE 1                  < Node # of drill location
JAN 30 2014   11:00 AM                < drill details
 WRNs: 1  SUPRVs: 0  DISBLs: 0  TRBLs: 0  < # Warnings, Supervisory, Disables and
                                        Troubles
```

Note: If drill function was activated from an addressable device at a remote location rather than from the drill button on the front of the fire alarm control panel, the SLC loop number and device address would be displayed in the drill details area.

Pressing the "ACK" button while in a fire drill, will acknowledge the drill event. This silences the internal buzzer and the display will show "Off-Normal State: Total". Off-normal state totals are listed in order of system priority; Pre-Alarms, Warnings, Supervisory, Troubles and Disabled.

Example of acknowledged fire drill (warning) event:

```
  [Off-Normal State  : Total]         < Off-Normal line


        WARNINGS    : 1               < Off-Normal type and event total
                                        Only active off-normal events are displayed

     (Press ✔ to select)             < More info pertaining to highlighted event
```

Pressing the check mark (✔) button, on the keypad navigation keys will allow the user to view further detailed information about the Warnings event.

Example of device detailed information pertaining to the Warning event:

```
            WARNING    ZONE 0701         < Warning message
Fire Alarm Control Panel                 < Zone text (32 Characters)
Drill Switch              [SWITCH     ]  < Device text (26 Characters) / type of device


     (Press →  for device details)       < Further device details
```

Example of further device details display:

```
            WARNING    ZONE 0701         < Warning message
Fire Alarm Control Panel                 < Zone text (32 Characters)
Drill Switch              [SWITCH     ]  < Device text (26 Characters) / type of device
                  NODE 1                 < Node # of drill location
JAN 30 2014   11:00 AM                   < Event details
```

7.5 Positive Alarm Sequence

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6.8.1.3 Positive Alarm Sequence shall be permitted if approved by the Authority Having Jurisdiction:
[1] Acknowledgement period = 15 seconds
[2] Investigation period = 180 seconds

If the Positive Alarm Sequence (P.A.S.) option is programmed and enabled, an alarm condition originating from a configured P.A.S. device is registered at the panel but will not immediately activate the notification appliances.

Note: The Positive Alarm Sequence feature must be enabled using the User Menu options. It can also be disabled (bypassed) by using the User Menu options.

Positive Alarm Sequence (P.A.S) is a "False Alarm Management" programmable feature of all Axis^{AX} fire alarm control panels. When the Axis^{AX} fire alarm control panel registers a P.A.S. (Positive Alarm Sequence) alarm, the alarm LED will flash, the internal buzzer will sound (continuously), the display will indicate "NEW ALARM IN ZONE xxxx" (unacknowledged event), the zone message (32 characters), the device message (26 characters) and the type of device for the specific active device. At the same time, any outputs programmed to activate on an initial P.A.S. alarm will activate.

In addition to the above displayed P.A.S. alarm information, the display will show an output delay Stage 1 – time period (Acknowledgement Period) for P.A.S. alarm acknowledgement. The bottom of the display will be highlighted indicating a tally of all alarms, MNS and supervisory events presently active on the system.

Example of an unacknowledged P.A.S. alarm:

```
     NEW ALARM IN ZONE 0001            < New unacknowledged P.A.S alarm message
First Floor                            < Zone P.A.S. alarm text(32 Characters)
Conference Room 100       [PHOTO SMOKE ] < Device text (26 Characters) / type of device


    OUTPUT DELAY  14 s    (ACK to extend) < Output delay Stage 1 - time to "ACK"
 ALARMS: 2     MNS: 0     SUPERVISORY: 0  < # Alarms # MNS and # Supervisory events
```

If the alarm is not acknowledged before the output delay Stage 1 – time period expires; the system will enter a full alarm condition and will activate all notification appliance circuits, relays, and other outputs programmed by the installer.

Pressing the "ACK" button within the allotted output delay Stage 1 - time period will acknowledge the P.A.S. alarm, reset the output delay to a Stage 2 - time period (Investigation Period), change the red Alarm LED to steady, silence the internal buzzer, and display "ALARM IN ZONE xxxx" (acknowledged event) with the zone/device messages.

Example of an acknowledged P.A.S. alarm:

```
         ALARM IN ZONE 0001
First Floor
Conference Room 100      [PHOTO SMOKE ]


    OUTPUT DELAY  140s
 ALARMS: 2     MNS: 0     SUPERVISORY: 0
```

< Acknowledged P.A.S. alarm message

< Zone P.A.S. alarm text(32 Characters)
< Device text (26 Characters) / type of device

< Output delay Stage 2 - time period
< # Alarms # MNS and # Supervisory events

The cause of the alarm can now be investigated. If the alarm is a false alarm and there is no longer smoke in the detector chamber, pressing the "RESET" button on the panel will clear the alarm condition. This must be done before the investigation time period expires or the panel will enter a full alarm condition and will activate all notification appliance circuits, relays, and other outputs programmed by the installer.

Note: If an additional alarm occurs on the system during a P.A.S. alarm cycle, the P.A.S. output delay time periods will terminated and a full alarm condition will be generated activating all notification appliance circuits, relays, and other outputs programmed by the installer. In addition, activating a manual pull station at anytime during the P.A.S. output delay time periods will terminate the P.A.S. process and activate all programmed outputs.

During an alarm (including P.A.S event), mass notification and/or supervisory condition all other events are suppressed from the display. Suppressed events during this situation can be interrogated through the display's menu functions.

7.6 Alarm Verification

6.8.5.4.1 Alarm Verification
[1] Applies to smoke detectors only. Configuration must be password protected.
[2] It must not delay the actuation of alarms more than 60 seconds.
[3] Alarms from other devices must actuate alarms without delay.

Alarm Verification provides a mechanism to delay an alarm from a smoke detector due to transitory events. It should not, however, be used as a substitute for proper detector location / application or regular system maintenance.

Alarm Verification is a "False Alarm Management" programmable feature of all Axis^{AX} fire alarm control panels. The alarm verification feature operates on a system or device basis (determined by programming) and is applicable to smoke detectors only. Manual pull stations are not verifiable.

ALARM VERIFICATION TIMING DIAGRAM

ALARM VERIFICATION PERIOD

| RETARD-RESET-RESTART PERIOD – MAXIMUM 60 SECONDS | CONFIRMATION PERIOD – 60 SECONDS | OPTIONAL |
| NO ALARM AT CONTROL UNIT | ALARM REQUIRED AT CONTROL UNIT | REGION |

CONTROL UNIT   DETECTOR RESTART
RETARD-RESET PERIOD   (POWER-UP) PERIOD

A   B   C   D   E
t=0 Seconds   t=n Seconds

If the smoke concentration level of a detector is at or above the alarm threshold at the end of the retard-reset-restart period the panel will enter a full alarm condition.

Maximum retard-reset-restart period is 30 seconds.

Alarm verification shall not be used with multiple detector or cross-zone applications.

If the smoke concentration level is below the alarm threshold at the end of the retard-reset-restart period the panel will enter a 60 second confirmation period. If this or any other detector enters an alarm condition during the confirmation period, the panel will enter a full alarm condition.

7.7 Multiple Detector Operation

6.8.5.4.3 Multiple Detector Operation shall be permitted provided the following are met:
[1] The system is not prohibited by the Authority Having Jursidiction.
[2] At least two automatic detectors are in each protected space.
[3] The Alarm Verification feature is not used.

Notification and other output signal circuits may be configured to only activate when two or more automatic devices within a detection zone enter an alarm condition.

At least two automatic devices shall be placed in the protected space. The spacing shall be as per NFPA 72 and shall be no more than 0.7 times the linear spacing for public mode notification uses.

Note: Smoke detectors employed in multiple detector operation must not be configured for Alarm Verification.

7.8   USER Menu Functions

The following table gives a list of the USER Menu Functions, the sub-functions available within each main function and a brief description for each function.

Main Menu Option	Sub Menus	Comments
VIEW	Alarms	View Zones and Inputs that are reporting an alarm condition.
	Off-Normal	View Zones, Inputs and Outputs that are reporting an off-normal condition. (Alarms, Supervisory, Trouble, Disabled, Pre-Alarm, Warning, Problems and MNS-Alarm)
	Network	View Network diagnostics
	Inputs	View the current state of Inputs (by zone/point).
	Outputs	View the current operational condition of all Output circuits (by zone/point).
	Log	View the Event Log and Alarm Counter
	Panel	View Local-Hardware, Software and Network-Hardware. Local-Hardware - view operational state, voltage and current loading of the panel input and output circuits. Software – view software revisions for Panel, Display, SLC, Network, PSU and Peripherals. Network-Hardware – view network node voltage and current loading of the network node panel input and output circuits.
DISABLE	Zone / Inputs [35]	Disable a complete zone or an individual input device.
	Outputs [35]	Disable NAC outputs or other output devices.
	Groups[35]	Group Disable – Disable a programmed group of inputs / outputs
	Controls [36]	Cancel Level 2 panel access.
	User ID[35]	Return Level 2 access to the default User 1
ENABLE	Zone / Inputs[35]	Enable a complete zone or an individual input device.
	Outputs[35]	Enable NAC outputs or other output devices.
	Groups[35]	Group Enable – Re-enable a group of inputs / outputs
	Remote[35]	Grant remote access for terminal mode or ipGateway
TEST	Zones[35]	Configure one or more zones for walk test.
	Display	Test the Display, Status Indicators (including Switch LED Module LEDs) and Keyboard.
	Buzzer	Test the Internal Buzzer
	Printer	Test the connection to the Printer
	Outputs	Test Outputs in the system
	Audio[35]	Test Audio area amplifier (s) with massage type (1 – 16 messages within amplifier [s])
P.A.S	Enabled	Enable P.A.S. operation
	Disabled	Disable P.A.S. operation
TOOLS	Program	Enter the Level 3 Commissioning and Panel Programming Functions (factory default Level 3 programming code 7654)
	Print	Setup printer and print inputs, outputs, troubles, disabled, log
	Change Time	Change time and date of the system
STATUS	---	Return to the Normal Operating Display immediately

---

[35] This option can be configured per User ID. User 1 does not have permission to change these options.
[36] Not required if a key switch is fitted to change access levels.

7.8.1 View Menu

MAIN MENU

```
[View Menu]              User 1 Node  1


  ALARMS    OFF-NORMAL    NETWORK
  INPUTS    OUTPUTS       LOG      PANEL


```

OFF-NORMAL SUB-MENU

```
[Off-Normal Menu]        User 1 Node  1

  ALARMS      SUPERVISORY    TROUBLE
  DISABLED    PRE-ALARM      WARNING
  PROBLEMS    MNS-ALARM

```

Note: Alarm, MNS-Alarm and other Off-Normal conditions (Supervisory, Trouble, Pre-Alarm, Disabled and Warning), with the exception of Problems, are all normally shown without having to select the view menu. If however, you wish to manually view any of these, they can be selected from this menu as required. Problems are specifically associated with device dirty (detectors) when utilizing the Advanced' enhanced calibration capabilities, these pre-dirty detector conditions can be view via the off-normal area, in addition to being transmitted via email from an optional AX-LAN (ipGateway).

7.8.1.1 View - Network

This Option can be used to obtain "real time" diagnostic information when a network is used to connect other panels or remote annunciators. The access level of all panels on the network can be checked from any display. Access level determines what user functions can be performed from the specific display. Below is an example of View-Network:

```
[NETWORK – Press 0 to Clear]      More>
Node Status
  1   LOCAL
  2   AccLev 2
  3   AccLev 1
  4    -
```

Additional network diagnostics (i.e.: node answer-backs, packet evaluation, etc.) are available by selecting the "More>" option.

View-Network:

```
[NETWORK – Press 0 to Clear]
Data Packets :      xxxxx
Bad Packets  :          0
Comms lost   :          0

Next Node at :          x
```

Pressing "0" allows the stored network status information to be cleared.

7.8.1.2   View Inputs

This function shows the current operational state and condition for all zones and individual inputs (including zones/points of other network nodes). The display presents a list of all of the zones containing input devices, with the first zone highlighted. For example:

```
[Inputs]                        More>
Zone Mode          Location
0001 Enabled        BASEMENT WEST
0002 ALL DISABLED   BASEMENT EAST
0008 Enabled        GROUND FLOOR
0009 Enabled        MAIN RECEPTION AREA
```

Press the ⬆⬇ buttons to highlight the required zone and then press the ➜ button to view the full location text.

Press the ➜ button again to view additional information and the inputs within the zone and their status. For example ➜ button pressed 6 times:

```
[     Inputs in Zone  0008]      <More
Mode     Lp Adrs    Sector   Node
Enabled   1 001.0     1        1
Disabled  1 002.0     1        1
Enabled   1 003.0     1        1
Enabled   1 004.0     1        1
```

The display shows the current disabled condition (mode) for each input, as either enabled or disabled. In addition, the SLC loop (Lp), address (Adrs), sector and node number.

Press the ⬆⬇ buttons to scroll through the inputs.

Pressing the ➜ button will show further information on device location, type, analog/digital values, etc.

Press the "Esc" button to return to previous view.

7.8.1.3   View Outputs

This function shows the current operational condition for all outputs (including outputs of other network nodes).

```
 [Outputs]                       More>
Zone     Mode      Location
0008     ENABLED   GROUND FLOOR
0100     ENABLED   MAIN RECEPTION
```

Press the ⬆⬇ buttons to highlight the required zone.

Press the ➜ button again to view additional information and the outputs within the zone and their status. For example ➜ button pressed 6 times:

```
 [     Outputs In Zone 0008]     <More
Mode     Lp Adrs    Sector    Node
Enabled  1 032.0     1         1
Enabled  1 056.0     1         1
Enabled  2 011.2     1         1
Enabled  3 026.2     1         1
```

Note: A * symbol preceding the state (e.g. *On) indicates the device has been configured as an inverted output (i.e. a trouble relay that is designed to de-energize when a trouble occurs).

7.8.1.4   View Log

After selecting to view the log option, the display presents a pop-up window to allow selection between; view all of the event history, view only the alarms events that have occurred, or view the alarm counter.

```
     ALL EVENTS
 ALARM EVENTS ONLY
 ALARM COUNTER
```

Press the ⬆⬇ buttons to highlight the required menu option and then press the ✔ button to select it. The display then shows the appropriate list of events.

Note: While viewing the log, if a printer is connected to the RS232 port, the log will be sent to the printer.

7.8.1.4.1 Event Log

The display will always show the most recent event to have occurred, i.e.

```
[View Alarm Events]        Entry 0076    < View Mode "All or Alarm" and Number of Event
Time/Date  Node Lp:Addr    Zone
10:54:23     1   1:001.0    0001          < Time, Node #, Device Address and Zone
03/14/14   ALARM                          < Date, Event
BASEMENT                        64        < Zone Text Description and Analog Value
ROOM 10                  PHOTO SMOKE      < Device Text Description and Device Type
```

In the above example, the latest alarm occurred (Event No. 76) at 10:54 am on March 14, 2014. This alarm was located at device address 001 (Addr) on Loop 1 (Lp) on Panel No. 1 (Node). The device was in Zone 0001. The analog value registered by the device (64) has also been recorded. The lower two lines show the zone description, device text description and device type for ease of identification.

Press the ⬆⬇ buttons to scroll through the events logged in the system. Press the ⬆ button to show more recent events and press the ⬇ button to show earlier events.

To view the details for a specific Log Entry Number, it is possible to select the record by typing in the required number using the number keys.

Press the ✔ button to confirm. The display will then display the required record.

Press the "Esc" button to return to the main view menu.

7.8.1.4.2 Alarm Counter

The panel records the number of times that an alarm condition has occurred at the panel since installation or last event log erase.

```
 ALARM COUNTER

     0000000033


```
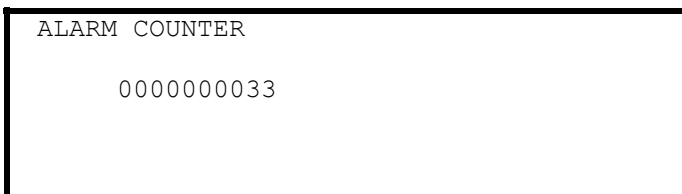
In the above example, the panel has entered an alarm condition 33 times since it was installed or since last log erase.

The panel increments the count by one each time it changes from the normal condition to indicate an alarm condition. While in the alarm condition, and until the panel is reset, further alarm events do not increment the counter.

Press the "Esc" button to return to the main view menu.

7.8.1.5   View Panel

The View Panel Option provides viewing of panel information regarding Local-Hardware, Software and Network-Hardware.

```
[Panel Information]        User 2 Node 1


    LOCAL-HARDWARE        SOFTWARE
    NETWORK-HARDWARE
```

7.8.1.5.1 Local-Hardware Viewing
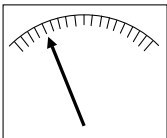
The View Hardware provides diagnostic meter readout of the operational condition and readings for the internal panel electronic circuits. When the option is selected, the display shows a list of the circuits. For example:

(Refer to Section 10.1.1)

```
[Panel Circuits]
ITEM DESCRIPTION    VALUE  STATE
01.0 NAC-1 A        5.6V   Normal
01.1 NAC-2 A        5.6V   Normal
01.2 NAC-3 A        5.6V   Normal
01.3 NAC-4 A        5.6V   Normal
```

Press the ⬆⬇ buttons to scroll through the panel internal circuits. Press the "Esc" button to return to the main view menu.

7.8.1.5.2 Software Viewing

The View Software provides software revisions viewing for the following circuits:

```
[Software]                User 2 Node 1

    PANEL       DISPLAY      LOOP CARDS
    NETWORK     PSU          PERIPHERAL
```

7.8.1.5.3 Network-Hardware Viewing

The View Network-Hardware provides information and diagnostic meter readouts for each additional networked panel. When the option is selected, the display shows a list of viewable network nodes:

```
[Hardware]                      More>
Zone   Location
0701   FACP Electrical Closet
0702   Remote FACP 2nd Floor
```
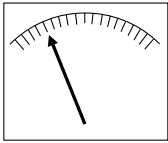
By pressing the more ➜ button operational information and diagnostic meter readouts for each available network panel electronic circuits can be viewed:

(Refer to Section 10.1.1)

```
  [Hardware in Zone 0701]          More>
Device Text        Value
NAC-1 A Volts        5.6V
NAC-2 A Volts        5.6V
NAC-3 A Volts        5.6V
NAC-4 A Volts        5.6V
```

Press the ⬆⬇ buttons to scroll through the network panel internal circuits. Press the "Esc" button to return to the network-hardware viewing menu.

7.8.2 Disable Menu

When selecting the Disable Menu, the display shows five possible options. For example:

```
[Disable]              User 1 Node  1

   ZONE/INPUTS    OUTPUTS    GROUPS
   CONTROLS       USER-ID

```

Press the ⬅➜ buttons to highlight the required menu option and then press the ✔ button to select it.

7.8.2.1 Disable - Zones and Inputs

This option provides the means to disable an entire zone, all inputs, selected inputs, only automatic detectors, only manual devices or all other devices.

If the current User ID (access level password) does not have the required authority, the display prompts for entry of an authorized password to guard against inadvertent disablements.

When selecting this option, the display shows a list of the current zones and their current disable status. For example:

```
[ 0 ZONE(s) with INPUTS DISABLED]  More>
Zone    Mode        Location
0001    Enabled     BASEMENT WEST
0002    Enabled     BASEMENT EAST
0008    Enabled     GROUND FLOOR
0009    Enabled     MAIN RECEPTION AREA
```

Press the ⬆⬇ buttons to scroll through the available zones or key in a specific zone number.

To disable the entire zone move over to the Mode column and highlight the existing mode. Press the ✔ button and a pop-up window appears showing the three possible options:

```
 ALL INPUTS
 SELECTED INPUTS
 ONLY AUTOMATIC DETECTORS
 ONLY MANUAL DEVICES       ↓
```

Press the ⬆⬇ buttons to scroll through and highlight the required option and then press the ✔ button to select it.

If ALL INPUTS is chosen, the Zone Mode status will change from "Enabled" to "ALL DISABLED".

If SELECTED INPUTS is chosen, the pop-up window disappears and a list of the input devices within the selected zone is presented. For example:

```
[  Inputs in Zone 0001]           More>
Mode       Device Text
Enabled    BASEMENT WEST
Disabled   BASEMENT EAST
Enabled    GROUND FLOOR
Enabled    MAIN RECEPTION AREA
```

Press the ➜ button for more information on the inputs, including loop number, address, device type, analog value, etc.

Press the ⬆⬇ buttons to scroll through and highlight the required input and then press the ✔ button to disable it.

Pressing the ✔ button when the input is already disabled will enable the input.

Press the "Esc" button to return.

If ONLY AUTOMATIC DETECTORS is chosen, the pop-up window disappears and all detectors within the zone will be disabled and the Zone Mode status will change from "Enabled" to "PART DISABLED".

If ONLY MANUAL DEVICES chosen, the pop-up window disappears and all manual pull stations within the zone will be disabled and the Zone Mode status will change from "Enabled" to "PART DISABLED". If there are no pull stations within the zone nothing will be disabled.

If ALL OTHER DEVICES chosen, the pop-up window disappears and all none alarm, none mass notification, none supervisory points (including firefighter phones) within the zone will be disabled and the Zone Mode status will change from "Enabled" to "PART DISABLED".

7.8.2.2   Disable - Outputs
The Disable Outputs Option allows for the isolation of some or all of the outputs. If disabled, the outputs will not activate in the event of an alarm or other programmed event.

If the current User ID (access level password) does not have the required authority, the display prompts for entry of an authorized password to guard against inadvertent changes.

Once a valid access password has been entered, a pop-up window is shown on the display to select the type of outputs to disable. Scroll down to view / select the available options.

```
 ALL OUTPUTS
 NACS
 RELAYS
 ONLY SELECTED OUTPUTS
```

Note: "Strobes" can be added to the disable outputs pop-up window via the PC-NeT field configuration programming tool, under "Disable Outputs Menu Options".

7.8.2.2.1 All Outputs

On access to the "Disable – Outputs" menu the "ALL OUTPUTS" will be highlighted and then pressing the ✔ button will disable all outputs. The display automatically reverts to the Main Disable Menu and the 'NAC Disabled' LED will illuminate, indicating NACs disabled.

```
 ALL OUTPUTS
 NACS
 RELAYS
 ONLY SELECTED OUTPUTS
```

Note: On networked systems this only disables the outputs connected to this panel. In addition, it will disable all NAC type outputs.

7.8.2.2.2 NAC Outputs

Press the ⬆⬇ buttons to scroll through and highlight the "NACS" option and then press the ✔ button to disable them. The display automatically reverts to the Main Disable Menu and the 'NAC Disabled' LED will illuminate, indicating NACs disabled.

```
 ALL OUTPUTS
 NACS
 RELAYS
 ONLY SELECTED OUTPUTS
```
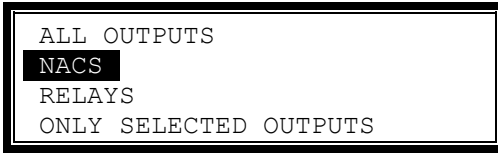
Note: On networked systems this only disables NACs connected to this panel.

7.8.2.2.3 Relay Outputs

Press the ⬆⬇ buttons to scroll through and highlight the "RELAYS" option and then press the ✔ button to disable them. The display automatically reverts to the Main Disable Menu.

```
 ALL OUTPUTS
 NACS
 RELAYS
 ONLY SELECTED OUTPUTS
```
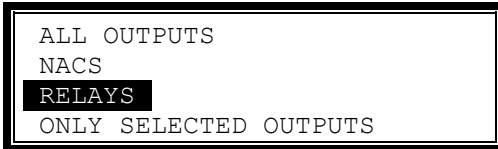
Note: On networked systems this only disables relays connected to this panel.

7.8.2.2.4 Only Selected Outputs

Press the ⬆⬇ buttons to scroll through and highlight the "ONLY SELECTED OUTPUTS" option and then press the ✔ button to select it.

```
 ALL NACS
 NACS
 RELAYS
 ONLY SELECTED OUTPUTS
```

The display then shows a list of Zones containing outputs. For example:
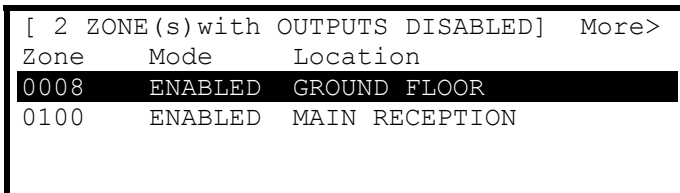
```
[ 2 ZONE(s)with OUTPUTS DISABLED]  More>
Zone     Mode     Location
0008     ENABLED  GROUND FLOOR
0100     ENABLED  MAIN RECEPTION
```

Press the ⬆⬇ buttons to scroll through and highlight the required Zone and then press the ➜ button to view the outputs within this zone. For example:

```
[ Outputs In Zone 0008]          More>
Mode     Device Text
Enabled  I/O Relay Output
Enabled  HVAC RELAY
Enabled  NAC MODULE
Enabled  RELAY MODULE
```
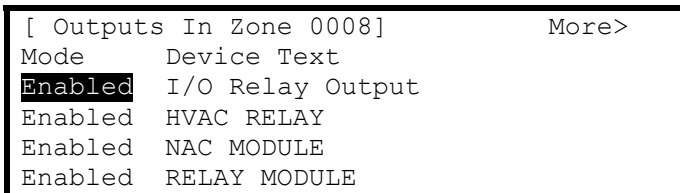
Press the ➜ button to more information on the outputs, including loop number, address, device type, analog value, etc.

Press the ⬆⬇ buttons to scroll through and highlight the required output and then press the ✔ button to change the device mode from Enabled to Disabled. The device mode will change from Enabled to Disabled and vice-versa.

Press the "Esc" button to return to the Zone list and to the Main Disable Menu.

7.8.2.3 Disable - Controls

Disabling Controls will cancel any Level 2 or above access User Level and return the panel to a Level 1 access level. Access Level 1 requires an access password for any control button (i.e.: ACK, RESET, etc.) or keypad entry usage.

Note: If the panel has an optional access Level key switch installed, the installer needs to program for disabled controls so the key switch will be the only means for access to control button and keypad usage.

Press the ←➔ buttons to highlight the Controls option and then press the ✔ button to select it.

```
[Disable]               User 1 Node  1

  ZONE/INPUTS    OUTPUTS    GROUPS
  CONTROLS       USER-ID

```

If the current User ID (access level password) does not have the required authority, the display prompts for entry of an authorized password to guard against inadvertent changes.

Once a valid access password has been entered, the control button functions and menu functions are disabled and the level 1 menu display will be shown:

```
         [ CONTROLS DISABLED ]

    ENABLE CONTROLS      VIEW
    LED TEST             STATUS

```

The display will automatically revert to the normal operating display after 15 seconds.

7.8.2.4 Disable – User ID

If User-ID access is programmed by the PC-NeT field configuration program, this operation will cancel the current User ID access and return to the Default User Level 1 access. User Level 1 can perform all actions except those defined as programmable (refer to the menu table).

```
[Disable]               User 5 Node  1

  ZONE/INPUTS    OUTPUTS    GROUPS
  CONTROLS       USER-ID

```

Press the ←➔ buttons to highlight the User-ID option and then press the ✔ button to select it.

```
 [Disable]               User 1 Node  1

  ZONE/INPUTS    OUTPUTS    GROUPS
  CONTROLS       USER-ID

```

NOTE: If configured to operate with a timeout and if there has been no user activity (button pressed) after the programmable time period (default "No Timeout"), the panel will automatically cancel a User ID level access and return the panel to User 1 ID access level. This is to ensure that access to restricted options, are automatically cancelled.

7.8.3   Enable Menu

When selecting the Enable Menu Option, the display shows the available Enable Functions.

```
[Enable]                 User 1 Node  1


   ZONE/INPUTS    OUTPUTS        GROUPS
   REMOTE


```

Press the ←→ buttons to highlight the required menu option and then press the ✔ button to select it.

7.8.3.1   Enable - Zones and Inputs

Selecting this option will show a list of zones containing disabled input devices. Either the complete zone or individual devices within the zone can then be enabled.

```
[ 4 ZONE(s) with INPUTS DISABLED]  More>
Zone    Mode        Location
0001    Disabled     BASEMENT WEST
0002    Disabled     BASEMENT EAST
0008    Disabled     GROUND FLOOR
0009    Disabled     MAIN RECEPTION AREA
```

7.8.3.2   Enable - Outputs

When this option is selected a pop-up menu appears asking if you want to enable ALL OUTPUTS, NACS, RELAYS or ONLY SELECTED OUTPUTS. If ONLY SELECTED OUTPUTS is selected, the display will list only zones containing outputs that have been disabled. The individual outputs within the zone can then be enabled.

```
 ALL OUTPUTS
 NACS
 RELAYS
 ONLY SELECTED OUTPUTS
```

7.8.4   Test Menu

```
[Test Menu]              User 1 Node  1

   ZONES    DISPLAY   BUZZER   PRINTER
   OUTPUTS


```

Note: If a printer is connected to the system all tests will be sent to the printer.

Press the ←→ buttons to highlight the required menu option and then press the ✔ button to select it.

7.8.4.1   Test Zones

The Test Zones function provides a means to implement a one-person walk test in order to test specific pull stations, detectors or any other input or output device in one or more zones.

If the current User ID (access level password) does not have the required authority, the display prompts for entry of an authorized password to guard against inadvertent changes.

When the Test Zones option is selected, a pop-up window is shown on the display to select whether the testing will or will not activate the NAC circuits for approximately 10-seconds when an input device is activated. For example:

```
   WITHOUT NACS
   WITH NACS
```

Press the ⬆⬇ buttons to scroll through and highlight the required option and then press the ✔ button to select it.

Note: All NAC circuits are defaulted to activate during a walk test with NACs, however the PC-NeT field configuration programming tool allows for customization of walk test outputs (NACs and relays).

The display then shows a list of the available Zones and their current test status. For example:

```
[   0 Zone(s) in Test ]
Zone    Test State   Location
0001         -          BASEMENT WEST
0002         -          BASEMENT EAST
0100         -           MAIN RECEPTION
```

Press the ⬆⬇ buttons to scroll through and highlight the required zone and then press the ✔ button to change the test state. For example:

```
[   1 Zone(s) in Test ]
Zone    Test State   Location
0001    IN TEST        BASEMENT WEST
0002       -           BASEMENT EAST
0008       -           GROUND FLOOR
0009       -           MAIN RECEPTION AREA
```

When one or more Zones are placed in a test state, the Test LED will illuminate. When an input device is activated (i.e. pull station or introducing test smoke into a smoke detector), the notification appliances will activate (if selected) and the display will indicate that a zone is registering a test condition by showing "FIRE" on the test zone display.

```
[   2 Zone(s)  in Test ]
Zone    Test State   Location
0001    IN TEST FIRE  BASEMENT WEST
0002       -           BASEMENT EAST
0008       -           GROUND FLOOR
0009    IN TEST        MAIN RECEPTION AREA
```

When the pull station is reset or when the smoke clears from the detector chamber, the panel will automatically reset and clear the test condition.

As an alternative to scrolling, a specific zone number can be entered by using the ⬅ button to move to the zone number column and then typing in the required number followed by the ✔ button.

If several consecutive zones are to be tested, an alternative to selecting them all individually is to specify a range of zones as follows:

   Move to the zone number column and highlight the first zone to test, then

   Press the ✔ button – the display will then ask for the last zone to be tested.

Individual zones can then be toggled in or out of test by pressing the ✔ button.

To leave the Zone Test menu, press the "Esc" button. If there are any zones still in a test condition a pop-up window with the following options will appear:

```
  DEVICE STILL ACTIVATED!

  FINISHED TEST
  KEEP ZONES IN TEST
```
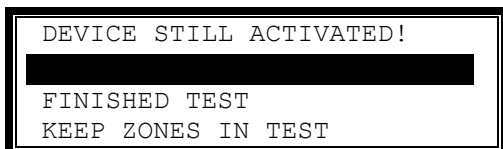
Selecting the "FINISHED TEST" option will cancel all zones that are in test mode. The Test LED will then extinguish.

Alternatively, it is possible to leave the Zone Test menu with one or more zones still in test mode by selecting the "KEEP ZONES IN TEST" option. This will enable the inspection or use of other menu functions and return the display to the normal operating mode. The Test LED will stay illuminated if this option is selected.

If no zones are still in test condition, a pop-up window with the following option will appear:

```
 FINISHED TEST
                                      .
```

Press the ✔ button to exit the Test area.

7.8.4.2   Test Display

The Test Display option checks the operation of all the LEDs and the graphical display of the AX-DSP. All of the LEDs are turned on and the entire display is shown in reverse (inverted). In addition to testing the AX-DSP, the Test Display also tests the LEDs of all of the Switch LED Modules connected to the associated AX-CTL base card.

Note: Test Display also tests the LEDs of all of the Switch LED Modules connected to the associated AX-CTL base card.

During this test, it is possible to test the operation of the ←, ↑, ↓, →, ✔ and **0-9** buttons. When a button is pressed it is indicated on the display. For example:

```
              LCD & KEY TEST


                    ←
```
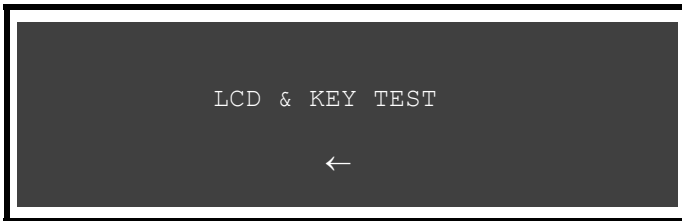
Press the "Esc" button to return to the Test Menu. If no button is pressed for 10 seconds, the display will automatically revert to the normal operating display.

7.8.4.3   Test Buzzer

When the Test Buzzer option is selected, the internal buzzer will pulse for approximately five seconds.

```
 [Test Menu]             User 1 Node  1

   ZONES   DISPLAY   BUZZER    PRINTER
   OUTPUTS
```

7.8.4.4   Test Printer

To Test the printer, highlight the Test Print option and press the ✔ button to confirm. The panel transmits 16 lines of test characters to the printer. The information sent is also sent to the AX-DSP graphical display.

Note: The printer test function will only work if a printer is programmed on the system. If no printer is programmed, the display will indicate "NO PRINTER SELECTED!"

When the test print is completed, the display automatically reverts to the Test Options Menu.

Press the "Esc" button at any time to cancel the test print.

7.8.4.5   Test Outputs

To Test outputs, highlight the Test Output option and press the ✔ button to confirm.

```
[ Outputs ]                          More>
Zone     Location
0001     BASEMENT WEST
0002     BASEMENT EAST
0008     GROUND FLOOR
0009     MAIN RECEPTION AREA
```

Press the ⬆⬇ buttons to scroll through and highlight the required zone and then press the ➔ button to scroll to the specific Output to be tested. For example:

```
 [   Outputs In Zone 0001 ]
More>
Mode       Device Text
Enabled    I/O Relay
Enabled    HVAC RELAY
Enabled    NAC MODULE
Enabled    RELAY MODULE
```

Press the ✔ button for the output you wish to test. Press the ✔ button again to begin the test, the device will activate until the ESC button is pressed.

```
TEST THIS DEVICE

```

7.8.5   P.A.S. (Positive Alarm Sequence) Menu

To enable or disable the P.A.S. operation access P.A.S. area.

```
[Main Menu]              User 1 Node  1

  VIEW        DISABLE      ENABLE
  TEST        P.A.S        TOOLS
              STATUS

```

If the P.A.S. delays are configured in the panel, the display shows the following pop-up window when the P.A.S. area is selected.

Note: P.A.S delay functionality can only be configured using the PC-NeT field configuration programming tool. If the P.A.S. delays are not configured, the display briefly shows "NOT CONFIGURED" before returning to the Main Menu options.

```
   [P.A.S. Options]
   NO P.A.S.
   PERMANENT (Use P.A.S.)
```

Highlight the required option using the ⬆⬇ buttons and then press the ✔ button to confirm. The display then reverts to the Main Menu.

Select "NO P.A.S." to disable the operation of the Positive Alarm Sequence Investigation Feature.

Select "PERMANENT" to enable the operation of the Positive Alarm Sequence Investigation Feature.

If using the investigation delays (PERMANENT) the "P.A.S." LED Indicator will illuminate. When the investigation delays are disabled (NO P.A.S.), the "P.A.S" LED is off.

Press "Esc" to cancel and make no change to the current operational setting.

7.8.6 Tools Menu

When selecting the Tools Menu, the display shows three possible options. For example:

```
[Tools]              User 1 Node  1


   PROGRAM     PRINT     CHANGE TIME


```

7.8.6.1 Program Menu

Note: To access the programming area a proper service level password is required. Refer to 682-002 Front Panel Programming Manual for information and details on front panel programming capabilities.

7.8.6.2 Print Menu

```
[Tools]              User 1 Node  1

   PROGRAM     PRINT     CHANGE TIME


```

Note: The data stream sent to the printer is in a serial format. If an external printer is used ensure that the communications settings in the printer are set as follows:

Interface Type:	RS232
Baud Rate:	9600
Parity:	None
Data Bits:	8
Stop Bits:	1

The following are printer capabilities within the Printer Menu:

```
[Print Menu]            User 1 Node 1

INPUTS    OUTPUTS    TROUBLES    DISABLED
LOG     FEED-PAPER  SETUP-PRINTER


```

Note: Before any printing can be done the printer must be Setup.

7.8.6.2.1 Set-up Printer

To enable or set-up the operating characteristics of the printer, highlight the Set-up Printer option and press the ✔ button to confirm.

If the current User ID (access level password) does not have the required authority, the display prompts for entry of an authorized password to guard against inadvertent changes.

Enter the password as normal. The display then shows a pop-up window giving programming options as follows:

```
 [ALARMS][OFF NORMAL][TRBL][TESTS]
     ✔         ✔        -      -

( Printer: Internal External/Wide )
              -         ✔        -
```

The upper line of options determines whether the panel will automatically print specific events as they occur.

The lower line of options determines whether a printer is connected and the type of printer it is.

Use the←,↑,↓,→ and ✔ buttons to highlight the required option and change its setting. Pressing the ✔ button turns the option on (✔ is shown) or off (– is shown) accordingly.

In the above option, an external printer is selected, with automatic printing of alarms and off-normal conditions.

Setting the wide option will change the printing from the default 40 characters per line to 80 characters per line.

Note: On network systems only trouble events registered on the panel controlling the printer are printed. Trouble events from other nodes are not printed.

7.8.6.2.2 Print Inputs

To print information on any input, highlight the Inputs option and press the ✔ button to confirm. The display will show the following:

```
[Inputs]

   First Zone  :    1
   Last Zone   :    5

(Press → to Start Print)
```

The display will prompt the zones in use on this panel. For networked systems it is possible to select any zones used in the system. Use the arrow (↑↓) buttons to highlight the first and last zone number and use the number keys to change the zone number required.

Press the → key to start printing.

The display will show the following, while information is sent to the printer and printed.

```
   WORKING ...

(Press Esc to Stop)
```

After all information has been printed, the display will automatically revert to the Print Menu. Press the "Esc" key to stop printing if required.

The printout will show all input points for the zones selected. Information printed includes zone number, device address with analog value, programmed detector mode (1-5), device text, device type and enabled status.

7.8.6.2.3 Print Outputs

To print information on any output, highlight the Outputs option and press the ✔ button to confirm. The display will show the following:

```
[Outputs]

   First Zone  :    1
   Last Zone   :    5

(Press → to Start Print)
```

The display will prompt the zones in use on this panel. For networked systems it is possible to select any zones used in the system. Use the arrow (↑↓) buttons to highlight the first and last zone number and use the number keys to change the zone number required.

Press the → key to start printing.

The printout will show all output points for the zones selected. Information printed includes zone number, device address, device text, device type and enabled status.

7.8.6.2.4 Print Troubles

To print information on any troubles, highlight the Troubles option and press the ✔ button to confirm. The display will show the following:

```
[    2 Zones in Trouble]

   First Zone  :    1
   Last Zone   :    5

(Press → to Start Print)
```

The panel will analyze the network and the display will prompt the zones in trouble condition to be printed.

Use the arrow (⬆⬇) buttons to highlight the first and last zone number and use the number keys to change the zone number as required.

Press the ➜ key to start printing.

The printout will show the location and state of all input and output points in a trouble condition for the zones selected.

Note: If there are no trouble conditions present then selecting this menu option will have no effect.

7.8.6.2.5 Print Disables

To print information on any disabled device or zone, highlight the Disabled option and press the ✔ button to confirm. The display will show the following depending on the disabled conditions present:
If there are zones with inputs disabled:

```
[    2 Zone(s) with Inputs Disabled]

   First Zone  :    1
   Last Zone   :    5

(Press → to Start Print)
```

If there are zones with outputs disabled:

```
[    1 Zone(s) with Outputs Disabled]

   First Zone  :    1
   Last Zone   :    5

(Press → to Start Print)
```

The panel will analyze the network and the display will prompt the zones in a disabled condition to be printed.

Use the arrow (⬆⬇) buttons to highlight the first and last zone number and use the number keys to change the zone number as required.

Press the ➜ key to start printing.

The printout will show the location and state of all input and output points in a disabled condition for the zones selected.

The display always presents the zones with inputs disabled first (if any exist). After printing the inputs, the display will present the information on disabled outputs (if any exist).

Note: If there are no disabled conditions present then selecting this menu option will have no effect.

7.8.6.2.6 Print Log

To print information from the History Log, highlight the Print Log option and press the ✔ button to confirm. A pop-up window will be shown asking if all events, or just alarms should be printed. Highlight the required option using the ⬆⬇ buttons and press the ✔ button to confirm.

When the History Log is completely printed the display will automatically revert to the Print Options Menu.

Press the "Esc" button at any time to cancel the log print.

Note: The pop-up window also allows selection of the Alarm Counter. The alarm count is displayed on the AX-DSP display only, it is not printed.

7.8.6.2.7 Print Feed Paper

Highlight the Feed Paper option and press the ✔button to confirm. The display does not change but a command is sent to the printer to advance the paper.

7.8.6.3 Change Time

This area allows the changing of the system time clock.

If the current User ID (access level password) does not have the required authority, the display prompts for entry of an authorized password to guard against inadvertent changes.

Note: Time change is in 12 hr [US – Standard] format with AM & PM or 24 hr [military] format depending upon PC-NeT field configuration programming tool setup. Default is 12 hr [US – Standard].

Example of time change:

```
[SET TIME/DATE]


    TIME =  5:28  PM
    DATE = 04/15/14    SAT 15 APR 2006
```

To change the settings, use the ⬆⬇ buttons to highlight the required option. Directly enter the new time or date using the number buttons. As soon as a number button is pressed, the display will clear the current setting and show the new value as it is entered. For example:

```
[SET TIME/DATE]


    TIME = 1 :--  PM
    DATE = 04/15/14    SAT 15 APR 2006
```

If this panel is connected to a network all network node panels will adjust to the new time value.

8   Mass Notification Capabilities

Note: This manual references MNS (Mass Notification System) features and operations which are programmable and usable. The user should understand that this product was designed to be compliant with the UL2572 Mass Notification Standard, however, its listing is pending. Please consult factory for updated UL2572 Mass Notification Standard listing status.

The AX-CTL-1L, AX-CTL-2 and AX-CTL-4 intelligent fire alarm control panel's in conjunction with an optional PBUS (RS485) floor (area) amplifier is capable of supporting numerous emergency notification messages (alarms, alerts, warnings, mass notification and other emergency event messages) based on installation requirements.

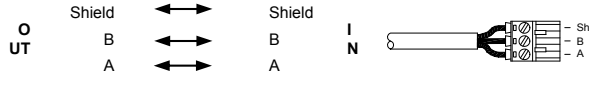Messages can be automatically or manually activated and based on an emergency response plan, prioritized by type of event. Identical synchronized messages can be played simultaneously throughout a facility via multiple PBUS (RS485) amplifiers, avoiding any broadcasting message confusion. Multiple synchronized messages can also be broadcasted simultaneously when installation demands require such functionality.

9   Axis^{AX} Wiring Guide

Unless otherwise noted, all circuits permitted to be in same conduit. Check local codes for additional restrictions. Twisted shielded cable provides a degree of protection and immunity to electrical noise interference (RFI/EMI) compared to twisted pair or untwisted wire. If shielded cable is used, connect the shield to the panel enclosure (out and return) and to the dedicated shield terminations in the bases only.

Note: If shielded cable is utilized, the shield connection must be a continuous circuit around the loop and <u>must not</u> be in contact with any other earth/ground point (including electrical back boxes).

If running NAC and/or 24 VDC circuits in the same conduit as other signals, you can reduce problems by exclusively using electronic sounders instead of electronically noisy notification appliances (such as electromechanical bells or horns).

Circuit Type	Circuit Function	Wire Types	Maximum Distance	Typical Wire Size (AWG)	Comments
SLC (power limited)	Connects to intelligent modules and smoke detectors	Twisted Unshielded Pair * Maximum resistance is dependent on SLC loop loading (see note #1)	12,500 feet (see note #1)	12-18 AWG	If multiple loops are inside the same conduit it is acceptable to use twisted unshielded wire as SLCs will not interfere with one another. It is acceptable to run other signals inside the same conduit however, it's recommended that the other wires are either twisted or twisted shielded. The Axis^{AX} panels contain loop power technology. The SLC circuits are capable of driving high current loads in alarm, which affects the load characteristics including V/I drops along the wire length. Therefore, it is important to utilize Advanced loop calculator in determining wire gauge and length.
		Twisted Shielded Pair	12,500 feet (see note 1)	12 -18 AWG	Shield must only be connected to earth ground at one location - at the fire panel.
		Untwisted, Unshielded Pair	1,000 feet (see note 1)		It's not recommended to mix inside conduit with other signals unless other signals use either twisted or twisted shielded wire.
PBUS EIA-485 (power limited)	Connects peripheral modules to AX-CTL base card	Twisted Unshielded or Twisted Shielded	5000 feet	18-20 AWG	Twisted unshielded or twisted shielded wire is acceptable whenever the PBUS is wired internal and/or external to the fire panel enclosure. Must install a 150 ohm resistor at end of the PBUS wire run. When using shielded wire, you must install a 2.2 µfd non polarized capacitor from shield to ground at one end and terminate shield to panel ground at other end.
EIA-232 (power limited)	Connects to printers or PC	Shielded	50 feet	18-20 AWG	
NACs (power limited)	Connects to horns, strobes, solenoids, etc.	Twisted Shielded, Twisted Unshielded, Untwisted Unshielded.	4000 feet (see note 2)	12-22 AWG	If supporting highly inductive/noisy loads use twisted shielded wire.
Network EIA-485 (power limited)	Ad-NeT-PluS peer-to-peer network	Twisted Shielded or Fiber Optic Cable	5000 feet Class B 66000 feet Class X (A) (5000 ft between Nodes)	18-20 AWG	Fiber Optic – 16,404 ft between nodes max. Jacket material must be rated for application. Note that network node to node communications are optically isolated and each node has an independent ground fault detection circuit. To insure prevention of earth "ground loops", the shield must be terminated at one node and not both. This is accomplished internally at each node via dedicated shield terminals. Each network node module has isolated outgoing and incoming network wiring terminals. Connect from the "OUT" terminal on the first node to the "IN" terminal on the next node (A, B and Shield).
Telephone Riser (power limited)	Firefighter Telephone communications1 to 6 channels for firefighter phones	Twisted Shielded Pair	4000 feet (see note 3)	18-20 AWG	
Audio Riser (power limited)	Audio input signal to amplifiers	Twisted Shielded Pair	4000 feet	18-20 AWG	
Speaker Circuits (power limited)	Speaker circuit to speakers	Twisted Pair or Twisted Shielded Pair	3000 feet (load dependant)	12-22 AWG	Twisted shielded wire if mixed inside same conduit as the audio and/or telephone riser(s)
24 VDC (power limited)	24 Volts DC resettable or non-resettable	Untwisted Unshielded, Twisted Pair or Twisted Shielded Pair	4000 feet	12-18 AWG	Size conductors per acceptable voltage drop. If supporting highly inductive/noisy loads, twisted shielded wire is recommended.

Circuit Type	Circuit Function	Wire Types	Maximum Distance	Typical Wire Size (AWG)	Comments
IDCs (power limited)	SLC based initiating device input circuits & conventional smoke zones	Untwisted Unshielded, Twisted Pair or Twisted Shielded Pair.	300 feet	18-20 AWG	EOL resistor value varies depending upon module.

Note #1: SLC (Signaling Line Circuit)

Maximum circuit impedance depends on the SLC loop load current. The voltage drop (load current x cable resistance) over the cable always needs to be taken into account to ensure the devices are receiving an adequate supply voltage (see table below):

Maximum Circuit Impedance	72Ω
Insulation Resistance (Core-Core and Core-Screen)	2M Ω
NB: Maximum Circuit Impedance is the sum of the resistance of both cable conductors.	

Circuit Loading	Max. Circuit Impedance
100mA	55.0Ω
200mA	27.5Ω
300mA	18.3Ω
400mA	13.7Ω
500mA	11.0Ω

Note #2: Notification Appliance Circuit

The voltage drop on notification appliance circuit should be calculated to ensure that the minimum voltage at the end of the circuit exceeds the minimum required by each notification appliances at the minimum alarm circuit output voltage.

The voltage at the end of the circuit is given by:

Minimum Alarm Voltage = $V_{OUT(MIN)} - (I_{ALARM} \times R_{CABLE})$

Minimum Output Voltage ($V_{OUT(MIN)}$) is $V_{BAT(MIN)} - 0.5V = 20.5V$

Alarm Current (I_{ALARM}) is the sum of the loads presented by the notification appliances in alarm

Cable Resistance (R_{CABLE}) is the sum of the cable resistance in both wires x cable length.

Typical wire size resistance (R_{CABLE}):   Loop Resistance (2 Wires)
   18 AWG solid: Approximately 6.5ohms/1000ft.   13ohms /1000ft.
   16 AWG solid: Approximately 4.1ohms/1000ft.   8.2ohms /1000ft.
   14 AWG solid: Approximately 2.6ohms/1000ft.   5.2ohms /1000ft.
   12 AWG solid: Approximately 1.8ohms/1000ft.   3.6ohms /1000ft.

Note #3: Telephone Riser

Maximum Riser Circuit Cable Resistance = Max Riser Volt Drop / Total Firefighter Jack/Phone Current.

Max Riser Volt Drop = 5V

Total Firefighter Jack/Phone Current (A) = (number of phones x 0.0063) + 0.08

Examples:

Number of Firefighter Jacks/Phones	Max Cable Resistance (ohms)
5	44
10	34
15	28
20	24
25	21
30	18
35	16

10 Maintenance & Troubleshooting

The system shall be inspected, tested and maintained in accordance with the recommendations outlined in NFPA72.

The recommendations provide for weekly, monthly, quarterly, bi-annual and annual inspections/tests.

72 NFPA® Inspection, Testing & Maintenance

Adequate records shall be maintained to document all inspections, tests and maintenance undertaken. Trouble conditions and their resolution to normal shall be recorded.

The AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel includes ground fault monitoring and detection. To test the ground fault circuitry, place a 100K resistor in series with a wire from the positive or negative (positive or negative ground fault) terminal of the auxiliary power supply output to ground.

The Advanced intelligent detectors employ a drift compensation and automatic sensitivity adjustment feature. The panel will indicate a trouble condition when the drift compensation reaches a point where alarm sensitivity cannot be maintained.

The AX-CTL-1L, AX-CTL-2 and AX-CTL-4 intelligent fire alarm control panel provides integral electronic meters to check the operation of the batteries, charger, and input and output circuits. The charging voltage and charging current can be read from the panel display. The batteries are also automatically subjected to a load equivalent to full load during normal operation. If the internal resistance of either battery rises beyond approximately 0.8 ohm, then the panel will report a battery trouble condition.

10.1 Troubleshooting

Designed with the technician in mind, each module of the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel is easy to install and service. All inputs and outputs of the AX-CTL base card are addressable and provide precise information of status condition. The power supplies offer status LEDs, temperature compensated charging, and the ability to operate directly from the batteries when AC supply is not yet available at the installation site. A user-friendly built-in intelligent multi-meter allows technicians to interrogate any input/output and diagnose potential time consuming trouble issues.

In addition to all of the AX-CTL-1L, AX-CTL-2 and AX-CTL-4 intelligent fire alarm control panel capabilities, the Advanced Remote Diagnostic Virtual Panel Simulator offers technicians the ability to access the AX-CTL-1L, AX-CTL-2 or AX-CTL-4 intelligent fire alarm control panel (w/integral modems) remotely. The Remote Diagnostic Virtual Panel emulates the onsite AX-DSP alphanumeric graphic display in real time from an offsite location.

10.1.1 AX-CTL Base Card I/O Addresses and Built-in Intelligent Multi-Meter

The following is a list of AX-CTL base card addresses for troubleshooting various input and output circuits:

Item (Address)	Description	Value (Real-Time)	State
01.0	NAC-1 A Volts	(Voltage)*	(State of Output Voltage)
01.1	NAC-2 A Volts	(Voltage)	(State of Output Voltage)
01.2	NAC-3 A Volts	(Voltage)	(State of Output Voltage)
01.3	NAC-4 A Volts	(Voltage)	(State of Output Voltage)

* ~5.5V quiescent and ~ 27V alarm = Normal
If system has only 2 NACs quiescent and alarm voltages for NAC-3 & NAC-4 = 0V

02.0	NAC-1 A Load	(Current)*	(State of Output Current)
02.1	NAC-2 A Load	(Current)	(State of Output Current)
02.2	NAC-3 A Load	(Current)	(State of Output Current)
02.3	NAC-4 A Load	(Current)	(State of Output Current)

* Dependent upon quiescent and alarm current draw of notification appliances per circuit
If only 2 NAC circuits per system quiescent and alarm currents for NAC-3 & NAC-4 = 0mA

03.0	Battery	(~27V = Normal)	(State of Battery Voltage)
04.0	Charger (V)	(~27V = Normal)	(State of Charger Voltage)
04.1	Charger (I)	(Current)*	(State of Charger Current)

* Dependent upon whether batteries are being charged, 0mA if no charge needed

04.2	Charger (C)	(~25 ^{0}C = Normal)	(State of Charger Temp. in ^{0}C)
05.0	Ground Volts	(~13V = Normal)*	(State of Ground Voltage)

* Higher voltage = positive ground, lower voltage = negative ground (voltage dependent upon ground potential)

05.1	System Volts	(~27V = Normal)	(State of System Voltage)
06.0	Aux Supply 1	(Current)*	(State of Aux 1 Output Current)
06.1	Aux Supply 2	(Current)*	(State of Aux 2 Output Current)

* Dependent upon current draw of auxiliary supply output

07.0	1st SLC Load	(Current)*	(State of 1st SLC Loop Current)
07.1	2nd SLC Load	(Current)	(State of 2nd SLC Loop Current)
07.2	3rd SLC Load	(Current)	(State of 3rd SLC Loop Current)
07.3	4th SLC Load	(Current)	(State of 4th SLC Loop Current)

* Dependent upon quiescent and alarm current draw of SLC devices per loop

08.0	1st SLC V. Out	(~23V = Normal)*	(State of 1st SLC Loop Voltage Out)
08.1	2nd SLC V. Out	(~23V = Normal)*	(State of 2nd SLC Loop Voltage Out)
08.2	3rd SLC V. Out	(~23V = Normal)*	(State of 3rd SLC Loop Voltage Out)
08.3	4th SLC V. Out	(~23V = Normal)*	(State of 4th SLC Loop Voltage Out)

* If system has only 2 SLCs voltage for SLC-3 & SLC- 4 = 0V, and State is RESET

09.0	1st SLC V. In	(~23V = Normal)*	(State of 1st SLC Loop Voltage In)
09.1	2nd SLC V. In	(~23V = Normal)*	(State of 2nd SLC Loop Voltage In)
09.2	3rd SLC V. In	(~23V = Normal)*	(State of 3rd SLC Loop Voltage In)
09.3	4th SLC V. In	(~23V = Normal)*	(State of 4th SLC Loop Voltage In)

* 0V if Class B, if Class A and only 2 SLCs voltage for SLC-3 & SLC- 4 = 0V
 at 0V State is RESET

10.0	1st Switch Input (LCD)	L*	(State of Control Circuitry)*
10.1	2nd Switch Input (LCD)	L	(State of Control Circuitry)
10.2	3rd Switch Input (LCD)	L	(State of Control Circuitry)
10.3	4th Switch Input (LCD)	L	(State of Control Circuitry)
10.4	5th Switch Input (LCD)	L	(State of Control Circuitry)
10.5	6th Switch Input (LCD)	L	(State of Control Circuitry)
10.6	7th Switch Input (LCD)	L	(State of Control Circuitry)
10.7	8th Switch Input (LCD)	L	(State of Control Circuitry)

* Normal Low (L – open contact), Active High (H – closed contact)
 State only changes on circuitry failure

11.0	Relay 1	-*	(State of Relay Circuitry)*
11.1	Relay 2	-	(State of Relay Circuitry)
11.2	Relay 3	-	(State of Relay Circuitry)
11.3	Output 1	-	(State of Relay Circuitry)
11.4	Output 2	-	(State of Relay Circuitry)
11.5	Output 3	-	(State of Relay Circuitry)
11.6	Output 4	-	(State of Relay Circuitry)
11.7	Output 5	-	(State of Relay Circuitry)
11.8	Output 6	-	(State of Relay Circuitry)
11.9	Output 7	-	(State of Relay Circuitry)
11.10	Output 8	-	(State of Relay Circuitry)

* - = No voltage or current readings, dry contact
 State normally equals RESET it only changes on circuitry failure

| 13.0 | | Control Panel | -* | | (State of Control Panel Circuitry)* |

13.0   Control Panel   -*   (State of Control Panel Circuitry)*

     * - = No meter readings available

     State normally equals RESET it only changes on circuitry failure

14.0   AC Supply   H*   (State of AC Supply Circuitry)*

14.1   Anc. Supply   H   (State of Anc. Supply Circuitry)

     * Normal High (H – closed contact), Active Low (L – open contact)

     State only changes on circuitry failure

21.0   Network Ground   0V   (State of Network Ground Potential)

10.2 Replacement of Components

In general, all of the component parts used in the construction of the panel have been selected for long life and reliability. However, certain components may require to be changed on a regular service basis. The details of these are as follows:

10.2.1 Batteries

Respect the Environment.
Batteries must be disposed of responsibly and in accordance with any local regulations.

10.2.1.1 Standby Batteries

Expected Life: -   3-5 years at an ambient temperature of 20°C

Replacement Schedule: -   As above. However, note that the expected battery life is shortened by increase in ambient temperature. The life reduces by 50% for every 18°F (10°C) rise above ambient. Refer to battery manufacturer for further information.

Manufacturer / Part Numbers: -

YUASA		POWERSONIC	
4AH	NP4-12	5AH	PS-1250-F1
7AH	NP7-12	7AH	PS-1270
12AH	NP12-12	12AH	PS-12100-F1
17AH	NP18-12	18AH	PS-12180-NB
24AH	NP24-12B	26AH	PS-12260-NB
38AH	NP24-38	38AH	PS-12400-NB

For optimum performance and charge retention, Yuasa recommends that batteries are 'top-charged' prior to installation.

For batteries up to 6 months old from date of manufacture, charge at 2.4V per cell (i.e. 14.4V per battery) for 20 hours prior to installing the batteries.

It is not recommended to use batteries that are more than 6 months old, from their date of manufacture, on a new installation.

It is quite normal for lead-acid batteries to vent hydrogen when being charged.

The panel is adequately ventilated to dissipate this hydrogen. DO NOT seal the enclosure or install in a sealed enclosure.
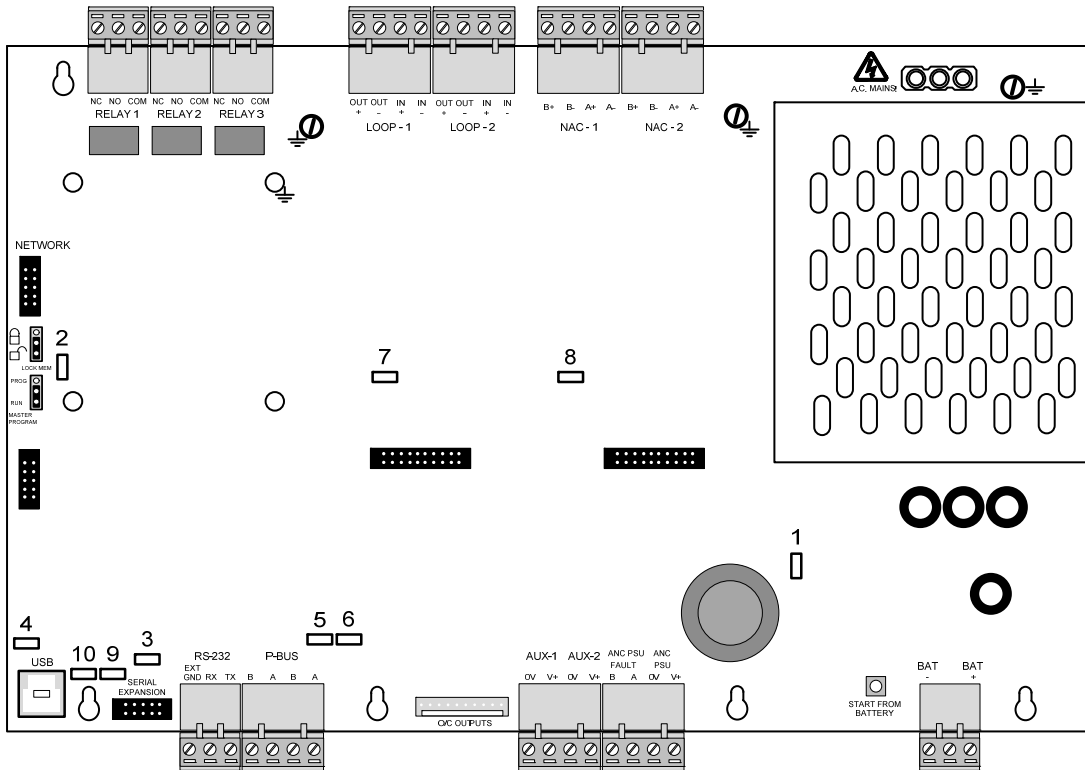
10.2.2 Liquid Crystal Display

Expected Life: -   > 10 years

Replacement Schedule: -   When the display becomes difficult to read due to gradual fading over time.

Manufacturer / Part Number: -   Consult Advanced

10.3 LED Status

On-board status LEDs are available for troubleshooting purposes on many of the Advanced modules.

10.3.1 AX-CTL Base Card

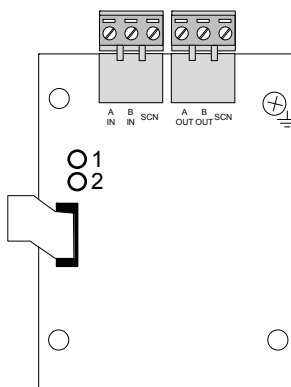| LED	Function	Description
1	Heartbeat LED – PSU	Normal: Flashes at 1Hz
2	Heartbeat LED – Main Microprocessor	Normal: Flashes at 1Hz
3	Serial Expansion Card	ON = Serial Expansion Card Connected
4	USB	ON = USB Connected
5	PBUS Communications – Transmit	Flashes when data transmitted to PBUS modules
6	PBUS Communications – Receive	Flashes when data received from PBUS modules
7	Heartbeat LED – SLC #1	Flashes when communicating on the SLC
8	Heartbeat LED – SLC #2	Flashes when communicating on the SLC
9	Serial Communications – Transmit[23]	Flashes when data transmitted
10	Serial Communications – Receive[23]	Flashes when data received

---

[23] Applies to USB, RS232 and Serial Expansion Circuits.

10.3.2 AX-LPD and AX-NAC Module
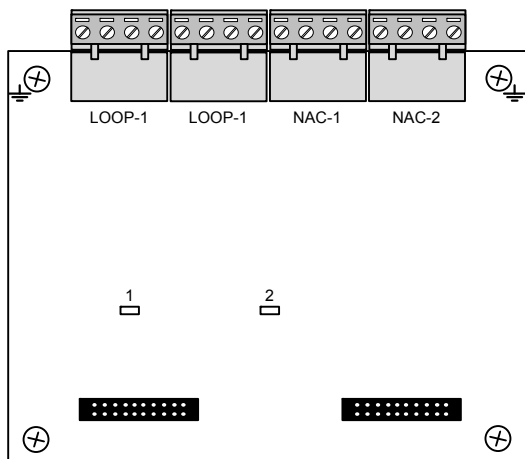
LED	Function	Description
1	Heartbeat LED – SLC #3	Flashes when communicating on the SLC
2	Heartbeat LED – SLC #4	Flashes when communicating on the SLC

10.3.3 AX-NET4/AX-NET7 Network Module

LED	Function	Description
1	Heartbeat LED	Normal: Flashes at 1Hz
2	Network Comms – Receive	Flashes when data received from network
3	Network Comms – Transmit	Flashes when data transmitted to network

10.3.4 AV-AMP-80 Audio Amplifier

Transmit
Heart Beat
Amplifier 1
Amplifier 2
40 Volts
USB Usage

TX
HB
AMP1
AMP2
40V
USB
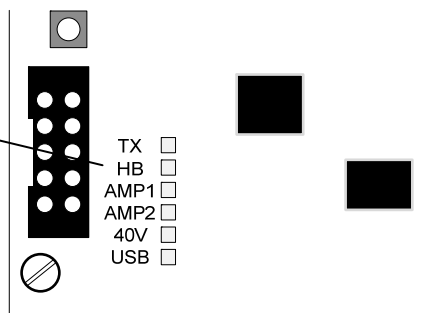
10.3.5 AX-PSU-6 Power Supply Charger

There are seven (7) onboard LEDs associated with the AX-PSU-6. Refer to the opposite diagram for LED descriptions and purpose.
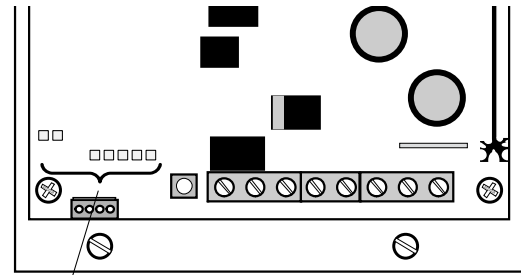

Earth Fault   Battery Connect
Heart Beat   Battery Low
                  Battery O-C
                  Charger Fault
                  PSU Fault

11 Appendices

11.1 Additional Intelligent Detector Information

Additional functions are available for Axis^{AX} intelligent detectors from the "Additional Info" field of the Loop View/Edit display. It is possible to view the internal drift (0-100%), perform a rapid compensation or access any of the internal EEPROM memory locations. Press the ✔ button and a pop-up window is shown presenting a list of options.
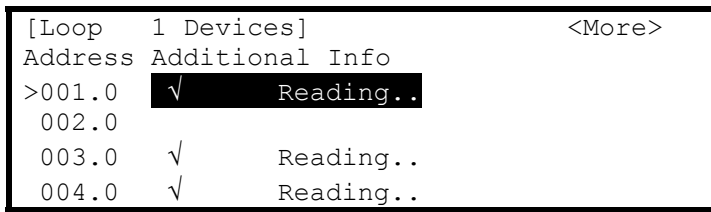
For example:
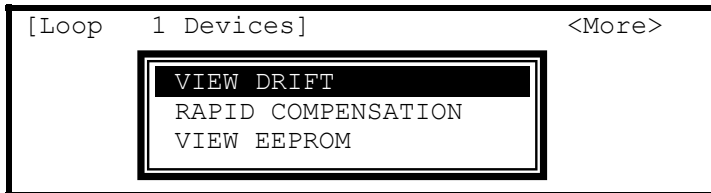
```
[Loop   1 Devices]                <More>

           VIEW DRIFT
           RAPID COMPENSATION
           VIEW EEPROM
```

Press the ⬆⬇ buttons to highlight the required menu option and then press the ✔ button to confirm.
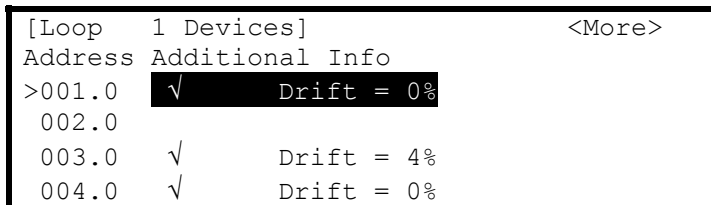
11.1.1 View Drift

When View Drift is selected, the display shows the intelligent smoke detectors, on the specific loop, that the panel is reading (addresses that are blank (without √ mark) are addresses allocated to pull stations, input and output devices). For example, select the View Drift option and the display shows:

```
[Loop   1 Devices]                <More>
Address Additional Info
>001.0    √        Reading..
 002.0
 003.0    √        Reading..
 004.0    √        Reading..
```

When the reading is complete, the display shows the drift (0-100%) per intelligent smoke detector on the SLC loop.

For example:

```
[Loop   1 Devices]                <More>
Address Additional Info
>001.0    √        Drift = 0%
 002.0
 003.0    √        Drift = 4%
 004.0    √        Drift = 0%
```

11.1.1.1 Intelligent Detector Drift Compensation

The Axis^{AX} intelligent detectors include compensation for sensor drift as part of the internal signal-processing algorithm. The algorithm will compensate for changes in sensor output caused, for example, by dust in the chamber, and will therefore hold the sensitivity at a constant level even with severe chamber contamination. This increased stability is achieved without affecting the detector's sensitivity to fire.

The compensation level is stored in the detector's memory as a single value between 0 and 31. The Axis^{AX} fire alarm control panel takes this information and converts it to a more user-friendly value in Drift % (0-100).

Note: The sensitivity of an Axis^{AX} intelligent detector does not change unless a detector, which has already indicated a specific trouble signal "Device Dirty" for detector address at the Axis^{AX} fire alarm control panel, can no longer maintain the programmed/installation location sensitivity. This is why a sensitivity report from an Axis^{AX} fire alarm control panel is not beneficial, instead the Axis^{AX} fire alarm control panel provides a % drift report (dirty detector report) via the Advanced' Service Tool. The Service Tool allows viewing, printing, storage, etc. of clean/dirty values (from 0 to 100) for all Axis^{AX} fire alarm control panel detectors.

The Axis^{AX} fire alarm control panel has two (2) methods of handling a detector that reaches 100% calibration:

Method One:
Method one is the default method of handling 100% drift detectors. When a detector reaches 100% drift, it activates a specific trouble signal "Device Dirty" for the detector address, at the Axis^{AX} fire alarm control panel. This trouble will remain active until the detector is cleaned/recalibrated or replaced. Acknowledgement of the trouble is possible to silence the panel trouble buzzer, however it will resound within 24 hrs from the time the device reported the trouble.

Method Two:
Method two is an enhanced method of handling 100% drift detectors, usually utilized when customers have a service contract with the installation site. In this method, field configuration programming tool setup, detector compensation is programmed to perform compensation based on time-of-day, day-of-week, etc. With the programming of time-of-day, day-of-week, etc. compensation (detector dirty reports – if any) will occur at this programmed time.

When a detector reaches 100% drift, it is placed in an Off-Normal, Problem area within the Axis^{AX} fire alarm control panel. The Problem area is viewable by a service technician on his next service/maintenance visit to the site. At this time, detectors that are in the Problem area can be cleaned/recalibrated or replaced. In addition to placing 100% calibrated detectors in the Problem area of the Axis^{AX} fire alarm control panel, email reports can be transmitted via the Advanced' optional AX-LAN (ipGateway), so service personal can respond and rectify the dirty detector prior to the customer being notified.

Note: With the enhanced method of programming compensation, when a "Problem" detector tries to recalibrate and cannot maintain the programmed detector sensitivity, a trouble signal "Device Dirty" for the specific detector will be generated at the Axis^{AX} fire alarm control panel.

11.1.2 Rapid Compensation

As previously indicated, compensation for environmental conditions of an installation is a standard feature of all Axis^{AX} intelligent detectors. Approximately every 24 hours (default setting), intelligent detectors are evaluated and compensated (if required) for any changes to the installed environment, due to device contamination and/or dust buildup.

Rapid compensation is a feature built into the AX-CTL-1L, AX-CTL-2 and AX-CTL-4 intelligent fire alarm control panel that allows the user to manually perform a drift compensate of SLC loop devices when they are first installed or if they are cleaned/replaced. It is recommended that during commissioning, cleaning or when replacing a detector rapid compensation be performed on detectors, to adjust them immediately to the present ambient conditions.

Note: If rapid compensation is not employed on a replaced device it could take up to 24 hrs before the replaced device is automatically compensated.

Highlight the required Axis^{AX} intelligent detector, select RAPID COMPENSATION and then press the ✔ button to confirm. The panel will now instruct the intelligent detector selected to perform a rapid compensation. This will take approximately 30 seconds.

This operation must only be performed with the detector in clean air.
No other operation should be performed on this device during this rapid compensation period.

11.1.3 View EEPROM

The panel can read any of the extended memory locations within the intelligent detectors.

Highlight any "Axis^{AX} intelligent detector, select VIEW EEPROM and then press the ✔ button to confirm. The display will prompt for entry of the required extended memory address. For example:

```
[Loop   1 Devices]              <More>
Address Additional Info


    EEPROM ADDRESS=#
```

Enter the required address (# = all intelligent detectors on that loop) using the number buttons and then press the ✔ button to confirm.

The panel will now read the extended memory locations for all intelligent detectors on the loop. When complete, the display will present the information as follows:

```
[Loop   1 Devices]                    <More>
Address Additional Info
>001.0  EEP[ 1] = 23
 002.0
 003.0  EEP[ 1] = 21
 004.0  EEP[ 1] = 22
```

Refer to the device data sheets for an explanation of the extended memory locations and for further information on the expected values.

11.2 Loop Isolators

It is recommended that there are a maximum of 20 intelligent detectors and/or addressable devices between loop isolators.

Note: Some devices (particularly modules) are specified as representing the equivalent of two or more device loads.

For further information, refer to the device data sheet.

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