SHIELD
TRUSTED WORLDWIDE

neo®

NX10-FACP - 1L, NX10-FACP – 2, NX10-FACP- 4

Fire Alarm Control Panel

Installation & Operation Manual

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Limitations of Fire Alarm and Emergency Communication Systems

An automatic fire alarm system and when required, interfaced emergency communication system (various emergency messages with or without live voice communications) can provide early warning and notification of the development of a fire. It cannot, 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 make sure that they detect the types of fire likely to occur in the protected area. Even so, many 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 FACP, 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 make sure that the system is operating at its optimum performance. Arrange a maintenance agreement with the manufacturer's local representative to make sure 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.

General Installation Notes

Before you install this product make sure that you comply with the ratings shown inside the equipment and in the specifications section of this manual.

Make sure that you have read and understood the instructions provided in this manual before you work on the panel. If you are not sure, stop work and seek guidance from the manufacturer or supplier.

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESDS procedures can damage the equipment.

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.

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

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.

Following installation or after any system change (including changes to operating software or configuration settings) the system shall be tested in accordance with the acceptance 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 must be tested.

This equipment has been tested and found to be compliant 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.

Ambient Temperature and Environment

This equipment meets the requirements for operation at 32°F - 120°F (0°C - 49°C) and relative humidity of 93% 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).

Product Firmware and Software

Shield Fire, Safety and Security Ltd continuously strives to keep up with the latest industry enhancements and changes, as such; periodic upgrades occur to the panels internal firmware and to its Windows™ based Shield Neo NX Config Tool and Neo NX NX10-AMP software. To make sure that the correct version of firmware and software are being used, Shield recommends that our partners be vigilant of technical information received from Shield and periodically review the Shield secured website for the most current versions of both. If you have any questions or concerns about the appropriate software and/or firmware, contact the Shield Technical Support Team.

1 Introduction / Overview

1.1 Product Description

This manual covers the installation and operation of the Neo NX10-FACP-1L, NX10-FACP-2 and NX10-FACP-4 Fire Alarm Control Panels or FACPs. Each FACP comes in its standard red colour.

- The NX10-FACP-1L is a single loop analogue addressable FACP with two notification appliance circuits.
- The NX10-FACP-2 is a two-loop analogue addressable FACP with two notification appliance circuits.
- The NX10-FACP-4 is a four-loop analogue addressable FACP with four notification appliance circuits.

The NX10-FACP-1L cannot support optional NX10-EM-PSU or NX10-EM-LPD modules.

The NX10-FACP-1L, NX10-FACP-2 and NX10-FACP-4 models are compatibility tested for use with the Shield range of intelligent detectors and modules, refer to Section 1.2.2 SLC Devices for a full list of devices. Each SLC (Signalling Line Circuit) loop supports the connection of 126 devices in any combination of intelligent detectors and modules.

1.2 System Components

1.2.1 Internal Peripherals

The following internal peripherals can be installed in a Neo NX10-FACP:

		Document
NX10-EM-LPD	SLC/NAC Expansion Module (cannot be used with NX10-ACS-1L)	NX686-011
NX10-EM-PSU	Power Supply Expansion Module (cannot be used with NX10-ACS-1L)	NX686-012
NX10-FANET4	Network Interface Module, Style 4 (Class B)	NX686-013
NX10-FANET7	Network Interface Module, Style 7 (Class A)	NX686-013
NX10-EM-PSU6	6 Amp Power Supply Charger	NX686-028
NX10-EM-ASW-16	Switch/LED Module with 16 Switches and 48 LEDs	NX686-020
NX10-EM-ACM-6	Fan/Damper Control Module	NX686-078
NX10-FA-LED16	LED Annunciator Module, 16 Red and 16 Yellow	NX686-020
NX10-FA-LED32R	LED Annunciator Module, 32 Red	NX686-020
NX10-FA-LED32Y	LED Annunciator Module, 32 Yellow	NX686-020
NX10-EM-IO48	16 Switch Input and 48 LED Driver Outputs	NX686-082
NX10-EM-PRN	Printer Module with Mounting Plate	NX686-022
NX10-AMP-80	Audio Amplifier with Two 40-Watt Speaker Circuits	NX686-032
NX10-ZS	Audio Zone Splitter Module	NX686-054

1.2.2 SLC Devices

	Addressable Pull Stations	Document
S-A4061	Dual Action Addressable Manual Pull Station	APD0519A130107
	Intelligent Analog/Addressable Detectors	
S-A5011	Enhanced Photoelectric Smoke Detector	39215-388
S-A5014	Enhanced Multi-Criteria Smoke Detector	39215-388
S-A5013	New Intelligent Heat Detector	39215-388
	Base	
S-A5001	SA Series 4” Low-Profile Detector Base (Isolating)	39215-388
	Addressable Modules	
S-A5041	Enhanced Switch Monitor Module	APD00994 A220503
S-A5043	Enhanced Relay Output Module	APD1000 A220503
S-A5044	Enhanced NAC Module	APD1002 A220503
S-A5042	Enhanced Dual Switch Monitor Module	APD0996 A220503
S-A4041	Mini Monitor Module	39214-632

S-A4044	Priority Switch Monitor Module	39214-426
S-A4042	Dual Switch Monitor Module	39214-432
S-A4045	I/O Relay Output & Switch Monitor Module	39214-427
S-A4046	NAC Output Module	39214-428
S-A4050	Relay Module	39214-425
	Loop Isolator Module	
S-A4051	Isolator Module (requires S-A4002 Isolator Mounting Base)	39214-424
S-A4002	Isolator Mounting Base for S-A4051 (fits 3” octagon electrical box)	39214-424
	Loop Powered Sounder/Beacons and Sounder Beacon Bases	
S-A4025	Enhanced Open Area Sounder/Beacon (Loop Powered) - Red	69214-690
S-A4021	Open Area Sounder (Loop Powered) - Red	39214-633
	Apollo XP95 Analog/Addressable Detectors	
S-A4011E	XP95A Photoelectric Smoke Detector	39215-388
S-A4014E	XP95A Multi-Criteria Smoke Detector	39215-388
S-A4013E	XP95A Heat Detector	39215-388
S-A4011	Photoelectric Smoke Detector	39214-035
S-A4014	Multi Sensor Detector	39214-035
S-A4013	Heat Detector	39214-035

If you have a device with an APO suffix or no suffix at all, contact Shield Technical Support for compatibility information.

1.2.3 NAC Devices

On board notification appliance circuits (NACs) are 24 VDC filtered and regulated. Any constant 24 VDC or pulsed 24 VDC, non-synchronized, signalling device that meet the voltage and current requirements of the signal circuit are considered compatible. For a list of compatible synchronization protocol devices refer to Shield NEO Analog/Addressable Device Compatibility NX686-081.

1.2.4 Network Devices

The following additional Ad-NeT-PluS network nodes can be added to the Neo NX FACP:

		Document
NX10-FAN-C	Remote Control Annunciator, Style 4 (Class B)	NX686-003
NX10-FAN-C/ST7	Remote Control Annunciator, Style 7 (Class A)	NX686-003
NX10-FAN-D	Remote Annunciator Only, Style 4 (Class B)	NX686-003
NX10-FAN-D/ST7	Remote Annunciator Only, Style 7 (Class A)	NX686-003
NX10-FA-PENN/ST4	Peripheral Expansion Network Node Module, Style 4 (Class B)	NX686-059
NX10-FA-PENN/ST7	Peripheral Expansion Network Node Module, Style 7 (Class A)	NX686-059
NX10-FA-BMS	Building Management Ad-VIEW Graphics Interface, Style 4 (Class B)	NX686-042
NX10-FA-BMS/ST7	Building Management Ad-VIEW Graphics Interface, Style 7 (Class A)	NX686-042

1.3 Programming Manuals

Neo NX FACPs are programmed with Shield Neo NX Config Tool and Neo NX NX10-AMP software. Installers and programmers must be factory certified, for additional information regarding certification contact Shield customer service/technical support.

		Document
Neo NX Config Tool	Shield Neo PC-NeT Programming Manual	NX686-100
Neo NX NX10-AMP Software	NX10-AMP Amplifier Programming Manual	NX686-055

2 Agency Listings / Approvals / Requirements

2.1 UL864 10th Edition

This product is listed for the following services and applications.

- Local
- Smoke Control
- 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

3 Enclosure Installation and Inner Door Assembly

The NX10-FACP-1L, NX10-FACP-2 and NX10-FACP-4 FACPs are delivered fully assembled in red enclosures.

All wiring should be in accordance with National Electric Code (NEC), State and Local codes.

The area should be readily accessible with enough room to easily install and maintain the panel. Enough knockouts are provided for wiring convenience in both the top and side walls of the backbox

1. Carefully unpack the system and check for shipping damage.
2. Remove the panel's inner and outer doors and remove all circuit boards.
3. Mount the enclosure's backbox in a clean, dry, vibration-free area where extreme temperatures are not encountered.
4. Locate the top of the cabinet approximately 5½ feet (1.7 m) above the floor with the hinge mounting on the left.
5. Determine the number of conductors required for the devices and circuits to be installed.
6. Select the appropriate knockout(s) and pull the required conductors into the backbox, separating power limited from non-power limited conductors. (Refer to the recommended cable routing diagram Section 7).

3.1 Enclosure Mounting and Dimensions

The NX10-FACP-1L, NX10-FACP-2 and NX10-FACP-4 enclosure may be either surface or semi-flush mounted.

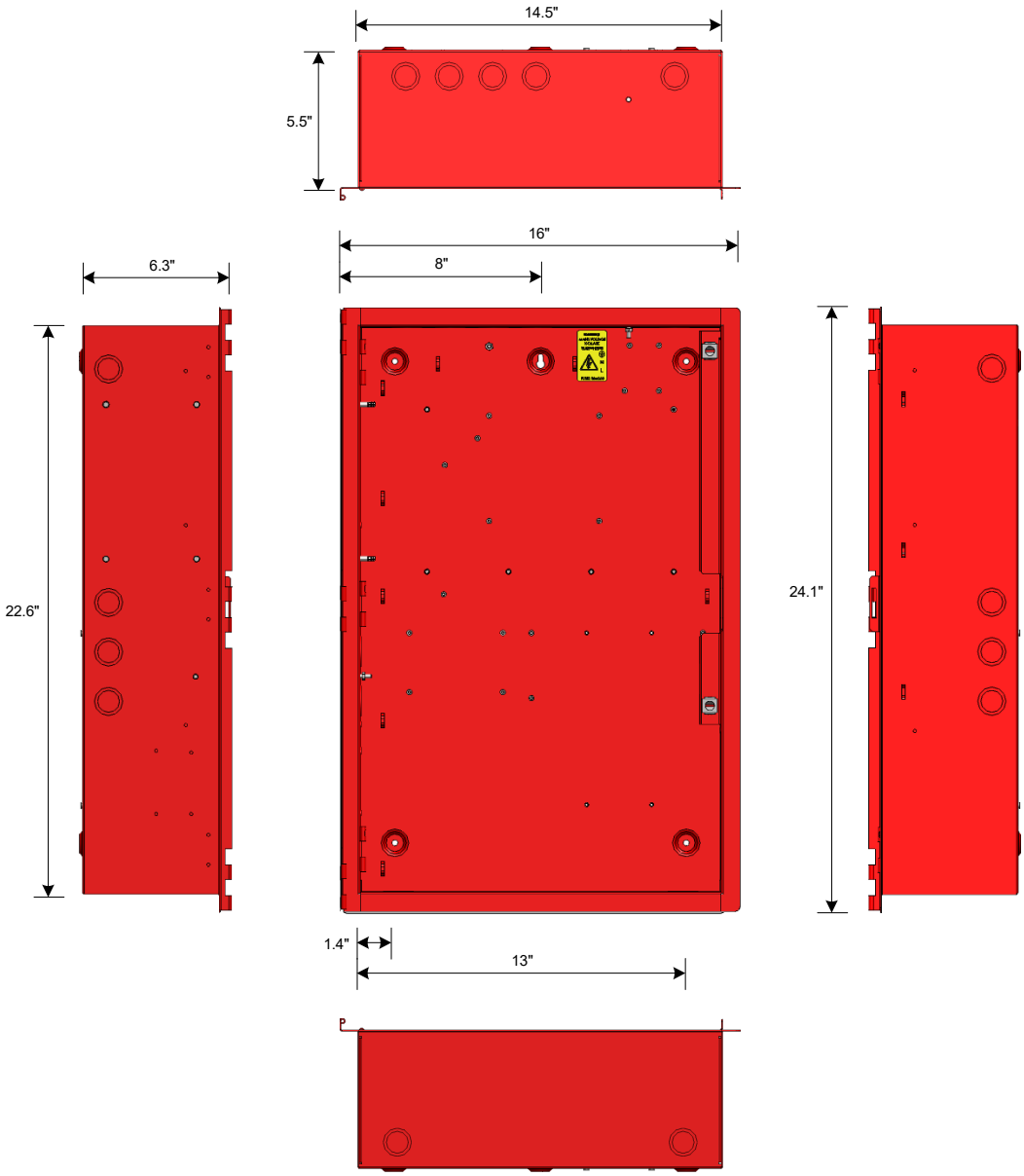


Figure 1 – NX10-FACP -(x) Enclosure Dimensions

The backbox includes fifteen double knockouts (1/2" or 3/4") for wiring requirements. Care should be taken when using the inner 1/2" knockout to avoid knocking out the 3/4" knockout.

For surface mounting there are five pre-drilled holes located on the rear of the backbox (Figure 1). The top centre mounting hole is keyed for ease of mounting.

1. Place the backbox on the wall and mark the top keyed mounting hole.
2. Drill the marked location and partially install the mounting screw in the wall.
3. Hang the backbox on the mounting screw.
4. Level the backbox and mark the remaining holes and then drill the holes.
5. 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 backbox for securing the enclosure to the wall studs.

3.2 Inner Door Assembly and Installation

The Neo NX FACP is factory assembled with a 2x2 inner door and half-plexiglass outer door.

Inner and outer doors are mounted to the backbox with AX-HPINs

The Neo NX FACP inner door supports one (1) double aperture module and two (2) optional single aperture modules. The inner door is preassembled with one NX10-ACS-DSP alphanumeric graphic display in the double aperture location and two AX-SAPs blank single aperture plates in the single aperture locations (Figure 2).

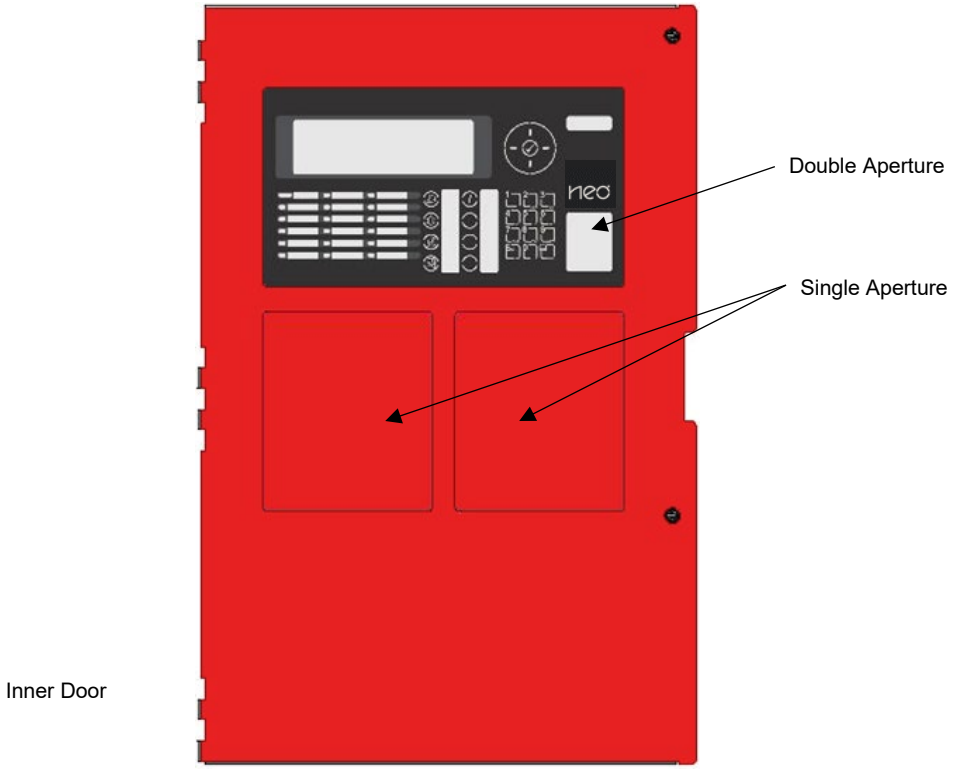


Figure 2 – NX10-FACP-(x) Inner Door

3.2.1 Inner Door Aperture Modules

Below is a list of inner door optional single aperture modules available for the Neo NX FACP.

Single Aperture Modules (size; 6 ⅝” H x 5 ⅝” W):

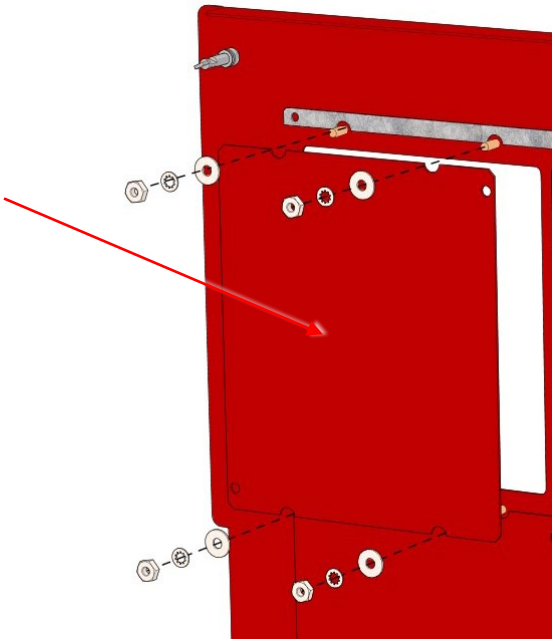
- NX10-EM-ASW-16 Switch/LED Module
- NX10-EM-ACM-6 Fan/Damper Module
- NX10-FA-LED16 LED Annunciator Module, 16 Red and 16 Yellow
- NX10-FA-LED32R LED Annunciator Module, 32 Red
- NX10-FA-LED32Y Led Annunciator Module, 32 Yellow
- NX10-EM-IO48 Switch and LED Driver
- NX10-EM-PRN Printer Module with Mounting Plate

3.2.1.1 Mounting Inner Door Aperture Modules

To install an aperture module onto the inner door of a Neo NX FACP, simply remove the nuts and washers securing the supplied single aperture blank plate to the inner door and remove the blank plate.

Place the aperture module into the single aperture location between the aperture standoffs and remount with the previously removed washers and nuts (opposite).

For individual aperture module wiring and information refer to the specific module section in this manual.



4 Main System Modules

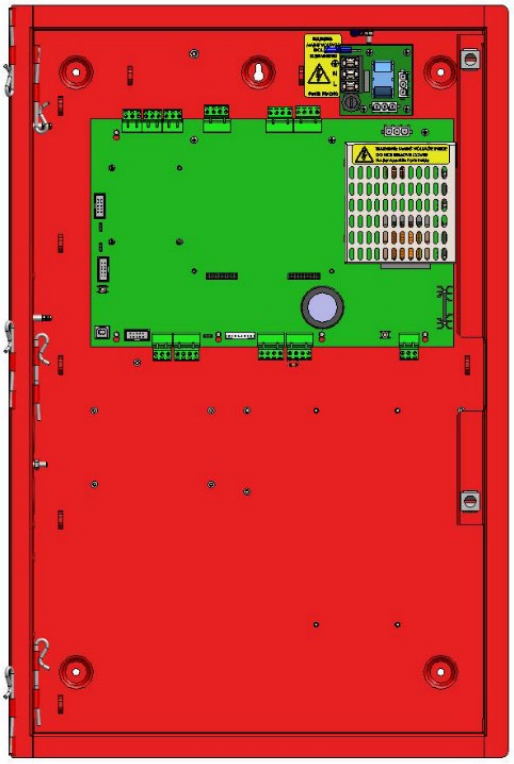
This product must be installed, serviced, and maintained in accordance with local, regional, and national codes/standards. All Neo NX FACPs are shipped fully assembled and tested as one-loop (NX10-FACP-1L), two-loop (NX10-FACP-2) or four-loop (NX10-FACP-4) FACPs. Additional circuit cards/modules for field expansion (present and future) are available and shipped in separate packing for protection, refer to Section 0 for optional modules available for these systems.

As the FACPs are shipped fully assembled, the following required modules are shipped within the enclosures and attached to the inner door.

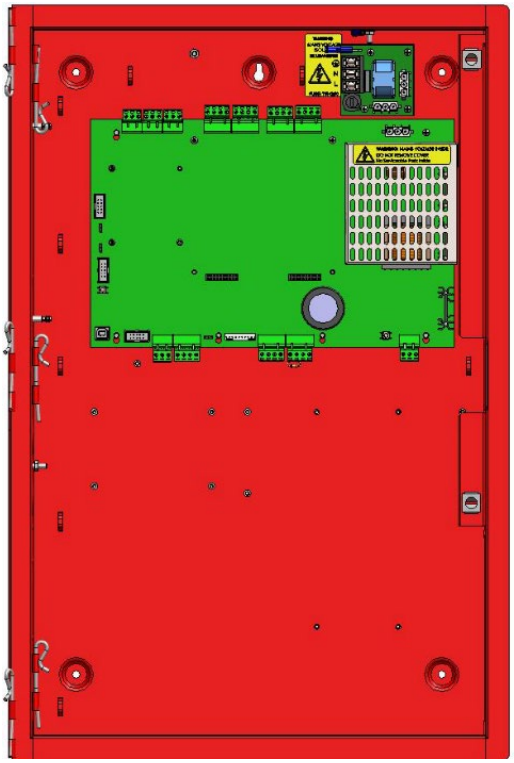
FACP	NX10-ACS-ACB	NX10-FACP Base Card	NX10-ACS-DSP	NX10-EM-LPD	NX10-EM-PSU
NX10-FACP-1L	✓	NX10-ACS-1L	✓		
NX10-FACP-2	✓	NX10-ACS-2L	✓		
NX10-FACP-4	✓	NX10-ACS-2L	✓	✓	✓

✓ = Shipped with this module installed.

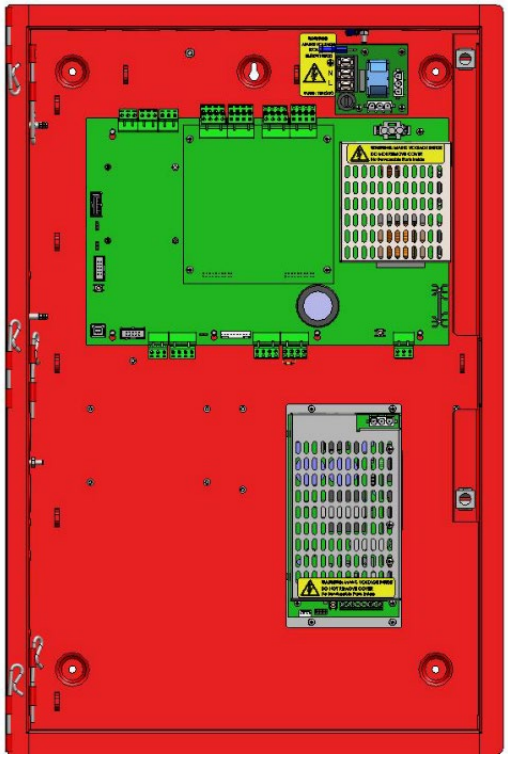
As previously mentioned, the Neo NX FACPs are shipped fully assembled, below are diagrams depicting the modules installed in the NX10-FACP-1L, NX10-FACP-2 and NX10-FACP-4 FACPs.



NX10-FACP-1L (Single Loop)



NX10-FACP-2 (Two Loop)



NX10-FACP-4 (Four Loop)

NX10-FACP-1L, 2 and 4 Inner Door

Figure 3 – NX10-FACP -1L, 2 and 4 Enclosure and Inner Door Modules

4.1 NX10-ACS-ACB AC Board

The NX10-ACS-ACB AC board is the AC interface board for the Neo NX FACP. The NX10-ACS-ACB is pre-mounted to standoffs on the rear of the backbox above the NX10-FACP base card.

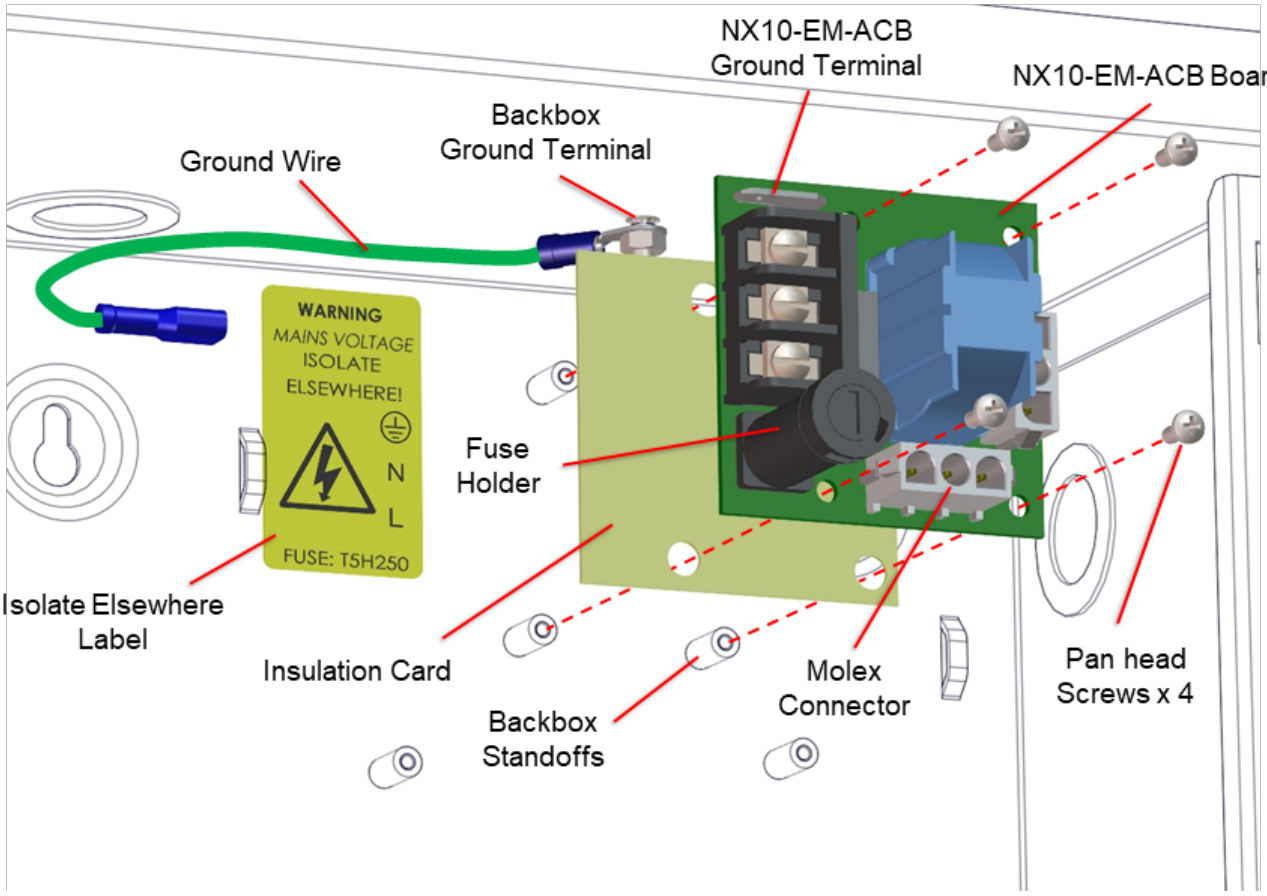


Figure 4 - NX10-ACS-ACB Location

When you choose your wiring route, make sure that any AC Mains wiring is kept separate from the low voltage wiring (SLC Loops, NAC Circuits, and any other power limited circuits).

If you do not tighten the four (4) panhead screws correctly, you will defeat the protection circuitry designed to protect the card from damage caused by lightning or static electricity

4.1.1 Installation

4.1.1.1 Package Contents

Carefully unpack the NX10-ACS-ACB Board from the box. Inside you will find:

- One (1) NX10-ACS-ACB Board
- One (1) NX10-ACS-ACB fiberglass laminated insulation card.
- One (1) Plastic bag containing:
  - One (1) Earth ground cable with washer, lock washer and hex nut
  - Four (4) panhead screws
  - One (1) Spare 5A, 250VAC Ceramic, Time Delay Fuse
  - One (1) AC isolate elsewhere label.

4.1.1.2 Remove

1. Isolate the equipment from the AC Mains supply.
2. Disconnect the battery power supply.
3. Disconnect the Primary 3-pin Molex connector.
4. Disconnect the Earth, Neutral and Live mains cables from the NX10-ACS-ACB Board (TB1).
5. Disconnect the earth cable spade connector from the NX10-ACS-ACB Board spade terminal.
6. Remove the four (4) panhead mounting screws.
7. Carefully remove the NX10-ACS-ACB Board from the backbox.

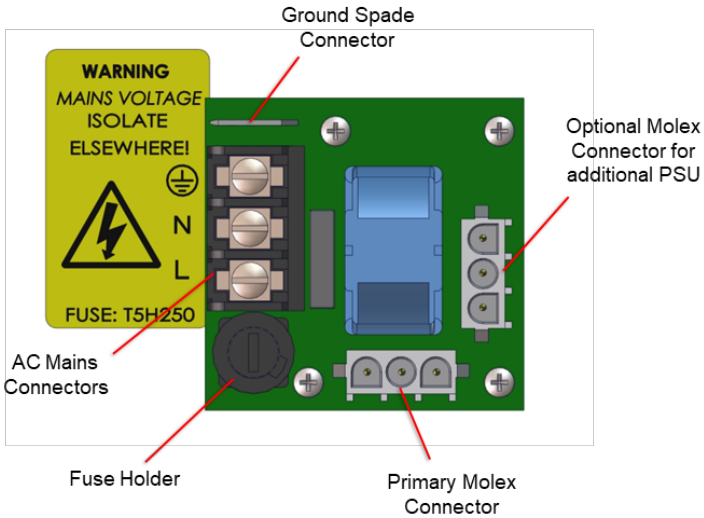
4.1.1.3 Install

1. Make sure that the correctly rated fuse is installed in the NX10-ACS-ACB fuse holder.
2. Make sure that the Fiberglass Laminated Insulation Card is in position on the backbox standoffs (Figure 4).
3. Place the NX10-ACS-ACB in position on the backbox standoffs.
4. Install the four (4) panhead mounting screws.
5. Connect the earth cable spade connector to the NX10-ACS-ACB Board spade terminal.
6. If the AC Isolate elsewhere label is not fitted to the backbox or not visible, install the new label supplied. Make sure that the label is aligned with the Earth, Neutral and Live terminals.
7. Connect the Earth, Neutral and Live mains cables to the NX10-ACS-ACB Board (TB1).
8. Connect the Primary 3-pin Molex connector.
9. Connect the battery power supply to the NX10-FACP Base Card.
10. Connect the equipment to the AC Mains supply.

4.1.2 Wiring

The NX10-ACS-ACB has three (3) AC installation wiring terminals. In addition to the installation wiring requirements, the NX10-ACS-ACB board is prewired to the NX10-FACP base card via an AC Molex connector and connected to an enclosure's backbox stud via the NX10-ACS-ACB preconnected Spade terminal with a 1-way blade connector cable (Figure 4).

4.1.2.1 Terminal Summary



Designation	Description
⏚	Earth Ground
N	AC Power Neutral
L	AC-Power Load (Hot)

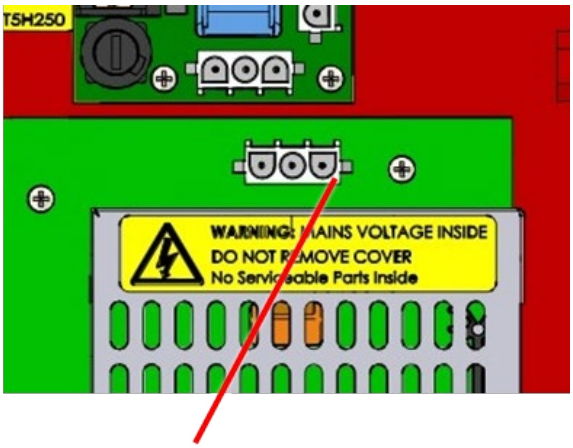
Figure 5 - NX10-ACS-ACB Wiring/Terminal Designations

4.1.2.2 Electrical Specifications

Mains Input	Supervised
Nominal Voltage **Frequency**	120V (1.4A [1 or 2 loop] / 2.8A [4 loop]) 240V (0.7A [1 or 2 loop] / 1.4A [4 loop]) 50/60Hz
Dedicated AC Branch Circuit Requirement	15A (over-current protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) and/or local codes)
Brown-out	98V nominal
On-Board AC Fuse	5A, 250VAC Ceramic, Time Delay (size 5x20mm) (Bussmann S505-5-R, Littelfuse 0215005.XP)
AC Wiring	#14 or #12 AWG Refer to NEC. If multiple AC wires are required under any of the input terminals, use 12AWG twin cable ferrule grey or Weidmuller part number 9037530000. If #10 AWG wire is required use TE Connectivity Plasti-Grip wire pin 12-10
Ground Terminal	Must be connected to a solid earth ground. Use #14 AWG (2 mm2) or larger wire with 600v insulation rating

4.2 NX10-ACS-1L One-Loop or NX10-ACS-2L Two-Loop Base Card

The NX10-ACS-1L one-loop or NX10-ACS-2L two-loop base card (referred to as NX10-FACP base card) is the main board of the Neo NX FACP and is pre-mounted to standoffs on the rear of the backbox. The NX10-FACP base card's mains supply voltage originates from the NX10-ACS-ACB board via a prewired AC Molex connector (opposite).



3-pin AC Molex Cable

Available as either a one-loop base card (NX10-ACS-1L) installed in the NX10-FACP-1L or a two-loop base card (NX10-ACS-2L) installed in the NX10-FACP-2 and NX10-FACP-4s, the NX10-FACP base card includes various required inputs and outputs for a FACP and many none required ones. Prewired inputs and outputs of the NX10-FACP base card include the NX10-ACS-ACB board AC Molex connector, as previously discussed, a 0 OHM end-of-line (EOL) resistor installed across the ANC PSU FAULT terminals and a 10-pin flat-ribbon cable connection (PL2) originating from the preinstalled NX10-ACS-DSP keyboard display module.

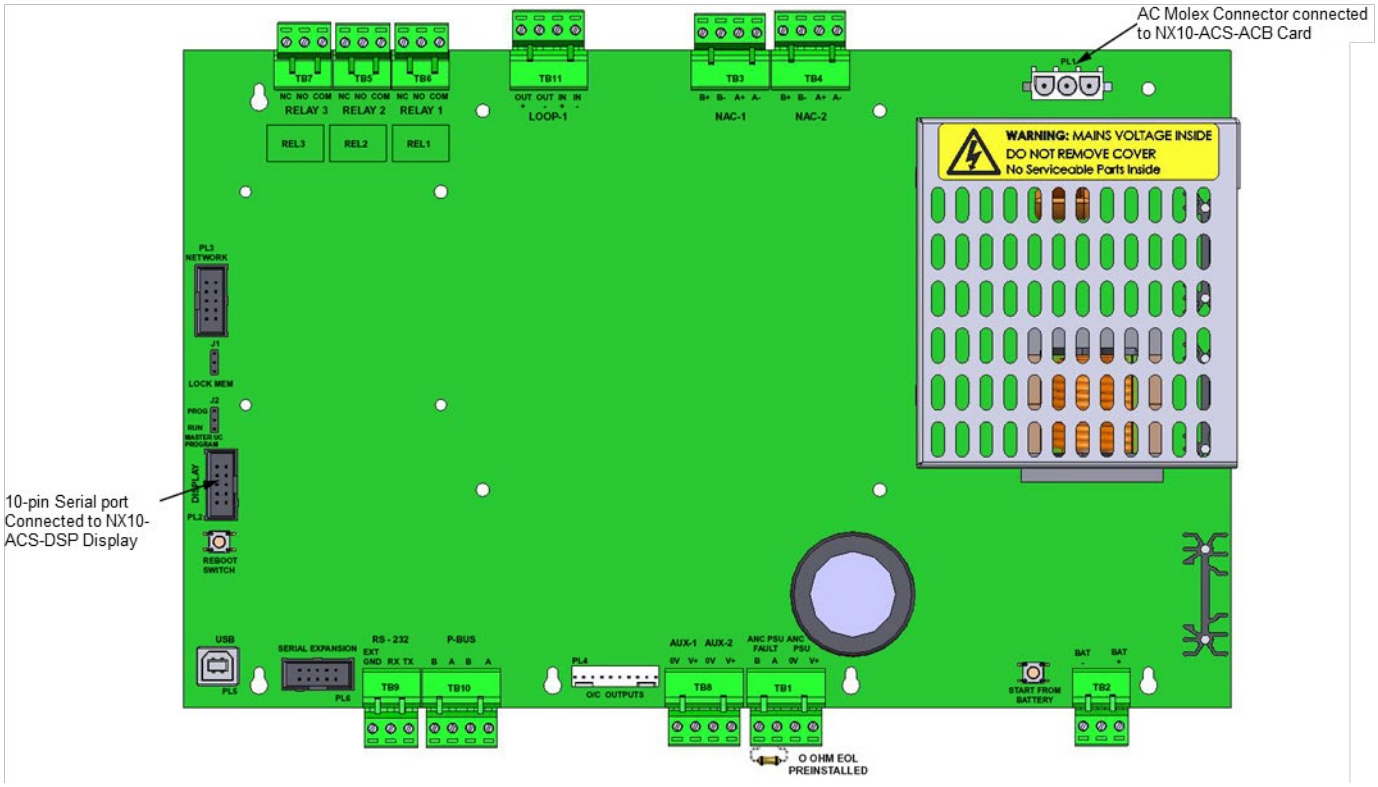


Figure 6 – NX10-FACP One-Loop Base Card (NX10-FACP -1L)

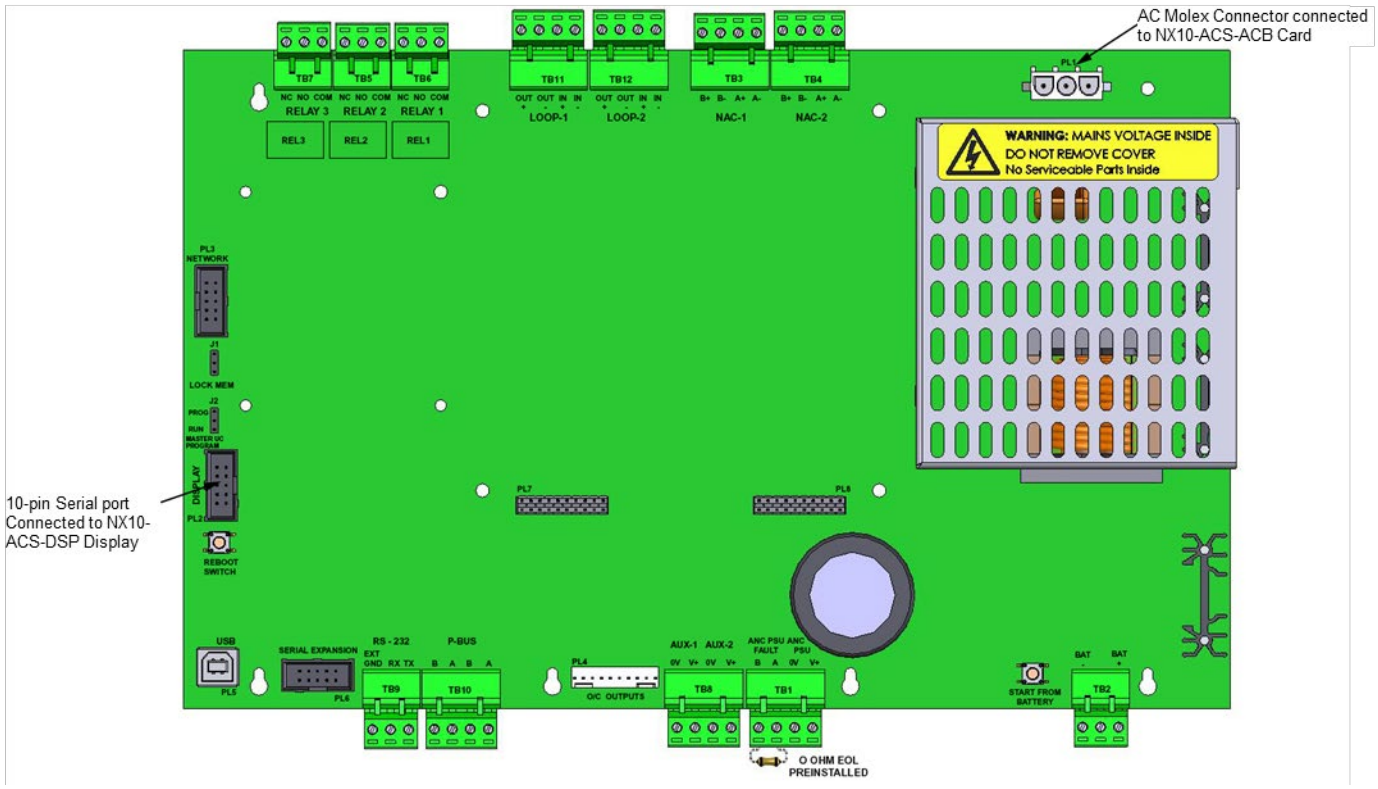


Figure 7 – NX10-FACP Two-Loop Base Card (NX10-FACP-2)

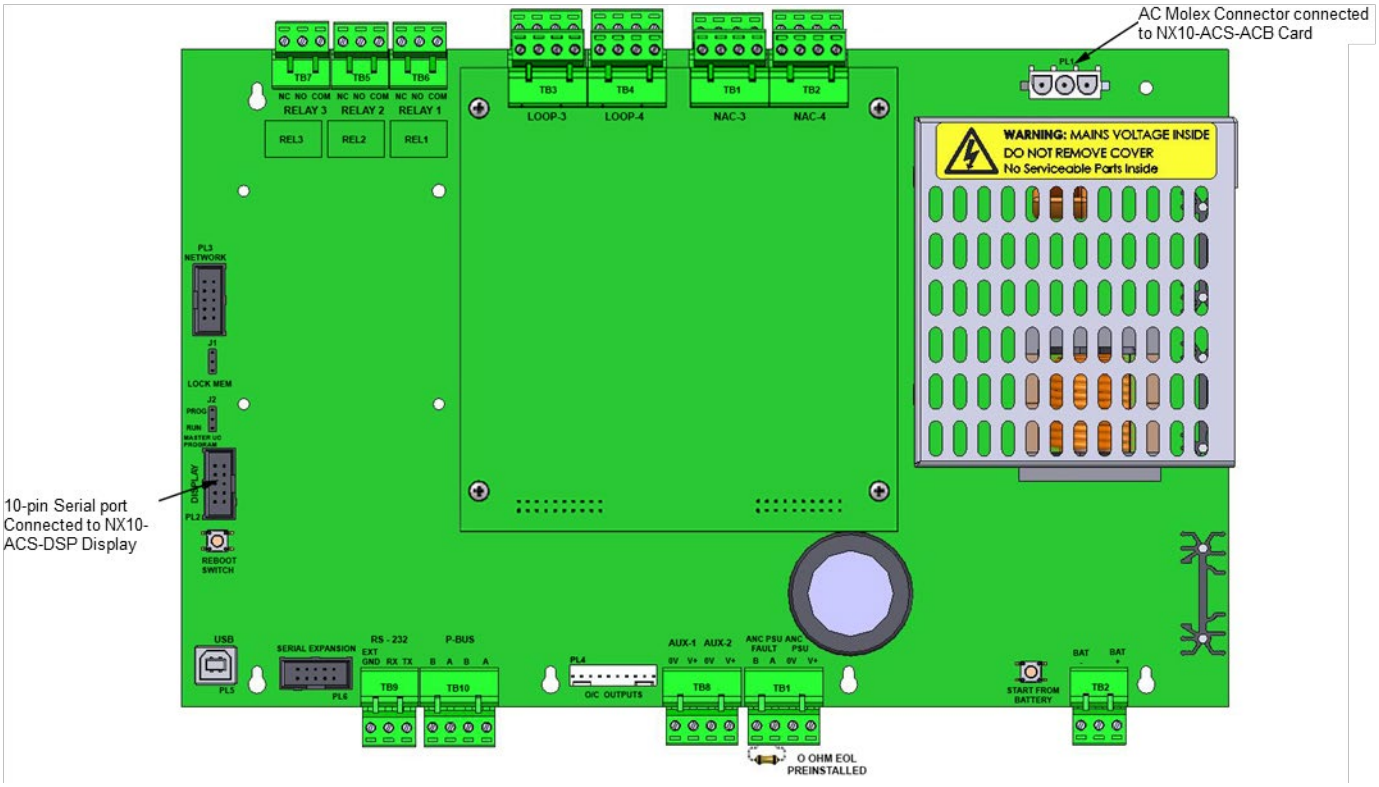


Figure 8 – NX10-FACP-2 Two-Loop Base Card with NX10-EM-LPD SLC/NAC Expansion Module (NX10-FACP-4)

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

If you do not tighten the three (3) panhead screws correctly, you will defeat the protection circuitry designed to protect the card from damage caused by lightning or static electricity.

If multiple wires are required under any of the terminals, use Weidmuller twin cable ferrules.

Keep a minimum of 1/4" (6.4 mm) separation between all power-limited and non-power-limited conductors. AC and battery wiring are non-power limited.

4.2.1 Installation

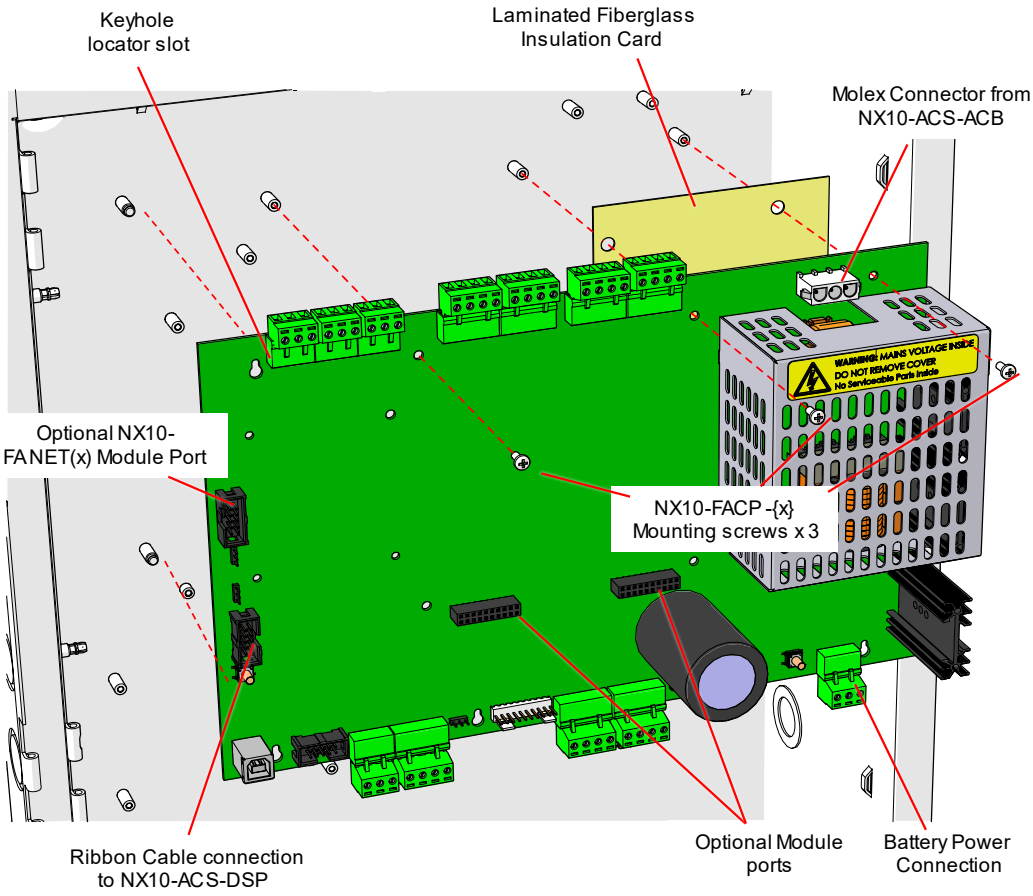


Figure 9 - NX10-FACP Base Card Installation

4.2.1.1 Package Contents

- One (1) NX10-ACS-1L or NX10-ACS-2L
- One (1) NX10-FACP fiberglass laminated insulation card.
- One (1) NX686-300 Quick Start Document.
- One (1) Plastic bag containing:
    - One (1) double ended 3-pin male Molex cable harness.
    - Four (4) UL 10K Class B End of Line resistors.
    - Three (3) panhead screws.
    - One (1) red (+) and One (1) black (-) battery lead.
    - One (1) battery link with 10A, 250V fuse.
    - One (1) Spare 2-pin little jumper

4.2.1.2 Remove

1. Disconnect all AC and DC power from the system.
2. Disconnect all the field wiring terminal blocks and the 3-pin Molex cable.
3. Disconnect the 10-pin ribbon cable that leads to the NX10-ACS-DSP keyboard display.
4. Remove any NX10-FANET or NX10-EM-LPD modules if fitted to the NX10-FACP card.
5. Remove the three (3) panhead screws that secure the NX10-FACP base card to the backbox.
6. Carefully lift the NX10-FACP base card from the five (5) top-hat stand-offs.
7. Transfer any modules removed in Step 4 to the new NX10-FACP base card.

4.2.1.3 Install

1. Place the laminated fiberglass insulation card in position on the backbox (Figure 9).
2. Carefully slide the NX10-FACP base card onto the five (5) top-hat stand-offs.
3. Install the three (3) panhead screws that secure the NX10-FACP base card to the backbox.
4. Connect the 3-pin Molex cable and field wiring terminal blocks.
5. Connect the 10-pin ribbon cable that leads from the NX10-ACS-DSP keyboard display.

4.2.2 Wiring

4.2.2.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB1	ANC PSU Fault B ANC PSU Fault A	Supervised normally closed relay contact input. Normally used for NX10-EM-PSU power supply expansion module but can monitor any normally closed contact. Shipped with 0 Ohm EOL (end-of-line) resistor. Any ancillary contact monitored must be located within 20 feet of the NX10-FACP base card in rigid conduit.
	ANC PSU 0V ANC PSU V+	Used for the input of 27.4 VDC from the NX10-EM-PSU power supply expansion module. (No Connection on NX10-ACS-1L)
TB2	BAT – BAT +	Negative power connection of battery Positive power connection of battery
TB3	NAC-1 B+ NAC-1 B- NAC-1 A+ NAC-1 A-	Notification appliance circuit 1, Class B positive Notification appliance circuit 1, Class B negative Notification appliance circuit 1, Class A positive, Return Notification appliance circuit 1, Class A negative, Return
TB4	NAC-2 B+ NAC-2 B- NAC-2 A+ NAC-2 A-	Notification appliance circuit 2, Class B positive Notification appliance circuit 2, Class B negative Notification appliance circuit 2, Class A positive, Return Notification appliance circuit 2, Class A negative, Return
TB5 Fail-Safe Trouble Relay (default)	RELAY 2 NC RELAY 2 NO RELAY 2 COM	NC (open contact as relay is inverted on power up) NO (closed contact as relay is inverted on power up) COM (relay contact common)
TB6 Supervisory Relay (default)	RELAY 3 NC RELAY 3 NO RELAY 3 COM	NC (closed contact) NO (open contact) COM (relay contact common)
TB7 Alarm Relay (default)	RELAY 1 NC RELAY 1 NO RELAY 1 COM	NC (closed contact) NO (open contact) COM (relay contact common)
TB8	AUX-1 0V AUX-1 V+ AUX-2 0V AUX-2 V+	Resettable 24 VDC Auxiliary Power, 0V (negative) Resettable 24 VDC Auxiliary Power, V+ (positive) Non-Resettable 24 VDC Auxiliary Power, 0V (negative) Non-Resettable 24 VDC Auxiliary Power, V+ (positive)
TB9	RS-232 Ground RS-232 Receive RS-232 Transmit	DB9 Printer Cable Interface:
TB10	PBUS B PBUS A PBUS B PBUS A	PBUS B = COMM B Output PBUS A = COMM A Output PBUS B = COMM B Output PBUS A = COMM A Output

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB11	LOOP-1 OUT+ LOOP-1 OUT- LOOP-1 IN+ LOOP-1 IN-	LOOP-1 OUT+ = Class B positive output LOOP-1 OUT- = Class B negative output LOOP-1 IN+ = Class A positive Return LOOP-1 IN- = Class A negative Return
B12 On NX10-FACP-2 and NX10-FACP-4 FACPs	LOOP-2 OUT+ LOOP-2 OUT- LOOP-2 IN+ LOOP-2 IN-	LOOP-2 OUT+ = Class B positive output LOOP-2 OUT- = Class B negative output LOOP-2 IN+ = Class A positive Return LOOP-2 IN- = Class A negative Return
J1	LOCK MEM	Upload/download lock, position one locked, position two unlocked
J2	MASTER UC PROGRAM	Position one PROG firmware, position two panel RUN
PL1	Molex Connector	AC Mains Molex connector, prewired to NX10-ACS-ACB board
PL2	DISPLAY	10-Pin Serial Port for NX10-ACS-DSP Keyboard Display Module
PL3	NETWORK	10-Pin Serial Port for optional NX10-FANET4 or NX10-FANET7 Network Module
PL4	O/C OUTPUTS	10-Pin Output Open Collector for optional NX10-EM-RL8 Eight Point Relay Module
PL5	USB	USB Port for Uploading/Downloading Shield Neo NX Config Tool and for Downloading to the Shield Neo NX Service Tool.

RS232 wiring must be located within 20 feet of the NX10-FACP base card within the same room wired in rigid conduit. In addition, this Port is shared with the USB and Serial Expansion Ports.

4.2.2.2 Electrical Specifications

NX10-FACP Base Card	5A Power (Section 0)
NX10-EM-PSU Expansion Power Supply (Provided with NX10-FACP-4)	3A Power Additional NAC Circuit Power
Battery Circuit Supervision	Non-Power-Limited, Supervised for Short Circuit, Open Circuit, Ground Fault, Charger Failure, Battery Disconnection and Battery Cell Failure If the batteries are disconnected the charger output is turned off.
Battery Charging Current	2.3 Amp, Temperature Compensated
Nominal Charging Voltage	27.4 VDC
Battery Type	Sealed Lead-Acid
Minimum Battery Capacity	7Ah
Maximum Battery Capacity	75Ah
Battery Deep Discharge Protection	Battery Disconnection < 19 VDC Nominal
Battery Link Wire Fuse	10A, 250 VAC Ceramic, Time Delay (size 5x10mm) Bussmann Part#: S505-10-R Littelfuse Part#: 0215010.XP

4.2.3 LEDs

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	Flashes when data transmitted
10	Serial Communications – Receive	Flashes when data received

4.2.4 Battery Charger

4.2.4.1 Wiring

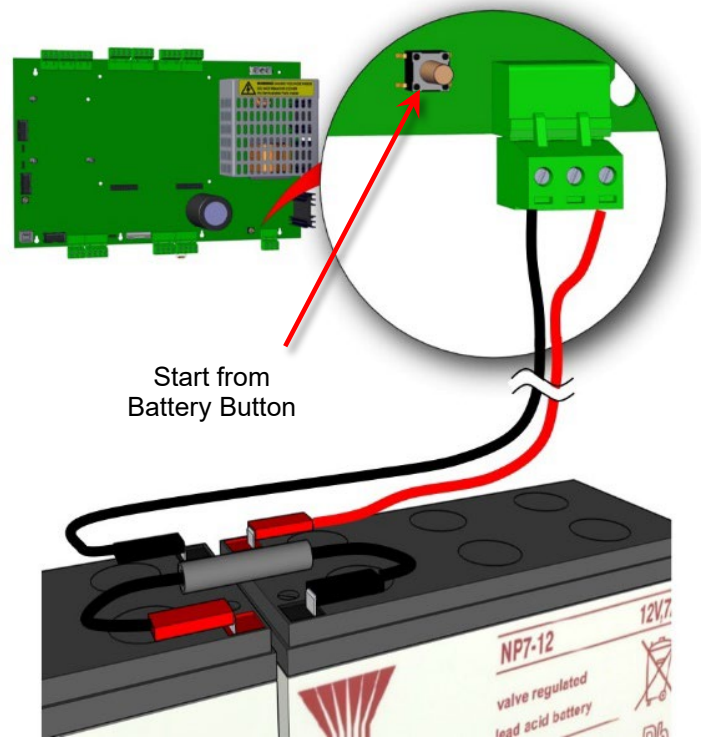


Figure 10 - Battery Connection

To wire batteries to the NX10-FACP base card, connect the two (2) supplied battery leads to the BAT+ (red battery lead) and BAT- (black battery lead) terminals of the NX10-FACP base card. Connect the red battery lead (BAT+) to the positive lead of one 12 VDC battery and connect the black battery lead (BAT-) to the negative lead of the second 12 VDC battery. Finally, connect the supplied battery link with 10A, 250V fuse from the negative lead of the first 12 VDC battery to the positive lead of the second 12 VDC battery. If a fully charged set of batteries are connected to the NX10-FACP base card, the panel can be powered without AC by pressing the Start from Battery Button (Figure 11).

4.2.4.1.1 NX10-FACP-1L One-Loop FACP

		Quiescent Load			Alarm Load		
Equipment		I (A)	x	Total	I (A)	x	Total
NX10-ACS-1L (One-Loop)		0.110	1.0	= 0.110	0.195	1.0	= 0.195
Sensor / SLC Current[1]	SLC #1		1.25[2]	=		1.25	=
NX10-FANET4 or NX10-FANET7 Network Card		0.02 or 0.062	1.0	=	0.02 or 0.062	1.0	=
NX10-FAN-C (D) – Style 4 or 7		0.078	1 to (x)[3]	=	0.140	1 to (x)	=
NX10-EM-ASW-16, NX10-EM-ACM-6, NX10-FA-LED16, NX10-FA-LED32R, NX10-FA-LED32Y or NX10-EM-IO48		0.014	1 to 16[4]	=	0.055	1 to 16	=
AUX #1 (Resettable) Supply Output[5]			1.0	=		1.0	=
AUX #2 Supply Output[5]			1.0	=		1.0	=
NAC Output 1[6]						1.0	=
NAC Output 2[6]						1.0	=
Total		ΣQuiescent Load		=	ΣAlarm Load		=
		x 24 hr. or 60 hr.		Ah	x 0.0833[7] hr.		Ah
		Total Quiescent Current		Ah	Total Alarm Current		Ah
		Total Load (Quiescent + Alarm)					Ah
		Total Load x 1.25 (battery de-rating factor)					Ah

Figure 11 - Standby Battery Calculations

[1] 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 Shield Neo NX Config Tool).

[2] The calculated loop loading must be multiplied by a factor of 1.25 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 backup.

[3] The NX10-FAN is a networked remote annunciator, the number of annunciators is based on network nodes and power available.

[4] 16 switch LED modules can be installed on an NX-FACP system.

[5] 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.

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

[7] 5 minutes in alarm, change to .166 for 10 minutes in alarm.

4.2.4.1.2 NX10-FACP-2 Two-Loop FACP

		Quiescent Load			Alarm Load		
Equipment		I (A)	x	Total	I (A)	x	Total
NX10-ACS-2L (Two-Loop)		0.110	1.0	= 0.110	0.195	1.0	= 0.195
Sensor / SLC Current[8]	SLC #1		1.25[9]	=		1.25	=
	SLC #2		1.25[9]	=		1.25	=
NX10-FANET4 or NX10-FANET7 Network Card		0.02 or 0.062	1.0	=	0.02 or 0.062	1.0	=
NX10-FAN-C (D) – Style 4 or 7		0.078	1 to (x)[10]	=	0.140	1 to (x)	=
NX10-EM-ASW-16, NX10-EM-ACM-6, NX10-FA-LED16, NX10-FA-LED32R, NX10-FA-LED32Y or NX10-EM-IO48		0.014	1 to 16[11]	=	0.055	1 to 16	=
AUX #1 (Resettable) 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 1.25 (battery de-rating factor)					Ah

[8] 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 Shield Neo NX Config Tool).

[9] The calculated loop loading must be multiplied by a factor of 1.25 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 backup.

[10] The NX10-FAN is a networked remote annunciator, number of annunciators is based on network nodes and power available.

[11] 16 switch LED modules can be installed on an NX10-FACP system.

[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.

4.2.4.1.3 NX10-FACP-4 Four-Loop FACP

		Quiescent Load			Alarm Load		
Equipment		I (A)	x	Total	I (A)	x	Total
NX10-ACS-2L (Two-Loop)		0.110	1.0	= 0.110	0.195	1.0	= 0.195
Sensor / SLC Current[15]	SLC #1		1.25[16]	=		1.25	=
	SLC #2		1.25[16]	=		1.25	=
	SLC #3		1.25[16]	=		1.25	=
	SLC #4		1.25[16]	=		1.25	=
NX10-FANET4 or NX10-FANET7 Network Card		0.02 or 0.062	1.0	=	0.02 or 0.062	1.0	=
NX10-FAN-C (D) – Style 4 or 7		0.078	1 to (x)[17]	=	0.140	1 to (x)	=
NX10-EM-ASW-16, NX10-EM-ACM-6, NX10-FA-LED16, NX10-FA-LED32R, NX10-FA-LED32Y or NX10-EM-IO48		0.014	1 to 16[18]	=	0.055	1 to 16	=
AUX #1 (Resettable) Supply Output[19]			1.0	=		1.0	=
AUX #2 Supply Output [19]			1.0	=		1.0	=
NAC Output 1[20]						1.0	=
NAC Output 2[20]							
NAC Output 3[20]							
NAC Output 4[20]						1.0	=
Total		ΣQuiescent Load		=	ΣAlarm Load		=
		x 24 hr. or 60 hr.		Ah	x 0.0833[21] hr.		Ah
		Total Quiescent Current		Ah	Total Alarm Current		Ah
		Total Load (Quiescent + Alarm)					Ah
		Total Load x 1.25 (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 Shield Neo NX Config Tool).

[16] The calculated loop loading must be multiplied by a factor of 1.25 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 backup.

[17] The NX10-FAN is a networked remote annunciator, number of annunciators is based on network nodes and power available.

[18] 16 switch LED modules can be installed on an NX-FACP system.

[19] 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.

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

[21] 5 minutes in alarm, change to .166 for 10 minutes in alarm.

4.2.5 Signalling Line Circuit (SLC)

The NX10-FACP-1L (NX10-ACS-1L base card) FACP provides one Class X, A or B signalling line circuit. The NX10-FACP-2 (NX10-ACS-2L base card) FACP provides two Class X, A or B signalling line circuits, and the NX10-FACP-4 (NX10-ACS-2L base card and NX10-EM-LPD SLC/NAC expansion module) FACP provides four Class X, A or B signalling line circuits.

For expansion capabilities, the NX10-FACP-2 FACP (NX10-ACS-2L two-loop base card) can be expanded to four Class X, A or B signalling line circuits (SLC) by installing an optional NX10-EM-LPD SLC/NAC expansion module.

Class X wiring requires the use of Shield devices with built-in isolators.

4.2.5.1 Wiring

To wire the signalling line circuit Class B, wire the NX10-FACP base card Loop OUT + and OUT - to the positive and negative inputs of the field analog/addressable devices. Also, wire (jumper) the Loop OUT + and OUT – terminals to the Loop IN + and IN – terminals, as shown in (Figure 12). This wiring (jumper arrangement) of the OUT and IN terminals is to maintain signalling line circuit voltage monitoring of the SLC circuit.

For multiple wires to be used during Class B wiring under the Loop OUT + and OUT – terminals use twin cable ferrules 18AWG to 12AWG, manufactured by Weidmuller.

To wire the signalling line circuit Class A, wire the NX10-FACP base card Loop OUT + and OUT - to the positive and negative inputs of the field analog/addressable devices, at the last wired analog/addressable device wire the positive and negative outputs to the Loop IN + and IN – terminals of the NX10-FACP base card.

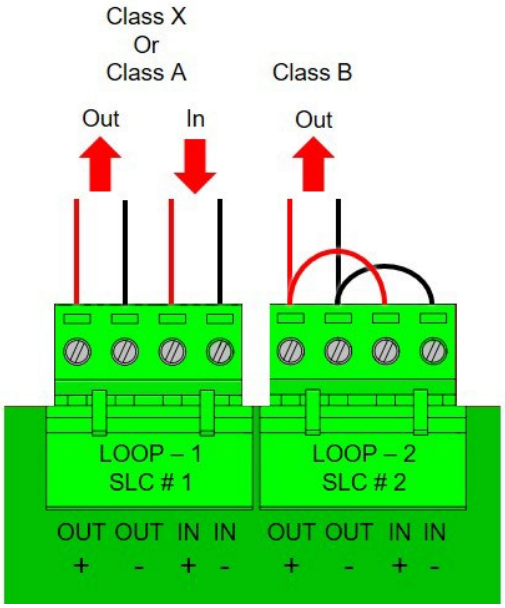
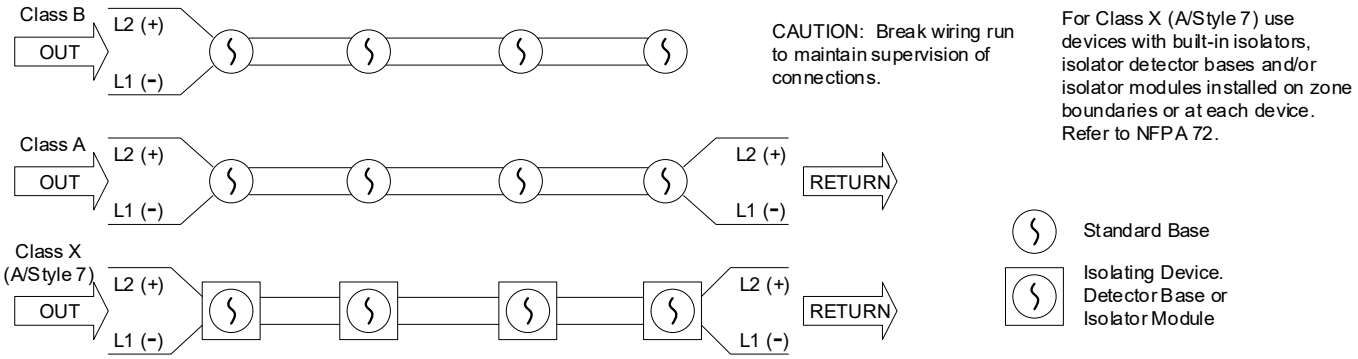


Figure 12 - Base Card SLC Circuit Wiring



During normal operation, the FACP 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. While in panel programming, the FACP will drive the SLC from the OUT connections only to enable easier SLC wiring trouble diagnosis.

4.2.5.1.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB11	LOOP-1 OUT+ LOOP-1 OUT- LOOP-1 IN+ LOOP-1 IN-	LOOP-1 OUT+ = Class B positive output LOOP-1 OUT- = Class B negative output LOOP-1 IN+ = Class A positive Return LOOP-1 IN- = Class A negative Return
TB12 On NX10-FACP-2 and NX10-FACP-4 FACPs	LOOP-2 OUT+ LOOP-2 OUT- LOOP-2 IN+ LOOP-2 IN-	LOOP-2 OUT+ = Class B positive output LOOP-2 OUT- = Class B negative output LOOP-2 IN+ = Class A positive Return LOOP-2 IN- = Class A negative Return

4.2.5.1.2 Electrical Specifications

Supervision	Supervised for Short Circuit, Open Circuit and Ground Fault POWER-LIMITED
Max. Voltage, Rated Current and Frequency	24 VDC, Filtered Regulated 0.5 Amp Total Output Load must not exceed panel supply rating, maximum 5A (8A if NX10-EM-PSU installed).
Minimum Return Voltage	17 VDC
Max. Line Impedance	Below
Analog/Addressable Device Compatibility	Refer to Section 1.2.2 SLC Devices
Wiring Classification	Class A, Class X or Class B
Impedance values for testing at which ground faults are annunciated	0 Ohms

Signalling Line Circuit (SLC) Line Impedance

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 considered to make sure the devices are receiving an adequate supply voltage (table below):

Maximum Circuit Impedance	72Ω
Insulation Resistance (Core-Core and Core-Screen)	2M Ω
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

4.2.6 Notification Appliance Circuit (NAC)

The NX10-FACP-1L (NX10-ACS-1L base card) and the NX10-FACP-2 (NX10-ACS-2L base card) FACPs provide two Class A or B notification appliance circuits. The NX10-FACP-4 NX10-ACS-2L base card and NX10-EM-LPD SLC/NAC expansion module) FACP provides four Class A or B notification appliance circuits. For expansion capabilities, the NX10-FACP-2 FACP (NX10-ACS-2L two-loop base card) can be expanded to four Class A or B notification appliance circuits (NAC) by installing either an optional NX10-EM-LPD SLC/NAC expansion module or a NAC expansion module.

Each notification appliance circuit can be programmed for synchronized or non-synchronized strobes/signal patterns. Protocols include Gentex, Wheelock and System Sensor. In addition to the synchronization programming, silence able or non-silence able strobe programming is available.

For a list of notification appliance compatibilities refer to Shield Neo Device Compatibility Document NX686-081.

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-silence able synchronization strobes are programmed, strobes will continue to flash after signal silence. In addition, each notification appliance circuit is capable of being programmed for Positive Alarm Sequence (P.A.S.) signalling.

4.2.6.1 Wiring

To wire the notification appliance circuits Class B, wire B+ and B- to the positive and negative inputs of the notification appliance devices, B+ to positive and B- to negative. Terminate the supplied UL Listed 10K end-of-line (EOL) resistor (part#: 855-027-103) at the last notification appliance.

To wire the notification appliance circuits Class A, wire B+ and B- to the positive and negative inputs of the notification appliance devices, B+ to positive and B- to negative. At the last notification appliance, return the B+ wire to A+ and the B- wire to A- on the notification appliance circuit terminals.

Notification appliance circuit polarity markings represent alarm (active) condition.

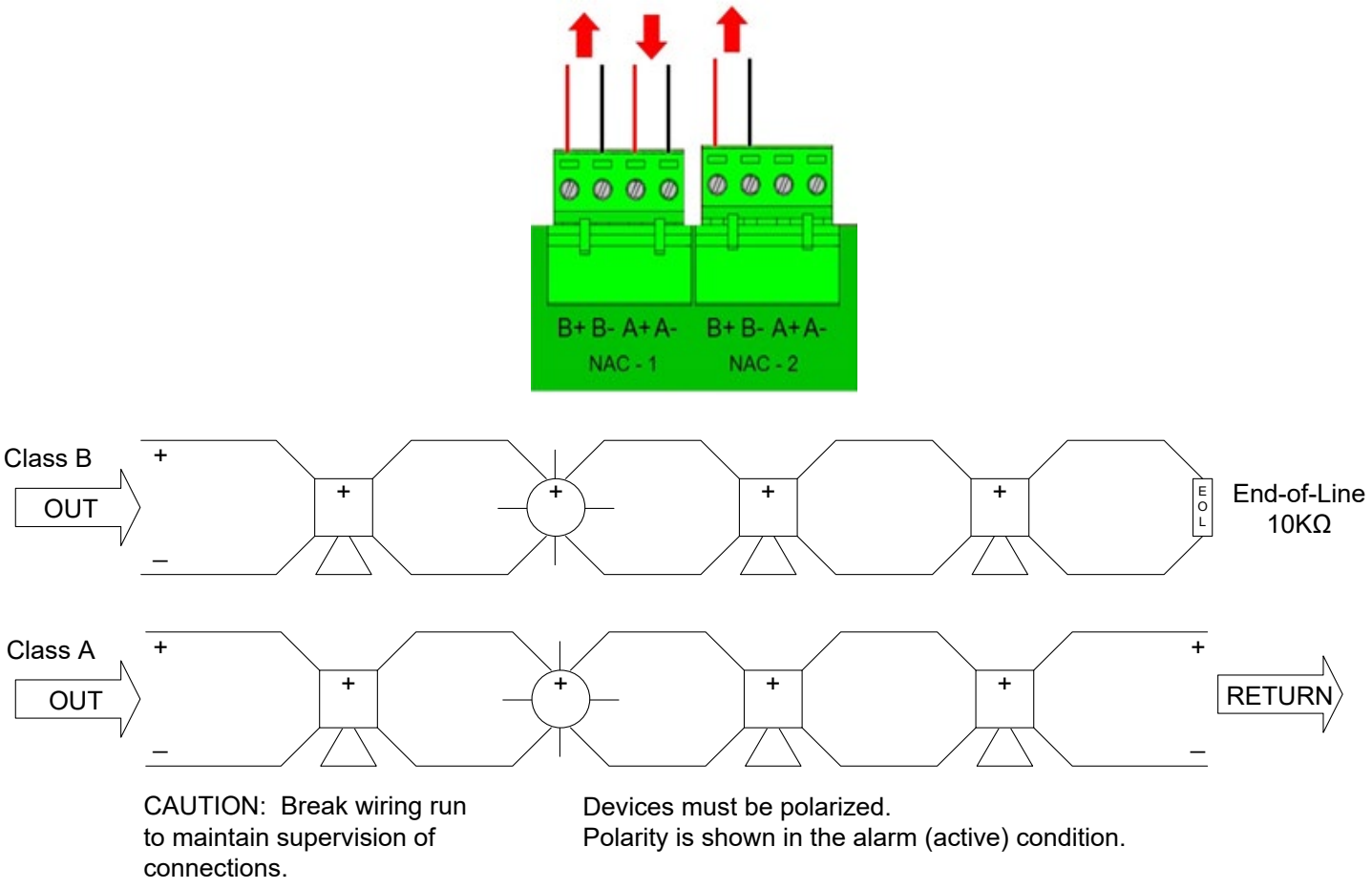


Figure 13 - Base Card NAC Circuit Wiring

4.2.6.1.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB3	NAC-1 B+	Notification appliance circuit 1, Class B positive
	NAC-1 B-	Notification appliance circuit 1, Class B negative
	NAC-1 A+	Notification appliance circuit 1, Class A positive, Return
	NAC-1 A-	Notification appliance circuit 1, Class A negative, Return
TB4	NAC-2 B+	Notification appliance circuit 2, Class B positive
	NAC-2 B-	Notification appliance circuit 2, Class B negative
	NAC-2 A+	Notification appliance circuit 2, Class A positive, Return
	NAC-2 A-	Notification appliance circuit 2, Class A negative, Return

4.2.6.1.2 Electrical Specifications

Supervision	Supervised for Short Circuit, Open Circuit and Ground Fault POWER-LIMITED
Max. Current, Rated Voltage and Frequency	2 Amps @ 24 VDC, Filtered and Regulated Power, per NAC circuit, not to exceed 7 Amps across all four NAC circuits when the NX10-EM-PSU Expansion Power Supply Module is supplied (NX10-FACP-4) or added (NX10-FACP-2)
Max. Line Impedance	1.5Ω
Rating Designation	Filtered, Regulated 24 VDC
Max. RMS Voltage Range Limits for Non-Synchronized Appliance (non-pulsing load)	16 – 33 VDC (below)
Synchronized NAC Appliance (Repetitive pulsing load)	Magnitude Impedance load equal to 5 times the maximum circuit rating for a duration of 16.7ms @ a frequency of 2 Hz, rated RMS value (16 – 33) during individual application of surge impedance. For a list of synchronized notification appliance compatibilities, refer to Shield Neo Device Compatibility Document 686-081
Wiring Classification	Class A or Class B
Impedance values for testing at which ground faults are annunciated	0 Ohms
Class B EOL (end-of-line) Resistor	10K, Part#: 855-027-103 (supplied with the FACP)

Notification Appliance Circuit Voltage Drop

The voltage drop on notification appliance circuits should be calculated to make sure that the minimum voltage at the end of the circuit does not exceed the minimum required by each notification appliance at the minimum alarm circuit output voltage.

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

Minimum Alarm Voltage = VOUT(MIN) – (IALARM x RCABLE)

Minimum Output Voltage (VOUT(MIN)) is VBAT(MIN) – 0.5V = 20.5V

Alarm Current (IALARM) is the sum of the loads presented by the notification appliances in alarm.

Cable Resistance (RCABLE) is the sum of the cable resistance in both wires x cable length.

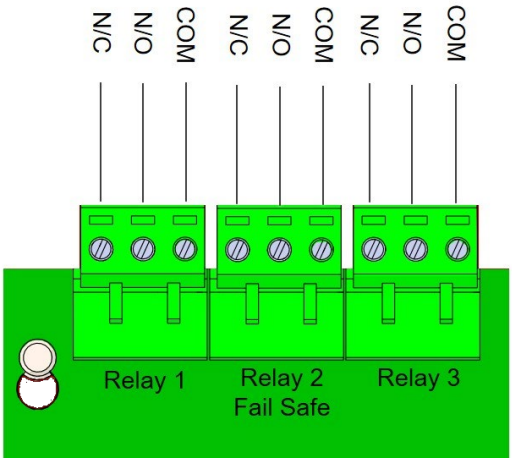
Typical wire size	Resistance (RCABLE):	Loop Resistance (2 Wires)
18 AWG solid:	~ 6.5 Ohms/1000ft	13 Ohms /1000ft
16 AWG solid	~ 4.1 Ohms/1000ft	8.2 Ohms /1000ft
14 AWG solid	~ 2.6 Ohms/1000ft	5.2 Ohms /1000ft
12 AWG solid	~ 1.8 Ohms/1000ft	3.6 Ohms / 1000ft

4.2.7 This section is intentionally blank

4.2.8 Relay Contacts

The NX10-FACP base card includes three programmable Form C relay contacts, defaulted Alarm, Trouble (fail-safe configured) and Supervisory.

4.2.8.1 Wiring



4.2.8.1.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB5 Fail-Safe Trouble Relay (default)	RELAY 2 NC RELAY 2 NO RELAY 2 COM	NC (open contact as relay is inverted on power up) NO (closed contact as relay is inverted on power up) COM (relay contact common)
TB6 Supervisory Relay (default)	RELAY 3 NC RELAY 3 NO RELAY 3 COM	NC (closed contact) NO (open contact) COM (relay contact common)
TB7 Alarm Relay (default)	RELAY 1 NC RELAY 1 NO RELAY 1 COM	NC (closed contact) NO (open contact) COM (relay contact common)

4.2.8.1.2 Electrical Specifications

Wiring	POWER-LIMITED
Designation	Programmable (Defaulted Common Alarm, Trouble and Supervisory)
Voltage, Current **Frequency** **Power Factor**	30 VDC/VAC 1 Amp PF=1 (resistive)

4.2.9 Peripheral Bus (PBUS) Communication Circuit

The peripheral bus (PBUS, RS-485) communications circuit of the NX10-FACP base card is for the connection of optional peripheral bus modules available for NX10-FACP-1L, NX10-FACP-2 and NX10-FACP-4.

Peripheral bus modules include:

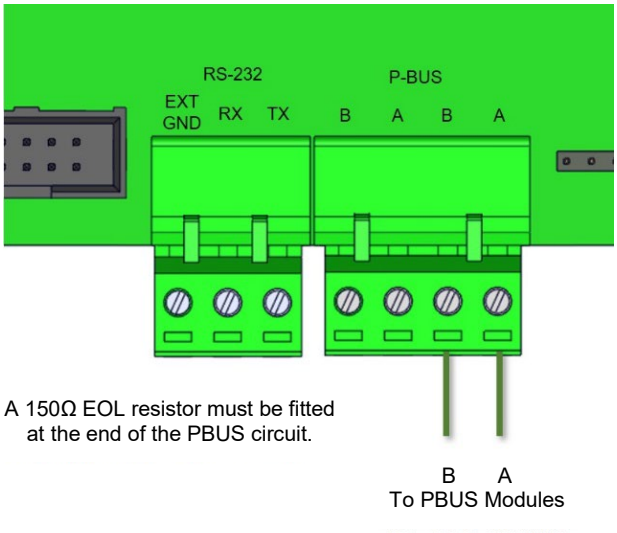
- NX10-EM-ASW-16 Switch/LED Module
- NX10-FA-LED16 16 Red/Yellow LED Module
- NX10-FA-LED32R 32 Red LED Module
- NX10-FA-LED32Y 32 Yellow LED Module
- NX10-EM-IO48 Switch LED Driver Module
- NX10-EM-ACM-6 Fan/Damper Module,
- NX10-AMP-80 Audio Amplifier Module.

Peripheral bus (PBUS) modules must be mounted within 20 feet of the NX10-FACP base card in the same room and in rigid conduit.

Refer to the Optional Peripheral Bus (PBUS) Modules section of this manual for peripheral bus module installation and wiring.

4.2.9.1 Wiring

To wire to a peripheral bus module, wire either of the A and B terminals of the NX10-FACP base card to the optional peripheral bus module A and B terminals, A to A and B to B. At the last peripheral bus module terminate the wiring with either a built on-board or supplied 150 Ohm end-of-line (EOL) filtering resistor.



4.2.9.1.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB10	PBUS B PBUS A PBUS B PBUS A	PBUS B = COMM B Output PBUS A = COMM A Output PBUS B = COMM B Output PBUS A = COMM A Output

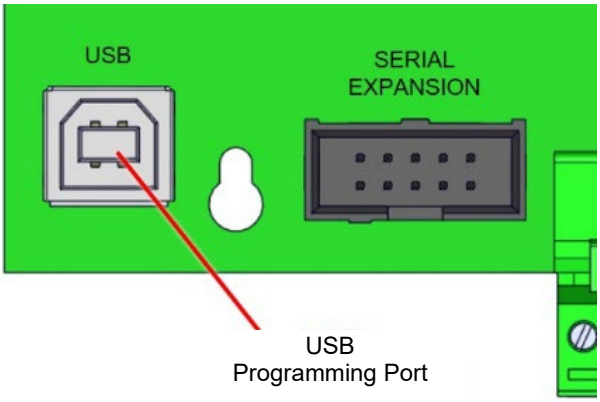
4.2.9.1.2 Electrical Specifications

PBUS Circuit Supervision	SUPERVISED, POWER-LIMITED
Communication Method	CCITT RS-485
Max. Line Impedance	50 Ohms
Max. Peripheral Bus Modules	32
Max. Type of Peripheral Bus Module	16
Filtering Resistor End-Of-Line (EOL)	150 Ohm, Built On-Board or Supplied with Peripheral Bus Module

Peripheral Bus optional modules MUST be mounted within 20 feet of the NX10-FACP base card in the same room in rigid conduit, the peripheral bus circuit is not protected for short circuit and ground fault conditions. For multiple wires to be used under the PBUS terminals use twin cable ferrules 18AWG to 12AWG, manufactured by Weidmuller.

4.2.10 USB Port

The NX10-FACP base card provides a USB port for Shield Neo NX Config Tool upload/download programming and for use with the Shield Neo NX Service Tool.



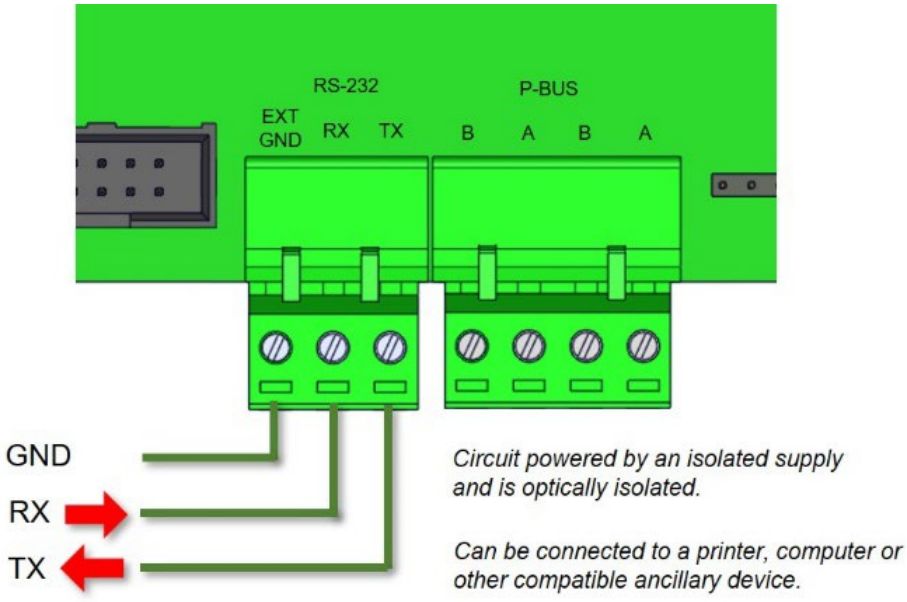
This Port is shared with the Printer and Serial Expansion Ports.

4.2.11 RS-232 Port

The NX10-FACP base card provides an RS-232 port for programming and connection of ancillary reporting devices (i.e., printer, CRT, etc.)

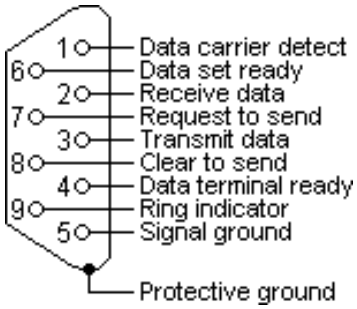
4.2.11.1 Wiring

RS232 wiring must be located within 20 feet of the NX10-FACP base card within the same room wired in rigid conduit.

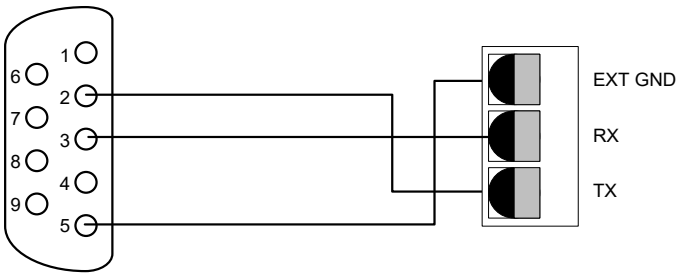


4.2.11.1.1 Pin-Out

RS-232 Pin Assignments



RS-232 to NX10-FACP



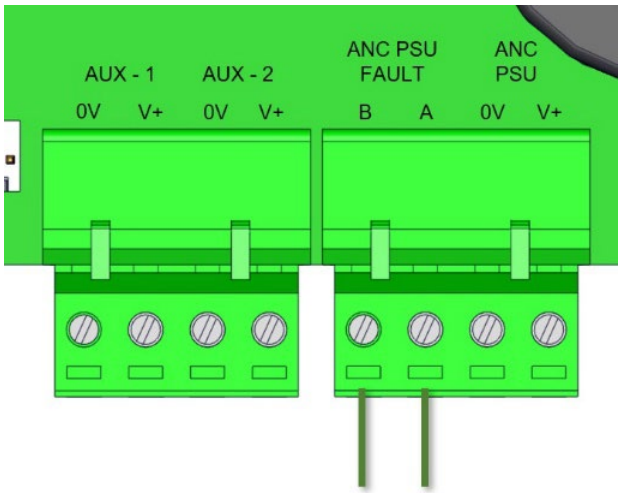
4.2.11.1.2 Electrical Specifications

Supervision	SUPERVISED, POWER-LIMITED
Communication Method	CCITT RS-232
Wire Range	22-12 AWG
Baud Rate:	9600
Parity	None
Date Bits	Eight (8)
Stop Bits	One (1)

4.2.12 Ancillary Contact Monitoring Input

NX10-FACP base card provides an ancillary contact monitoring input which allows the NX10-FACP to monitor any normally closed contact for supervision. If the contact opens a trouble/fault is generated by the NX10-FACP base card. This input is normally used for the NX10-EM-PSU module and in a hardwired audio amplifier installation, for the monitoring of the NX10-AMP-80 modules.

Any ancillary contact monitored must be located within 20 feet of the NX10-FACP base card in the same room and in rigid conduit.



Normally Closed Contact Monitoring Input

4.2.13 NX10-ACS-2L Ancillary NX10-EM-PSU DC Input

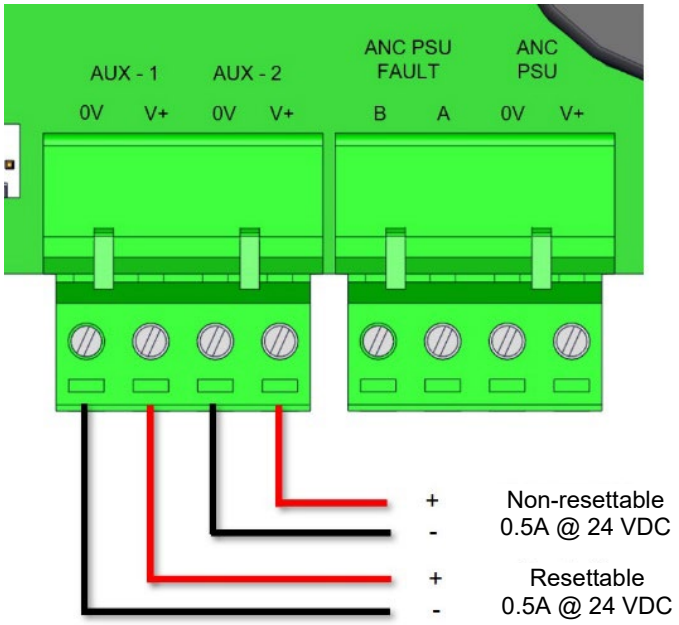
The NX10-ACS-2L base card provides an ancillary NX10-EM-PSU DC power input which allows an additional 3 Amp, 24 VDC power to be supplied to the NX10-ACS-2L base card. This additional power is specifically for notification appliance circuit and signalling line circuit power requirements when the NX10-EM-LPD or NAC modules are used.

4.2.14 AUX Power Outputs

The NX10-FACP base card provides two 24 VDC power outputs, one resettable and one non-resettable.

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

4.2.14.1 Wiring



4.2.14.1.1 Electrical Specifications

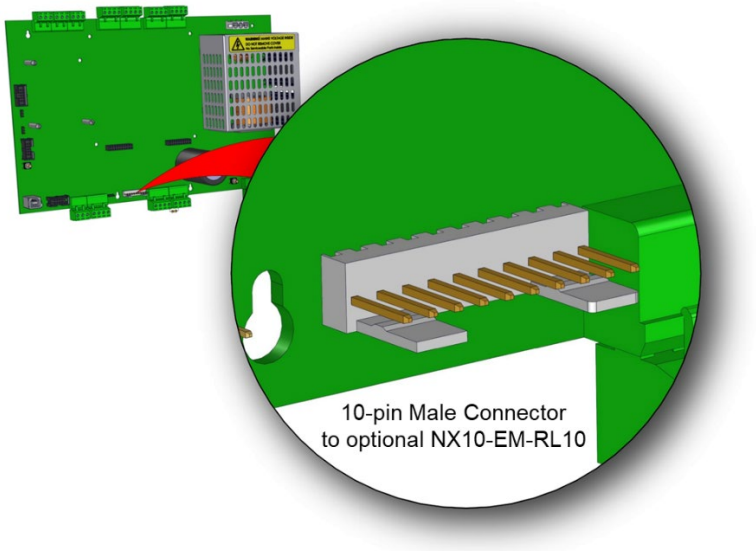
Circuit Supervision	SUPERVISED, POWER-LIMITED
Voltage -current	24 VDC @ 0.5A[22]
Aux#1	4-wire smoke detector power or similar application. Power turns OFF for 10-15 seconds on reset.
Aux#2	24 VDC (nominal) power output for internal peripheral cards or external equipment.
Wire Range	22-12 AWG
Circuit Supervision	SUPERVISED, POWER-LIMITED

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

4.2.15 Open Collector Output

4.2.15.1 Wiring

The NX10-FACP base card includes a 10-pin O/C (Open Collector) output keyed header for connection to an optional NX10-EM-RL10 10-Point Relay Module. For information regarding the installation of the optional NX10-EM-RL10 module refer to NX10-EM-RL10 10-Point Relay Module section of this manual.



4.3 NX10-EM-LPD Combined SLC/NAC Expansion Module

The NX10-EM-LPD SLC/NAC expansion module is preinstalled in the NX10-FACP-4. The NX10-EM-LPD module provides two Class X, A or Class B signalling line circuits (SLC) and two Class A or Class B notification appliance circuits (NAC). In addition, the NX10-EM-LPD module can be used in the field to expand an NX10-FACP-2 and NX10-ACS-2L base card.

Class X wiring requires the use of Shield devices with built-in isolators.

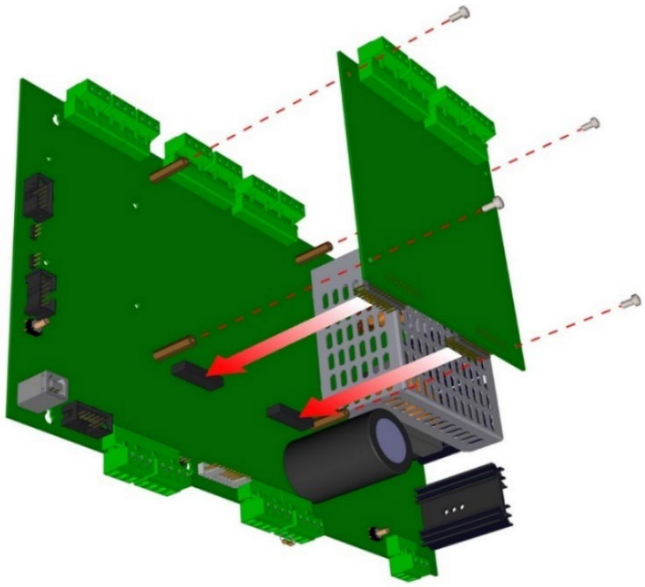


Figure 14 - NX10-EM-LPD Module Installation to an NX10-ACS-2L Base Card

4.3.1 Installation

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

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

4.3.1.1 Package Contents

Carefully unpack the NX10-EM-LPD module, within the box you will find the following items:

- One (1) NX10-EM-LPD Module
- One (1) plastic bag containing:
  - Four (4) metal hexagon spacers
  - Four (4) panhead screws
  - Two (2) UL 10K end-of-line resistors

4.3.1.2 Remove

1. Disconnect AC and DC power.
2. Disconnect the connectors from the SLC/NAC terminal blocks.
3. Remove the four (4) panhead screws (Figure 17).
4. Carefully unplug the NX10-EM-LPD module from the connectors on the base card.

4.3.1.3 Install

1. If not fitted already, insert, and carefully tighten the four (4) metal hexagon spacers to the NX10-FACP base card (Figure 17).
2. Carefully position the module over the spacers while you plug the two 20-pin male connectors into the NX10-ACS-2L base card's two black 20-pin female connectors (PL7 and PL8).
3. With the module correctly plugged into the base card, secure the module with the four (4) panhead screws (Figure 17).

4.3.2 Wiring

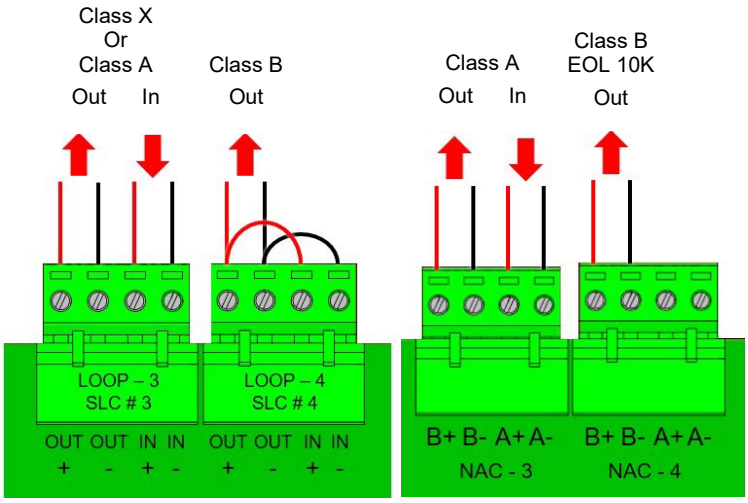


Figure 15 - NX10-EM-LPD SLC and NAC Wiring

4.3.2.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB3	LOOP-3 OUT+ LOOP-3 OUT- LOOP-3 IN+ LOOP-3 IN-	LOOP-3 OUT+ = Class B positive output LOOP-3 OUT- = Class B negative output LOOP-3 IN+ = Class A positive Return LOOP-3 IN- = Class A negative Return
TB4	LOOP-4 OUT+ LOOP-4 OUT- LOOP-4 IN+ LOOP-4 IN-	LOOP-4 OUT+ = Class B positive output LOOP-4 OUT- = Class B negative output LOOP-4 IN+ = Class A positive Return LOOP-4 IN- = Class A negative Return
TB1	NAC-3 B+ NAC-3 B- NAC-3 A+ NAC-3 A-	Notification appliance circuit 3, Class B positive Notification appliance circuit 3, Class B negative Notification appliance circuit 3, Class A positive, Return Notification appliance circuit 3, Class A negative, Return
TB2	NAC-4 B+ NAC-4 B- NAC-4 A+ NAC-4 A-	Notification appliance circuit 4, Class B positive Notification appliance circuit 4, Class B negative Notification appliance circuit 4, Class A positive, Return Notification appliance circuit 4, Class A negative, Return

4.3.2.2 Electrical Specifications

4.3.2.2.1 Signalling Line Circuit (SLC)

Supervision	Supervised for Short Circuit, Open Circuit and Ground Fault POWER-LIMITED
Max. Voltage, Rated Current and Frequency	24 VDC, Filtered Regulated 0.5 Amp Total Output Load must not exceed panel supply rating, maximum 5A (8A if NX10-EM-PSU installed).
Minimum Return Voltage	17 VDC
Max. Line Impedance	See NX10-FACP base card SLC circuits
Analog/Addressable Device Compatibility	Refer to Section 1.2.2 SLC Devices
Wiring Classification	Class A, Class X or Class B
Impedance values for testing at which ground faults are annunciated	0 Ohms

4.3.2.2.2 Notification Appliance Circuit (NAC)

Supervision	Supervised for Short Circuit, Open Circuit and Ground Fault POWER-LIMITED
Max. Current, Rated Voltage and Frequency	2 Amps @ 24 VDC, Filtered and Regulated Power, per NAC circuit, not to exceed 7 Amps across all four NAC circuits (if NX10-EM-PSU installed)
Max. Line Impedance	1.5Ω
Rating Designation	Filtered, Regulated 24 VDC
Max. RMS Voltage Range Limits for Non-Synchronized Appliance (non-pulsing load)	16 – 33 VDC (below)
Synchronized NAC Appliance (Repetitive pulsing load)	Magnitude Impedance load equal to 5 times the maximum circuit rating for a duration of 16.7ms @ a frequency of 2 Hz, rated RMS value (16 – 33) during individual application of surge impedance. For a list of synchronized notification appliance compatibilities, refer to Shield Neo Device Compatibility Document NX686-081
Wiring Classification	Class A or Class B
Impedance values for testing at which ground faults are annunciated	0 Ohms
Class B EOL (end-of-line) Resistor	10K, Part#: 855-027-103 (supplied with the FACP)

4.3.2.3 LEDs

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

4.3.2.4 Signalling Line Circuit (SLC)

To wire the signalling line circuit Class B, wire the NX10-EM-LPD SLC/NAC expansion module Loop OUT + and OUT - to the positive and negative inputs of the field analogue/addressable devices. Also, wire (jumper) the Loop OUT + and OUT – terminals to the Loop IN + and IN – terminals, as shown in (Figure 18). This wiring (jumper arrangement) of the OUT and IN terminals is to maintain signalling line circuit voltage monitoring of the SLC circuit.

For multiple wires to be used during Class B wiring under the Loop OUT + and OUT – terminals use twin cable ferrules 18AWG to 12AWG, manufactured by Weidmuller.

4.3.2.5 Notification Appliance Circuit (NAC)

To wire the notification appliance circuits Class B, wire B+ and B- to the positive and negative inputs of the notification appliance devices, B+ to positive and B- to negative. Terminate the supplied UL Listed 10K end-of-line (EOL) resistor (part#: 855-027-103) at the last notification appliance. To wire the notification appliance circuits Class A, wire B+ and B- to the positive and negative inputs of the notification appliance devices, B+ to positive and B- to negative. At the last notification appliance, return the B+ wire to A+ and the B- wire to A- on the notification appliance circuit terminals (Figure 18).

Notification appliance circuit polarity markings represent alarm (active) condition.

4.4 NX10-EM-PSU Expansion Power Supply

The NX10-EM-PSU expansion power supply module is preinstalled in the NX10-FACP-4. The NX10-EM-PSU module provides 27.4 VDC at 3 Amps, temperature compensated power designed to track the NX10-ACS-2L base card DC supply. The additional 3A of power is for the addition of the two SLC and NAC circuits supplied with the NX10-FACP-4. In addition, an NX10-EM-PSU module can be added to an NX10-FACP-2 when using the optional NX10-EM-LPD SLC/NAC expansion module or NAC expansion module. The AC power required for the module is provided via a prewired AC Molex cable harness, originating at the systems NX10-ACS-ACB board, and terminating at the PL1 Molex connector on the NX10-EM-PSU. In addition, COM and NO terminals are prewired to the NX10-ACS-2L Base Card, ANC PSU Fault B and A terminals.

The NX10-FACP-1L cannot support the NX10-EM-PSU expansion power supply module. When using the NX10-EM-PSU module, the FACP enclosure can only accommodate 12AH batteries, larger size batteries will require the use of a UL864 certified battery enclosure.

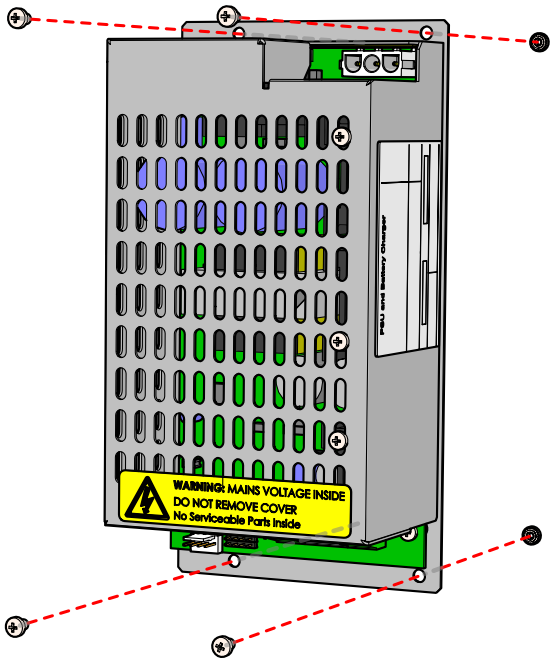


Figure 16 - NX10-EM-PSU Installation

4.4.1 Installation

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

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

4.4.1.1 Package Contents

If installing an NX10-EM-PSU expansion power supply module in an NX10-FACP-2, carefully unpack the module from its box, within the box you will find a plastic bag containing the following items:

- One (1) AC Molex cable harness
- One (1) NX10-EM-PSU DC cable harness
- Two (2) cable ties
- Four (4) panhead screws

4.4.1.2 Remove

1. Make sure that the panel has been isolated from the main (AC) and battery (DC) power supplies.
2. Unplug the Molex connector from the NX10-EM-PSU socket (PL1).
3. Unplug the fail-safe relay cables from the NX10-EM-PSU terminal block (TB2).
4. Remove the four (4) panhead screws that secure the NX10-EM-PSU to the panel enclosure and carefully remove the NX10-EM-PSU module (Figure 19).

4.4.1.3 Install

1. Mount the NX10-EM-PSU module to the enclosure's blind thread PEM standoffs, located on the right-side of the enclosure below the NX10-ACS-2L base card, using the four (4) screws supplied with the module (Figure 20).
2. After the NX10-EM-PSU module is installed, plug the heat shrink wrapped, ferrite core end of the provided AC Molex cable harness into the NX10-ACS-ACB board, male Molex connector (PL1).
3. Plug the other end of the Molex cable harness into the NX10-EM-PSU Molex connector (PL1) [Figure 20]. It is recommended to use the supplied cable ties to secure the AC Molex cable harness to the enclosure's backbox.

4.4.2 Wiring

To interface the additional power to the NX10-ACS-2L two-loop base card, connect the four (4) flying leads of the supplied NX10-EM-PSU DC cable harness to the proper terminals of the NX10-EM-PSU module (green lead to common (C), second green lead to normally open (NO), black lead to negative (-) and red lead to positive (+) [Figure 20].

After the leads are wired to the correct NX10-EM-PSU module terminals, remove the four-position terminal block of the NX10-ACS-2L two-loop base card, located at the ANC PSU FAULT and ANC PSU terminals (Figure 20). With the four-position terminal block removed, plug the four-position terminal block installed on the NX10-EM-PSU DC cable harness into the removed four-position terminal block location.

The power from the NX10-EM-PSU expansion power supply module is not power limited, cabling must run as shown in Figure 20, power limited wiring must maintain a .25" spacing from these wires.

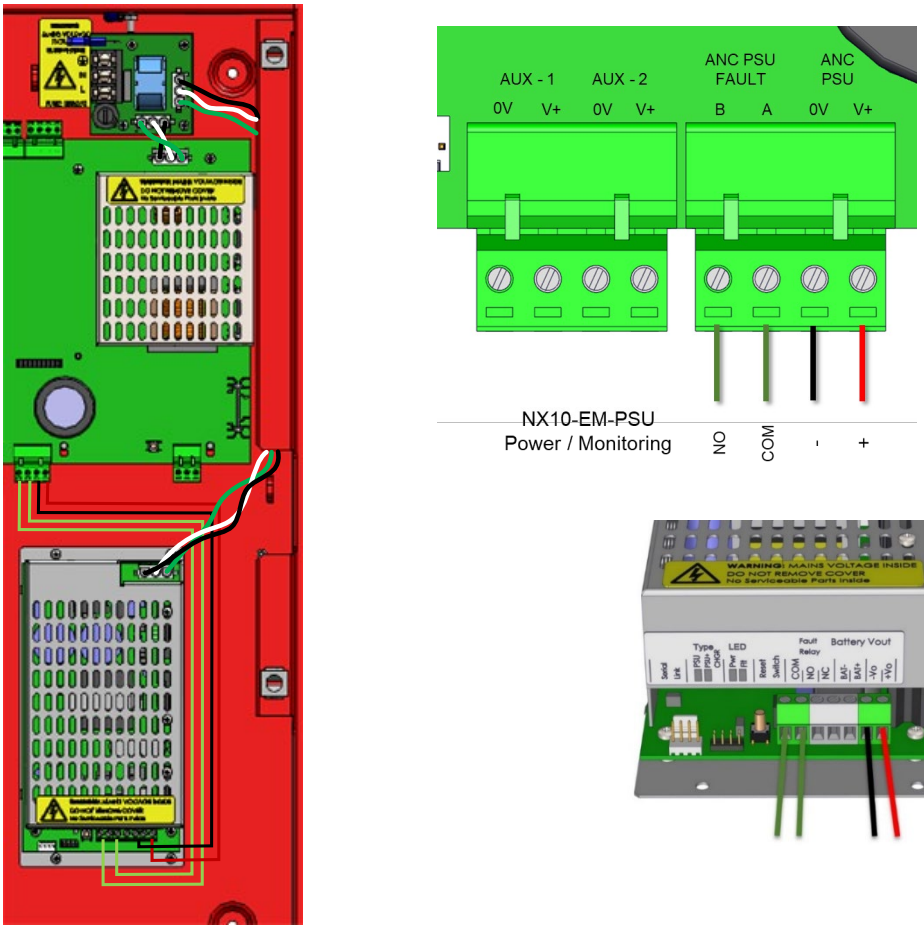
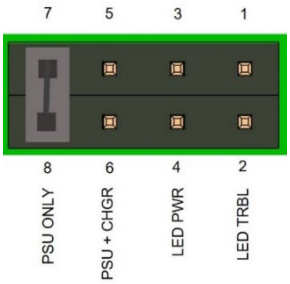


Figure 17 – NX10-EM-PSU Module Installation and Wiring

Figure 18 - AC Molex Cable Harness

The NX10-EM-PSU is used as an expansion power supply for the Neo NX FACP, make sure that the jumper J1 located on the NX10-EM-PSU is configured for PSU ONLY mode or the NX10-EM-PSU module will report a trouble condition.



4.4.2.1 Terminal Summary

If multiple wires are required under any of the terminals, use Weidmuller twin cable ferrules. Keep a minimum of 1/4" (6.4 mm) separation between all power-limited and non-power-limited conductors. AC and battery wiring are non-power limited.

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
PL1	N/A	Supervised Molex Connector for NX10-ACS-ACB AC Harness Earth Ground AC Power Neutral AC Power Load (Hot)
TB2 (fail-safe relay)	COM N-O N-C	Relay Common Relay Normally Open Relay Normally Closed
TB1	0V +VO +BAT -BAT	Negative 24 VDC Positive 24 VDC Unused Unused

4.4.2.2 Electrical Specifications

Mains Input	Supervised
Nominal Voltage **Frequency**	120V (1.7A) 240V (0.61A) 50/60Hz
24 VDC Power	Supervised, Filtered and Regulated POWER-LIMITED
Max. Current	3A
LEDs	Mains Fault Heartbeat

4.4.2.3 LEDs

Designation	Colour	Description
HEARTBEAT	Green	Heartbeat
MAINS FLT.	Yellow	Mains Fault

4.5 NX10-ACS-DSP Alphanumeric Graphical Display

The NX10-ACS-DSP alphanumeric graphical display, also referred to as keyboard display, is the colorized human interface with slide-in labels for status and control of the Neo NX FACP (Figure 22). The NX10-ACS-DSP is pre-mounted in the double aperture of the control panel's inner door and is connected to the system's NX10-FACP base card via a flat ribbon cable.

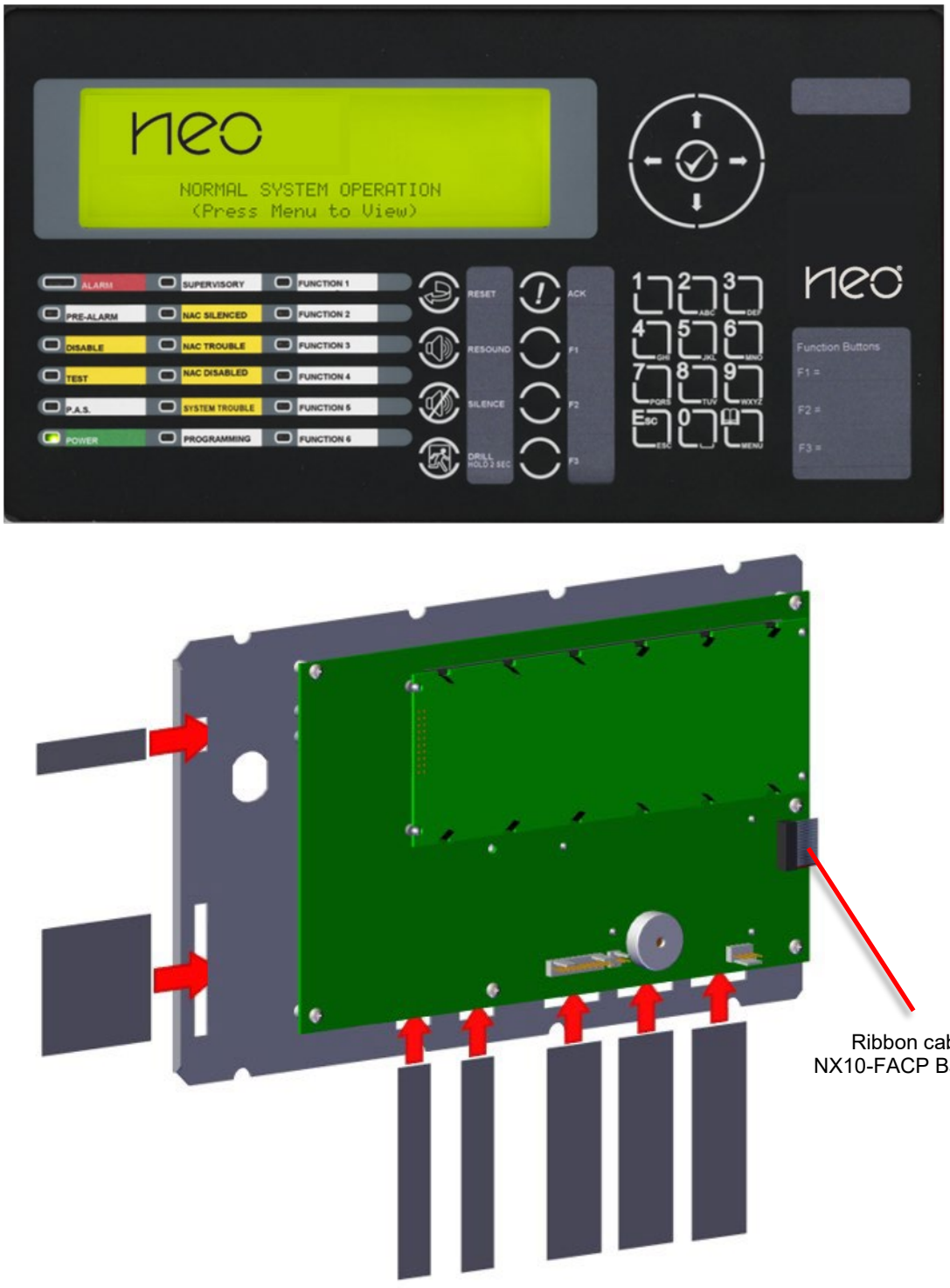


Figure 19 - NX10-ACS-DSP and Slide-In Labels

4.5.1 Installation

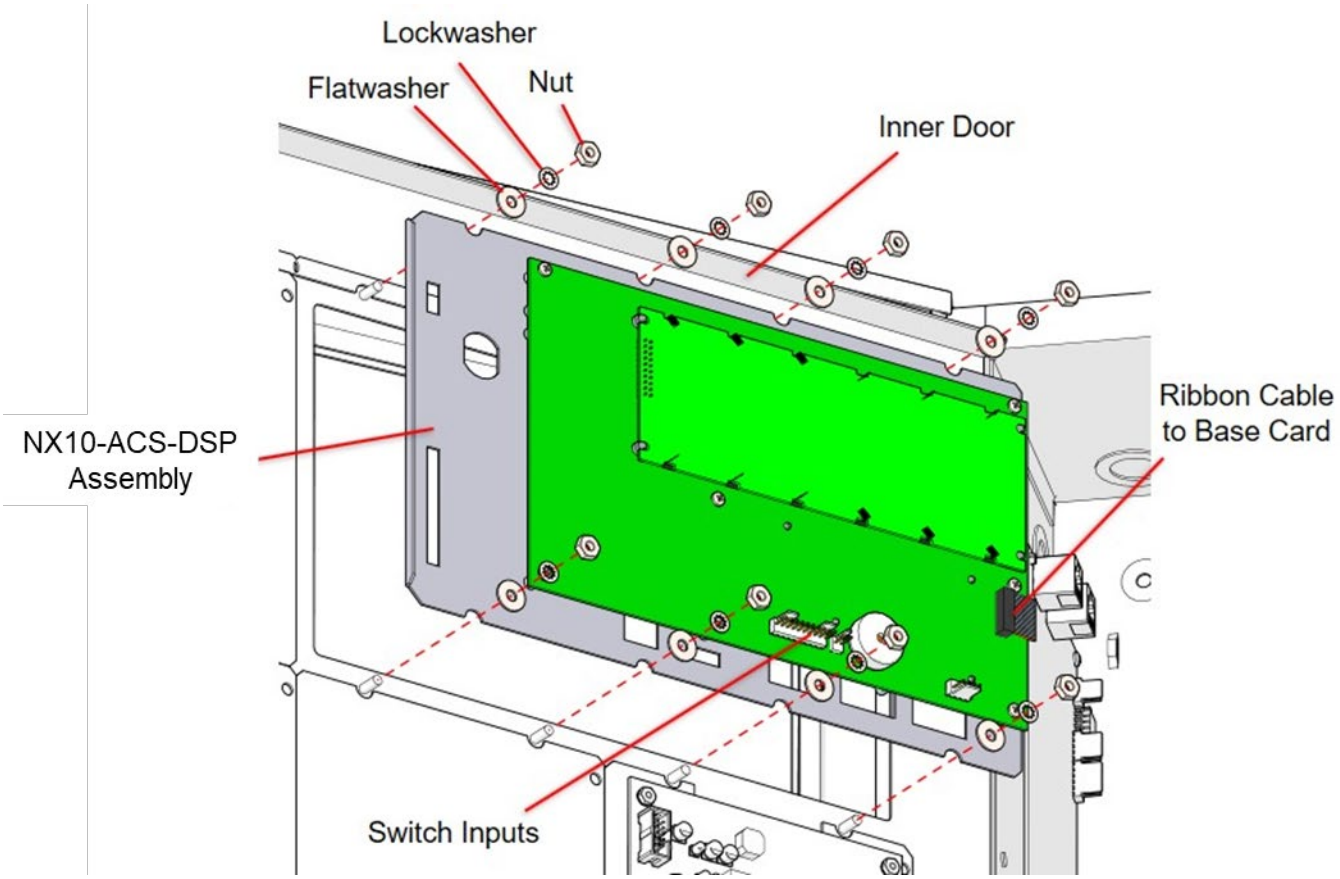


Figure 20 - NX10-ACS-DSP Module

4.5.1.1 Package Contents

- One (1) Alphanumeric Graphical Display Unit
- One (1) Plastic bag containing:
  - Eight (8) hex steel nuts
  - Eight (8) star lock washers
  - Eight (8) flat washers

4.5.1.2 Remove

1. Disconnect AC and DC power.
2. Disconnect the 10-pin flat ribbon cable from NX10-FACP base card DISPLAY port.
3. Disconnect any switch inputs from the graphical display.
4. Remove the eight (8) hex nuts, lock washers and flat washers.
5. Remove the graphical display from the inner door assembly.
6. Transfer any custom label inserts to the new graphical display.

4.5.1.3 Install

1. Put the graphical display in position on the inner door assembly.
2. Fit the eight (8) new flat washers, lock washers and hex nuts.
3. Connect the switch inputs to the graphical display.
4. Connect the 10-pin flat ribbon cable to the NX10-FACP base card DISPLAY port.
5. Install any customized display labels.

4.5.2 Wiring

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

4.5.2.1 NX10-ACS-DSP Switch Inputs

On the back of the NX10-ACS-DSP keyboard display are two (2) male plug-in connectors; one 10-pin and one 2-pin. The 10-pin male connector includes two (2) Common pins and eight (8) separate switch input pins. The second 2-pin male connector is a duplicate of the 10-pin's Common and input eight (Figure 24).

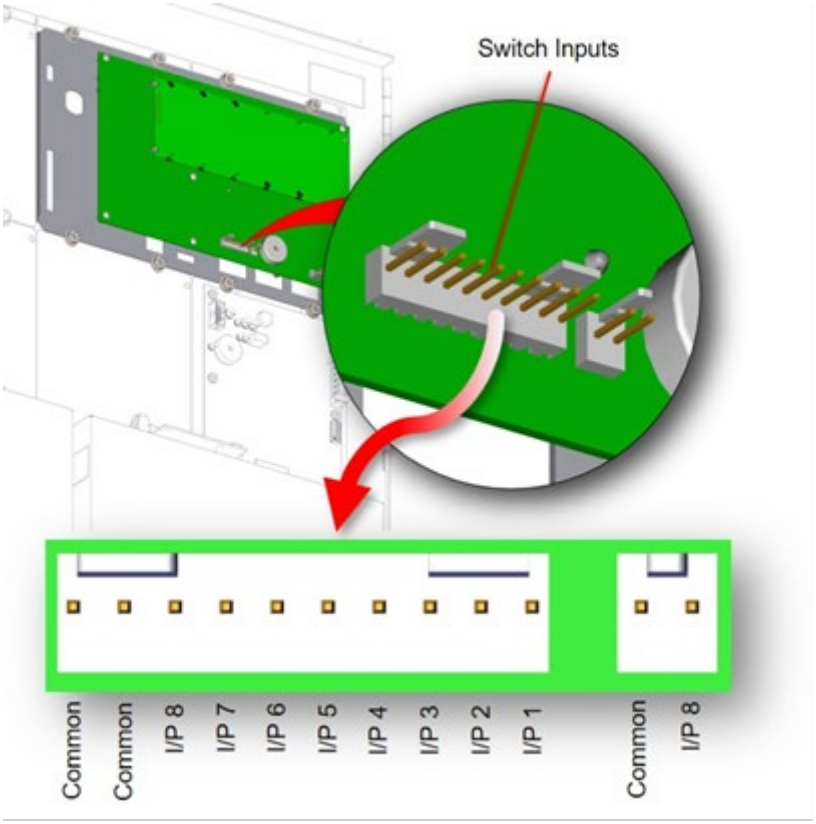


Figure 21 - NX10-ACS-DSP Switch Input Wiring

Switch input contacts of the NX10-ACS-DSP keyboard display must be located within 20 feet of the NX10-ACS-DSP in the same room and in rigid conduit.

4.5.2.2 NX10-ACS-DSP Switch Input Programming

Programming of switch inputs of the NX10-ACS-DSP keyboard display is done via the Shield Neo NX Config Tool. To program the switch inputs, access the NX10-FACP base card, On-Board Devices/Points programming area and configure a specific input action for each used input (Figure 25).

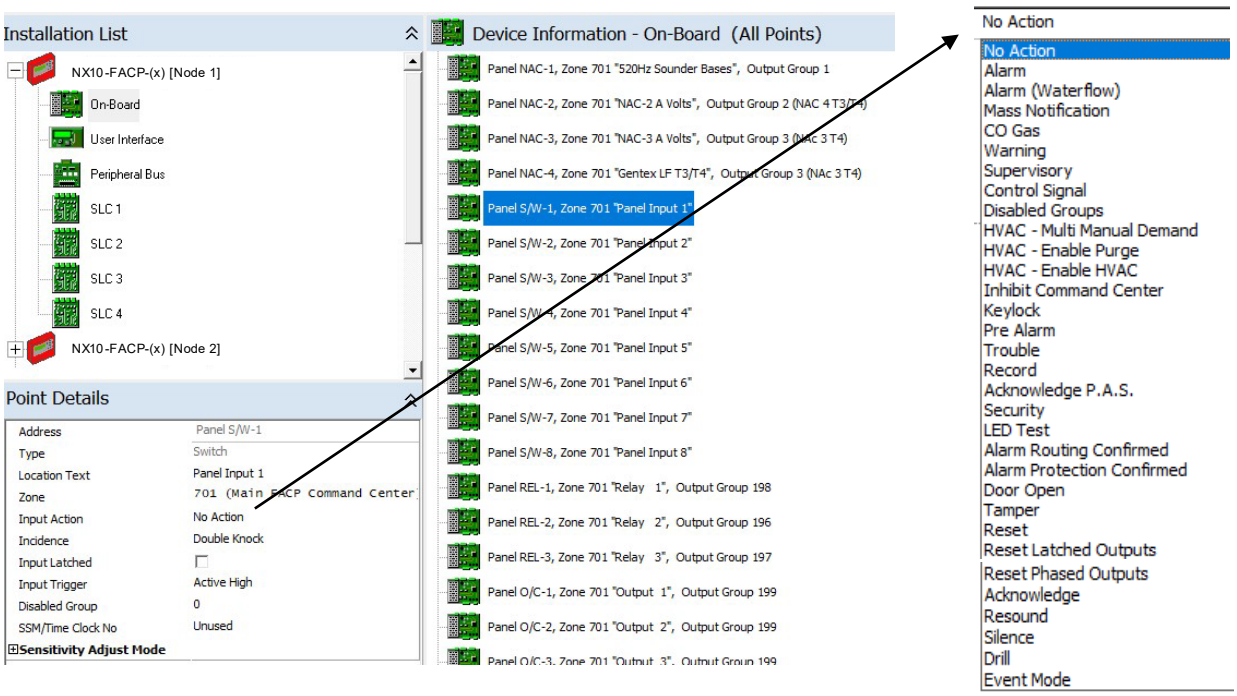


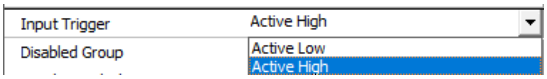
Figure 22 - Neo NX Config Tool, NX10-ACS-DSP Switch Input Programming

The Neo NX fire alarm control panel is not approved for Mass Notification or Security applications, the use of these Input Actions is not permitted unless approved by the Authority Having Jurisdiction.

HVAC Input Actions are for smoke control purposes only.

Non-Latching inputs are not Listed and must not be utilised unless requested by the authority having legal control. If utilized, caution should be used as this device would not require human intervention to return the alarm condition to normal (non-alarm).

In addition to assigning an Input Action to the input point, the input point can monitor for a relay contact closure (Active High) or a relay contact opening (Active Low). Default setting is to monitor for a relay contact closure (Active High) [see opposite].



4.5.2.3 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
PL1	Base Card	10-Pin Flat Ribbon Cable with Connector for Base Card
PL3		4-Pin Male Connector, Unused
PL4		10-Pin Male Connector
	Common	Common Voltage
	Common	Common Voltage
	I/P 8	Input 8
	I/P 7	Input 7
	I/P 6	Input 6
	I/P 5	Input 5
	I/P 4	Input 4
	I/P 3	Input 3
	I/P 2	Input 2
	I/P 1	Input 1
PL8		2-Pin Male Connector
	Common	Common Voltage
	I/P	Input 8

4.5.2.4 Electrical Specifications

Supervision	Supervised POWER-LIMITED
Operating Voltage	24 VDC
PL4 and PL8 Common	5 VDC
Operating Current	Included within NX10-FACP Base Card Currents

4.5.3 LEDs

The NX10-ACS-DSP keyboard display includes twelve (12) predefined LED status indicators and six (6) field programmable LED indicators.

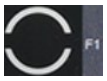
DESIGNATION	COLOR	VISUAL STATUS
ALARM	Red	Flashes whenever an alarm condition has occurred. Turns steady when ACK is pressed. (Only turns off when RESET is pressed).
PRE-ALARM	Yellow	Flashes to indicate that a detector has sensed the early signs consistent with an alarm condition. The levels of smoke 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 the POSITIVE ALARM SEQUENCE feature is used.
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 silence able 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. Turns off when the panel is returned to normal operation.
FUNCTION 1	Red	Configurable LED. Default is not used.
FUNCTION 2-6	Yellow	Configurable LEDs. Default is not used.

4.5.4 Programmable LEDs and Buttons

NX10-ACS-DSP keyboard display field programmable LEDs and control buttons are configured using the Shield Neo NX Config Tool. After the LEDs and control buttons are programmed, the NX10-ACS-DSP keyboard display slide-in labels can be changed to accommodate the defining of the added LEDs and control buttons (Figure 22).

4.5.5 Control Buttons

The NX10-ACS-DSP keyboard display includes five (5) predefined control buttons and three (3) field programmable buttons.

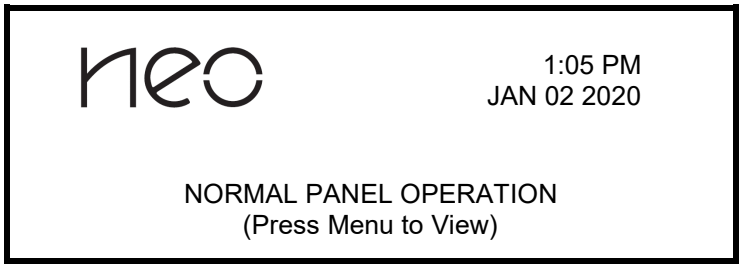
SYMBOL	FUNCTION	OPERATION
	RESET	Press to reset the panel from a latched alarm (or other programmed latched input i.e., latching trouble or supervisory condition) or press to deactivate a Drill condition.
	ACK	Press to acknowledge an alarm, CO, supervisory and/or trouble condition. LED indications on the panel change from flashing to steady and zone/device display removes the word “New.” All current conditions are simultaneously acknowledged “Global Acknowledgement.”
	RESOUND	Press to reactivate any silenced notification appliances connected to system NAC circuits or any output programmed as “Silence able.”
	SILENCE	Press to silence active notification appliances connected to system NAC circuits or any output programmed as “Silence able.”
	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.
	F1, F2, F3	Programmable function (control) buttons.
	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 used to view detailed information regarding events.
	Keypad	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.

4.5.6 Piezo Sounder

The NX10-ACS-DSP keyboard display includes a Piezo sounder for audible event status indications.

CONDITION	AUDIBLE STATUS
Alarm	Continuous tone from the piezo sounder with associated red alarm LED
CO Alarm	Continuous tone from the piezo sounder. If programmed, associated red or yellow LED
Pre-Alarm	Continuous tone from the piezo sounder with associated pre-alarm red LED
Supervisory	Pulsed piezo sounder with associated supervisory LED
Trouble	Pulsed piezo sounder with associated system trouble LED

4.5.7 Graphical LCD Event Status Indications



The graphical LCD display provides detailed information on the operational status of the FACP. Above is an example of the normal standby state of the display.

Event status display/information of the graphical LCD display is prioritized with alarms and CO events having the highest priority.

- Alarms[1]
- CO Alarm [1]
- Pre-Alarms[1]
- Supervisory Events[2]
- Trouble Events[3]
- Other Events including Disable, Test and Warning Conditions[4]

4.5.7.1 Alarm and CO Conditions

To minimize confusion and only provide pertinent information during emergency situations, the FACP when in an alarm state will only display fire alarm and if applicable CO and supervisory events. The display will also provide 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 any time by accessing the panel menu and selecting the view button.

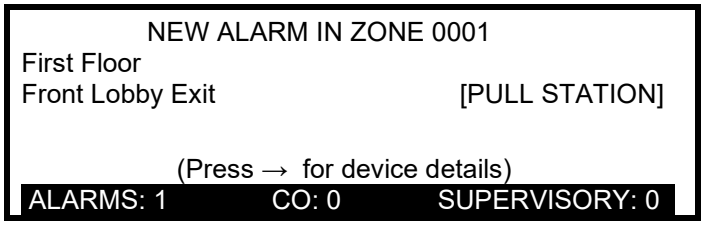
Different messages are displayed during an alarm event, the message types depend on whether the alarm has been acknowledged and whether a CO and/or supervisory event is present.

4.5.7.1.1 Unacknowledged and Acknowledged Alarms with/without CO 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, CO events 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, CO events and supervisory events. If multiple alarm, CO, 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:

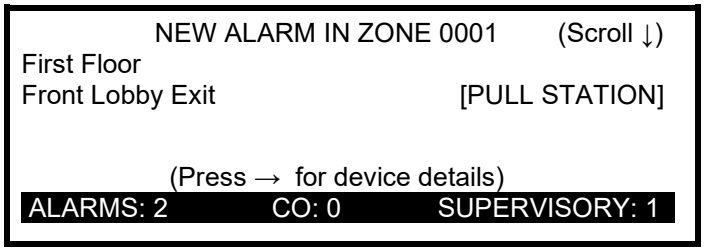


< New unacknowledged alarm message

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

< Further device details
< # Alarms, # CO and # Supervisory events

Example of unacknowledged multiple alarms, CO, and supervisory events:



< 1st New alarm message, w/Scroll active
< Zone alarm text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device (English or French)
< Further device details
< # Alarms, # CO and # Supervisory events

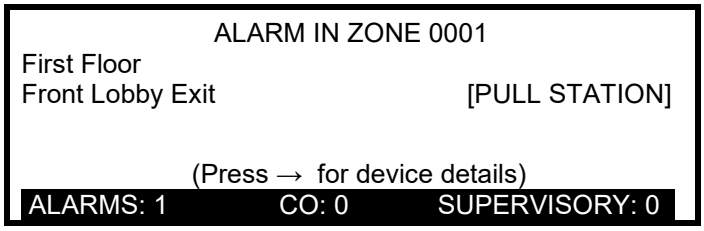
Pressing the “ACK” button will acknowledge the alarm condition(s). This changes the red Alarm LED to steady, the internal buzzer silences, and the display will show “ALARM IN ZONE xxxx” (acknowledged event) with zone/device messages for the specific device in alarm.

The Neo 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, CO, and supervisory events. To view additional alarm, CO, 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 first then CO and then supervisory each are labelled; 1st Alarm, 2nd Alarm, 3rd Alarm, 4th Alarm, 1st CO, 2nd CO, 1st Supervisory, 2nd Supervisory, etc.).

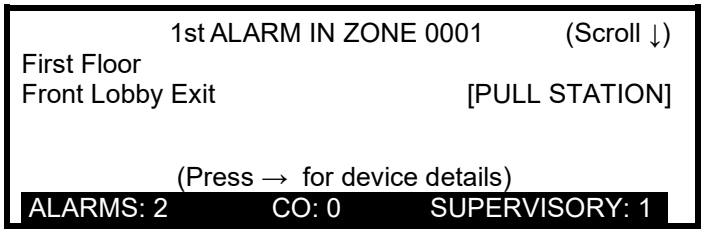
The (Scroll ↓) feature is only active when multiple viewable events are present. When using the scroll buttons, if the buttons are not activated for approximately 15 seconds, the display will return to the 1st Alarm message.

Example of acknowledged single alarm event:



< Acknowledged alarm message
< Zone alarm text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device
< Further device details
< # Alarms # CO and # Supervisory events

Example of acknowledged multiple alarm and supervisory events:



< 1st alarm message, w/scroll active
< Zone alarm text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device
< Further device details
< # Alarms # CO and # Supervisory events

If a new alarm, CO, or supervisory event occurs after a previously acknowledged alarm, CO and/or supervisory event, the event type LED (alarm, CO or supervisory) will begin to flash, the internal buzzer will resound (continuously for alarm or CO and pulsed for supervisory), and the alarm, CO 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 using the scroll (Scroll ↓) button.

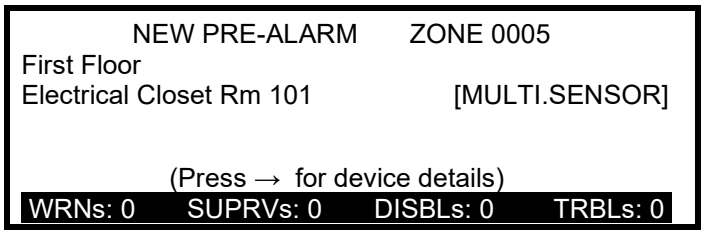
If a supervisory event occurs without an alarm or CO event refer to the below Non-Alarm, Non-CO Conditions section.

4.5.7.2 Non-Alarm, Non-CO Conditions

4.5.7.2.1 Unacknowledged and Acknowledged Non-Alarm, Non-CO Events

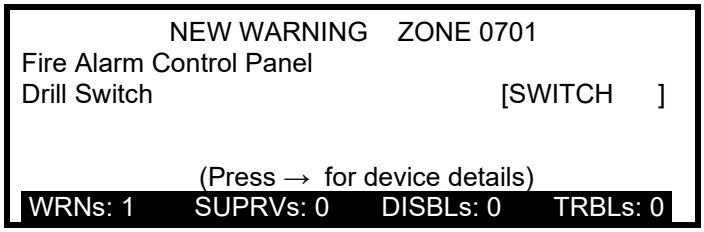
When the system registers a non-alarm or non-CO event (pre-alarm, warning, supervisory and/or trouble condition), the event LED will flash, the internal buzzer will sound (pulsing) and the display will indicate “NEW xxxxxx (event type), ZONE xxxx” (unacknowledged assigned zone number), the zone event 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 [WRNs], Supervisory [SUPRVs], Disables [DISBLs] and Troubles [TRBLs]) prior to the event being acknowledged.

Example of an unacknowledged pre-alarm event:



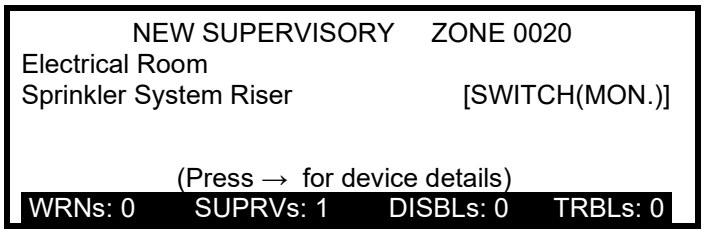
< New pre-alarm message (unacknowledged)
< Zone pre-alarm text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device
< Further device details
< # Warnings # Supervisory # Disables and # Troubles

Example of an unacknowledged warning event (system drill):



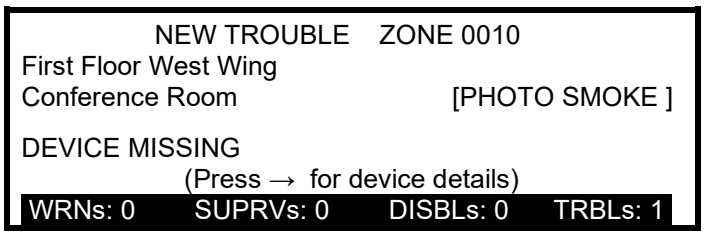
< New warning message (unacknowledged)
< Zone warning text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device
< Further device details
< # Warnings # Supervisory # Disables and # Troubles

Example of an unacknowledged supervisory event when no alarms or CO events are present (refer to Alarm and CO Conditions section of this manual for displaying supervisory events with alarms and/or CO events present):



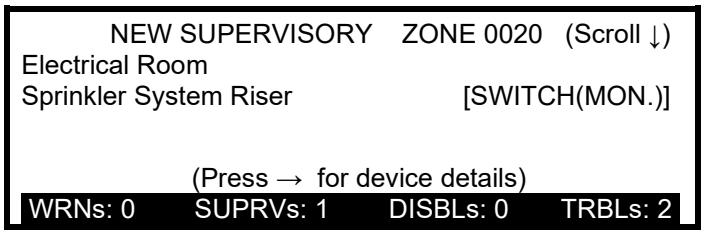
< New supervisory message (unacknowledged)
< Zone supervisory text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device
< Further device details
< # Warnings # Supervisory # Disables and # Troubles

Example of an unacknowledged trouble event:



< New trouble message (unacknowledged)
< Zone trouble text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device
< Type of Trouble
< Further device details
< # Warnings # Supervisory # Disables and # Troubles

Example of multiple unacknowledged events:



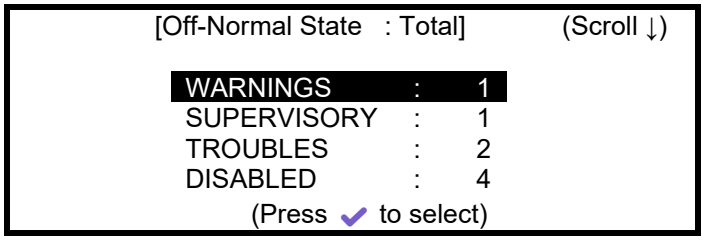
< New supervisory message, w/scroll active
< Zone supervisory text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device
< Further device details
< # Warnings # Supervisory # Disables and # Troubles

During unacknowledged, non-alarm and non-CO 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 FACP.

The Neo 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):

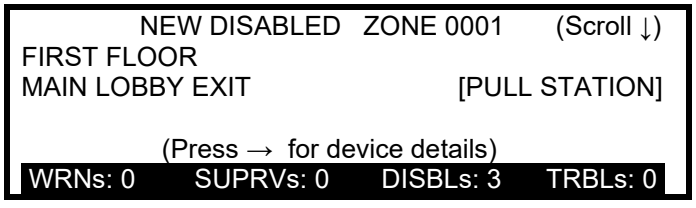


< Off-Normal line, w/scroll
(Scroll shown only with multiple events)
< More info pertaining to highlighted event

4.5.7.3 Disabled Condition

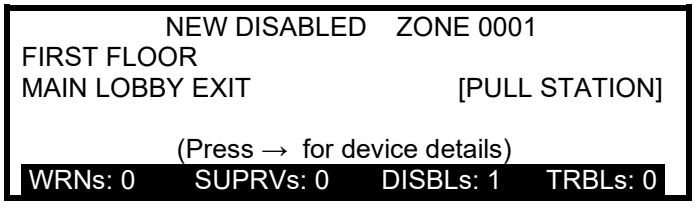
If any zone, input device or output device has been disabled, the DISABLE LED and if programmed via the Shield Neo NX Config Tool, the TROUBLE LED will illuminate. In addition, the NAC DISABLE LED will illuminate if one or more notification appliance circuits or NAC SLC devices have been disabled. The 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 using the navigation down arrow button.

Unacknowledged Zone Disablement with Multiple Devices:



< New unacknowledged Disabled message
< Disabled zone text (32 Characters)
< Disabled device text (26 Characters) / Pre-assigned type of device
< Further device details
< # Warnings # Supervisory # Disables and # Troubles

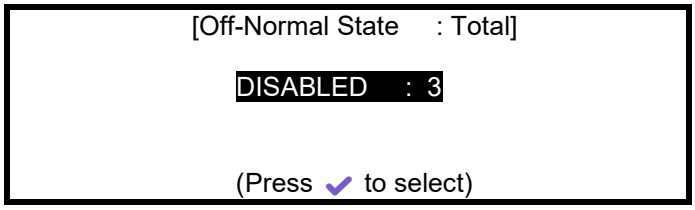
Unacknowledged Device Disablement:



< New unacknowledged Disabled message
< Disabled zone text (32 Characters)
< Disabled device text (26 Characters) / Pre-assigned type of device
< Further device details
< # Warnings # Supervisory # Disables and # Troubles

Pressing the “ACK” button will acknowledge the disable condition(s) and change the LEDs to steady. In addition, the display will change to showing “Off-Normal State: Total.”

Acknowledged Disablements:



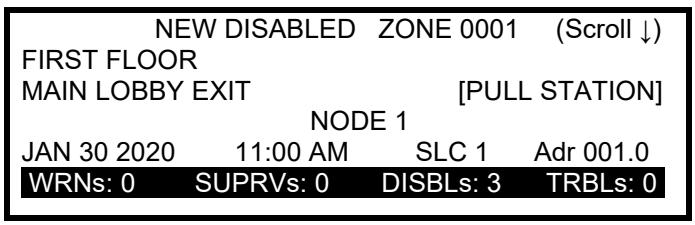
< Off-Normal line

< 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 FACP.

To obtain detailed information about the disabled device, press the ➔ button on the keypad navigation.

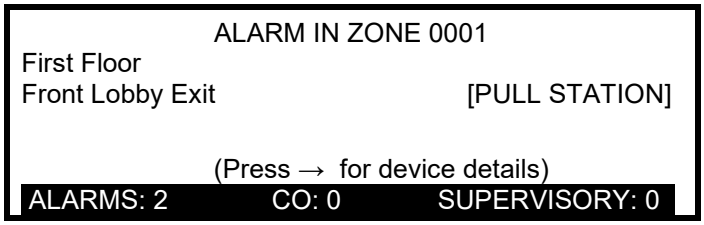


< New unacknowledged Disabled message
< Disabled zone text (32 Characters)
< Disabled device text (26 Characters) / Pre-assigned type of device
< Node # of device location
< Disabled device details
< # Warnings # Supervisory # Disables and # Troubles

4.5.7.4 Obtaining Detailed Device Information During Events

When any event message display indicates (Press → for device details), pressing ➔ 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:

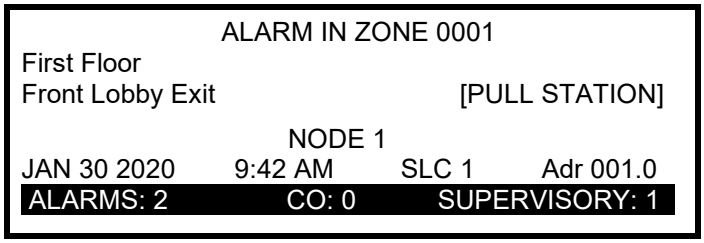


< Alarm message

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

< Further device details
< # Alarms # CO and # Supervisory events

Example of a device details display:



< Alarm message

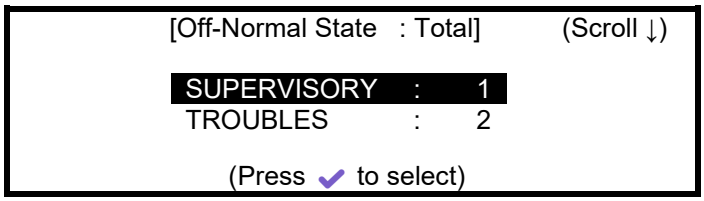
< Zone alarm text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device

< Node # of device location
< Alarm device details
< # Alarms # CO and # Supervisory events

The above details display indicates that Node 1, SLC loop 1, device address 001.0 alarmed on Jan. 30, 2020, at 9:42 AM. After approximately 15 seconds this display will revert to its original alarm display.

When the “Off-Normal State: Total” display indicates (Press ✔ to select), pressing the ✔ 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 ✔ button on the keypad navigation keys.

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

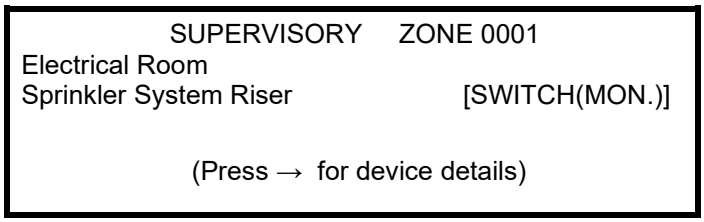


< Off-Normal line, w/scroll

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

< Detailed info pertaining to the highlighted event

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



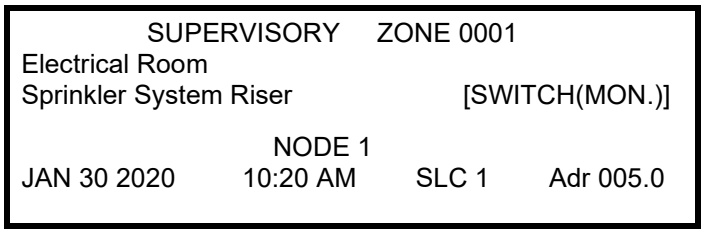
< Supervisory message

< Zone supervisory text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device

< Further device details

If the display indicates (Press → for device details), pressing the ➔ 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 message

< Zone supervisory text (32 Characters)
< Device text (26 Characters) / Pre-assigned type of device

< Node # of device location
< Supervisory device details

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5 Optional System Modules

Below and in conjunction with the Peripheral Bus Modules section of this manual are a list of optional modules available for the NX10-FACP-1L, NX10-FACP-2 and NX10-FACP-4.

5.1 NX10-EM-RL10 10-Point Relay Module

The NX10-EM-RL10 module provides ten (10) Form C relay contacts for use with ten (10) NX10-EM-IO48 LED driver outputs. The NX10-EM-RL10 allows the NX10-EM-IO48 programmable LED drive outputs (maximum 48) to be converted to Form “C” relay contacts. Up to five (5) NX10-EM-RL10 modules can be connected to a single NX10-EM-IO48 switch LED driver module, converting 48 LED drive outputs to 48 Form “C” relay contacts.

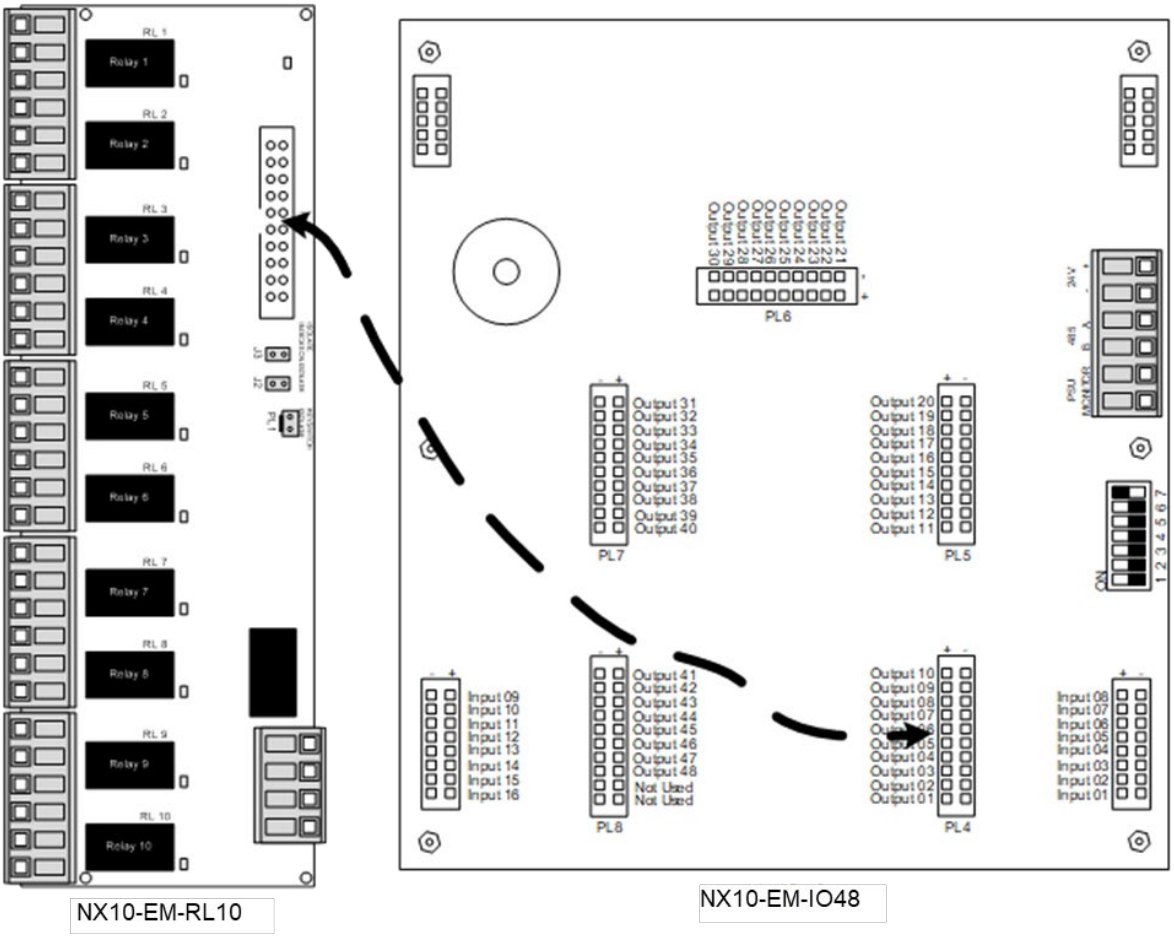


Figure 23 - NX10-EM-RL10 to IO48 Interface

5.1.1 Installation

5.1.1.1 Mounting

The NX10-EM-RL10 10 Point Relay Module with associated NX10-EM-IO48 Switch LED Driver Module can be mounted in any ANSI/UL Listed enclosure.

To mount an NX10-EM-RL10 module, determine a mounting location close enough to the associated NX10-EM-IO48 Switch LED Driver Module, to easily accommodate the interconnected supplied 11” 20-pin IDC flat ribbon cable. Mark and drill the mounting holes to support the four (4) standoffs supplied with the NX10-EM-RL10 (see figure 2). Mount the NX10-EM-RL10 to the standoffs and secure with the four (4) supplied screws.

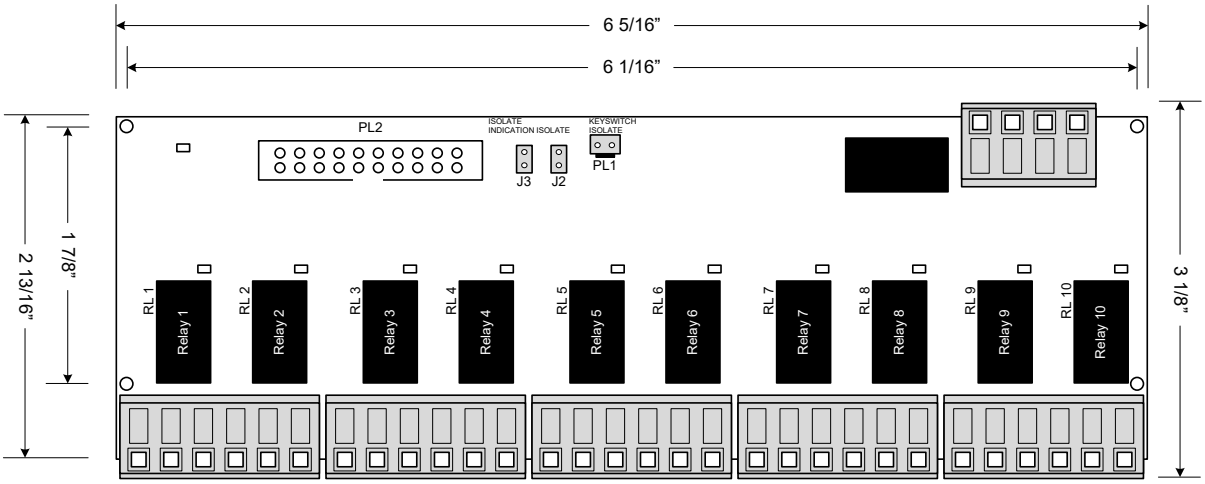


Figure 24 - NX10-EM-RL10 Dimensions

5.1.2 Wiring

The NX10-EM-RL10 module is designed for easy wiring via pluggable terminal blocks and a 20-pin IDC flat ribbon cable.

5.1.2.1 IDC Flat Ribbon Cable

The supplied 11” IDC flat ribbon cable plugs into the 20-pin IDC male connector (PL2) on the NX10-EM-RL10 module, the other end of the 20-pin flat ribbon cable plugs into an associated 20-pin male connector (PL4, PL5, PL6, PL& or PL8) on the NX10-EM-IO48 module (see Figure 27).

Observe polarity of the 20-pin IDC flat ribbon connections.

5.1.2.2 24VDC Power

Wire 24 VDC from a Shield Neo FACP, NX10-EM-PSU6 power supply charger or from a power-limited, filtered, and regulated fire alarm listed power supply charger to the +24V and 0V terminals of the NX10-EM-RL10 module (see figure 3).

5.1.2.3 Relays

As previously mentioned, the NX10-EM-RL10 module provides ten (10) Form “C” relay contacts, each individually controlled by the programmable associated NX10-EM-IO48 LED drive output (see figure 3). Each relay has an associated LED which illuminates when the relay is active. Relays are rated 1A @ 30VDC, resistive.

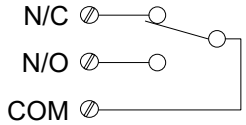


Figure 25 - NX10-EM-RL10 Relay

To program the NX10-EM-RL10 relays, refer to the Shield Neo PC-NeT Programming Manual, NX10-EM-IO48 programming.

5.1.2.4 Disable (Isolation) Inputs and Output

The disable inputs and output of the NX10-EM-RL10 card are polarity sensitive, observe polarity of the 20-pin IDC flat ribbon connections.

5.1.2.4.1 Inputs

Two (2) disable (isolation) input connections are provided on the NX10-EM-RL10 which when active will disable all relays from activating. One input is for a relay or switch activation input, while the other input is for a direct drive input from one of the LED outputs of the NX10-EM-IO48 Switch LED Driver Module

5.1.2.4.2 Relay or Switch Input

The relay or switch input PL1 (see figure 3) on the NX10-EM-RL10 module when activated, will disable all 10 relays associated with the NX10-EM-RL10 module.

5.1.2.4.3 LED Direct Drive Input

The LED direct drive input J2 (see figure 3) on the NX10-EM-RL10 module when activated, based on disable programming of the associated LED drive output, will disable all 10 relays associated with the NX10-EM-RL10 module.

5.1.2.4.4 Output

One disable (isolation) indication output is provided from the NX10-EM-RL10 card via J3 (see figure 3) which can be used as an input to the NX10-EM-IO48 module, for status of relay disablement of the 10 relays.

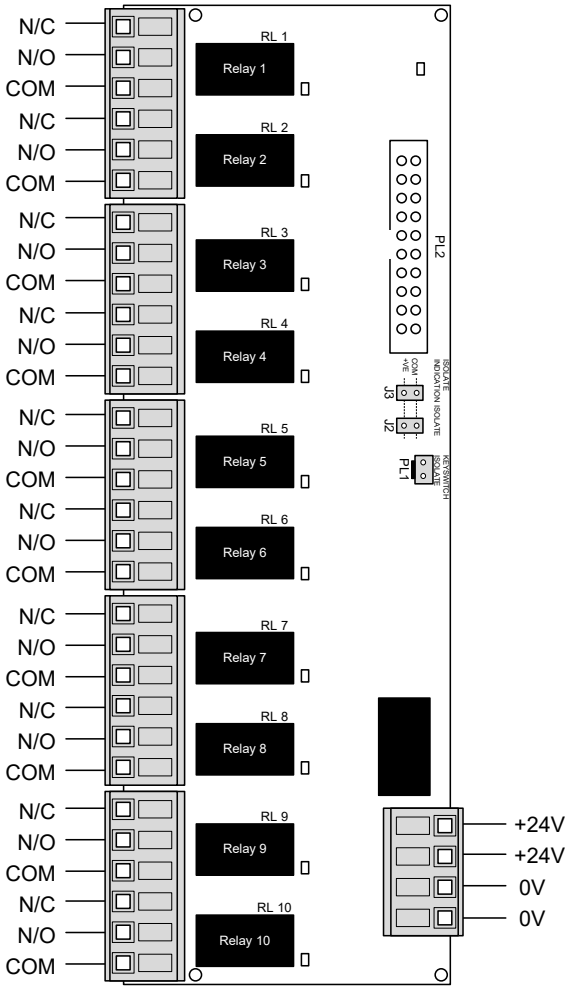


Figure 26 - NX10-EM-RL10 Wiring

5.1.3 Specifications

NX10-EM-RL10 Specifications	
Operating Voltage	24 VDC (wired from FACP 24 VDC or an ANSI/UL Listed power supply)
Operating Current Quiescent Disable (Isolation) Active Per Relay All Relays	 0mA 13mA 13mA 130mA
Temperature	32–120^{0}F (0-48^{0}C)
Humidity	10-95% (non-condensing)
Relay Rating	30VDC @ 1A, Resistive
Inputs Disable Control	 Switch/Relay (PL1) LED Direct Drive from NX10-EM-IO48 (J2)
Output Disable Indication	 Open Collector for NX10-EM-IO48 Input (J3)
Terminal Blocks Wire Size	Pluggable 12 - 24 AWG

5.2 NX10-FANET4 and NX10-FANET7 Network Modules

The NX10-FANET4 and NX10-FANET7 modules are network modules (CCITT RS-485) used for connecting the Neo NX FACPs to the Shield NEO PC-NeT network. The Shield NEO PC-NeT network can support FACPs, Audio FACPs, local operating consoles, remote annunciators with/without control and other network nodes. The NX10-FANET4 module is used with a Class B Ad-NeT-PluS network, while the NX10-FANET7 is used with a Class X (Class A) Ad-NeT-PluS network.

Optional NX10-FOC-MM Fiber Optic Converter Modules are available for converting NX10-FANET4 and NX10-FANET7 copper wiring to fibre optic.

5.2.1 Installation

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

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

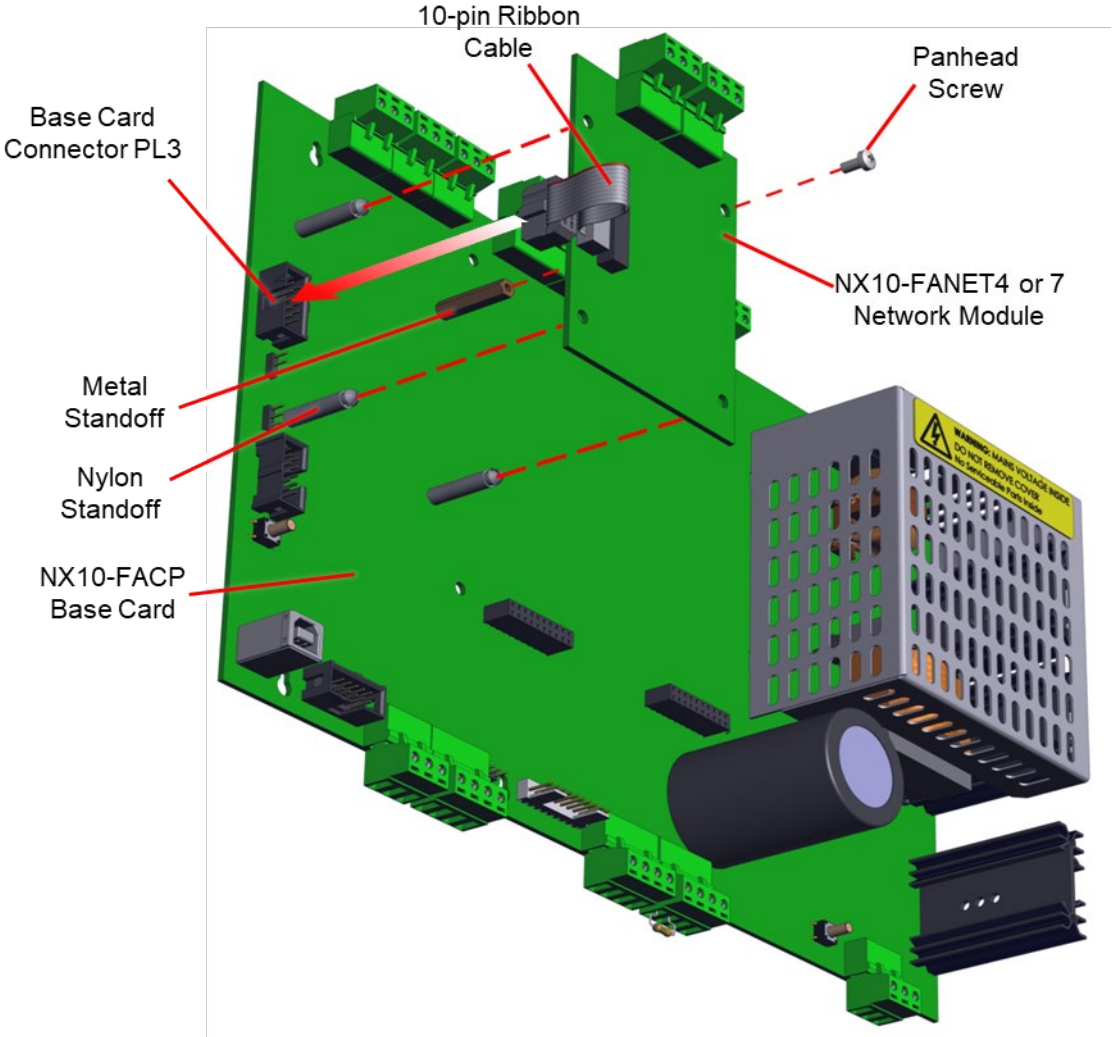


Figure 27 - NX10-FANET4 and NX10-FANET7 Installation

5.2.1.1 Package Contents

NX10-FANET4

- One (1) NX10-FANET4 Network Module
- One (1) plastic bag containing:
  - One (1) metal hexagon spacer
  - One (1) pan head screw.
  - Three (3) nylon spacers
  - One (1) UL 150Ω filtering resistor.
  - 2-pin wire NX10-FANET4 to NX10-ACS-DSP harness

NX10-FANET7

- One (1) NX10-FANET7 Network Module
- One (1) plastic bag containing:
  - One (1) metal hexagon spacer
  - One (1) pan head screw.
  - Three (3) nylon spacers

5.2.1.2 Remove

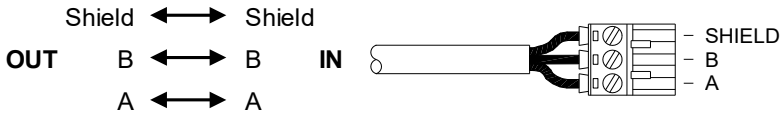
1. Disconnect AC and DC power.
2. Remove the plugin terminal blocks. In addition, if replacing and NX10-FANET4 module that is providing network ground fault status, remove the 2-pin cable connecting the module to the keyboard display module.
3. Remove the pan head screw securing the network module and lift the module off the snap on standoffs.
4. Unplug the 10-pin female flat-ribbon cable connecter from the NX10-FACP base card.

5.2.1.3 Install

1. Insert the supplied metal hexagon spacer and three (3) nylon spacers.
2. Plug the 10-pin female flat-ribbon cable connector into the PL3 NETWORK male connector located on the NX10-FACP base card.
3. Snap the network module onto the installed nylon spaces and secure with the supplied pan head screw via the metal hexagon spacer.
4. Install the supplied 150Ω filtering resistor between the IN A and B terminals of the module.

5.2.2 Wiring

Both the NX10-FANET4 and NX10-FANET7 modules have independent connectors for the outgoing and incoming Ad-NeT-PluS network wiring. Using twisted shielded cable, connect from the “OUT” terminal on the previous network node to the “IN” terminal on the next network node; A to A, B to B and SCN to SCN (Figure 31).



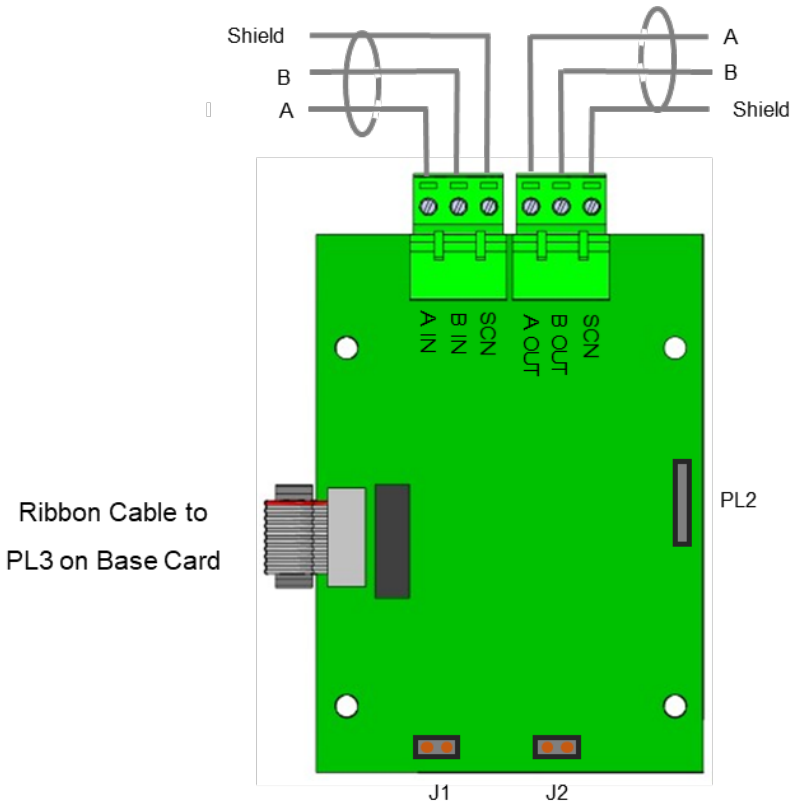


Figure 28 - NX10-FANET4 and NX10-FANET7 Wiring

5.2.2.1 Terminal Summary

Module	Not Visible Terminal Designation	Visible Terminal Designation	Terminals
NX10-FANET4	TB1	A IN B IN SCN	Ad-Net-PluS Network A IN Ad-Net-PluS Network B IN Ad-Net-PluS Network Shield
	TB2	A OUT B OUT SCN	Ad-Net-PluS Network A OUT Ad-Net-PluS Network B OUT Ad-Net-PluS Network Shield
NX10-FANET7	TB1	IN	Ad-Net-PluS Network A IN Ad-Net-PluS Network B IN Ad-Net-PluS Network Shield
	TB2	OUT	Ad-Net-PluS Network A OUT Ad-Net-PluS Network B OUT Ad-Net-PluS Network Shield

5.2.2.2 Electrical Specifications

Specifications	
Circuit Supervision POWER-LIMITED CIRCUIT	Supervised for Short Circuit, Open Circuit and Ground Fault
Communications	CCITT RS485
Cabling Type	Twisted Shielded
NX10-FANET4	Class B Network Wiring
	32 Nodes Maximum
	5000ft (1500m) Maximum Cable Length
	Requires 150Ω filtering resistor at beginning and end of network
	2-Pin Programmable Network Ground Fault Output
NX10-FANET7	Class X (A) Network Wiring
	200 Nodes Maximum
	5000ft (1500m) Maximum Cable Length Between Nodes
	66000ft (20000m) Maximum Overall Cable Length

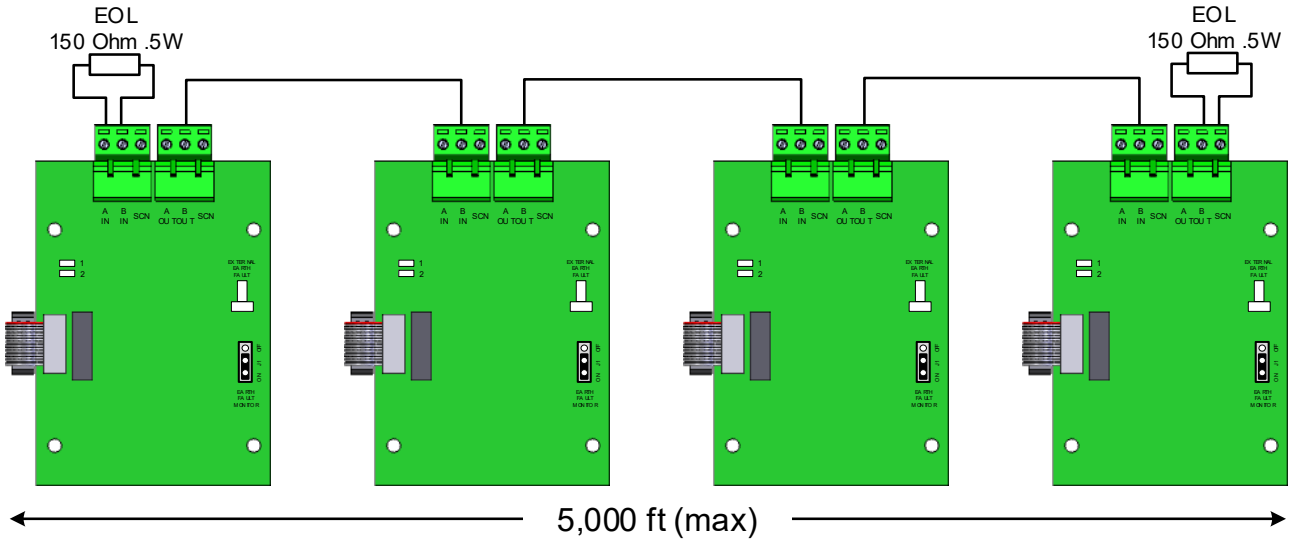
When Ad-NeT-PluS networks incorporate audio, 150 nodes maximum will guarantee 10 second synchronization of audio across the network.

5.2.2.3 LEDs

LED	Function	Description
NX10-FANET4		
1	TX	Network Transmit
2	RX	Network Receive
NX10-FANET7		
1	Heartbeat	
2	RX	Network Receive
3	TX	Network Transmit

5.2.2.4 NX10-FANET4 Class B w/End-of-Line Filtering Resistors

The Ad-NeT-PluS Class B network wiring requires the IN terminals on the first network node and the OUT terminals on the last network node to be terminated with the supplied 150Ω end-of-line filtering resistors.



If the 150Ω filtering end-of-line resistor is not installed on the last network node a network ground fault will be reported.

5.2.2.4.1 NX10-FANET4 Class B Network Ground Fault Detection

The NX10-FANET4 module can be configured to monitor an entire Class B Ad-NeT-PluS network for ground fault conditions. This network monitoring must be implemented if the Class B Ad-NeT-PluS network does not incorporate at least one NX10-FAN-C or NX10-FAN-D remote annunciator.

To configure the NX10-FANET4 module (only one configured NX10-FANET4 per Class B Ad-NeT-PluS network is required) for network ground fault monitoring, simply move jumper J1 (Earth Fault Monitor) from its OFF position to its ON position (Figure 32). In addition, if a specific network ground fault indication is required, wire the supplied 2-pin NX10-FANET4 to NX10-ACS-DSP harness from the PL2 header of the NX10-FANET4 module to the Common/IP8 input on the back of the NX10-ACS-DSP keyboard display and program the input to the specific indication requirements (i.e., LED, etc.).

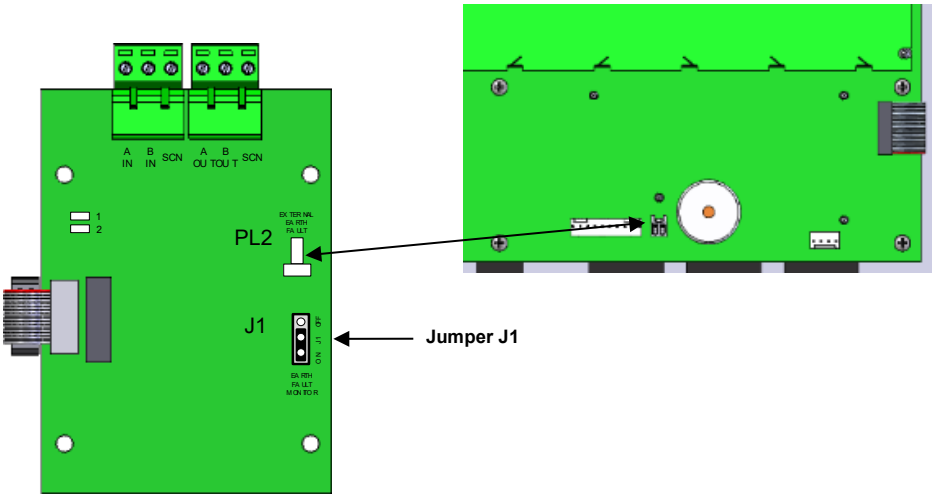
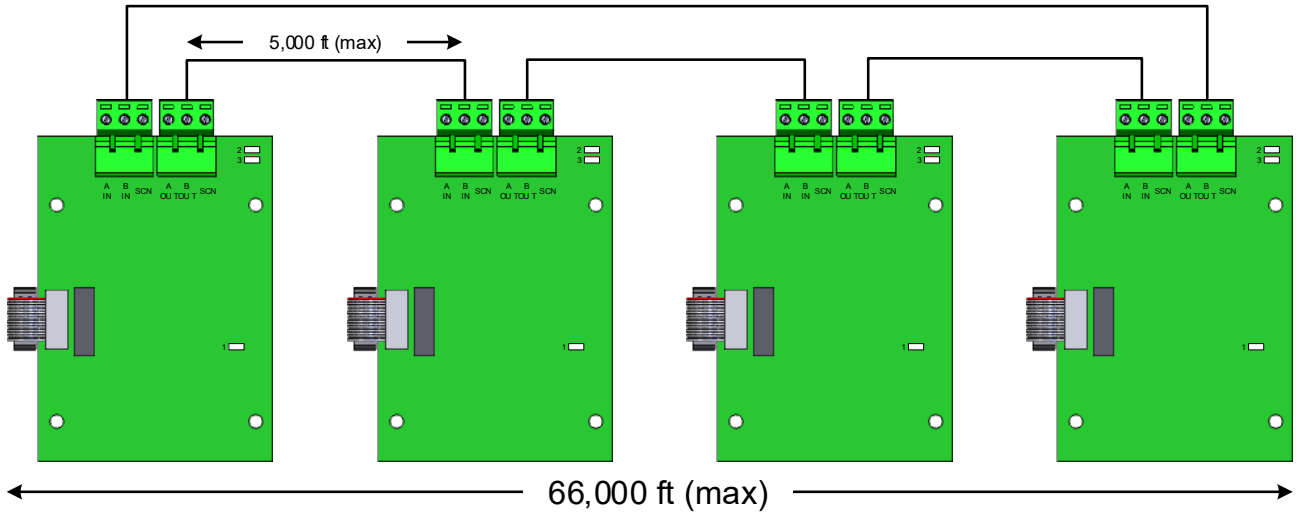


Figure 29 – NX10-FANET4 Network Ground Fault Detection Configuration

5.2.2.5 NX10-FANET7 Class X(A)

The Ad-NeT-PluS Class X(A) network wiring requires the OUT terminals on the last network node to be wired back to the IN terminals on the first network node, this forms a loop “ring.”



5.3 NX10-EM-PSU6 Power Supply Charger Module

The NX10-EM-PSU6 power supply charger module is an optional 24 VDC @ 5A filter, regulated power supply charger to meet various installation power requirements, including powering an NX10-AMP-80 audio amplifier module.

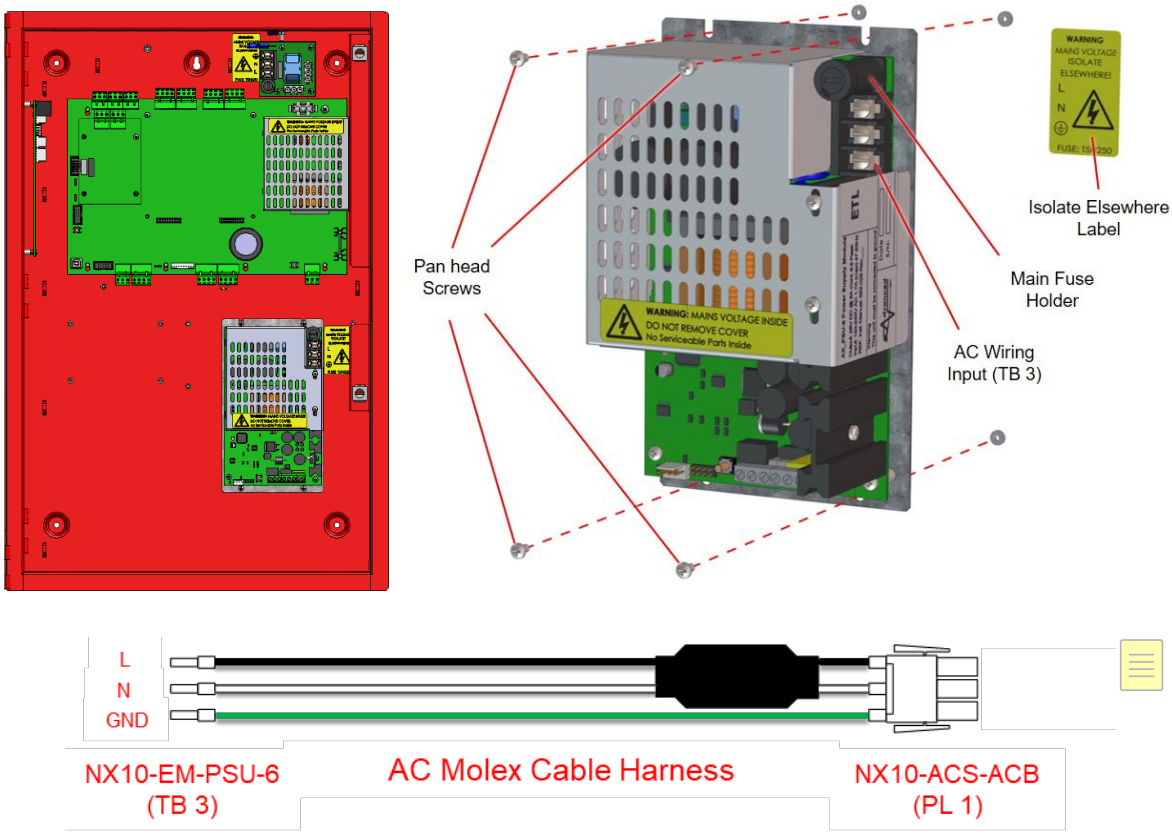


Figure 30 – NX10-EM-PSU6 Module Installation

5.3.1 Installation

The NX10-EM-PSU6 module can be mounted within the Neo NX FACP where there is no NX10-EM-PSU expansion power supply already installed (Figure 33).

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

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

If an NX10-EM-PSU expansion power supply is already installed in the FACP, the NX10-EM-PSU6 power supply charger will need to be installed in another Neo enclosure.

5.3.1.1 Package Contents

- One (1) NX10-EM-PSU6 Module
- One (1) plastic bag containing:
    - One (1) AC Molex cable harness with flying leads
    - One (1) L670-1362-01 AC Mains Isolate Label
    - Two (2) cable ties
    - Four (4) panhead screws
    - One (1) red (+) and One (1) black (-) battery lead
    - One (1) battery link with 10A, 250V fuse
    - One (1) spare 5A, 250V AC fuse

5.3.1.2 Remove

1. Disconnect all AC and DC power from the system.
2. Disconnect the Molex cable from TB 3.
3. Disconnect the NX10-EM-PSU6 output wires.
4. Remove the four (4) panhead screws that secure the NX10-EM-PSU6 to the backbox.
5. Carefully remove the NX10-EM-PSU6 from the backbox.

5.3.1.3 Install

1. Carefully position the NX10-EM-PSU6 on the backbox.
2. Fit the four (4) panhead screws that secure the NX10-EM-PSU6 to the backbox.
3. Attach the Isolate Elsewhere label, make sure that the L, N and GND symbols align with the terminals of TB 3.

5.3.2 Wiring

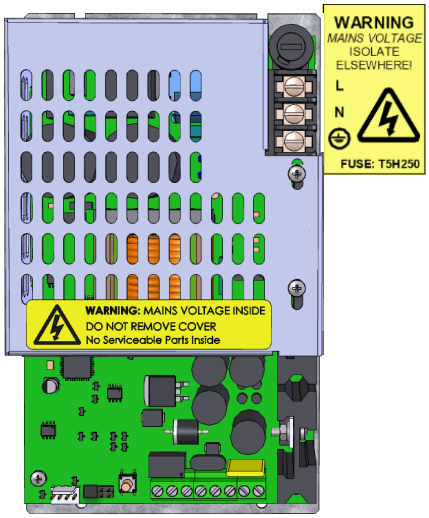
5.3.2.1 Terminal Summary

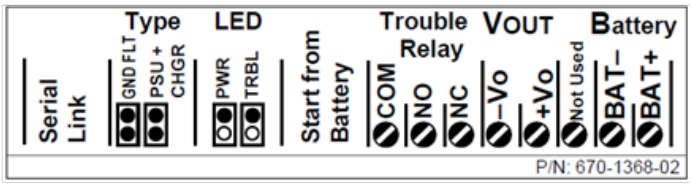
Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB3	⏚	Earth Ground
	N	AC Power Neutral
	L	AC Power Load (Hot) If multiple AC wires are required under any of the input terminals, use 12AWG twin cable ferrule grey or Weidmuller part number 9037530000. If #10 AWG wire is required use TE Connectivity Plasti-Grip wire pin 12-10
TB2 (fail-safe relay)	COM NO NC	Relay Common Relay Normally Open (without power) Relay Normally Closed (without power)
TB1	0V +VO	Negative 24 VDC Positive 24 VDC
TB4	-BAT +BAT	Battery Negative Battery Positive

5.3.2.2 Electrical Specifications

Specifications	
Mains Input	Supervised
Nominal Voltage, Frequency	120V (1.7A), 240V (0.61A), 50/60Hz
24 VDC Power	Supervised, POWER-LIMITED
Max. Current	5A Continuous
Dedicated AC Branch Circuit Requirement or Molex connector located on the NX10-ACS-ACB module	15A (over-current protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) and/or local codes)
Brown-out	98V nominal
On-Board AC Fuse	5A, 250VAC Ceramic, Time Delay (size 5x20mm) (Bussmann S505-5-R, Littelfuse 0215005.XP)
AC Wiring	#14 or #12 AWG Refer to NEC. If multiple AC wires are required under any of the input terminals, use 12AWG twin cable ferrule grey or Weidmuller part number 9037530000. If #10 AWG wire is required use TE Connectivity Plasti-Grip wire pin 12-10
Ground Terminal	Must be connected to a solid earth ground. Use #14 AWG (2 mm^2) or larger wire with 600v insulation rating
Battery Circuit Supervision	Non-Power-Limited Circuit, Supervised for Short Circuit, Open Circuit, Ground Fault, Charger Failure, Battery Disconnection and Battery Cell Failure *Note: If the batteries are disconnected the charger output is turned off.*
Battery Charging Current	1 Amp, Temperature Compensated
Nominal Charging Voltage	27.4 VDC
Battery Type	Sealed Lead-Acid
Minimum Battery Capacity	7Ah
Maximum Battery Capacity	26Ah
Battery Deep Discharge Protection	Battery Disconnection < 19 VDC Nominal
Battery Link Wire Fuse	10A, 250 VAC Ceramic, Time Delay (size 5x10mm) Bussmann Part#: S505-10-R Littelfuse Part#: 0215010.XP

AC wiring for the power supply charger module can originate from a dedicated fire alarm AC branch circuit, or from the fire alarm system's second Molex connector located on the NX10-ACS-ACB board. If wiring to the NX10-ACS-ACB board, plug the supplied Molex cable assembly into the NX10-ACS-ACB PL1 Molex connector and terminate the three (3) flying leads to the correct AC and ground terminal blocks (TB3) on the NX10-EM-PSU6 module (Black to Load, White to Neutral and Green to Ground).





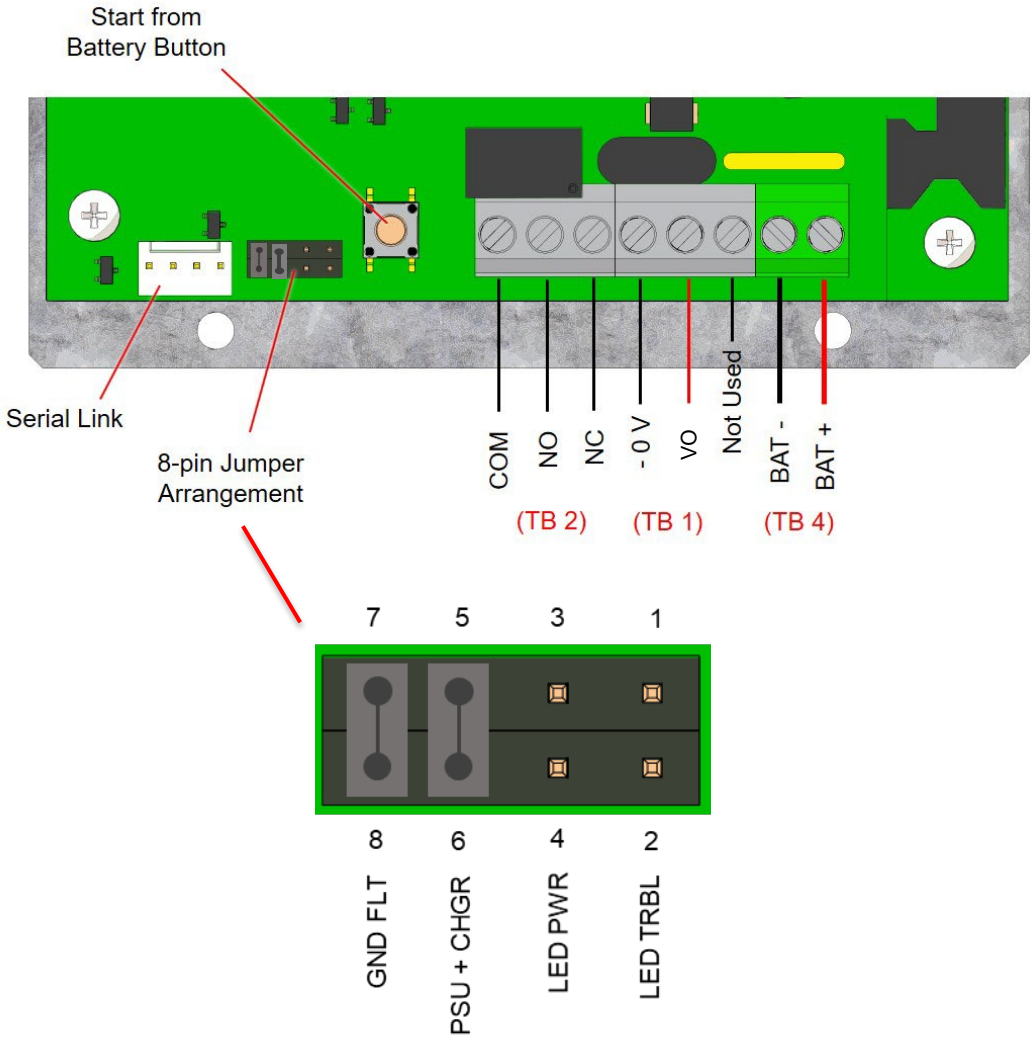


Figure 31 - NX10-EM-PSU6 Connections

5.3.2.3 LEDs

Designation	Colour	Description
HEARTBEAT	Green	Heartbeat
EARTH FAULT	Yellow	Ground Fault
MAINS FLT.	Yellow	Mains Fault
CHGR. FLT.	Yellow	Charger Fault
BAT. O/C	Yellow	Battery Open Circuit
BAT. LOW	Yellow	Battery Low
BAT. CON	Yellow	Battery Disconnected

5.3.3 Supervision

The NX10-EM-PSU6 module's fail-safe trouble relay contact terminals (TB2) COM, NO (closed unless NX10-EM-PSU6 is in trouble) or NC (open unless NX10-EM-PSU6 is in trouble) must be monitored by the Neo NX FACP (Figure 34)

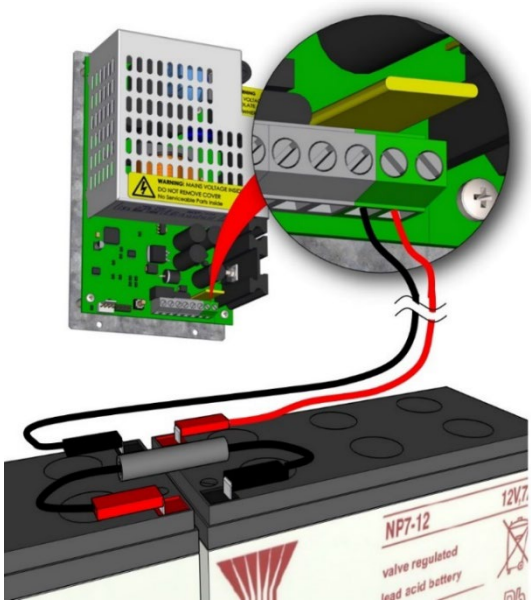
The NX10-EM-PSU6 power supply charger module's fail-safe trouble relay contact must be monitored by the FACP.

5.3.4 24 VDC Power

Terminals (TB 1) +VO (positive) and 0V (negative) are the 24 VDC @ 5A power output terminals of the NX10-EM-PSU6 power supply charger, wire these terminals to the devices requiring 24 VDC power (Figure 34).

5.3.5 Battery Charger

The NX10-EM-PSU6 requires its own set of batteries. To wire the batteries to the NX10-EM-PSU6 module, first connect the supplied in-line fuse cable harness, red slip-on connector to the positive terminal of the first 12 VDC battery and the black slip-on connector to the negative terminal of the second 12 VDC battery. Wire the supplied red cable with red slip-on connector to the +BAT terminal of the NX10-EM-PSU6 module and wire the supplied black cable with black slip-on connector to the -BAT terminal. Connect the red and black cables to the associated positive and negative terminals of the two batteries, red slip-on connector to the positive terminal of the second battery and black slip-on connector to the negative terminal of the first battery (opposite).



The internal series resistance of the batteries is continuously checked, if the resistance increases above 0.8Ω then the NX10-EM-PSU6 module will indicate a battery cell failure.

Start the NX10-EM-PSU6 power supply charger on AC power first then connect the batteries. If AC power is not available, the NX10-EM-PSU6 module can be started directly from the batteries. Connect a fully charged set of batteries and press the "START FROM BATTERY" push button.

Due to space limitation, the NX10-EM-PSU6 batteries must be installed in a separate battery enclosure.

5.3.5.1 Standby Battery Calculations

5.3.5.1.1 Standalone

	Quiescent Load			Alarm Load		
Equipment	I (A)	x	Total	I (A)	x	Total
NX10-EM-PSU6						
Total	ΣQuiescent Load		=	ΣAlarm Load		=
	x 24 hr. or 60 hr.		Ah	x 0.0833[23] hr.		
	Total Quiescent Current		Ah	Total Alarm Current		Ah
	Total Load (Quiescent + Alarm)					Ah
	Total Load x 1.25 (battery de-rating factor)					Ah

5.3.5.1.2 NX10-AMP-80 Audio Amplifier

	Quiescent Load			Alarm Load		
Equipment	I (A)	x	Total	I (A)	x	Total
NX10-EM-PSU6						
NX10-AMP-80	0.050	1.0	= 0.050	0.220	1.0	= 0.220
Amplifier 1[24]					1.0	=
Amplifier 2[24]					1.0	=
Total	ΣQuiescent Load		=	ΣAlarm Load		=
	x 24 hr. or 60 hr.		Ah	x 0.0833[25] hr.		
	Total Quiescent Current		Ah	Total Alarm Current		Ah
	Total Load (Quiescent + Alarm)					Ah
	Total Load x 1.25 (battery de-rating factor)					Ah

Converting Watts to Amps:

1 Watt = 0.051A

40 Watts = 2.04A

[23] 5 minutes in alarm, change to .166 for 10 minutes in alarm.

[24] Add total speaker circuit load of each amplifier, 40 watts maximum per amplifier.

[25] 5 minutes in alarm, change to .166 for 10 minutes in alarm.

5.3.6 Optional Common System Ground Fault Monitoring

Located on the NX10-EM-PSU6 PCB (printed circuit board) is an eight (8) pin jumper arrangement, one of those pairs of pins is a jumper (pins 7 and 8) for setting up the NX10-EM-PSU6 ground fault detection. The NX10-EM-PSU6 module is shipped with this jumper installed across pins 7 and 8, configuring the NX10-EM-PSU6 to monitor for ground fault conditions (below).

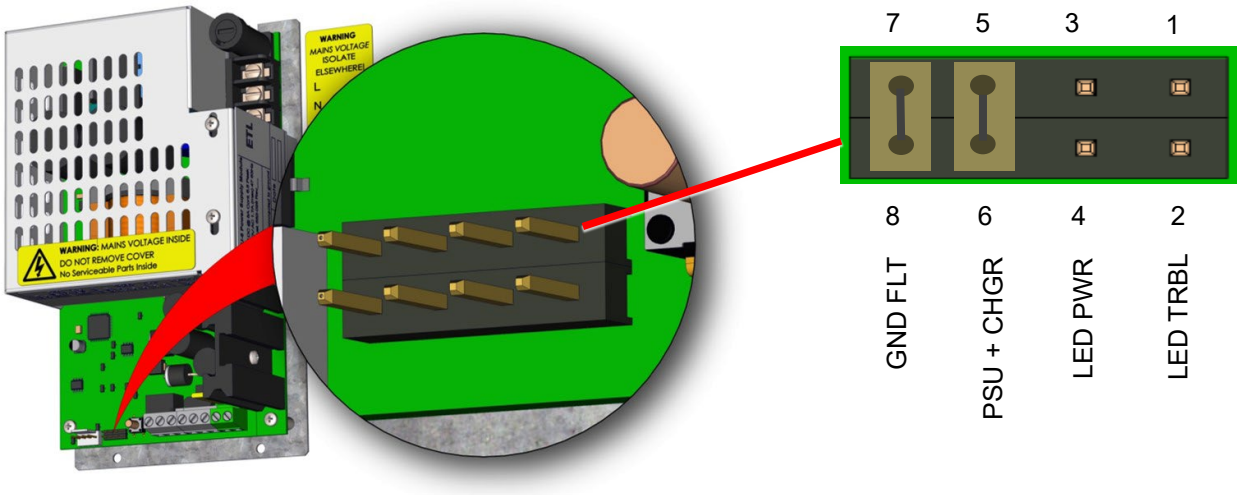


Figure 32 – NX10-EM-PSU6 Ground Fault Jumper

5.3.6.1 Jumper Arrangement and Wiring

To allow the Neo NX FACP to monitor the NX10-EM-PSU6 module for ground fault detection, the factory installed jumper across pins 7 and 8 on the NX10-EM-PSU6 module must be removed to avoid paralleling ground fault detection circuity (above). In addition, wire a cable from the -V0 terminal of the NX10-EM-PSU6 module to the ANC PSU 0V terminal located on the NX10-FACP base card. As there will be two (2) wires required under the NX10-EM-PSU6 module's -V0 terminal, use a twin cable ferrule, manufactured by Weidmuller.

5.4 NX10-ZS Audio Zone Splitter Module

The NX10-ZS amplifier zone splitter module allows for the splitting of the two (2) audio amplifier circuits (speaker circuits) to four (4) audio speaker circuits [one to two speaker circuits]. In addition, if only one audio amplifier circuit (speaker circuit) requires splitting, it can be split to four (4) audio speaker circuits (one to four speaker circuits). The maximum Wattage per NX10-ZS speaker circuit is 10 Watts, with a 30 Watt maximum per module. The NX10-ZS module mounts on top of the NX10-AMP-80 audio amplifier module.

5.4.1 Installation

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

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

5.4.1.1 Package Contents

Carefully unpack the NX10-ZS module from its box, within the box you will find the following items:

- Four (4) panhead screws
- Three (3) metal hexagon spacers
- One (1) nylon standoff
- Four (4) 47K Class B, UL end-of-line (EOL) resistors

5.4.1.2 Remove

1. Disconnect AC and DC power.
2. Unplug any used terminal block of the NX10-ZS module.
3. Remove the three (3) panhead screws securing the module to the NX10-AMP-80 audio amplifier module.
4. Remove the NX10-ZS module from the enclosure.

5.4.1.3 Install

1. Remove the three (3) bottom panhead screws securing the NX10-AMP-80 audio amplifier module to its mounting plate and replace with the three (3) supplied metal hexagon spacers (Figure 36).
2. Install the supplied nylon standoff onto the upper-right screw hole (non-corner hole) of the zone splitter module with one of the supplied panhead screws (Figure 36).
3. Place the zone splitter module over the installed metal hexagon spacers and secure with three (3) panhead screws (Figure 36).

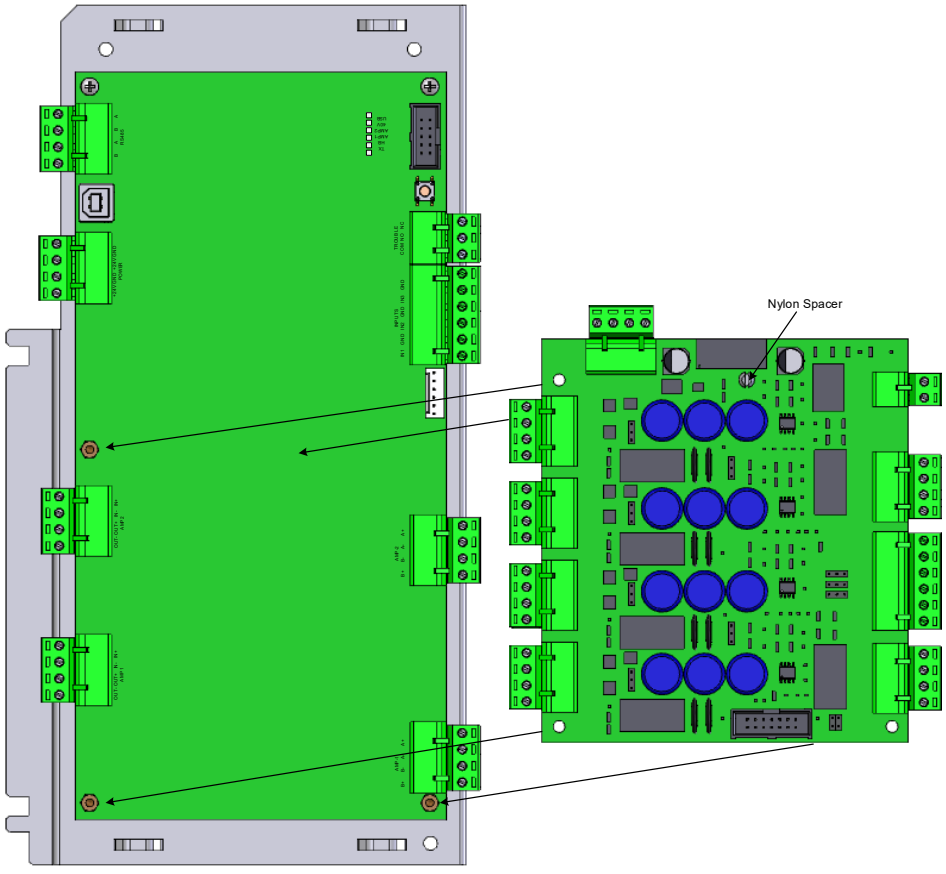


Figure 33 – NX10-ZS Module Installation

5.4.2 Wiring

The NX10-ZS audio zone splitter module requires wiring to the NX10-AMP-80 audio amplifier's 24 VDC power terminals, connection to one or both audio amplifier circuits (speaker circuits) and wiring to one (all circuits active) or multi (individual circuit activations) relay contacts. In addition, if a specific zone splitter trouble is required, wiring the on-board fail-safe Form A (normally closed) relay contact to an input point on the Audio FACP. If a specific zone splitter trouble indication is not required, all NX10-ZS trouble status is reported to the interfaced NX10-AMP-80 audio amplifier circuit (speaker circuit).

The NX10-ZS zone splitter module reports module and speaker circuit status (i.e., opens, shorts and ground fault conditions) via the connected audio amplifier's circuits (speaker circuits). If individual zone splitter status is required, the zone splitter module's normally closed fail-safe trouble relay contact can be monitored.

5.4.2.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation		Terminal Description
TB1	+24V DC IN	24V	24 VDC Power (Positive) In/Out
		0V	24 VDC Power (Negative) In/Out
		24V	24 VDC Power (Positive) In/Out
		0V	24 VDC Power (Negative) In/Out
TB2	TROUBLE	COM	Trouble Relay Common
		N/O	Trouble Relay Normally Open (Closed when Powered)
TB3	ZONE 1	A+	Class A (Positive) Speaker Circuit Return
		A-	Class A (Negative) Speaker Circuit Return
		B-	Class B (Negative) Speaker Circuit Out
		B+	Class B (Positive) Speaker Circuit Out
TB4	AUDIO INPUT 2	B+	Class B (Positive) Audio Input
		B-	Class B (Negative) Audio Input
		A-	Class A (Negative) Audio Return
		A+	Class A (Positive) Audio Return
TB5	AUDIO INPUT 1	B+	Class B (Positive) Audio Input
		B-	Class B (Negative) Audio Input
		A-	Class A (Negative) Audio Return
		A+	Class A (Positive) Audio Return
TB6	INPUT ZONE SELECTION	COM	Common Switching Voltage
		Z1	Zone 1 Activation Input
		Z2	Zone 2 Activation Input
		Z3	Zone 3 Activation Input
		Z4	Zone 4 Activation Input
		ALL	Zone 1, 2, 3 and 4 Activation Input
TB7	ZONE 2	A+	Class A (Positive) Speaker Circuit Return
		A-	Class A (Negative) Speaker Circuit Return
		B-	Class B (Negative) Speaker Circuit Out
		B+	Class B (Positive) Speaker Circuit Out
TB8	ZONE 3	A+	Class A (Positive) Speaker Circuit Return
		A-	Class A (Negative) Speaker Circuit Return
		B-	Class B (Negative) Speaker Circuit Out
		B+	Class B (Positive) Speaker Circuit Out
TB9	ZONE 4	A+	Class A (Positive) Speaker Circuit Return
		A-	Class A (Negative) Speaker Circuit Return
		B-	Class B (Negative) Speaker Circuit Out
		B+	Class B (Positive) Speaker Circuit Out

5.4.2.2 Electrical Specifications

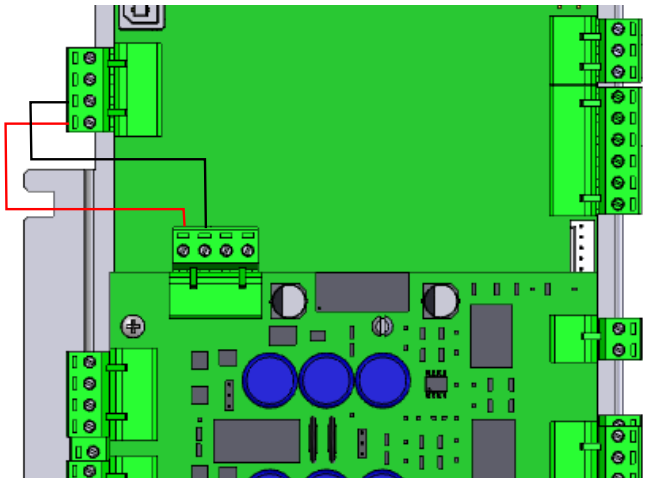
Operating Voltage	24 VDC
Operating Current **Quiescent** **One Circuit Active** **All Circuits Active**	 46mA 53mA 76mA
Speaker Circuits **ZONE 1** **ZONE 2** **ZONE 3** **ZONE 4**	30 Watts maximum per NX10-ZS module Class A or B, 25 Vrms @ 10 Watts max., 47K end-of-line Class A or B, 25 Vrms @ 10 Watts max., 47K end-of-line Class A or B, 25 Vrms @ 10 Watts max., 47K end-of-line Class A or B, 25 Vrms @ 10 Watts max., 47K end-of-line
Audio Input 1 & 2	25 Vrms @ 30 Watts maximum (one or both circuits)

5.4.2.3 LEDs

LED	Function	Description
1	O/C Z1	Zone 1 Open Circuit
2	S/C Z1	Zone 1 Short Circuit
3	O/C Z2	Zone 2 Open Circuit
4	S/C Z2	Zone 2 Short Circuit
5	O/C Z3	Zone 3 Open Circuit
6	S/C Z3	Zone 3 Short Circuit
7	O/C Z4	Zone 4 Open Circuit
8	S/C Z4	Zone 4 Short Circuit

5.4.2.4 24 VDC Power

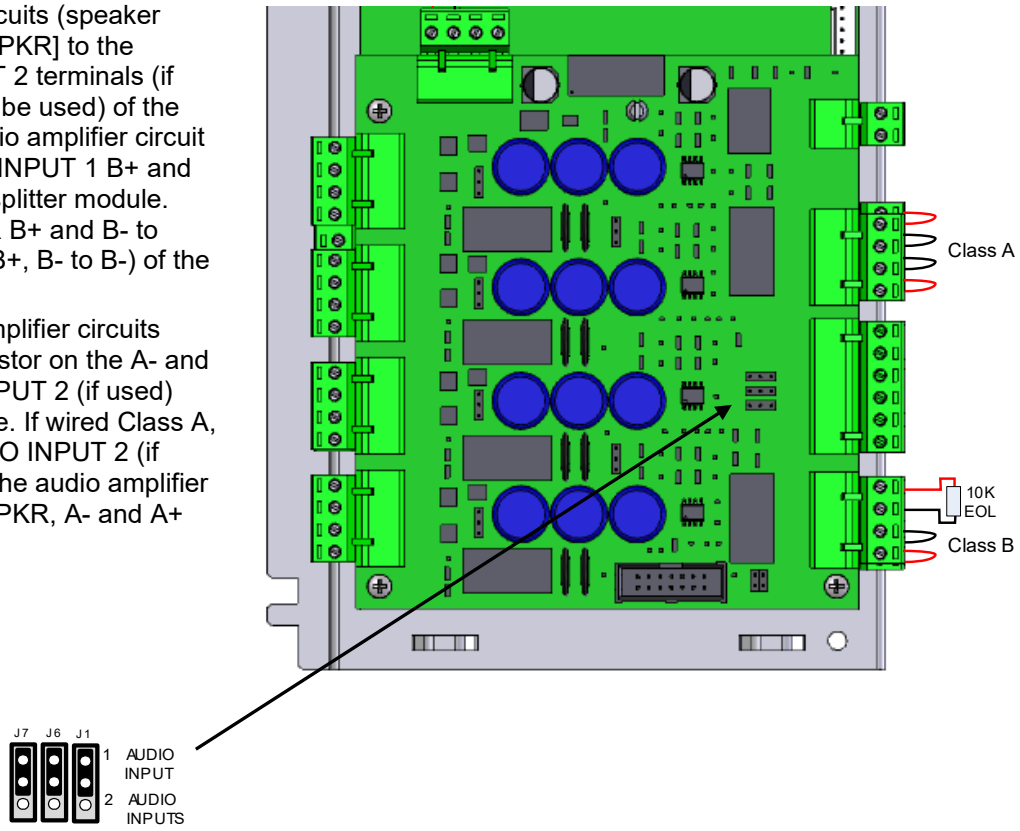
Wire 24 VDC power from the audio amplifier's POWER +24V (positive) and GND (negative) terminals to the +24V (positive) and 0V (negative) terminals of the NX10-ZS zone splitter module (opposite).



5.4.2.5 NX10-AMP-80 Audio Amplifier Circuit

Wire one or both audio amplifier circuits (speaker circuits) [AMP1 SPKR and AMP2 SPKR] to the AUDIO INPUT 1 and AUDIO INPUT 2 terminals (if booth audio amplifier circuits are to be used) of the NX10-ZS zone splitter module. Audio amplifier circuit AMP 1 SPKR B+ and B- to AUDIO INPUT 1 B+ and B- (B+ to B+, B- to B-) of the zone splitter module. Audio amplifier circuit AMP 2 SPKR B+ and B- to AUDIO INPUT 2 B+ and B- (B+ to B+, B- to B-) of the zone splitter module.

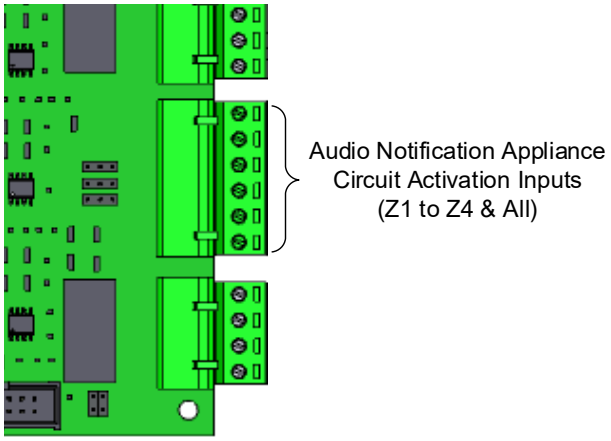
If wired Class B, place the audio amplifier circuits supplied 10K end-of-line (EOL) resistor on the A- and A+ AUDIO INPUT 1 and AUDIO INPUT 2 (if used) terminals of the zone splitter module. If wired Class A, wire the AUDIO INPUT 1 and AUDIO INPUT 2 (if used) A- and A+ terminals back to the audio amplifier circuit's AMP 1 SPKR and AMP2 SPKR, A- and A+ terminals (opposite).



Based on whether the NX10-ZS zone splitter module is splitting one (1) or two (2) audio amplifier circuits (speaker circuits), set jumpers J7, J6 and J1 to the 1 AUTO INPUT or 2 AUDIO INPUTS.

5.4.2.6 Zone (Speaker) Circuit Activation

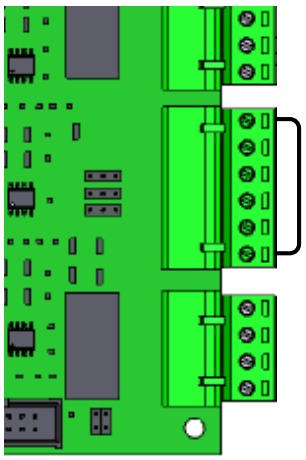
The Zone (Speaker) Circuits of the NX10-ZS are activated by using normally open relay contacts and transferring the INPUT ZONE SELECTION common switching voltage (COM) to the individual zone activation inputs (Z1, Z2, Z3 and/or Z4) of each zone (speaker) circuit or by activating the INPUT ZONE SELECTION ALL, which will activate all the zone (speaker) circuits.



Zone splitter speaker circuit activations are unsupervised, wiring must be within 20 feet of the activation relay contact in same room and in rigid conduit.

5.4.2.6.1 Peripheral Bus Controlled

To allow an associated peripheral bus controlled, audio amplifier to activate the zone splitter speaker circuits, wire a jumper between the INPUT ZONE SELECTION COM and ALL terminals (opposite). This jumper when installed forces the four (4) speaker circuits associated with the zone splitter module to always be active. By the speaker circuits always being active, the peripheral bus controlled, activation of the audio amplifier's speaker circuits will immediately be broadcasted through the zone splitter module.



Audio Notification Appliance Circuit Activation Activate ALL

When the zone splitter module is used with a peripheral bus, controlled audio amplifier module, a jumper wire must be installed between the INPUT ZONE SELECTION terminals COM and ALL.

5.4.2.7 Zone (Speaker) Circuit Wiring

The NX10-ZS zone splitter module zone (speaker) circuits are capable of being wired either Class A or B based on module jumper selections. If wired Class A, set the associated zone speaker circuit jumper to the A position. If wired Class B, set the associated zone speaker circuit jumper to the B position.

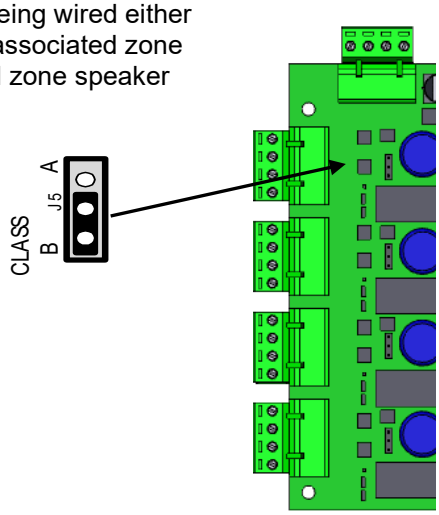
Zone (Speaker) Circuit Jumpers:

ZONE 1 (speaker circuit 1) = J5

ZONE 2 (speaker circuit 2) = J9

ZONE 3 (speaker circuit 3) = J10

ZONE 4 (speaker circuit 4) = J11



To wire speaker circuits of the zone splitter module, wire the B+ and B- terminals of the speaker circuit to the field installed speakers. If wired Class B, place the supplied 47K end-of-line (EOL) resistor at the last field speaker. If wired Class A, return the wiring of the last field speaker back to the A+ and A- terminals of the speaker circuit (Figure 37).

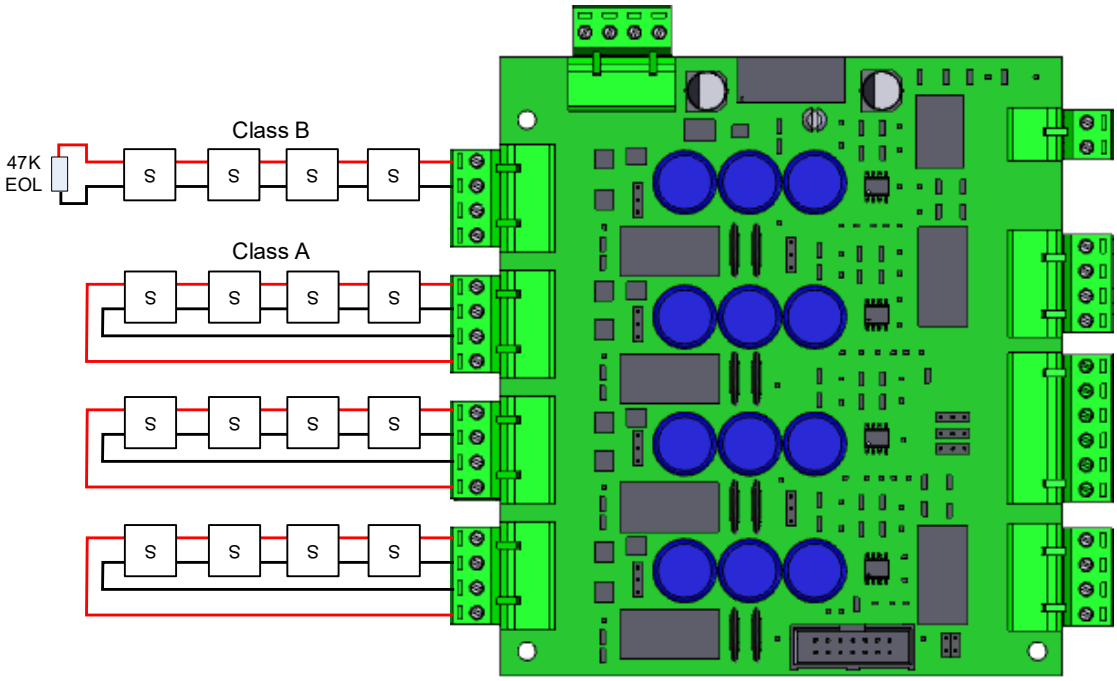


Figure 34 -NX10-ZS Speaker Circuit Wiring

5.5 NX10-EM-PRN Printer Module

The NX10-EM-PRN printer module is a configurable printer which can be installed on the inner door of the Neo Panel.

5.5.1 Installation

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

Due to cabling requirements, it is suggested that the NX10-EM-PRN printer module be mounted in the left single aperture location (seen from the rear) of the Neo panel inner door.

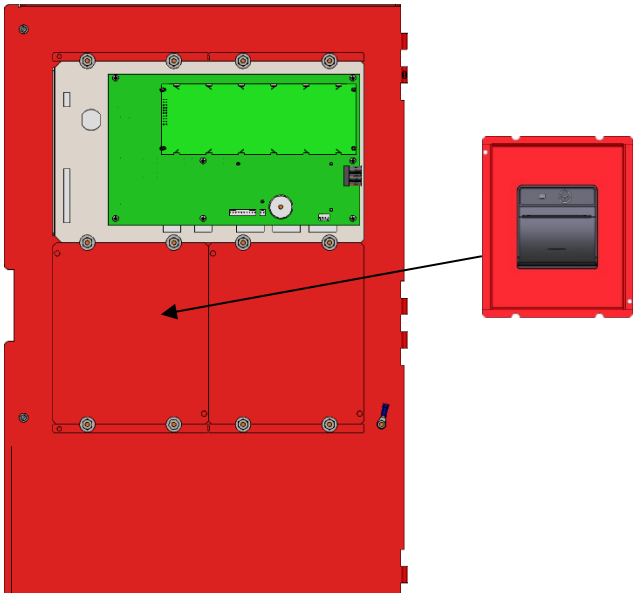


Figure 35 – NX10-EM-PRN Printer Module Installation

5.5.1.1 Package Contents

To install an NX10-EM-PRN printer module, carefully unpack the module from its box, within the box you will find the following items:

- One (1) NX10-EM-PRN Module
- One (1) plastic bag containing:
    - Four (4) hex steel nuts
    - Four (4) washers (spare)
    - Four (4) star lock washers
    - Four (4) adhesive backed cable clips.
    - One (1) adapter card with 14-pin and 10-pin male ports
    - One (1) 14-pin flat ribbon cable with connectors
    - Two (2) male/female nylon standoffs
    - One (1) female/female nylon standoff
    - One (1) panhead screw

5.5.1.2 Remove

NX10-EM-PRN Printer Module

1. Remove the 14-pin flat ribbon cable female connector from the 14-pin male port on the NX10-EM-PRN printed circuit board (PCB) (Figure 40).
2. Remove the four (4) hex steel nuts, four (4) lock washers and four (4) regular washers (Figure 38).
3. Remove the NX10-EM-PRN printer module from the inner door.

NX10-EM-PRN Adaptor Card

1. Remove the 14-pin flat ribbon cable connector from the port on the adaptor card.
2. Remove the 10-pin flat ribbon cable connector from the port on the adaptor card.
3. Remove the two (2) panhead screws which mount the card onto the NX10-ACS-DSP PCB.
4. Carefully remove the adaptor card from the NX10-ACS-DSP PCB.
5. Remove the panhead screw which holds the female/female nylon standoff to the adaptor and retain them for the new adaptor card.

5.5.1.3 Install

NX10-EM-PRN Adaptor Card

1. Before you install the NX10-EM-PRN adapter card, fit the supplied female/female nylon standoff to the single mounting hole on the left side of the adapter card and secure with the supplied panhead screw.
2. On the NX10-ACS-DSP keyboard display (PCB), remove the two (2) right side bottom screws securing the PCB to its associated mounting plate.
3. With the NX10-ACS-DSP PCB screws removed, install the two male/female nylon standoffs supplied (Figure 39).
4. Mount the NX10-EM-PRN adapter card to the standoffs and secure it with the removed two (2) panhead screws (Figure 39).

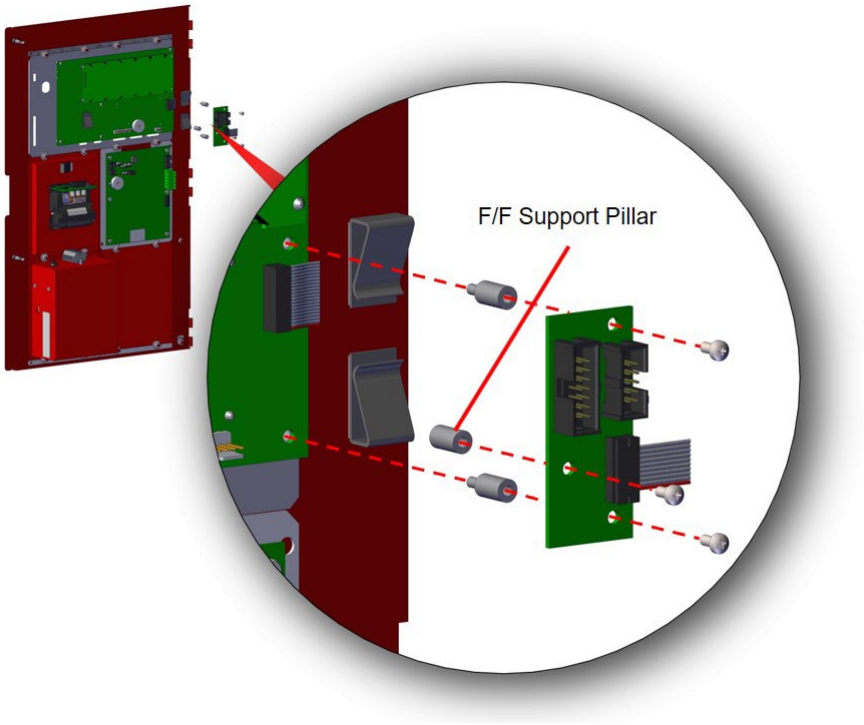


Figure 36 – NX10-EM-PRN Adapter Card Installation

NX10-EM-PRN Printer Module

1. Remove the preinstalled blank single aperture plate on the left side of the inner door by removing the four (4) hex steel nuts, lock washers and regular washers.
2. Place the NX10-EM-PRN printer module between the removed blank single aperture PEMs.
3. Install the regular washers, lock washers and hex steel nuts (Figure 38).
4. Install the supplied adhesive backed cable clips (Figure 41)
5. Disconnect the NX10-ACS-DSP keyboard display 10-pin cable terminated at the NX10-FACP base card PL2 port.
6. Install the cable disconnected above, through the top cable clip mounted on the enclosure inner door and plug it into the 10-pin male port on the adapter card.
7. Install the adapter card 10-pin ribbon cable and feed it through the bottom cable clip mounted on the enclosure inner door, then plug it into the NX10-FACP base card's PL2 port (Figure 40).
8. Take the 14-pin flat ribbon cable with female connectors (supplied) and attach one end to the 14-pin male port on the adapter card. Feed the cable through the two cable clips (one installed on NX10-ACS-DSP PCB and the other installed on the NX10-EM-PRN mounting plate) and plug it into the 14-pin male port located on the NX10-EM-PRN printed circuit board (Figure 40).

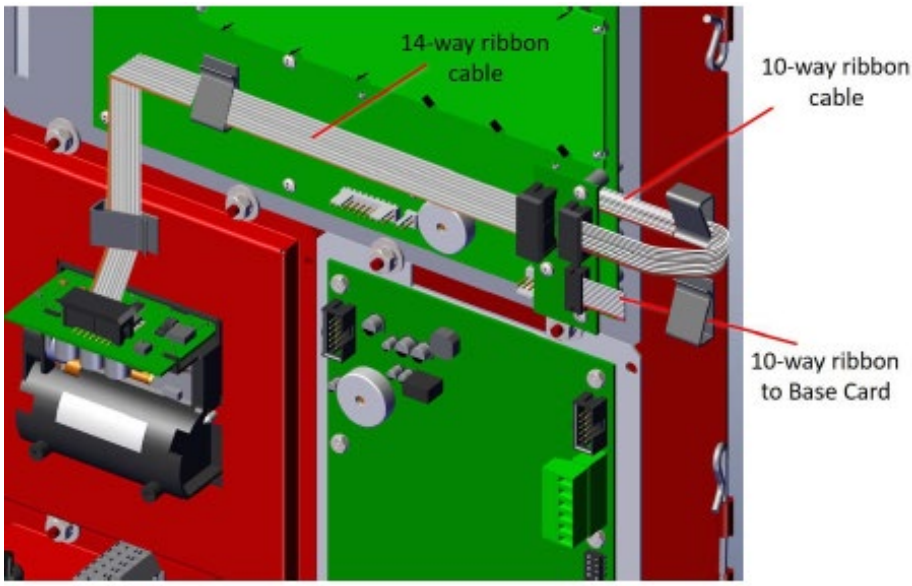


Figure 37 – NX10-EM-PRN Module

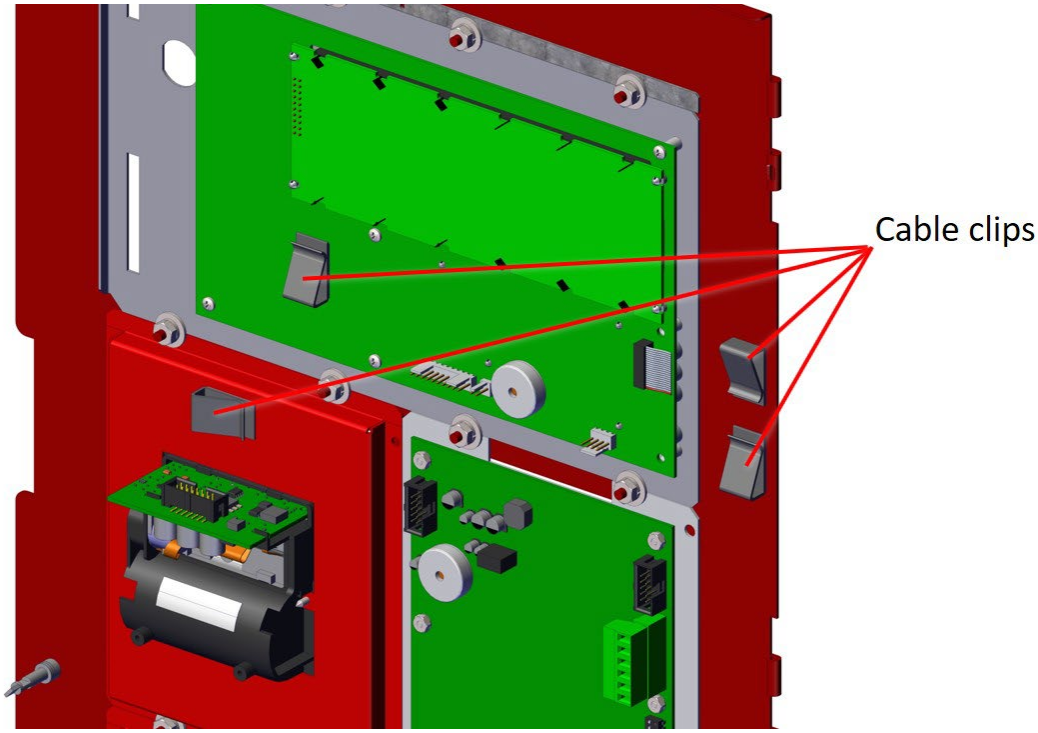


Figure 38 - NX10-EM-PRN Cable Clips

5.5.2 Wiring

5.5.2.1 Terminal Summary

Connector	Termination Location
14-Pin Female Connector	Connect one end to the supplied 14-pin male connector to the port on the adapter card, connect the other end to the 14-pin male connector to the port located on the NX10-EM-PRN printed circuit board

5.5.2.2 Electrical Specifications

Printer Connection	Supervised, POWER-LIMITED
Nominal Voltage	24 VDC
24 VDC Power	Supervised, Filtered and Regulated
Operating Current **Quiescent** **Active (printing)**	 18mA 538mA
Printer Type	Thermal dot matrix
Printer Resolution	384 dots per line
Paper	Thermal, 2.28” (55mm) wide x 1.26” (32mm) diameter roll Length 10.9yd (10m)
Built on-board sensor with trouble LED	Out of Paper Paper door open

6 Optional Peripheral Bus (PBUS) Modules

As previously discussed, the NX10-FACP base card provides a peripheral bus (PBUS) communication circuit for the connection of such modules as, NX10-EM-ASW-16, NX10-FA-LED16, NX10-FA-LED32R, NX10-FA-LED32Y, NX10-EM-IO48, NX10-EM-ACM-6, NX10-AMP-80.

Peripheral bus (PBUS) modules must be mounted within 20 feet of the NX10-FACP base card in the same room and in rigid conduit.

6.1 Switch LED Modules

Switch LED modules are peripheral bus (PBUS) field configurable switch input and LED status indicator modules for use with the Neo NX FACP. There are six (6) types of switch LED modules (NX10-EM-ASW-16, NX10-EM-ACM-6, NX10-EM-IO48, NX10-FA-LED16, NX10-FA-LED32R and NX10-FA-LED32Y) available based on installation requirements.

Module	Description
NX10-EM-ASW-16	Switch/LED Module incorporating 16 switches and 48 LEDs
NX10-EM-ACM-6	Fan/Damper Module
NX10-EM-IO48	Switch LED Driver Module incorporating 16 switch inputs and 48 LED Drive Outputs
NX10-FA-LED16	LED Module incorporating 16 red and 16 yellow LEDs
NX10-FA-LED32R	LED Module incorporating 32 red LEDs
NX10-FA-LED32Y	LED Module incorporating 32 yellow LEDs

Any combination of sixteen (16) switch LED modules (NX10-EM-ASW-16, NX10-EM-ACM-6, NX10-EM-IO48, NX10-FA-LED16, NX10-FA-LED32R and NX10-FA-LED32Y) can be connected to the NX10-FACP base card's peripheral bus (PBUS).

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 or they can be configured to provide complete HOA (Hand-Off-Auto) control functionality. When used with the peripheral bus (PBUS) controlled NX10-AMP-80 audio amplifier module, switches can be configured for all call, selective zone/area paging, individual message selection, etc. LEDs can be programmed for various status indications by points, zones and/or groups within the system, including alarm, waterflow alarm, CO 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, except of course the NX10-EM-IO48 driver module, allowing switches and LEDs to have customized labelling based on installation usage.

For additional programming and configuration of the Switch LED Modules refer to NX686-100 PC-NeT Manual.

6.1.1 Installation

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

6.1.1.1 Package Contents

To install a switch LED module, carefully unpack the module from its box, within the box you will find a plastic bag containing the following items:

- Four (4) hex steel nuts (spare)
- Four (4) washers (spare)
- Four (4) star lock washers (spare)
- One (1) 10-pin flat ribbon cable with connectors
- Four (4) cable ties

6.1.1.2 Remove

1. Disconnect AC and DC power.
2. Unplug the terminal block and if connected the 10-pin flat ribbon cable(s).
3. Remove the four (4) hex steel nuts, star lock washers and washers securing the Switch LED module to the enclosure's inner door and remove the module from the aperture location.

6.1.1.3 Install

1. Remove the blank single aperture plate from the enclosure's inner door by removing the four (4) hex steel nuts, star lock washers and washers securing the plate to the inner door.
2. Place the Switch LED module between the PEMs where the blank single aperture plate was removed.
3. Secure the Switch LED Module to the inner door by installing the four (4) washers, star lock washers and hex steel nuts (Figure 42).

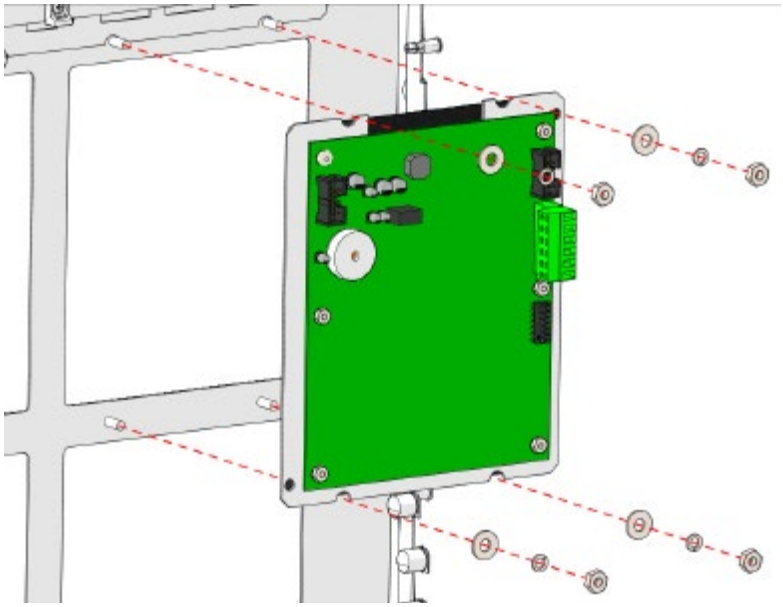


Figure 39 - Switch LED Module Installation

6.1.2 Wiring

As previously indicated, each switch LED module requires connection to the NX10-FACP base card's peripheral bus (PBUS). In addition, each switch LED module requires 24 VDC filtered and regulated power.

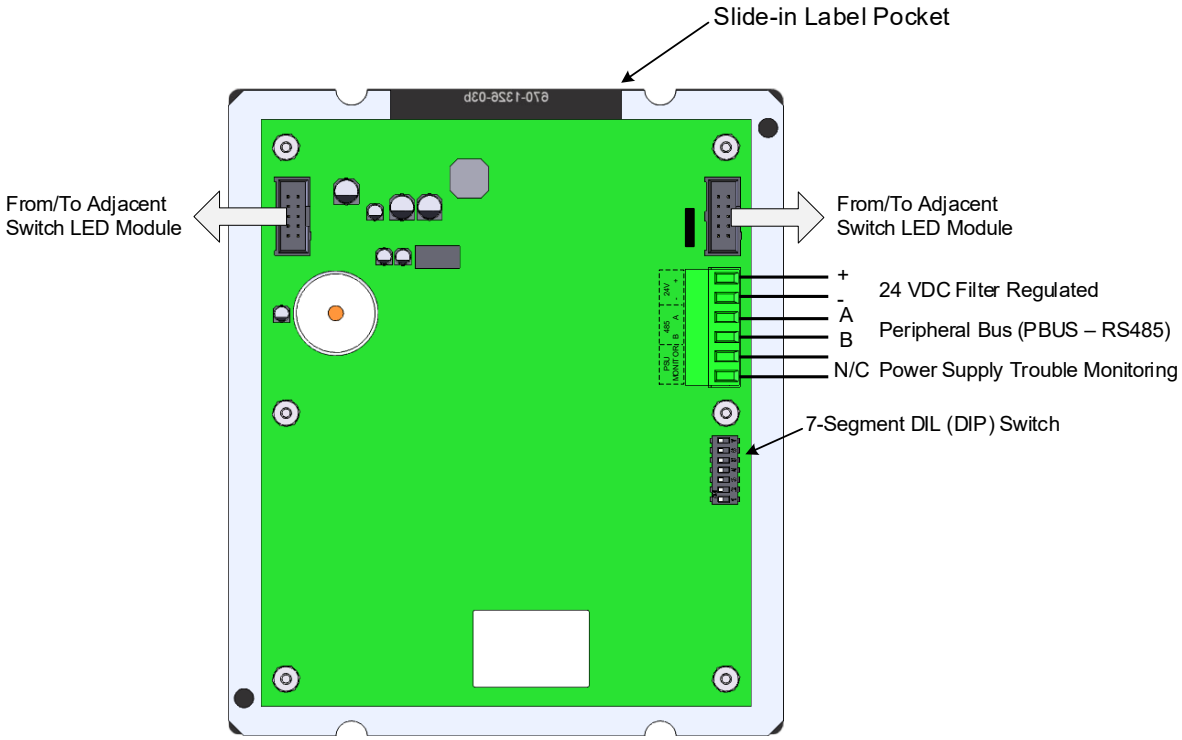


Figure 40 - Switch LED Module Wiring

6.1.2.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation	Terminal Description
TB1	24V + 24V – 485 A 485 B PSU Monitor PSU Monitor	Positive 24 VDC Negative 24 VDC PBUS COMM A PBUS COMM B Supervised remote power supply monitoring input

6.1.2.2 Electrical Specifications

Operating Current	Quiescent	Active State (All switches/LEDs)
NX10-EM-ASW-16	14mA	55mA
NX10-EM-ACM-6	14mA	55mA
NX10-EM-IO48	14mA	55mA
NX10-FA-LED32R or Y	14mA	55mA
NX10-FA-LED16	14mA	55mA
Operating Voltage	18-28 VDC	
Switches (Buttons) **NX10-EM-ASW-16** **NX10-EM-ACM-6** **NX10-EM-IO48**	 16 programmable 18 programmable 16 programmable switch inputs	
LEDs **NX10-EM-ASW-16** **NX10-EM-ACM-6** **NX10-FA-LED16** **NX10-FA-LED32R** **NX10-FA-LED32Y** **NX10-EM-IO48**	 48 programmable (16 green, 16 red, 16 yellow) 36 programmable (18 white, 6 yellow, 12 bicolour (red or green)) 32 programmable (16 red, 16 yellow) 32 programmable (32 red) 32 programmable (32 yellow) 48 programmable LED drive outputs	
PL3 and PL4	Daisy chain in/out serial connections for transmission of power and PBUS.	

6.1.2.3 LEDs

LED	Function	Description
Green	TX	Peripheral Bus Transmit
Green	RX	Peripheral Bus Receive
Green	HB	Heartbeat

6.1.2.4 Peripheral Bus (PBUS)

To connect a switch LED module to the peripheral bus (PBUS), wire terminals A and B of the switch LED module to terminals A and B of the NX10-FACP base card peripheral bus (PBUS), A to A, B to B (Figure 43). If the switch LED module is the last peripheral bus (PBUS) module on the PBUS, set the “485 EOL” DIP switch to the ON position (Figure 45).

6.1.2.5 24 VDC Power

24 VDC power for switch LED modules can come from any fire alarm listed 24 VDC power-limited, filtered, and regulated power supply NX10-FACP AUX Power [non resettable], NX10-EM-PSU6 Power Supply Charger. Wire 24 VDC filter, regulated power to terminals 24V+ and – of the switch LED module (Figure 43).

The switch LED modules can monitor a remote listed 24 VDC power supply for trouble conditions. To monitor a remote power supply, wire the power supply’s trouble N/O contact (fail-safe [closed unless trouble]) to the PSU Monitor terminals of the switch LED module (Figure 43). When monitoring a remote power supply, set the “PSU MON DISABLED” DIP switch to its OFF position (Figure 45).

6.1.2.6 Multiple Switch LED Modules

If multiple switch LED modules are installed along-side each other on a single aperture row, wiring between the switch LED modules can be done via the supplied 10-way flat ribbon cable (Figure 44).

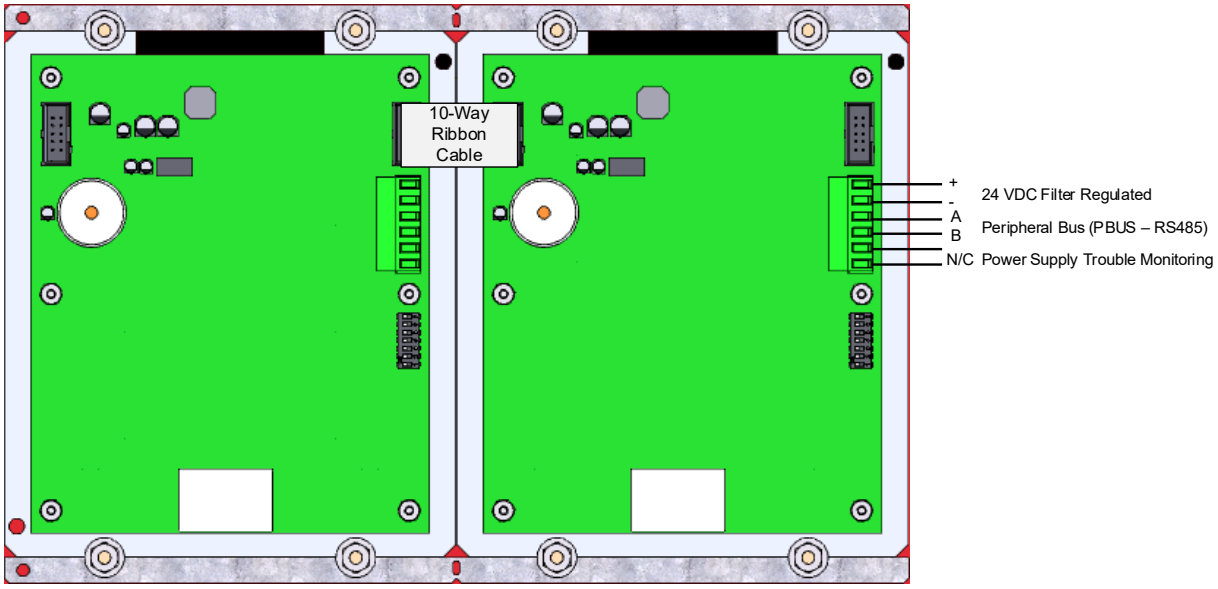
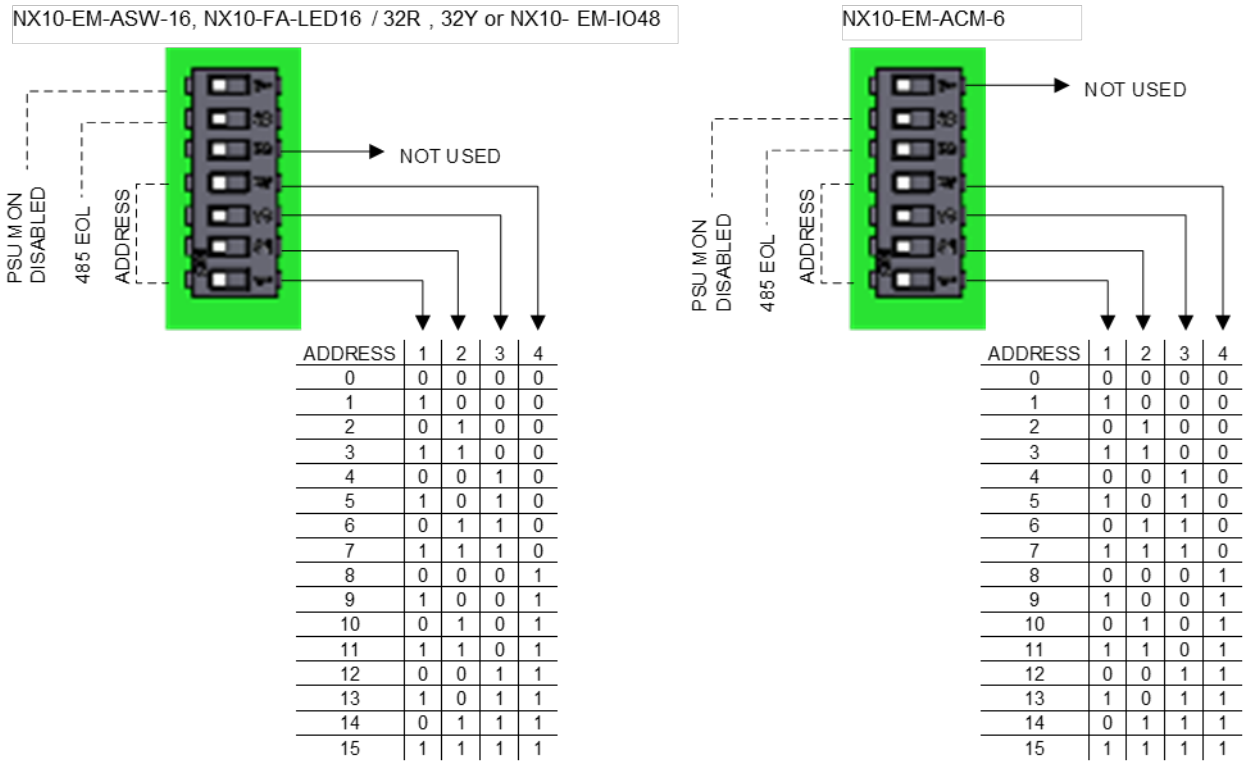


Figure 41 - Switch LED Module Daisy Chain Wiring

6.1.3 Addressing

Each switch LED module must be connected to a peripheral bus (PBUS). As the switch LED modules reside on the peripheral bus (PBUS) each module must be configured with a unique address (Figure 45). The address setting corresponds to peripheral bus (PBUS) programming criteria used within the Shield Neo NX Config Tool.



ADDRESS	1	2	3	4
0	0	0	0	0
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
10	0	1	0	1
11	1	1	0	1
12	0	0	1	1
13	1	0	1	1
14	0	1	1	1
15	1	1	1	1

ADDRESS	1	2	3	4
0	0	0	0	0
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
10	0	1	0	1
11	1	1	0	1
12	0	0	1	1
13	1	0	1	1
14	0	1	1	1
15	1	1	1	1

Figure 42 - Switch LED Module Addressing

6.2 NX10-AMP-80 Audio Amplifier Module

The NX10-AMP-80 audio amplifier module is an optional module that provides digital audio capabilities that can be added to an NX10-FACP-1L or NX10-FACP-2 FACP. The NX10-AMP-80 audio amplifier module incorporates two, simultaneously activated, independent 40-Watt amplifier output circuits (speaker circuits) capable of being wired either Class A or B. The two 40-Watt amplifiers are activated simultaneously and can be turned on via system software (peripheral bus controlled) or by a hardwired contact closure (hardwired controlled). The second 40-Watt amplifier can also be configured as a backup amplifier to the primary amplifier in the Shield Neo NX NX10-AMP software.

The NX10-FACP-4 cannot support an NX10-AMP-80 audio amplifier module. The NX10-FACP-4 is preassembled with an NX10-EM-PSU expansion power supply which uses the installation location for the NX10-AMP-80 required NX10-EM-PSU6 power supply charge module.

When activated, the audio amplifier module can either broadcast an internally preconfigured audio message/tone or it can rebroadcast an audio signal (live voice and/or audio message/tone) generated from a remote audio amplifier module (i.e., an amplifier located at a fire alarm command centre).

If using an audio amplifier module with an NX10-FACP-1L or NX10-FACP-2, the panel does not support an optional NX10-MIC microphone assembly. In addition, when an NX10-AMP-80 audio amplifier module and its associated NX10-EM-PSU6 power supply charger module is used, an NX10-EM-PSU expansion power supply cannot be installed to support the additional power for the NX10-EM-LPD (SLC circuits).

When Ad-NeT-PluS networks incorporate audio amplifiers, 150 nodes maximum will guarantee 10 second synchronization of audio messages/tones across the network.

6.2.1 Installation

This equipment contains electrostatic discharge sensitive devices. Make sure that you always obey anti-static precautions when working on the system. Failure to obey ESD procedures can damage the equipment.

The NX10-AMP-80 audio amplifier module is preassembled on a mounting plate, do not remove the mounting plate from the audio amplifier module, this plate is part of the heatsink assembly for the amplifier circuitry. If replacing an audio amplifier module, the replacement audio amplifier module will be supplied with the preassembled mounting plate.

6.2.1.1 Package Contents

- One (1) NX10-AMP-80 Module
- One (1) plastic bag containing:
    - Two (2) 10K Class B, UL end-of-line resistors
    - One (1) 6-pin female supervision plug
    - Three (3) panhead screws

6.2.1.2 Remove

1. Disconnect AC and DC power.
2. Disconnect all used terminal blocks.
3. Remove the two (2) panhead screws that secure the NX10-AMP-80 mounting plate to the backbox.
4. Carefully slide the NX10-AMP-80 module with mounting plate from under the left-side bottom tabs of the backbox and remove from the enclosure.

6.2.1.3 Install

1. Install the NX10-AMP-80 audio amplifier module with plate assembly on the left-side of the enclosure's backbox below the NX10-FACP base card.
2. Carefully slide the NX10-AMP-80 mounting plate tabs under the two left-side bottom tabs of the backbox (Figure 46).
3. Position the mounting plate on the two posts below the NX10-FACP base card and secure with the two (2) panhead screws (Figure 46).
4. With the audio amplifier module mounted, insert the supplied 6-pin female microphone supervision plug into the audio amplifier's 6-pin male connector (NX10-MIC PL2) [Figure 47]. The connector and plug are keyed and can only be inserted one way.

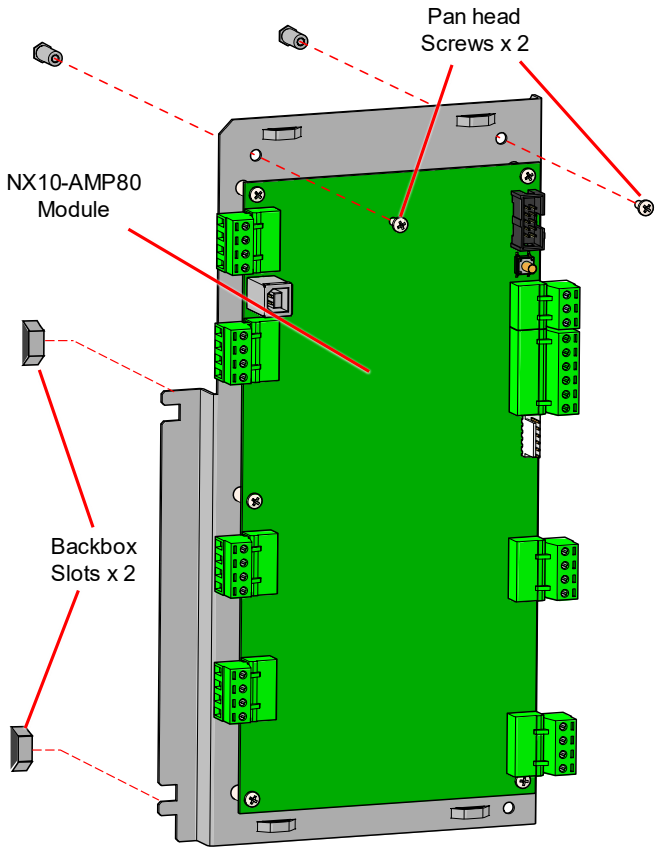


Figure 43 - NX10-AMP-80 Module Installation

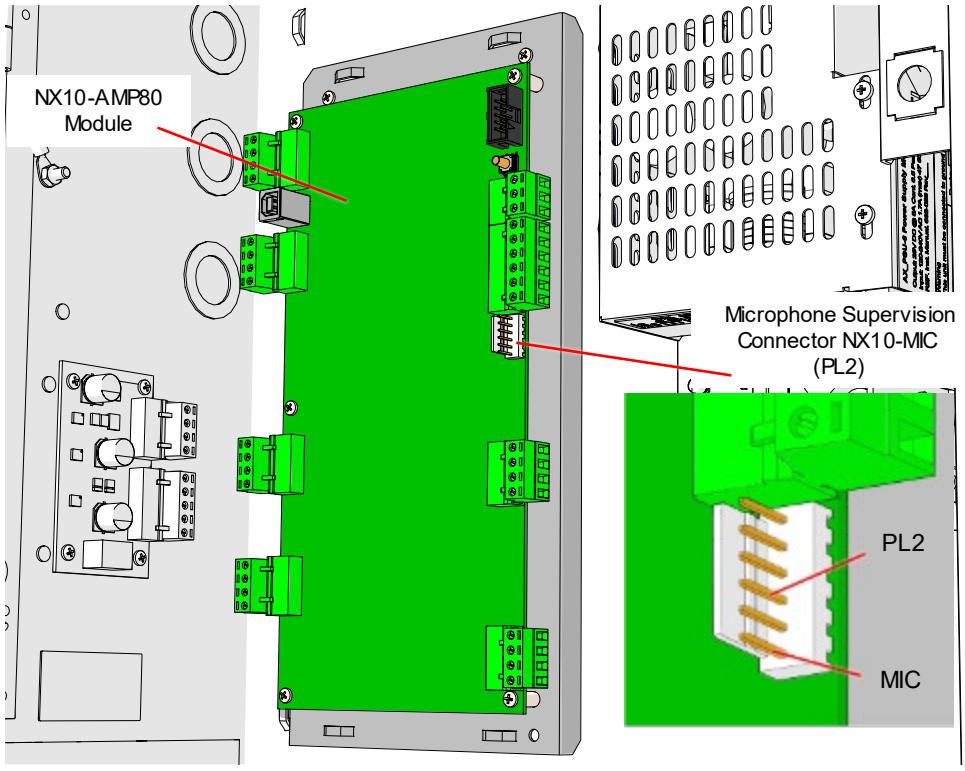


Figure 44 - Connector NX10-MIC-PL2

6.2.2 Wiring

6.2.2.1 Terminal Summary

Not Visible Terminal Designation	Visible Terminal Designation		Terminal Description
TB1	AMP 1 IN	OUT-	Remote Audio OUT (Negative)
		OUT+	Remote Audio OUT (Positive)
		IN-	Remote Audio IN (Negative)
		IN+	Remote Audio IN (Positive)
TB2	AMP 2 IN	OUT-	Remote Audio OUT (Negative)
		OUT+	Remote Audio OUT (Positive)
		IN-	Remote Audio IN (Negative)
		IN+	Remote Audio IN (Positive)
TB3	RS485	B	Peripheral Bus Communication B In/Out
		A	Peripheral Bus Communication A In/Out
		B	Peripheral Bus Communication B In/Out
		A	Peripheral Bus Communication A In/Out
TB4	POWER	+24V	24 VDC Power (Positive) In/Out
		GND	24 VDC Power (Negative) In/Out
		+24V	24 VDC Power (Positive) In/Out
		GND	24 VDC Power (Negative) In/Out
TB5	AMP1 SPKR	B+	Class B (Positive) Amplifier 1 Speaker Circuit Output
		B-	Class B (Negative) Amplifier 1 Speaker Circuit Output
		A-	Class A (Negative) Amplifier 1 Speaker Circuit Return
		A+	Class A (Positive) Amplifier 1 Speaker Circuit Return
TB6	AMP2 SPKR	B+	Class B (Positive) Amplifier 2 Speaker Circuit Output
		B-	Class B (Negative) Amplifier 2 Speaker Circuit Output
		A-	Class A (Negative) Amplifier 2 Speaker Circuit Return
		A+	Class A (Positive) Amplifier 2 Speaker Circuit Return
TB7	INPUTS	IN1	Input 1 (Hardwired = Activates Message 1, Peripheral Bus = Supervises NX10-EM-PSU6)
		GND	Input 1 Negative Voltage for Switching
		IN2	Input 2 (Hardwired = Activates Message 2)
		GND	Input 2 Negative Voltage for Switching
		IN3	Input 3 (Hardwired = Activates Amplifier Booster, Rebroadcasts Remote Audio)
		GND	Input 3 Negative Voltage for Switching
TB8	TROUBLE	COM	Trouble Relay Common
		NO	Trouble Relay Normally Open (Closed when Powered)
		NC	Trouble Relay Normally Closed (Open when Powered)
PL2	MIC		6-Pin Male Connector for NX10-MIC Microphone Assembly Input or Supervisory Jumper
PL3	USB		USB Port for NX10-AMP-80 Programming
J1	BACKUP TEST		OFF/ON Jumper for Testing Backup Amplifier

6.2.2.2 Electrical Specifications

Supervision	Supervised for Short Circuit, Open Circuit and Ground Fault POWER-LIMITED
Operating Voltage	24 VDC
Operating Current **Quiescent** **Active**	 50 mA 220mA, plus 51mA per 1 Watt of audio (maximum 4.3A @ 80 Watt)
Audio Amplifier Wattage **Amp1** **Amp2**	 40 Watt @ 25 Vrms 40 Watt @ 25 Vrms
Audio Amplifier Circuit **AMP1 (Speaker Circuit 1)** **AMP2 (Speaker Circuit 2)**	* Circuits Activated Simultaneously Class A or B (10K end-of-line) Class A or B (10K end-of-line)
Audio Amplifier Audio Input **Amp1** **Amp2**	 25 Vrms max. 25 Vrms max.
Trouble Relay Contact Rating	1A @ 30 VDC

6.2.2.3 LEDs

LED	Designation	Colour	Description
LED1	HB	Green	Heartbeat
LED2	A1	Green	Amplifier 1 Status
LED3	A2	Green	Amplifier 2 Status
LED4	TX	Green	Peripheral Bus Transmit
LED5	40V	Green	40V Power
LED6	USB	Green	USB Port Active

6.2.2.4 Activation

As previously indicated, the NX10-AMP-80 audio amplifier module can be activated either via software (peripheral bus (PBUS) controlled) or hardwired relay (hardwired controlled).

6.2.2.4.1 Peripheral Bus (PBUS) Controlled

As a peripheral bus (PBUS) controlled audio amplifier, the audio amplifier would be configured in the Shield Neo NX Config Tool as a Floor Amp (area amplifier). As a Floor Amp, the audio is activated whenever an automatic message event, manual message button or a request to page is received at the specific floor (area) amplifier.

When a request to play a message is received at the floor (area) amplifier, the request will be accompanied with a message number (1 to 16) to play. This message number indicates to the floor (area) amplifier which of it is one (1) through sixteen (16) possible on-board programmed messages to play. The sixteen (16) messages/tones of the floor (area) amplifier can be tailored to meet any specific installation messaging demand, such as alarms, alerts, CO events, warnings, and other event type messaging requirements.

If other Floor Amps, either allocated to the same floor (area) amplifier number or to different floor (area) amplifier numbers are installed within the installation, the Shield Neo NX NX10-AMP software can be configured to synchronize all identical messages throughout an entire facility. With multiple peripheral bus (PBUS) controlled audio amplifiers, multiple floors (areas) can be broadcasting synchronized messages throughout a facility (i.e., alarm message to fire floor, floor above and floor below and alert message to the remainder of the facility).

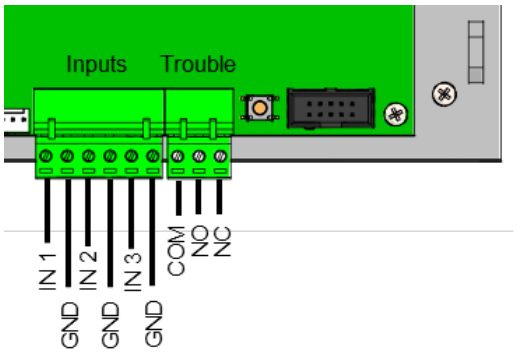
Refer to the Shield Neo NX10-AMP Programming Manual regarding the programming of an NX10-AMP-80 audio amplifier module via the Shield Neo NX NX10-AMP software.

Within the Shield Neo NX Config Tool, the first four (4) message programming numbers (1, 2, 3, and 4) are prelabelled (non-editable); Alarm, Alert, All Clear and Pre-announce. Though these message numbers are pre-labelled and cannot be changed in the Neo NX Config Tool, the floor (area) amplifier can have any message programmed within the message 1, 2 and 3 locations. The message 4 location cannot be used for any other message type, this message location is dedicated to a field programmed pre-announcement tone, which if used would be played prior to the activation of the microphone push-to-talk button.

6.2.2.5 Hardwired Controlled

A hardwired controlled audio amplifier activates whenever one of three (3) relay-controlled Inputs (IN1 & GND [input 1], IN2 & GND [input 2] and IN3 & GND [input 3]) are activated (opposite).

Based on the input activated (built-in priority), the audio amplifier will either broadcast one of two (2) field programmable messages/tones (programmed via the Shield Neo NX NX10-AMP software) or rebroadcast (amplifier “booster mode”) a remote audio amplifier’s live voice page or message/tone. Based on the input prioritization, if inputs 1 and 2 are active, the audio amplifier will broadcast its on-board message/tones 1. If all inputs are activated, the audio amplifier will rebroadcast a remote audio amplifier’s signal (below).



Hardwired Controlled Input Prioritization		
Control	**Input Active Operation**	**Priority**
Input 1 (IN1 & GND)	Play Field Programmed Message/Tone 1 (default Alarm Message)	2 (Medium)
Input 2 (IN2 & GND)	Play Field Programmed Message/Tone 2 (default All Clear Message)	3 (Low)
Input 3 (IN2 & GND)	Rebroadcast a Remote Audio Amplifier Live Voice Communications or Message/Tones	1 (High)

6.2.2.6 Configurations and Wiring

As previously stated, an audio amplifier module can be configured as a peripheral bus controlled or hardwired controlled amplifier. Based on which amplifier type is configured, specific configurations and wirings will be different, the common configuration and wiring requirements will be 24 VDC power wiring, remote audio amplifier input wiring from either a Mic Bus Amp (peripheral bus controlled) or a remote audio amplifier (hardwired controlled) and of course, the audio amplifier output circuit (speaker circuit) wiring.

6.2.2.6.1 Common Peripheral Bus and Hardwired Controlled Wiring

6.2.2.6.1.1 24 VDC Power

When using an NX10-AMP-80 audio amplifier module, the audio amplifier requires 24 VDC power from an NX10-EM-PSU6 power supply charger module. For information regarding installation and wiring of the NX10-EM-PSU6, refer to the NX10-EM-PSU6 Power Supply Charger Module section of this manual.

To connect the 24 VDC power from the power supply charger module, wire the +VO terminal of the power supply charger module to the Power +24V terminal of the audio amplifier module. Wire the 0V terminal of the power supply charger module to the Power GND terminal of the audio amplifier module (Figure 48).

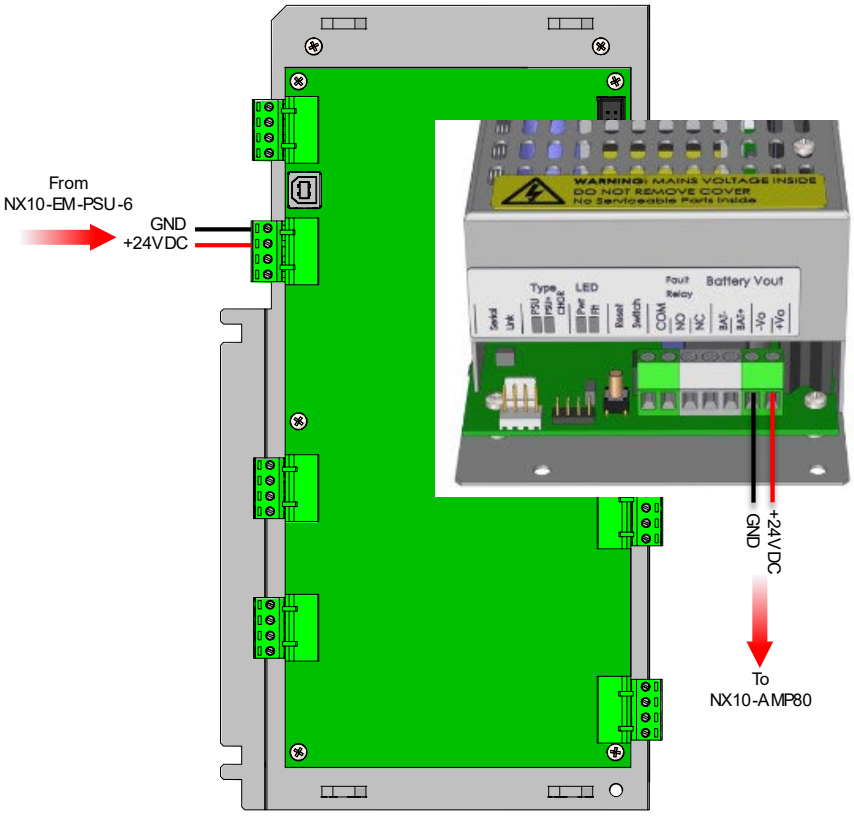


Figure 45 - NX10-AMP-80 24 VDC Wiring

6.2.2.6.1.2 Remote Audio Amplifier Input

As previously indicated, the remote audio amplifier input wiring to an NX10-FACP-1L or NX10-FACP-2 audio amplifier module is the same whether it be a peripheral bus or hardwired controlled amplifier. Where the differences exist is based on what type of controlled amplifier is generating the incoming audio. In a peripheral bus, controlled Floor Amp, the incoming live voice communications will originate from a peripheral bus Mic Bus Amp, in a hardwired controlled amplifier, the incoming audio (live voice communications and/or message/tones) will originate from another hardwired audio amplifier.

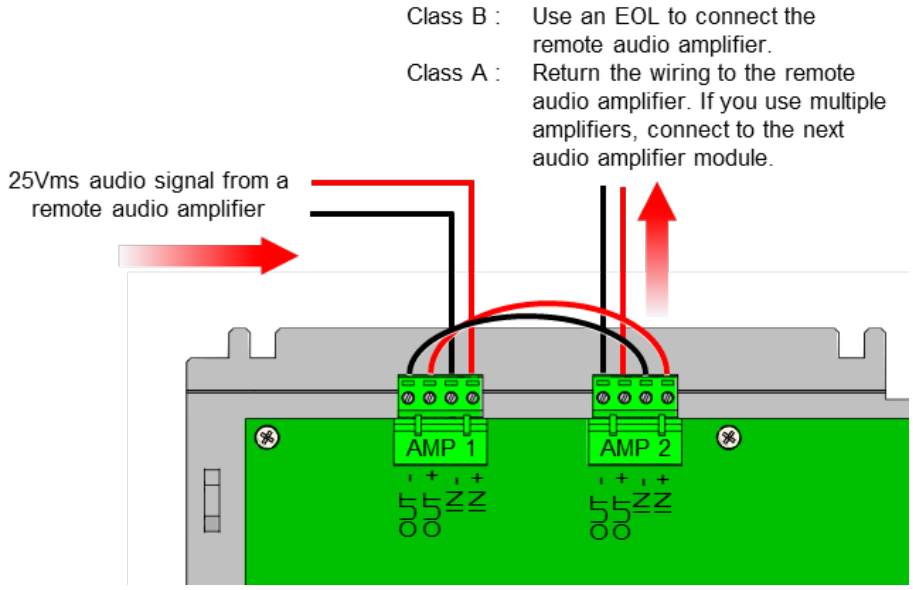


Figure 46 - Remote Audio Amplifier Wiring

To rebroadcast an audio signal from a remote location (Mic Bus Amp or hardwired amplifier), the remote audio amplifier's speaker circuit (25 Vrms signal) must be connected to the audio inputs (AMP1 and AMP2) of the installed audio amplifier module.

Wire the remote audio amplifier's speaker circuit B+ and B- terminals to the installed audio amplifier's AMP1 IN+ and IN-, B+ to IN+ and B- to IN-. If the second onboard amplifier of the audio amplifier requires the rebroadcasted audio signal also, wire the audio amplifier's AMP1 OUT+ and OUT- terminals to the audio amplifier's AMP2 IN+ and IN-, OUT+ to IN+ and OUT- to IN- (Figure 49).

If the remote audio amplifier's speaker circuit is wired Class B and is not required for additional installation audio amplifiers, connect the remote audio amplifier's 10K end-of-line resistor on the OUT+ and OUT- terminals of the audio amplifier's AMP2 terminals. If the remote audio amplifier's speaker circuit is wired Class A or if the remote audio amplifier speaker circuit is required for additional installation audio amplifiers, wire the OUT+ and OUT- terminals of the audio amplifier's AMP2 terminals back to the remote audio amplifier's speaker circuit A+ and A- terminals. If wiring to additional installation audio amplifiers, wire the OUT+ and OUT- terminals of the audio amplifier's AMP2 terminals to the next audio amplifier's AMP1 IN+ and IN- terminals (Figure 49).

6.2.2.6.1.3 Audio Amplifier Circuits (Speaker Circuits)

Each audio amplifier module incorporates two (2) independent 40-Watt audio amplifier circuits (speaker circuits) capable of being wired Class A or B. To wire the circuit Class B, wire AMP1 and/or AMP2 (speaker circuits) B+ and B- terminals to the field speakers and terminate the last speaker with the supplied 10K end-of-line (EOL) resistor. If wiring the circuit Class A, return the last speaker wiring to the AMP1 and/or AMP2 (speaker circuit) A+ and A- terminals (Figure 50).

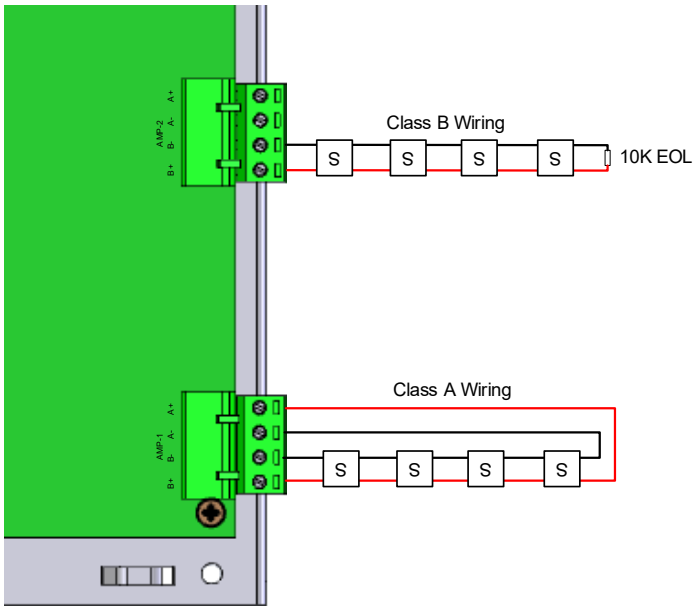


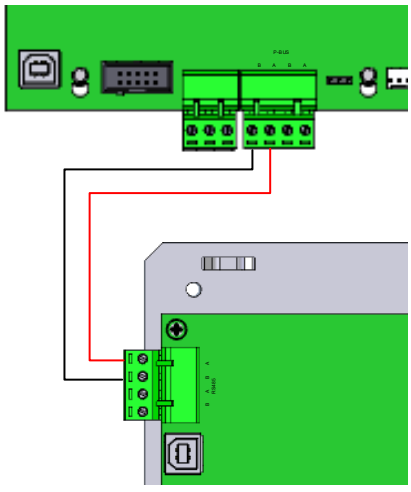
Figure 47 - Amplifier (Speaker Circuit) Class A and B Wiring

6.2.2.6.2 Peripheral Bus (PBUS) Specific Configuration and Additional Wiring

As a peripheral bus-controlled audio amplifier, the audio amplifier module will require a peripheral bus address and connection to the NX10-FACP base card peripheral bus. In addition, besides the NX10-EM-PSU6 power supply charger 24 VDC, the audio amplifier module will require a supervision connection to the NX10-EM-PSU6 power supply charger.

6.2.2.6.2.1 Peripheral Bus (PBUS) Wiring

To wire the audio amplifier module to the NX10-FACP base card's peripheral bus, wire the RS485 terminals A and B of the audio amplifier module to the A and B terminals of the NX10-FACP base card peripheral bus. Terminals from both modules; A to A and B to B (opposite).



6.2.2.6.2.2 NX10-EM-PSU6 Power Supply Charger Supervision

To supervise the audio amplifier's associated NX10-EM-PSU6 power supply charge module, wire the Input terminals IN1 and GND of the NX10-AMP-80 module to the fail-safe COM and NO terminals of the power supply charger module. IN1 terminal (audio amplifier module) to COM terminal (power supply charger module), GND terminal (audio amplifier module) to NO terminal (power supply charger module) [Figure 51].

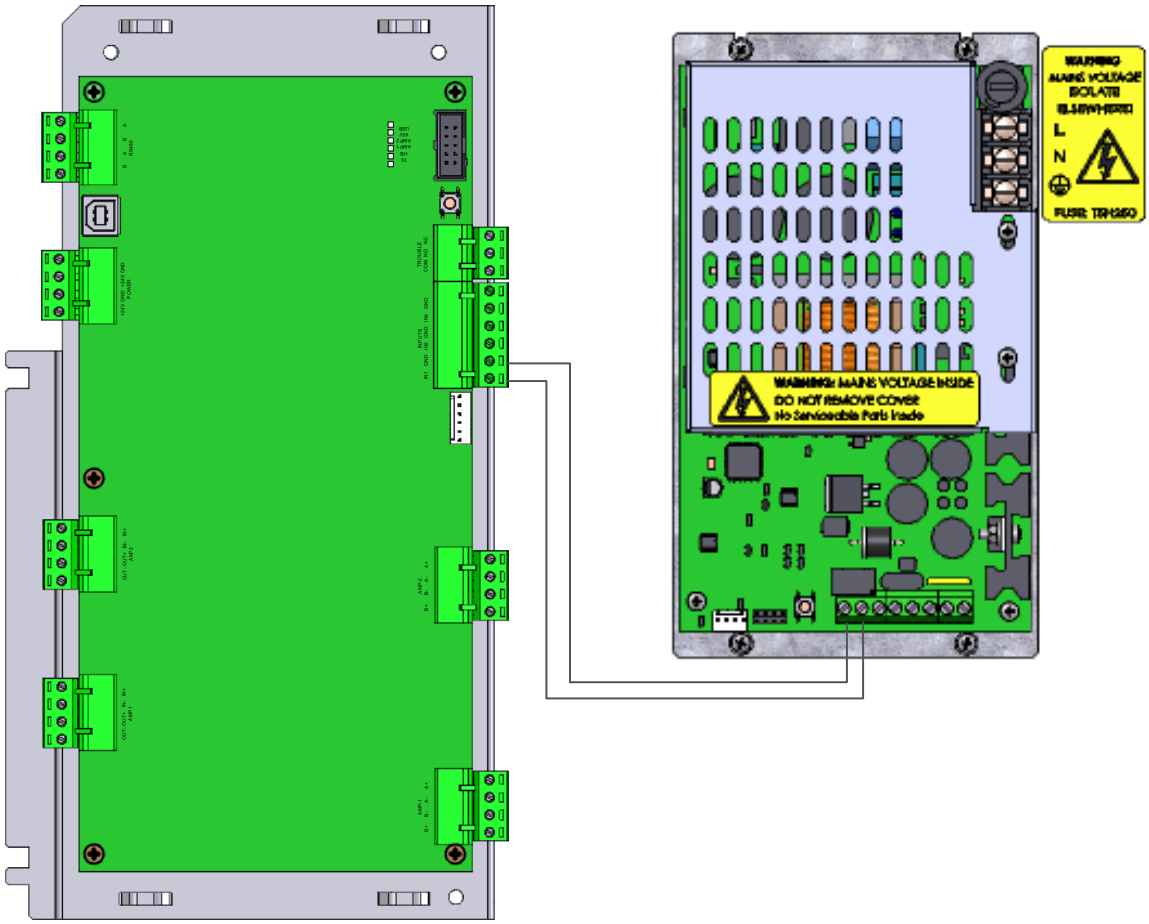


Figure 48 - Peripheral Bus Audio Amplifier NX10-EM-PSU6 Monitoring

6.2.2.6.3 Hardwired Specific Wiring

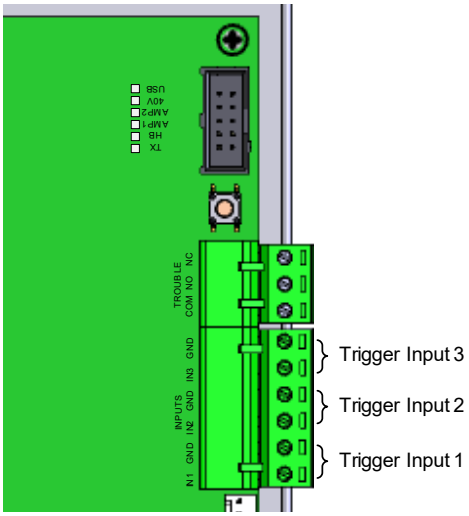
As a hardwired controlled audio amplifier, the audio amplifier module will require connection to the relay contacts for message/tone control and remote audio input signal control. In addition, the audio amplifier and its associated power supply charger module will require supervision by NX10-FACP base card.

6.2.2.6.3.1 Relay Activation

To activate message 1 of the audio amplifier module, program a normally open relay (closed on active event) to activate on any event requiring message 1 to be broadcasted. Wire the normally open relay to the audio amplifier's INPUTS IN1 and GND. Whenever the relay contact is active the audio amplifier module will broadcast message 1, unless input 3 is active.

To activate message 2 of the audio amplifier module, program a normally open relay (closed on active event) to activate on any event requiring message 2 to be broadcasted. Wire the normally open relay to the audio amplifier's INPUTS IN2 and GND. Whenever the relay contact is active the audio amplifier module will broadcast message 2, unless input 1 or 3 are active.

To activate input 3 of the audio amplifier to rebroadcast a remote audio signal, program a normally open relay (closed on active rebroadcasting event) to activate on any event requiring the amplifier to rebroadcast a remote signal. Wire the normally open relay to the audio amplifier's INPUTS IN3 and GND. Whenever the relay contact is active the audio amplifier module will rebroadcast the remote audio signal. Input 3 has the highest priority, if input 1 and/or 2 is active the audio amplifier will continue to rebroadcast the remote audio signal. This is how a remote microphone can perform paging in a remote location.



The hardwired INPUTS of the audio amplifier module are unsupervised, wiring between the inputs and the relay contacts controlling the activations must be within 20 feet in same room and in rigid conduit.

6.2.2.6.3.2 Hardwired NX10-AMP-80 and NX10-EM-PSU6 Supervision

As a hardwired wired controlled audio amplifier, the NX10-AMP-80 audio amplifier and its associated NX10-EM-PSU6 power supply charger require supervision by the FACP's NX10-FACP base card.

To supervise the audio amplifier and associated power supply charger, wire the NX10-FACP base card's ANC PSU Fault B terminal to the fail-safe trouble relay NO (normally open without power) terminal of the audio amplifier module. Wire the fail-safe trouble relay COM terminal of the audio amplifier module to the power supply charger module's fail-safe trouble relay NO (normally open without power) terminal. Wire the power supply charger module's COM terminal back to the NX10-FACP base card's ANC PSU Fault A terminal (Figure 52).

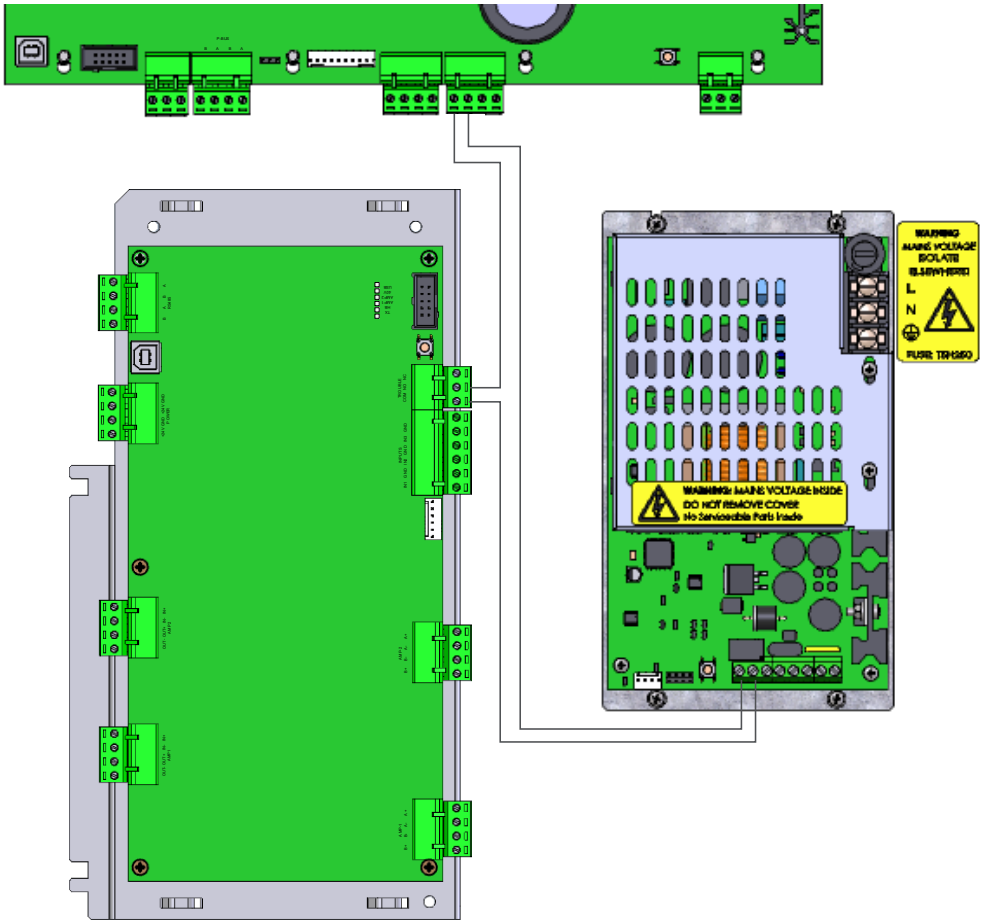
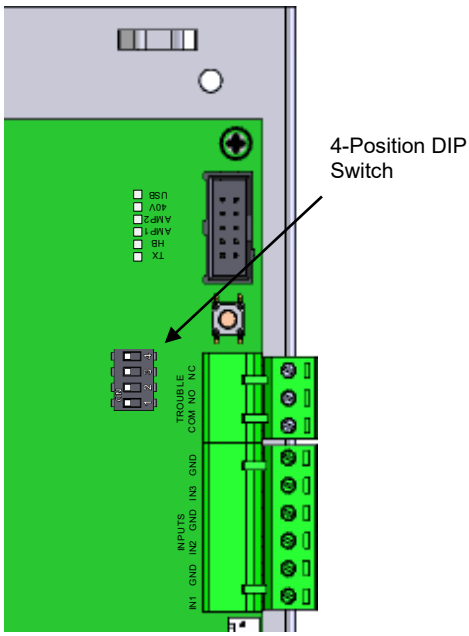


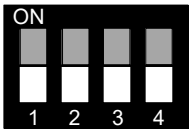
Figure 49 - Hardwired Audio Amplifier and Power Supply Charger Supervision Wiring

6.2.3 Addressing

To address a peripheral bus (PBUS) audio amplifier module, locate the 4-position DIP (DIL) switch on the audio amplifier module (opposite).

Using the 4-position DIP (DIL) switch, set the audio amplifier module to its required address, addresses range from 0 to 15. The peripheral bus of the NX10-FACP base card can support up to 16 audio amplifier modules (Figure 53).





Address	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Figure 50 - NX10-AMP-80 Peripheral Bus Addressing

The peripheral bus (PBUS) can support up to 32 peripheral bus (PBUS) modules and sixteen (16) of one type. Peripheral bus (PBUS) modules must be mounted within 20 feet from where the peripheral bus originates in the same room and in rigid conduit.

6.2.4 Configuring AMP2 as a Backup

As previously discussed, both amplifiers (AMP 1 and AMP 2) of the NX10-AMP-80 audio amplifier module are controlled together. However, based on installation or local code requirements, amplifier 2 (AMP2) can be configured as a backup amplifier for amplifier 1 (AMP1).

Configuring amplifier 2 (AMP2) as a backup amplifier is done in the Shield Neo NX10-AMP software. Within the software, navigate to the Properties amplifier programming and place a check mark within the associated Backup Mode Enable box (Figure 54).

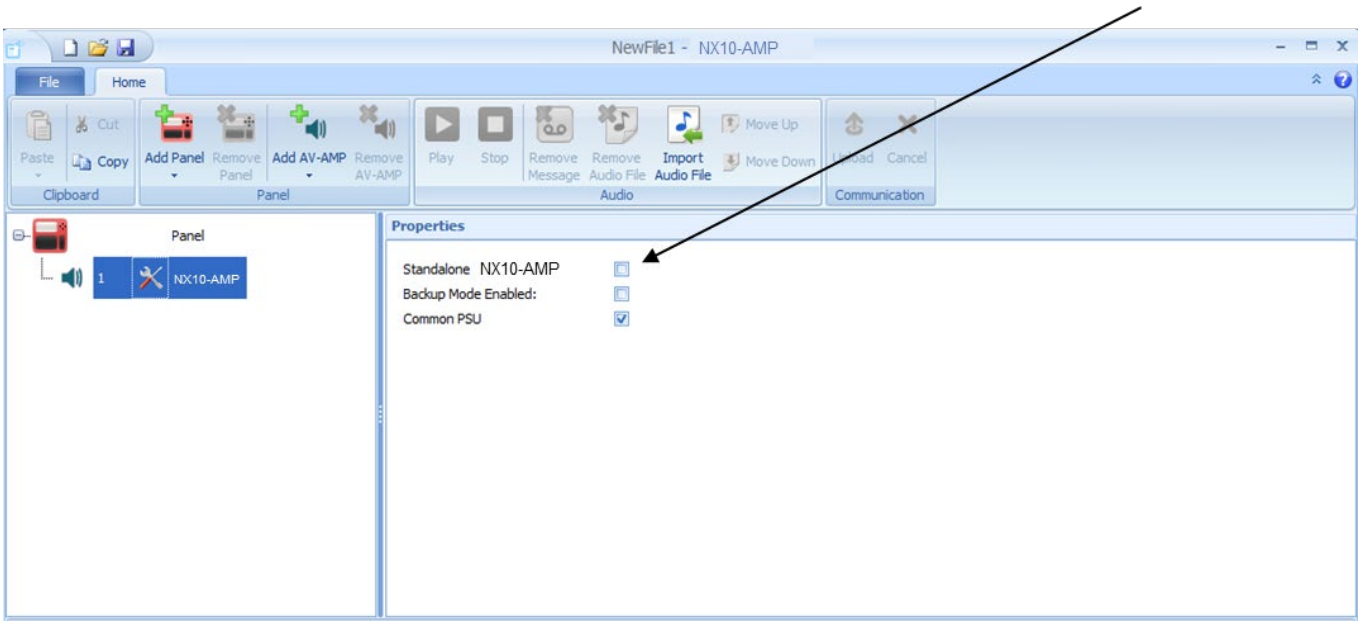


Figure 51 - Audio Amplifier Backup Programming

7 Recommended Cable Routing

Power limited and non-power limited circuit wiring must remain separate in the FACP 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 (Figure 55).

AC Wiring must be wire wrapped to the wire tie of the enclosure as indicated below. In addition, notification appliance circuits 2 and 4 must maintain a minimum of 0.25” (6.35mm) from the AC wiring via correct wire routing and the use of wire wraps (Figure 55).

For multiple wires to be used under any terminal, use twin cable ferrules 18AWG to 12AWG, manufactured by Weidmuller.

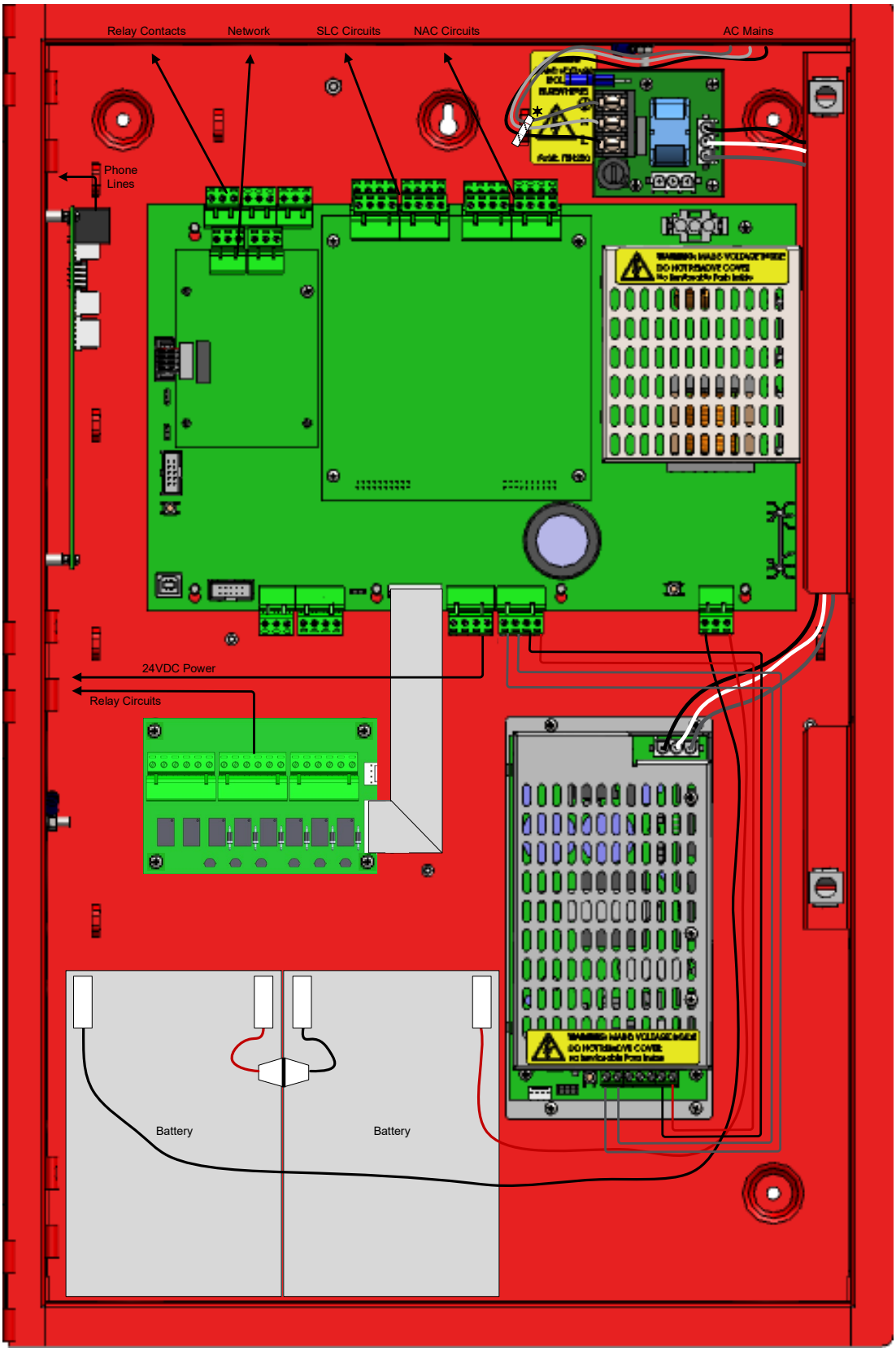


Figure 52 – NX10-FACP-(x) Wire Routing (NX10-FACP-4 shown)

8 System Features

8.1 Drift Compensation

The Neo NX FACP incorporates drift compensation reporting and control, based on integral intelligent and enhanced smoke detector drift compensation. The drift compensation of the intelligent/enhanced smoke detectors are part of their 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 intelligent or enhanced detector's sensitivity to fire. The drift compensation level is stored in the detector's memory as a single value between 0 and 31. The Neo NX FACP takes this information and converts it to a more user-friendly value, detector Drift % (0-100). Device drift reports can be generated at any time from the FACP either by using the password protected NX10-ACS-DSP keyboard display or the Shield Neo NX Service Tool. The Shield Neo NX Service Tool allows viewing, printing, storage, etc. of clean/dirty drift values (0 to 100%) for all Neo NX FACP intelligent and enhanced detectors.

The programmed installation sensitivity of smoke detectors will not change unless the detector has already indicated a Device Dirty trouble signal (drift of 100%) on the FACP and the device is not cleaned or replaced.

There are two (2) methods the Neo panel deals with drift compensation, Method 1 – No Calibration Clock Setting or Method 2 - Calibration Clock Setting.

Method 1 – No Calibration Clock (Default Setting)

When an intelligent or enhanced smoke detector reaches its internal drift compensation limit (100% drift), a drift flag will be set in the individual device. At the same time, the Neo panel will initiate a trouble and report a Device Dirty for the specific intelligent/enhanced smoke detector. At the 100% drift, the intelligent/enhanced smoke detector will maintain its programmed sensitivity. The Device Dirty indication and programmed sensitivity are maintained until the device is cleaned and recalibrated or replaced, however if the device is not cleaned or replaced, when a change in calibration is required again, the programmed sensitivity of the device can no longer be maintained.

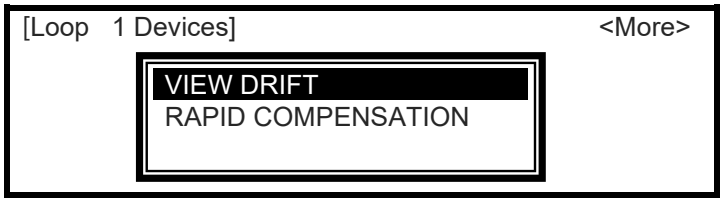
Method 2 - Calibration Clock (Programmable Setting)

This method is normally used when the installer has a maintenance agreement on the installed Neo NX FACP. With this method of drift compensation reporting, the installer would program a Calibration Clock for a specific time-of-day and days-of-week for the intelligent/enhanced smoke detectors to be calibrated. During calibration, if an intelligent/enhanced detector reaches a 100% drift, a Dirty Scale 1 for the address will be placed in the Neo NX FACP Problems Menu area. When placed in the Problems Menu area, the Dirty Scale 1 information can be viewed via the keyboard display during the service personnel's next scheduled maintenance. In addition, when the Dirty Scale 1 status is generated, specific CBE indications can occur. Like Method 1, the programmed sensitivity of the intelligent/enhanced detector will be maintained if the Dirty Scale 1 is either cleaned and recalibrated or replaced. If the device is not cleaned or replaced, when a calibration test occurs that requires an additional device calibration, the Neo NX FACP will indicate a Device Dirty status and device sensitivity can no longer be maintained.

With Method 2 of Dirty Scale 1 status, when the dirty device tries to recalibrate and it can no longer maintain its programmed sensitivity, a trouble signal Device Dirty will be generated at the Neo NX FACP.

8.1.1 Drift Compensation Viewing

If not using the Shield Neo NX Service Tool, intelligent detector drift compensation can be viewed via the Neo NX FACP's keyboard display. To view drift compensation, while in panel programming, navigate to the Loops/SLC area, select a Loop number, and enter the View/Edit area, select a detector, and scroll across (→) to the end of the detector type's programming area and under the Additional Info field area press the ✔ button and a View Drift/Rapid Compensation screen will appear.

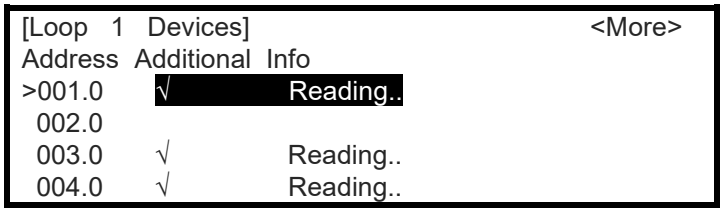


Confirm that you want to VIEW DRIFT which is highlighted by press the ✔ button.

8.1.1.1 View Drift

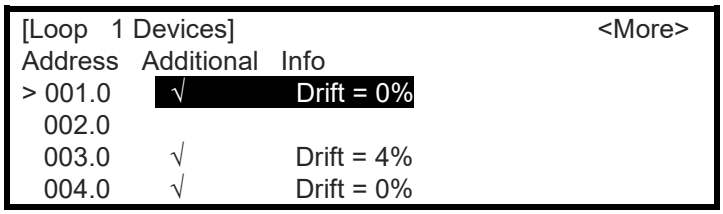
When View Drift is selected, the display shows the intelligent smoke detectors on the specific loop with a √ mark and Reading... Other devices that are not smoke detectors on the loop will have no √ mark.

For example, select the View Drift option and the display shows:



When the reading is complete, the display will show the drift (0-100%) per intelligent smoke detector on the SLC loop.

For example:



8.1.2 Rapid Compensation

Compensation for environmental conditions of an installation is a standard feature of all intelligent smoke detectors. 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.

A rapid compensation feature is built into the Neo NX FACP, it is recommended that during commissioning, detector cleaning or when a detector is replaced, rapid compensation be performed to adjust the intelligent detector to present ambient conditions.

If rapid compensation is not employed during commissioning, detector cleaning or when a detector is replaced it could take up to 24 hrs. before the device is automatically compensated.

To perform a rapid compensation, refer to the Drift Compensation Viewing section above and select Rapid Compensation instead of Drift Compensation. After the Rapid Compensation selection, all smoke detectors on the SLC loop will be compensated.

8.2 Multiple Detection Operation for Evacuation

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.

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

8.3 Positive Alarm Sequence

Positive Alarm Sequence (P.A.S) is a False Alarm Management programmable feature of the Neo NX FACP. 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.

The Positive Alarm Sequence feature must be enabled using the NX10-ACS-DSP keyboard display, refer to NX10-ACS-DSP Keypad Menu Functions, P.A.S. section of this manual.

When the Neo NX FACP 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 count down (acknowledgement time) for P.A.S. alarm acknowledgement. The bottom of the display will be highlighted indicating a tally of all alarms, CO, 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 Conference Room 100 [PHOTO SMOKE]	< Zone alarm text (32 Characters) < Device text (26 Characters) / Pre-assigned type of device
OUTPUT DELAY 14 s (ACK to extend)	< Output delay Stage 1 - time to “ACK”
ALARMS: 1 CO: 0 SUPERVISORY: 0	< # Alarms # CO and # Supervisory events

If the alarm is not acknowledged before the Output Delay (Stage 1) time expires; the FACP 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 will acknowledge the P.A.S. alarm, reset the Output Delay to a Stage 2 time (investigation time), 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	< Acknowledged P.A.S alarm message
First Floor Conference Room 100 [PHOTO SMOKE]	< Zone alarm text (32 Characters) < Device text (26 Characters) / Pre-assigned type of device
OUTPUT DELAY 140s	< Output delay Stage 2 – time-period
ALARMS: 1 CO: 0 SUPERVISORY: 0	< # Alarms # CO and # Supervisory events

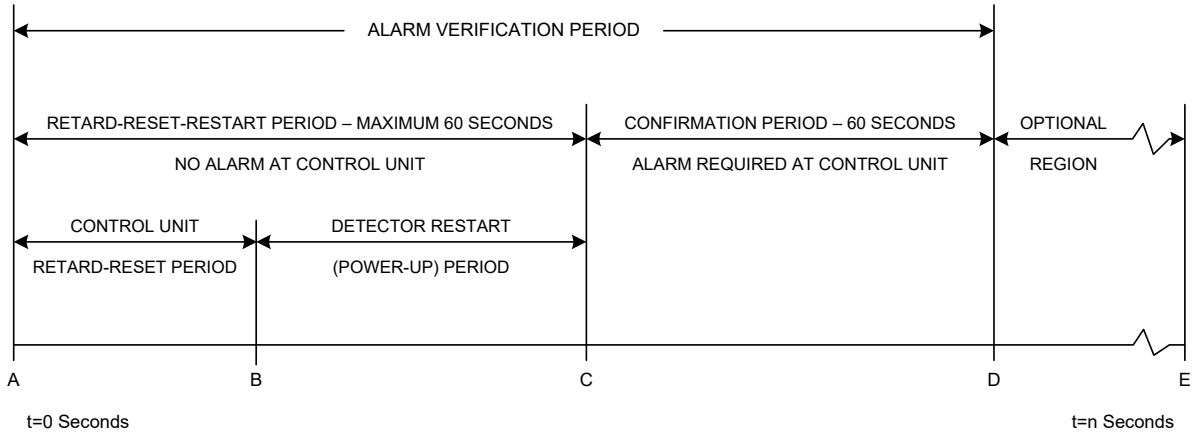
If the alarm is not reset before the Output Delay (Stage 2) time expires; the fire alarm control panel will enter a full alarm condition and will activate all notification appliance circuits, relays, and other outputs programmed by the installer.

If an additional alarm occurs on the FACP during a P.A.S. alarm cycle, the P.A.S. output delay time periods will be 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 any time during the P.A.S. output delay time periods will terminate the P.A.S. process and activate all programmed outputs.

8.4 Alarm Verification

Alarm Verification is a False Alarm Management programmable feature of the Neo NX FACP. The alarm verification feature operates on a system or device basis (determined by programming) and is applicable to smoke detectors only. If required and programmed within the Shield Neo NX Config Tool, the alarm verification of a smoke detector in alarm can be indicated at the FACP and tied to a CBE (control-by-event) logic.

ALARM VERIFICATION TIMING DIAGRAM



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.

If a smoke detector with alarm verification is activated and the smoke concentration is at or above the alarm threshold at the end of the retard-reset-restart period, the FACP will initiate an alarm condition.

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

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

8.5 Cross Zoning

Notification appliance circuits and other output circuits may be configured to only activate when two alarm zones enter an alarm condition.

Smoke detectors employed in cross-zone operation must not be configured for alarm verification or multiple detector operation.

8.6 Walk Test

The Neo NX FACP provides a means to implement a one-person alarm walk test feature for manual pull stations and smoke detectors, refer to the NX10-ACS-DSP Keypad Menu Functions, TEST, ZONES section of this manual for detailed information regarding walk test activations.

8.7 Zone, Group and Point Disablements

The Neo NX FACP can perform disable functions via the NX10-ACS-DSP keyboard display or via any button configurated as a disable button within the system. For information regarding the disabling of zones, groups, or individual points, refer to the NX10-ACS-DSP Keypad Menu Functions, DISABLE section of this manual.

8.8 Day/Night Sensitivity

The Neo NX FACP incorporates individual detector day/night sensitivity configurations. To configure a detector for day/night operation, the detector would be tied to one (1) of the ten (10) time clocks available within the FACP's software. Once the time clock has been allocated a Special Sensitivity Mode (SSM) programming area will be available for setting a different sensitivity while the time clock is active. Individual time clocks can be programmed based on time-of-day and days-of-week. Time clock settings can also incorporate two (2) different settings, i.e., ON – Off and ON-OFF again. In addition, individual time clocks can be gated by other FACP input functions, for example, allowing time clock usage only if a specific gated key switch is active.

8.9 Detection Sensitivity Adjustment

Each Neo intelligent detector of the FACP is capable of being field programmed for one of five response/sensitivity modes (below). The Response modes correspond to unique response behaviours 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 than in the FACP 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	135ºF	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 (ºF)**	**Sensitivity Characteristics**	**Spacing**
1	135ºF Ordinary	Static/Rate-of-Rise	70 ft
2	150ºF Ordinary	Static/Rate-of-Rise	70 ft
3	150ºF Ordinary	Static	70 ft
4	200ºF Intermediate	Static/Rate-of-Rise	70 ft
5	200ºF Intermediate	Static	70 ft

Analog values/answerbacks of each installed intelligent detector can be viewed at any time via the panel's alphanumerical graphical display. Analog values/answerbacks range from 0 to above 55 based on various status conditions of the intelligent detector, below.

Photoelectric Detector, Ionization Detector and Multi Sensor Analog Values

Analog Values	Status Condition
55 and above	Detector in Alarm
45-54	Pre-Alarm (Detector Close to Alarm Condition)
23 (+4/-0)	Quiescent (Normal)
8	Low Alarm Level
7	ASIC Communication Error
6	Compensation Limit Reached
4	Type Code Error
2	Secondary Sensor Fault
1	Primary Sensor Fault
0	Device Missing or Microprocessor Fault

Heat Detector Analog Values

Analog Values	Status Condition
55 and above	Detector in Alarm
45-54	Pre-Alarm (Detector Close to Alarm Condition)
10-44	Quiescent (Normal – Value Temperature Dependent)
8	Low Alarm Level
7	ASIC Communication Error
4	Type Code Error
1	Sensor Fault
0	Device Missing or Microprocessor Fault

8.10 NX10-ACS-DSP Keypad Menu Functions

The following table gives a list of the Main Menu (user menu) Options and the Sub Menus available from the NX10-ACS-DSP keyboard display. In addition, a brief description for each sub menu is provided.

Main Menu Option	Sub Menus	Description
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, CO-Alarm, Supervisory, Trouble, Disabled, Pre-Alarm, Warning and Problems)
	Network	View Network diagnostics
	Inputs	View the current state of Inputs (by zone/point).
	Outputs	View the current operational condition of Outputs (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 [26]	Disable a complete zone or an individual input device.
	Outputs26	Disable NAC outputs or other output devices.
	Groups26	Group Disable – Disable a programmed group of inputs / outputs
	Controls[27]	Disable NX10-ACS-DSP controls
	User-ID26	Exits User-ID timed password access
ENABLE	Zone / Inputs26	Enable a complete zone or an individual input device.
	Outputs26	Enable NAC outputs or other output devices.
	Groups26	Group Enable – Re-enable a group of inputs / outputs
	Remote26	Grant remote access for terminal mode or ipGateway
TEST	Zones26	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
	Outputs26	Test Outputs in the system
	Audio26	Test Audio area amplifier (s) with massage type (1 – 16 messages within amplifier [s])
	HVAC26	Test Smoke Control fans and dampers
P.A.S.	Enabled26	Enable P.A.S. operation
	Disabled26	Disable P.A.S. operation
TOOLS	Program[28]	Enter the Level 3 Commissioning and Panel Programming Functions (Factory default Level 3 programming code 7654)
	Print26	Setup printer and print inputs, outputs, troubles, disabled, log
	Change Time26	Change time and date of the system
STATUS	---	Return to the Normal Operating Display immediately

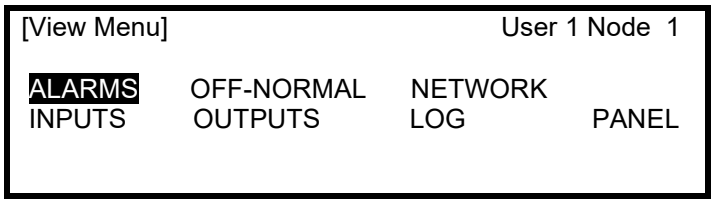
[26] This option requires a User-ID access password with time-out.

[27] This option should not be utilized as this will disable ACK, Silence, Resound, Drill and Reset controls.

[28] This option requires a user Level 3 commissioning/programming password.

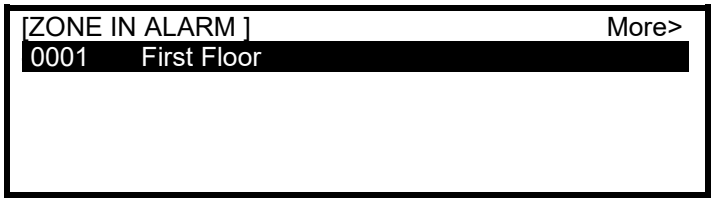
8.10.1 View

The View Menu area is normally only used by service technicians, below is an example of the View Menu.



8.10.1.1 Alarms

Fire alarm events are shown on the FACP without having to access the View Menu options area. To access the ALARMS area, the FACP must have an active alarm event. When in the ALARMS area, pressing the navigation ➔ button will provide additional information pertaining to the device in alarm, including Device Text, State, Type, Value, Lp Adrs, Sector and Node.



8.10.1.2 Off Normal

When accessing the OFF-NORMAL area an Off-Normal Menu will appear.

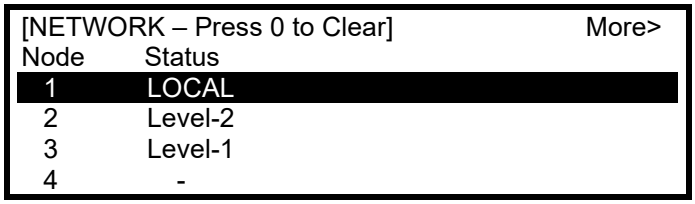
Like the previous ALARMS area, all the Off-Normal Menu events, with the exception, of the PROBLEMS area are shown on the FACP without having to access the View Menu options area. To access any of these Off-Normal Menu areas, the FACP must have an active event type. When in any of the event type areas, pressing the navigation ➔ button will provide additional information pertaining to the active event, including Device Text, State, Type, Value, Lp Adrs, Sector and Node.

The PROBLEMS area is for logging Dirty Scale 1 intelligent/enhanced detector events and is used when the enhanced calibration programming is used.

8.10.1.3 Network

This view area 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 nodes can be viewed and if the navigation ➔ button is pressed specific node information is provided (i.e., Data Packets, Bad Packets, Comms lost, FT Ring Trbl and Next Node at).

Below is an example of access to the View NETWORK area.



Below is an example of the View NETWORK area after pressing the navigation ➔ button.

```
[NETWORK – Press 0 to Clear]
Data Packets   :    xxxxx
Bad Packets    :      0
Comms lost     :      0
FT Ring Trbl   :      0
Next Node at   :      x
```

Pressing the 0 key on the keyboard display keypad will Clear (reset) all network status information.

8.10.1.4 Inputs

This sub menu area 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 the zones containing input devices with the first zone highlighted. For example:

```
[Inputs]                                More>
Zone    Mode            Location
000 1   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, press the ➔ button 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 will show Mode (Enabled or Disabled status for each input device), Lp Adrs (SLC loop the specific device is programmed to), Sector (sector programming is an enhanced partitioning programming) and Node number the device is connected to.

Press the ↑↓ buttons to scroll through the inputs.

Press the Esc button on the NX10-ACS-DSP keypad to return to the previous view.

8.10.1.5 Outputs

This sub menu area shows the current operational condition for all outputs (including outputs of other network nodes). The display presents a list of all the zones containing output devices with the first zone highlighted. For example:

```
 [Outputs]                              More>
Zone    Mode          Location
0008    ENABLED       GROUND FLOOR WEST
0009    ENABLED       MAIN RECEPTION
0012    ENABLED       SECOND FLOOR WEST
0013    ENABLED       SECOND FLOOR EAST
```

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, press the ➔ button 4 times:

```
[  Outputs In Zone 0008 ]                    <More>
Mode      State      Type
Enabled   Off        RELAY
Enabled   Off        RELAY
Enabled   Off        VOLTAGE
Enabled   *On        RELAY
```

*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 [loss of power]).*

8.10.1.6 Log

After selecting the LOG area, the display presents a pop-up window to allow selection viewing of ALL EVENTS, ALARM EVENTS ONLY or the ALARM COUNTER.

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

Press the ↑↓ buttons to highlight the required view option and then press the ✔ button to select it. The display then shows the appropriate list of events.

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

8.10.1.6.1 All Events

Below is an example of the ALL EVENTS log, press the ↑↓ buttons to scroll through the logged events.

```
[View All Events]                          Entry 0248
Time/Date      Node      Lp:Addr   Zone
 7:54:23          1       2:001.0   0012
01/14/20      SUPERVISORY
BASEMENT                     64
SPRINKLER RISER                      SWITCH(MON.)
```

< View Mode ALL EVENTS and Displayed Event #

< Time, Node/Loop #, Device Address and Zone
< Date, Event Type
< Zone Text Description and Analog Value
< Device Text Description and Device Type

8.10.1.6.2 Alarm Events Only

Below is an example of the ALL-ALARM EVENTS log, press the ↑↓ buttons to scroll through the logged alarm events.

```
[View Alarm Events]                        Entry 0176
Time/Date      Node      Lp:Addr   Zone
 10:54:23         1       1:001.0   0001
11/14/19      ALARM
BASEMENT                                        64
ROOM 10                              PHOTO SMOKE
```

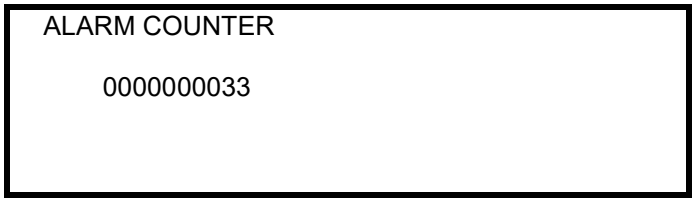
< View Mode ALL ALARM EVENTS and Displayed Event #
< Time, Node/Loop #, Device Address and Zone
< Date, ALARM Event

< Zone Text Description and Analog Value
< Device Text Description and Device Type

In the above example, the latest alarm occurred (Event No. 176) at 10:54 am on March 14, 2019. 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.

8.10.1.6.3 Alarm Counter

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



The FACP increments the alarm count each time it changes from the normal condition to an alarm state. While the panel is in alarm, if an additional alarm event occurs it does not advance the counter.

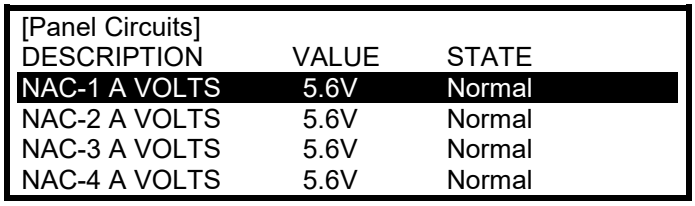
Press the “Esc” button to return to the main view menu.

8.10.1.7 Panel

When accessing the PANEL area, a Panel Information sub menu will appear allowing selection of LOCAL-HARDWARE, SOFTWARE or NETWORK-HARDWARE.

8.10.1.7.1 Local-Hardware

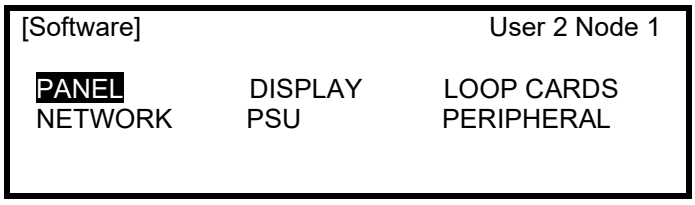
Entering the LOCAL-HARDWARE area allows the viewing of FACP’s associated electronic circuits. Information includes each electronic circuits, DESCRIPTION, VALUE and STATE.



Press the ↑↓ buttons to scroll through the FACP’s electronic circuits. Press the Esc button to return to the main view menu.

8.10.1.7.2 Software

Entering the SOFTWARE area will bring up a SOFTWARE sub menu. The SOFTWARE sub menu allows the viewing of the FACP’s associated product firmware version.



8.10.1.7.3 Network-Hardware

Entering the NETWORK-HARDWARE area allows the selection of a network node's specific Zone number.

```
[HARDWARE]                                  MORE>
 ZONE    LOCATION
 0701    FACP Electrical Closet
 0702    Lobby Local Operating Panel
 0703    Remote Panel Third Floor
 0704    Ancillary Annunciator
```

Scroll ↓ to a network node Zone and scroll to the left → to view the network node's electronic circuits, Device Text, and Value.

```
  [   HARDWARE IN ZONE 0703]                <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 nodes electronic circuits. Press the Esc button to return to the HARDWARE menu.

8.10.2 Disable

When entering the Disable area, a Disable sub menu will appear. The Disable sub menu allows the selection of ZONE/INPUTS, OUTPUTS, GROUPS, CONTROLS and USER-ID disablements.

```
[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.

8.10.2.1 Zone/Inputs

This area provides a way to disable an entire zone, all inputs, selected inputs, only automatic detectors, only manual devices, or all other devices.

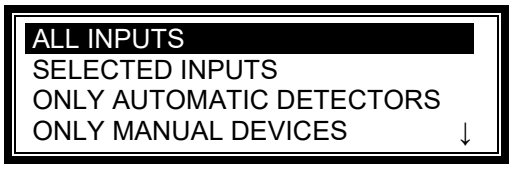
If the current User-ID (access level password) does not have the required authority, the display prompts for entry of an authorized password to guard against inadvertent disablements.

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
```

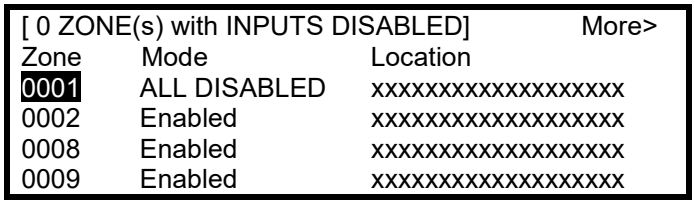
Press the ↑↓ buttons to scroll through the available zones or key in a specific zone number.

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



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

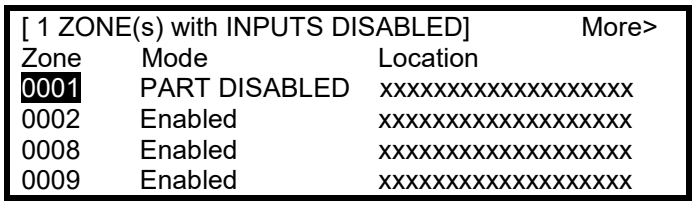
If ALL INPUTS is chosen, the Zone Mode status will change from “Enabled” to “ALL DISABLED.”



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:

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. The Zone Mode status will change from “Enabled” to “PART DISABLED.”



Press the “Esc” button to return to the previous display.

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 is 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.

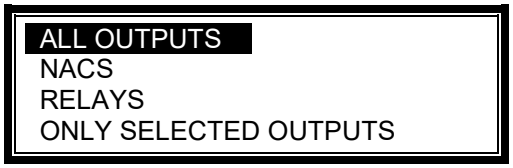
If ALL OTHER DEVICES is chosen, the pop-up window disappears and all none alarm, including firefighter phones will be disabled and the Zone Mode status will change from “Enabled” to “PART DISABLED.”

8.10.2.2 Outputs

The Disable Outputs Option allows for the isolation of some or all 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.



Strobes can be added to the disable outputs pop-up window via the Shield Neo NX Config Tool, under the Disable Outputs Menu Options.

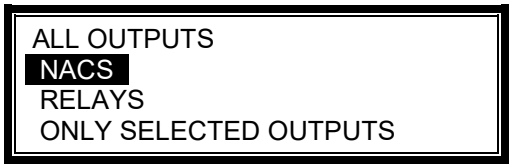
8.10.2.2.1 All Outputs

On access to the Disable – Output's sub menu, the ALL OUTPUTS will be highlighted and then pressing the ✔ button will disable all outputs. The display automatically reverts to the Main Menu – Disable.

On networked systems this only disables the outputs connected to the associated FACP.

8.10.2.2.2 NACS

Press the ↑↓ buttons to scroll through and highlight the NACS option and then press the ✔ button to disable all NAC outputs. The display automatically reverts to the Main Menu - Disable and the NAC Disabled LED will illuminate, indicating NACs disabled.



On networked systems this only disables NACs connected to the associated FACP.

8.10.2.2.3 Relays

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 Menu – Disable.

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

On networked systems this only disables relays connected to the associated FACP.

8.10.2.2.4 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 OUTPUTS
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 view more information on the outputs including Mode, Device Text, State, Type, Value, LP (loop), Adrs (address), Sector and Node. Below is an example of pressing the ➔ button 6 times.

```
[     Outputs In Zone 0008   ]                <More
Mode          Lp    Adrs        Sector      Node
ENABLED       1     010.2         1           0
ENABLED       1     012.0         1           0
ENABLED       1     015.0         1           0
ENABLED       1     022.2         1           0
```

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.

Press the “Esc” button to return to the Zone list and to the Main Menu – Disable.

8.10.2.3 Groups

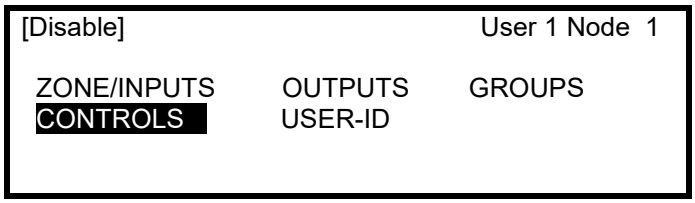
The Disable Groups option allows for the disablement of user defined disable groups that were created in the Neo NX Config Tool. When the Disable groups option is selected, a list of all configured Disable Groups with assigned Disable Group Text will be displayed. To disable one of the groups, press the ↑↓ buttons to scroll through and highlight the required disable group and then press the ✔ button. The disabled group mode will change from Enabled to Disabled.

8.10.2.4 Controls

Disabling Controls will disable all controls on the FACP including acknowledge, reset, signal silence, resound and drill.

The disablement of panel controls is not advised unless used for special applications such as a key switch in the display for enabling control key usage.

Press the ←→, ↑↓ buttons to highlight the Controls option and then press the ✔ button to select it.



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.

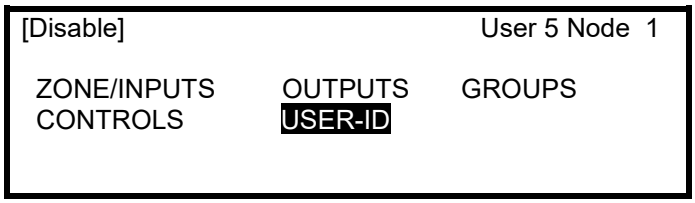
Once a valid access password has been entered, the control button functions, and menu functions are disabled, and a access Level 1 menu will be shown:

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

8.10.2.5 User-ID

If a User-ID password has been used to access password protected areas, selecting the Disable User-ID cancels the current User-ID access. If access is required to additional areas, the User-ID password would need to be re-entered.

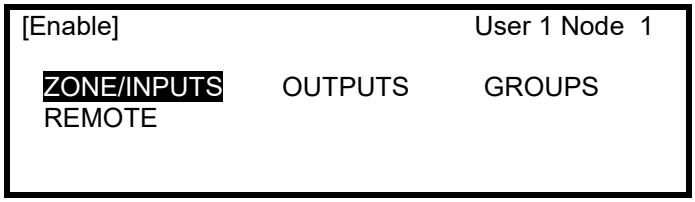
Press the ←→, ↑↓ buttons to highlight the User-ID option and then press the ✔ button to select it.



If there has been no User-ID activity (button presses) after the password access time-out, the panel will automatically cancel a User-ID level access. This is to make sure that access to restricted options is automatically cancelled.

8.10.3 Enable

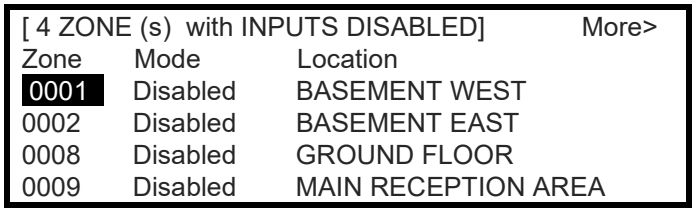
When selecting the Main Menu – Enable Option, the display shows the available Enable functions.



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

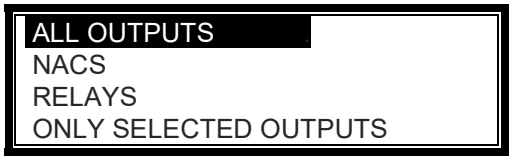
8.10.3.1 Zone/Inputs

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.



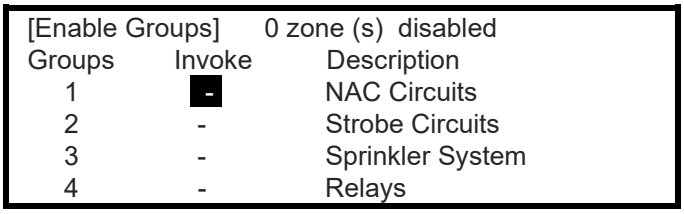
8.10.3.2 Outputs

When this option is selected, a pop-up sub 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.



8.10.3.3 Groups

When this option is selected, a list of the disable groups will be available, press the ↑↓ buttons to scroll to the correct group requiring enablement and press the ✔ button.



8.10.4 Test

The Main Menu – Test area allows users to test various items of the FACP.

If a printer is connected to the FACP all activated tests will be sent to the printer.

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

8.10.4.1 Zones

The test ZONES function provides a means to implement a one-person walk test to test zones or specific detectors or manual pull stations.

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 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 10-seconds when the device is tested. 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.

All NAC circuits are defaulted to activate during a walk test; however, the Shield Neo NX Config 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 a device is activated (i.e., manual pull station or introduction of test smoke to a smoke detector), the notification appliances will activate (if selected), and the display will indicate that the 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 manual pull station is reset or when the smoke clears from the detector chamber, the FACP 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:

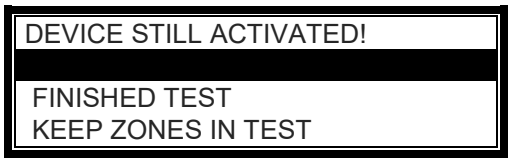
Move to the zone number column and highlight the first zone to test, then press the ✔ button, the display will then prompt for the last zone to be tested.

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

To leave the zone test sub menu, press the “Esc” button.

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

If there are any zones still in a test or alarm condition, a pop-up window with the following options will appear:



Alternatively, it is possible to leave the Test – Zone’s sub menu with one or more zones still in test mode by selecting the KEEP ZONES IN TEST option. This will enable the 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, the display will revert to the Test Menu.

8.10.4.2 Display

The test DISPLAY option checks the operation of all the LEDs and the graphical display of the NX10-ACS-DSP keyboard. All the LEDs are turned on and the entire display is shown in reverse (inverted). In addition to testing the NX10-ACS-DSP, the Display test will also test all programmed LEDs of Switch LED Modules connected to the associated NX10-FACP base card peripheral bus.

The display test will also test all programmed LEDs of optional Switch LED Modules connected to the associated NX10-FACP base card peripheral bus.

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:

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

8.10.4.3 Buzzer

When the test BUZZER option is selected, the internal FACP buzzer will pulse for approximately five seconds.

```
[Test Menu]                          User 1   Node  1

 ZONES      DISPLAY     BUZZER      PRINTER
 OUTPUTS    AUDIO       HVAC
```

8.10.4.4 Printer

To test the printer, highlight the PRINTER 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 NX10-ACS-DSP keyboard display.

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

When the test printer is completed, the display automatically reverts to the Main Menu – Test. Press the Esc button at any time to cancel the test printer.

8.10.4.5 Outputs

To test outputs, highlight the OUTPUTS 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 containing the output 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.

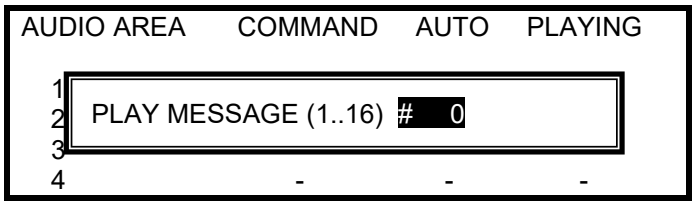
```
TEST THIS DEVICE
```

8.10.4.6 Audio

When the AUDIO option is selected, the user is given a list of AUDIO AREAs with COMMAND, AUTO and PLAYING information.

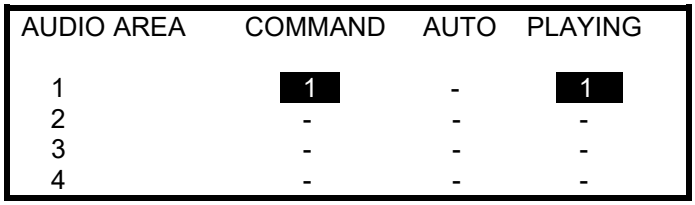
```
AUDIO AREA      COMMAND     AUTO     PLAYING

   1                -          -          -
   2                -          -          -
   3                -          -          -
   4                -          -          -
```

Press the ↑↓ buttons to scroll to an AUDIO AREA requiring testing and then press the → button to scroll to the COMMAND criteria and press the ✔ button.



Once the COMMAND has been selected, the user is capable of broadcasting one of the 16 audio amplifier stored messages.

The following is an example of audio message 1 (COMMAND 1) being tested in AUDIO AREA 1, PLAYING message 1.

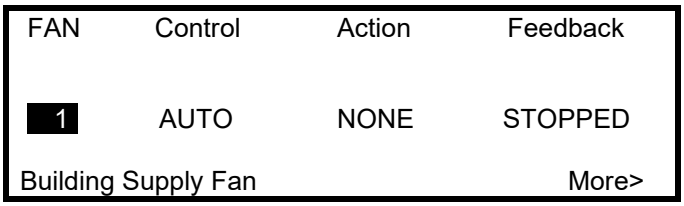


8.10.4.7 HVAC

To test the smoke control of the FACP, press the ↑↓ and/or → buttons to scroll to the HVAC test area and press the ✔ button.

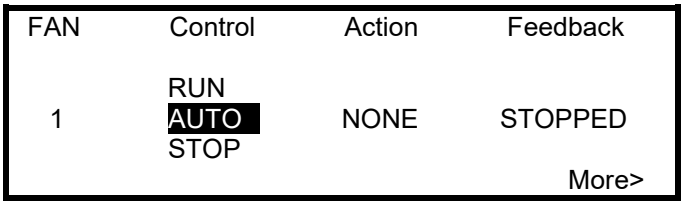
8.10.4.7.1 Fans

To test fans, highlight FANS and then press the ✔ button and the following screen will appear:



If the fan is not being monitored for Feedback, a dash (-) will be indicated under the Feedback section.

Enter the FAN number to be tested and press the → button to scroll and highlight the Control AUTO button. Once the AUTO button is highlighted, the following screen will be displayed:



Pressing the ↑ arrow will RUN the fan and the Action will than indicate RUN, if feedback is provided, the Feedback will indicate RUNNING. Pressing the ↓ arrow will STOP the fan and if feedback is provided, the Feedback will indicate STOPPED.

8.10.4.7.2 Dampers

Dampers are tested the same way as the fans, press the → button to scroll to DAMPERS and press the ✓ button, then press the ↑↓ buttons to select Close or Open:

DAMPER	Control	Action	Feedback
	CLOSE		
1	AUTO	NONE	CLOSED
	OPEN		
			More>

8.10.4.7.3 Auto Tests

The AUTO TESTS area will give the user status of the auto tests that have been performed by the FACP. Press the ↓ arrow and scroll through the AUTO TEST RESULTS.

The following Auto Test Status screen will appear:

[AUTO TEST RESULTS]				MORE>
	Pass	Fail	In Test	Untested
FAN	4	0	0	0
DAMPER	9	1	0	0

To retest a FAN or DAMPER that has Failed a test, press the ←→, ↑↓ buttons to scroll to the Failed FAN or DAMPER and press the ✓ button:

[AUTO TEST RESULTS]				MORE>
	Pass	Fail	In Test	Untested
FAN	4	0	0	0
DAMPER	9	1	0	0

The following screen will appear:

DAMPER AUTO TEST

6 FAILED 06/22/17 1:00 AM
OPEN NOT CONFIRMED

2nd Floor Exhaust Damper

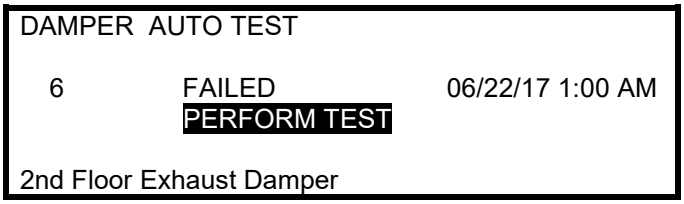
Press the → arrow scroll button to navigate to the FAILED text.

DAMPER AUTO TEST

6 FAILED 06/22/17 1:00 AM
PERFORM TEST

2nd Floor Exhaust Damper

Press the ↓ arrow scroll button to navigate to the PERFORM TEST and press the ✔ button.



8.10.4.7.4 Smoke Compartments

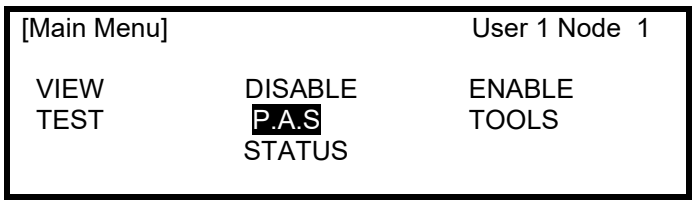
Once the test SMOKE COMPARTMENTS has been entered a user can either select to test all configured smoke compartments or select a specific smoke compartment to be tested.

8.10.4.7.5 Multi Selectors

Multi selectors (multi manual demands) are configured smoke control functions that control both a fan(s) and/or damper(s) together, rather than controlling one fan or one damper. To test multi selectors, access the MULTI SELECTORS area and select programmed individual multi selectors (multi manual demands) to be tested.

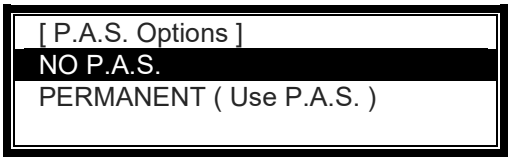
8.10.5 P.A.S. (Positive Alarm Sequence)

To enable or disable FACP programmed P.A.S. (positive alarm sequence) operation, press the ←→, ↑↓ buttons to scroll to the P.A.S. area and press the ✔ button.



If P.A.S delay functionality has not been configured, when accessing the P.A.S. area, the display will briefly show NOT CONFIGURED before returning to the Main Menu.

Once access to the P.A.S. area is granted, the display shows the following pop-up window.



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

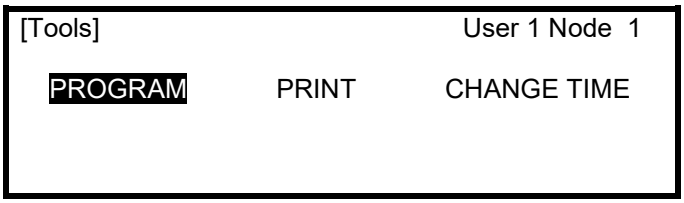
Select NO P.A.S. to disable the operation of the Positive Alarm Sequence investigation feature.

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 will be off.

8.10.6 Tools

When selecting TOOLS, the display shows three possible options:



8.10.6.1 Program

The PROGRAM area allows access to the front panel programming of the FACP, to access the PROGRAM area a Level 3 service password is required.

Refer to NX686-002 Front Panel Programming Manual for information and details on front panel programming capabilities.

8.10.6.2 Print

```
[Tools]                                  User 1 Node  1

   PROGRAM          PRINT          CHANGE TIME
```

The data stream sent to a printer is in a serial format, if an external printer is used, make sure that the communications settings of the printer are set correctly.

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

The following are Print Menu capabilities:

```
[Print Menu]                             User 1 Node 1

INPUTS    OUTPUTS     TROUBLES    DISABLED
LOG       FEED-PAPER  SETUP-PRINTER
```

Before any printing can be done the printer must be setup in the SETUP-PRINTER area.

8.10.6.2.1 Setup-Printer

To enable or setup the operating characteristics of the printer, highlight the SETUP-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 ←, →, ↑,↓ buttons 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.

On network systems only trouble events on the FACP controlling the printer are printed, trouble events from other nodes are not printed. To print all network events to a single printer on a FACP, configuration is required in the Shield Neo NX Config Tool.

8.10.6.2.2 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 the FACP. For networked systems it is possible to select any zone used within the network. Use the arrow ↑↓ buttons to highlight the first and last zone number and use the number keys to change the zone number.

Press the → button to start printing.

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

```
  WORKING ...

(Press Esc to Stop)
```

After all information has been printed, the display will automatically revert to the Print Menu. Press the Esc button 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.

8.10.6.2.3 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 the FACP. For networked systems it is possible to select any zone used within the network. Use the arrow ↑↓ buttons to highlight the first and last zone number and use the number keys to change the zone number.

Press the → button 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.

8.10.6.2.4 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 analyse 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 ➔ button 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.

If there are no trouble conditions present, then selecting the TROUBLES option will have no effect.

8.10.6.2.5 Disabled

To print information on any disabled device(s) or zone(s), 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 analyse 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 ➔ button 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).

If there are no disabled conditions present, then selecting the DISABLED option will have no effect.

8.10.6.2.6 Log

To print information from the history log, highlight the 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 Menu.

Press the Esc button at any time to cancel the log printing.

The pop-up window also allows selection of an Alarm Counter, when selected an alarm count is displayed on the NX10-ACS-DSP display only, it is not printed.

8.10.6.2.7 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.

8.10.6.3 Change Time

The Change Time area allows the changing of the FACP's 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.

The displaying of the FACP's time is in 12 hr. format (Standard). If 24 hr. format (Military) is required, this can be configured in the Shield Neo NX Config Tool.

Example of SET TIME/DATE:

```
[ SET TIME/DATE ]

  TIME   =   5:28 PM
  DATE   =   04/15/19      MON  15  APR  2019
```

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 AM/PM changing use the ↑↓ buttons.

```
[ SET TIME/DATE ]

  TIME   =   1-:-- PM
  DATE   =   04/15/19      MON  15  APR  2019
```

If the FACP is node 1 on an Ad-NeT-PluS network, all network node panels will adjust to the new time value.

9 Maintenance and Troubleshooting

The FACP 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.

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

The Neo NX FACP includes circuitry for signalling line circuit (SLC) and notification appliance circuit (NAC) supervision for opens and short circuits, to test these circuits perform the following procedure:

Open Circuit: Break (disconnect) one of the wires leading to an addressable module or notification appliance and confirm an open circuit trouble condition is indicated at the NX10-ACS-DSP keyboard display.

Short Circuit: Short the positive and negative wires of an SLC or NAC circuit and confirm that a short circuit trouble condition is indicated at the NX10-ACS-DSP keyboard display.

In addition to the various supervised circuits of the Neo NX FACP, each panel incorporates ground fault monitoring and detection. To test the ground fault circuitry, place a wire from the positive or negative (positive or negative ground fault) terminal of the auxiliary power supply output to ground and confirm the panel indicates a ground fault condition and the ground fault LED, if one is programmed illuminates.

9.1 Batteries

Power supply chargers of the Neo NX FACP provide charging voltage and current to their associated attached batteries. Using the panel's integral multi meter, charging voltage, charging current and internal enclosure temperature can be viewed at any time via the NX10-ACS-DSP keyboard display. The power supply chargers also automatically subject the batteries to a load equivalent to full load during normal operation. If the internal resistance of any attached battery rises beyond approximately 0.8 ohm, the FACP will report a battery cell failure trouble condition.

Respect the Environment.

Batteries must be disposed of responsibly and in accordance with any local regulations.

9.1.1 Battery Recommendations

Expected Life: 3-5 years at an ambient temperature of 68°F

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 rise above ambient. Refer to battery manufacturer for further information.

Manufacturer / Part Numbers:

YUASA		POWERSONIC	
4AH	NP4-12FR	5AH	PS-1250 FR
7AH	NP7-12FR	7AH	PS-1270 FR
12AH	NP12-12FR	12AH	PS-12120 FR
17AH	NP18-12FR	18AH	PS-12180 FR
24AH	NP24-12BFR	20AH	PS-12200 FR
38AH	NP24-38FR	26AH	PS-12260 FR
		28AH	PS-12280 FR
		35AH	PS-12350 FR
		38AH	PS-12380 FR
		40AH	PS-12400 FR
		55AH	PS-12550 FR
		75AH	PS-12750S FR

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 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.

9.2 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). In addition, the drill zone and device message will be displayed. 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). In most cases, no other events will be present on the FACP so the bottom highlighted display will only indicate WRNs: 1.

Example of unacknowledged fire drill:

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 ➔ button, the user can view further detailed information about the drill activation.

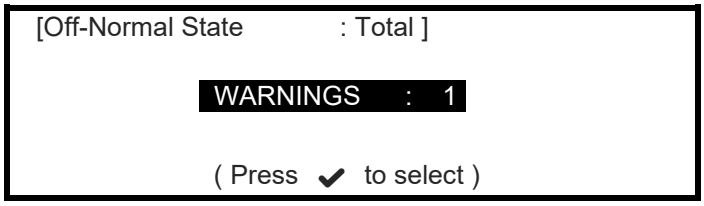
Example of device detailed display pertaining to a specific drill event:

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 2020 11:00 AM	< Drill details
WRNs: 1 SUPRVs: 0 DISBLs: 0 TRBLs: 0	< # Warnings, # Supervisory, # Disables and # Troubles

If the drill were activated from an addressable device at a remote location, rather than from the drill button on the FACP, the SLC loop number and device address would be displayed in the drill details line.

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. Off-normal state totals are listed in order of system priority, Pre-Alarms, Warnings, Supervisory, Troubles and Disabled.

Example of acknowledged fire drill:



< Off-Normal line

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

< More info pertaining to highlighted event

9.3 Built-in Electronic Multi-Meter

Designed with the technician in mind, each module of the Neo NX FACP is easy to install and service. All inputs and outputs of the NX10-FACP base card are addressable and provide precise information of status condition. To help in the installation, maintenance and troubleshooting of the Neo NX FACP, a user-friendly built-in multi-meter allows technicians to interrogate any input / output and diagnose potential time-consuming trouble issues.

9.3.1 NX10-FACP Base Card I/O Addresses and Electronic Values

The following is a list of NX10-FACP base card input and output circuit addresses for maintenance and troubleshooting purposes.

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 Volts	(~27V = Normal)	(State of Charger Voltage)
04.1	Charger Amps	(Current)*	(State of Charger Current)
* Dependent upon whether batteries are being charged, 0mA if not charging			
04.2	Charger Temp.	(ºF = Norma [Int. Temp])	(State of Charger Temp. in ºF)
05.0	Ground Volts	(~13.5V = 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)
Only shown if used.			
* Normal Low (L – open contact), Active High (H – closed contact)			
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 state shown.			
13.0	Control Panel	RESET*	(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)
Only shown if network module used.			
23.0	Monitored Printer		(State of Monitored Printer)

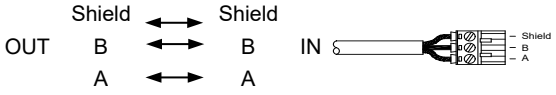
9.4 FACP Recommended Wiring Guide

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.

If shielded cable is used, the shield connection must be a continuous circuit around the loop and must not be in contact with any other earth/ground point (including electrical backboxes).

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).

For multiple wires to be used under any terminal, use twin cable ferrules 18AWG to 12AWG, manufactured by Weidmuller.

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	12,500 feet	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 is recommended that the other wires are either twisted or twisted shielded. The Neo NX panels contain loop power technology. The SLC circuits can driving high current loads in alarm, which affects the load characteristics including V/I drops along the wire length. Therefore, it is important to use a loop calculator in determining wire gauge and length.
		Twisted Shielded Pair	12,500 feet	12 -18 AWG	Shield must only be connected to earth ground at one location - at the fire panel.
		Untwisted, Unshielded Pair	1,000 feet		It is 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 NX10-FACP base card	Twisted Unshielded or Twisted Shielded	20 feet within the same room	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 the 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	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 A(X) (5000 ft between Nodes)	18-20 AWG	Fiber Optic – 16,404 ft between nodes max. Jacket material must be rated for application. *Note: Network node to node communications is optically isolated and each node has an independent ground fault detection circuit. To ensure 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 Phone communication	Twisted Shielded Pair	4000 feet	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 dependent)	12-22 AWG	Twisted shielded wire if mixed inside same conduit as the audio and/or telephone riser(s)

Circuit Type	Circuit Function	Wire Types	Maximum Distance	Typical Wire Size (AWG)	Comments
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.
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.

9.5 NX10-ACS-DSP 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 Shield Global

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Doc Number: NX686-001
Revision: 01c