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Status Codes
1-APP – No Exceptions Taken
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Sincerely,
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Operation & Maintenance Manuals

Project No. 204792

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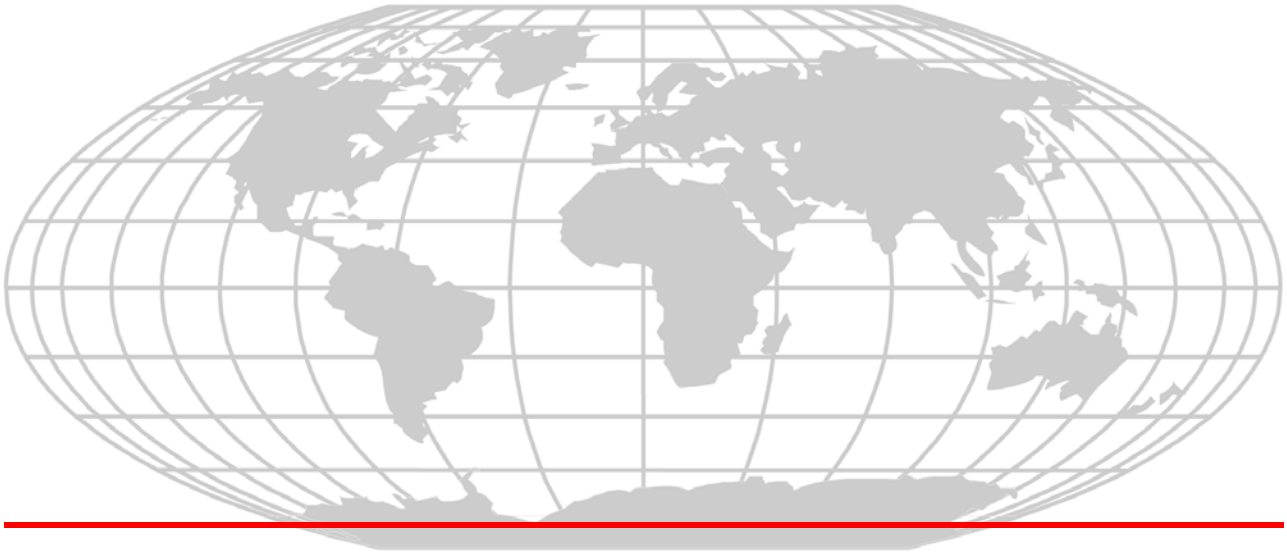

Fire Alarm Control Panel
NFS2-640/E
Operations Manual

Document 52743
11/7/16 Rev: L3
P/N 52743:L3 ECN 16-579

Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premises to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

Limit-D-1-2013

Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Overtightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

Precau-D1-9-2005

FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are 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 his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

Documentation Feedback

Your feedback helps us keep our documentation up-to-date and accurate. If you have any comments or suggestions about our online Help or printed manuals, you can email us.

Please include the following information:

- Product name and version number (if applicable)
- Printed manual or online Help
- Topic Title (for online Help)
- Page number (for printed manual)
- Brief description of content you think should be improved or corrected
- Your suggestion for how to correct/improve documentation

Send email messages to:

FireSystems.TechPubs@honeywell.com

Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.

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Section 1: General Information

1.1 UL 864 Compliance

This product has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864 9th Edition and ULC-S527 11th edition.

1.2 About This Manual

1.2.1 Cautions and Warnings

This manual contains cautions and warnings to alert the reader as follows:

CAUTION:
INFORMATION ABOUT PROCEDURES THAT COULD CAUSE PROGRAMMING ERRORS, RUNTIME ERRORS, OR EQUIPMENT DAMAGE.

WARNING:
INDICATES INFORMATION ABOUT PROCEDURES THAT COULD CAUSE IRREVERSIBLE DAMAGE TO THE CONTROL PANEL, IRREVERSIBLE LOSS OF PROGRAMMING DATA OR PERSONAL INJURY.

1.2.2 Typographic Conventions

This manual uses the following typographic conventions as listed in below:

When you see	Specifies	Example
text in small caps	the text as it appears in the LCD display or on the control panel	MARCH TIME is a selection that appears in the LCD display; or Press the ENTER key
text in quotes	a reference to a section or a LCD menu screen	“Read Status”; specifies the Read Status section or menu screen
bold text	In body text, a number or character that you enter	Press **1**; means to press the number “1” on the keypad
italic text	a specific document	*NFS2-640 Installation Manual*
a graphic of the key	In a graphic, a key as it appears on the control panel	Press Esc means to press the Escape key

Table 1.1 Typographic Conventions in this Manual

NOTE: In this manual, the term NFS2-640 is used to refer to the NFS2-640 and NFS2-640E unless otherwise noted.

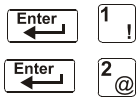
1.2.3 Supplemental Information

The table below provides a list of documents referenced in this manual, as well as documents for selected other compatible devices. The document series chart (DOC-NOT) provides the current document revision. A copy of this document is included in every shipment.

Compatible Conventional Devices (Non-addressable)	**Document Number**
Device Compatibility Document	15378
Fire Alarm Control Panel (FACP) and Main Power Supply Installation	**Document Number**
NFS2-640/E Installation, Operations, and Programming Manuals	52741, 52742, 52743
DVC Digital Voice Command Manual	52411
DVC-RPU Manual	50107425-001
DVC-RPU UL Listing Document	50107424-001
DAL Devices Reference Document	52410
DS-DB Digital Series Distribution Board and Amplifier Manual	53622
DAA2 and DAX Amplifiers Manual	53265
SLC Wiring Manual	51253
Note: For individual SLC Devices, refer to the *SLC Wiring Manual*	
Off-line Programming Utility	**Document Number**
VeriFire® Tools CD help file	VERIFIRE-TCD
Cabinets & Chassis	**Document Number**
CAB-3/CAB-4 Series Cabinet Installation Document	15330
Heat Dissipation for Cabinets with Audio Products	53645
Battery/Peripherals Enclosure Installation Document	50295
Power Supplies, Auxiliary Power Supplies & Battery Chargers	**Document Number**
ACPS-2406 Installation Manual	51304
ACPS-610 Installation Manual	53018
APS-6R Instruction Manual	50702
APS2-6R Instruction Manual	53232
CHG-120 Battery Charger Manual	50641
FCPS-24 Field Charger/Power Supply Manual	50059
FCPS-24S6/FCPS-24S8 Field Charger/Power Supply Manual	51977
Networking	**Document Number**
High-Speed NCM Installation Document	54014
Noti•Fire•Net Manual, Network Version 5.0 & Higher	51584
NCM-W/F Installation Document	51533
HS-NFN Installation Document	54013
ONYXWorks™ Workstation Hardware & Software Application: Installation and Operation Manual	52342

ONYXWorks™ NFN Gateway (PC Platform) Installation & Operation Manual	52307
ONYXWorks™ NFN Gateway (Embedded Platform) Installation & Operation Manual	52306
NCS ONYX® Network Control Station Manual, Network Version 4.0 & Higher	51658
NCA-2 Network Control Annunciator Manual	52482
NCA Network Control Annunciator Manual	51482
System Components	**Document Number**
Annunciator Control System Manual	15842
FDU-80Remote Annunciator Manual	51264
LCD-80 Liquid Crystal Display Remote Annunciator	15037
LCD2-80 Liquid Crystal Display Remote Annunciator	53242
LDM Series Lamp Driver Annunciator Manual	15885
SCS Smoke Control Manual (Smoke and HVAC Control Station)	15712
DPI-232 Direct Panel Interface Manual	51499
TM-4 Installation Document (Reverse Polarity Transmitter)	51490
UDACT Manual (Universal Digital Alarm Communicator/Transmitter)	50050
UDACT-2 Manual (Universal Digital Alarm Communicator/Transmitter)	54089
UDACT-2 Listing Document (Universal Digital Alarm Communicator/Transmitter)	54089LD
AA-Series Audio Amplifiers Manual	52526
ACT-1 Installation Document	52527
ACT-2 Installation Document	51118
FireVoice-25/50, FireVoice-25/50ZS & FireVoice-25/50ZST Manual	52290
FirstCommand Emergency Communication System	LS1001-001NF-E
RM-1 Series Remote Microphone Installation Document	51138
RA100Z Remote LED Annunciator Installation Document	I56-0508
XP Transponder Manual	15888
XP10-M Installation Document	I56-1803
XP5 Series Manual	50786
XP6-C Installation Document	I56-1805
XP6-MA Installation Document	I56-1806
XP6-R Installation Document	I56-1804
FSA-5000(A) FAAST XS Intelligent Aspiration Sensing Technology Document	I56-6008
FSA-8000(A) FAAST XM Intelligent Aspiration Sensing Technology Document	I56-3903
FSA-20000(A) FAAST XT Intelligent Aspiration Sensing Technology Document	I56-3903
FWSG Wireless Manual	LS10036-000NF-E

1.2.4 Shortcuts to Operating Functions



To the left of each program function, you'll find a keypad shortcut, which contains a series of keypad entries required to access the program function. All shortcuts start with the control panel in normal operation.

For example, the keypad shortcut to the left, shows how to enter the Read Status function with the control panel in normal operation, as well as how to exit the function.

1.3 Introduction to the Control Panel

The NFS2-640 is a modular, intelligent Fire Alarm Control Panel (FACP) with features suitable for most applications. Following is a list of operating features available.

- Alarm Verification selection, to reduce unwanted alarms, for intelligent detector points
- Positive Alarm Sequence (PAS) and Presignal per NFPA 72
- Silence Inhibit timer and Auto Silence timer for Notification Appliance Circuits (NACs)
- March time/temporal code for Notification Appliance Circuits (NACs)
- Programmable Signal Silence, System Reset, and Alarm Activate functions through monitor modules
- Automatic time-of-day and day-of-week control functions, with holiday option
- Intelligent Sensing with nine field-adjustable Pre-Alarm levels with programmable Control-By-Event (CBE)
- Operate automatic smoke or heat detector sounder base on action Pre-Alarm level, with general evacuation on alarm level
- Security alarm point option with separate audible signal code
- Centralized voice paging and audible alarm signaling options
- Programmable Control-By-Event control of outputs from individual alarm or supervisory addressable devices
- Networks with other FACPs and equipment for large applications.

Section 2: Use of the Controls

2.1 Introduction

Listing of the controls and indicators and where to find information on their use:

Operating Components	Covered in
Twelve System Status Indicator LEDs	“System Status Indicator LEDs” on page 12
Five Control Keys	“Control Keys” on page 13
Programming Keypad	“Programming Keypad” on page 15

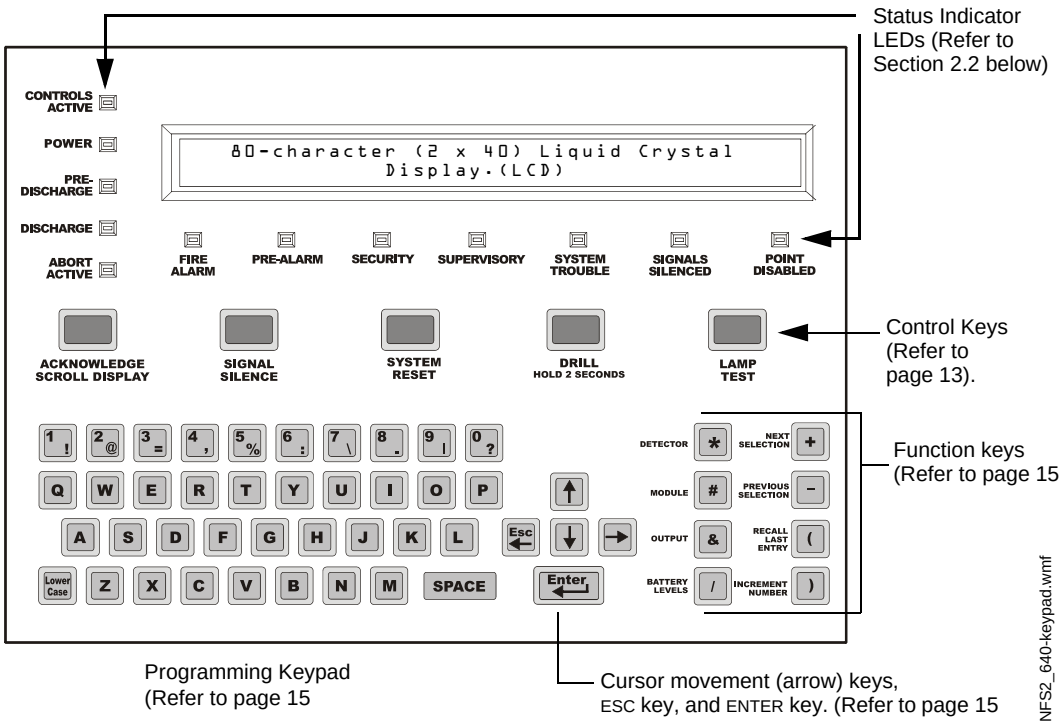


Figure 2.1 NFS2-640 Control Panel Keys and Indicators

2.2 System Status Indicator LEDs

The control panel contains 12 labeled LEDs described in Table 2.1.

Indicator	Color	When Active	To Turn Off
CONTROLS ACTIVE	Green	LIghts when the panel assumes control of local operation as primary display.	Turns off automatically when another panel assumes control of local operation.
POWER	Green	Lights when the proper primary AC power is applied. Remains lit while power is applied.	Always lit with AC power applied.
PRE-DISCHARGE	Red	Lights when any of the releasing zones have been activated, but have not yet discharged a releasing agent.	Turns off automatically when no releasing zones are in the pre-discharge state.

Table 2.1 Descriptions of System Status Indicator LEDs (1 of 2)

Indicator	Color	When Active	To Turn Off
DISCHARGE	Red	Lights when any of the releasing zones are active and in the process of discharging a releasing agent.	Turns off automatically when no releasing zones are discharging a releasing agent.
ABORT ACTIVE	Yellow	Lights when an abort switch has been activated.*	Turns off automatically when an abort switch has been pressed and its timer is still counting down.
FIRE ALARM	Red	Flashes when a non-acknowledged fire alarm exists. Lights steadily after you acknowledge the fire alarm.	Clear the alarm condition and reset the system.
PRE-ALARM	Red	Flashes when a non-acknowledged fire Pre-Alarm exists. Lights steadily after you acknowledge the Pre-Alarm.	Clear the pre-alarm condition. (An Action Pre-Alarm requires a system reset.)
SECURITY	Blue	Flashes when a non-acknowledged Security alarm exists. Lights steadily after you acknowledge the alarm.	Clear the Security alarm condition and reset the system.
SUPERVISORY	Yellow	Flashes when a non-acknowledged Supervisory condition exists. Lights steadily after you acknowledge the event.	Clear the condition (Supervisory inputs require a system reset if they are latching. Refer to Table 3.4 page 30 for latching information.).
SYSTEM TROUBLE	Yellow	Flashes when a non-acknowledged system trouble exists. Lights steadily after you acknowledge the trouble.	Clear the trouble condition.
SIGNALS SILENCED	Yellow	Lights steadily after a fire alarm condition occurs and after you press SIGNAL SILENCE to silence all outputs. Flashes to indicate that some silenceable outputs are on and some are off.	Press SYSTEM RESET. DRILL will also turn off the LED.
POINT DISABLED	Yellow	Lights when one or more system devices are disabled.	Enable the device or remove the disabled device from the system program.

Table 2.1 Descriptions of System Status Indicator LEDs (2 of 2)

* Activation of a Manual Release Switch will override Predischarge Delay and override an active Abort Release Switch, resulting in an immediate agent release.

2.3 Control Keys

The control panel provides five Control Keys as described below:

2.3.1 Acknowledge/Scroll Display

Use the ACKNOWLEDGE/SCROLL DISPLAY key to respond to new alarm or trouble signals. When pressed, the control panel does the following:

- Silences the panel sounder
- Changes all active LED indicators from flashing to steady
- Sends an Acknowledge message to the History buffer and installed printers, CRT-2 terminals, and FDU-80 annunciators
- Sends a signal to silence the sounders on the FDU-80 and ACS annunciators

You can also press this key to display multiple alarms or troubles. If more than one alarm or trouble exists, the control panel displays the next alarm or trouble for 3 seconds (or until you press the ACKNOWLEDGE/SCROLL DISPLAY key), then displays the next alarm or trouble.

NOTE: If Local Control is set to “0” (No Control), the FACP will not respond to ACKNOWLEDGE, and the piezo will not sound.

2.3.2 Signal Silence

Use the SIGNAL SILENCE key to silence the panel sounder and turn off all audio and visual devices connected to Notification Appliance Circuits. When pressed, the control panel does the following:

- Turns off the panel sounder
- Turns off all silenceable output circuits
- Lights the SIGNALS SILENCED LED
- Sends a SIGNALS SILENCED message to the History buffer and installed printers, CRT-2 terminals, and annunciators

Partial Signal Silence

When some active outputs are silenced and others remain constant, the SIGNALS SILENCED LED will flash.

NOTE: If Local Control is set to "0" (No Control) or "2" (Partial Control), the FACP will not respond to SIGNAL SILENCE.

2.3.3 System Reset

Use the SYSTEM RESET key to reset the control panel. When pressed, the control panel does the following:

- Clears ALL active inputs
- Interrupts resettable power
- Sends a "System Reset" message to the History buffer, and installed printers, CRT-2 terminals, and FDU-80 annunciators
- Decouples from Noti•Fire•Net, if connected, for 60 seconds to allow Cooperative Control By Event (CCBE) to clear.

If any alarm or trouble exists after you press the SYSTEM RESET key, all NACs, control outputs, and panel audio and visual indicators will reactivate.

NOTE: Trouble conditions will not clear and re-report upon reset.

NOTE: If Local Control is set to "0" (No Control), the FACP will not respond to SYSTEM RESET.

2.3.4 Drill

Use the DRILL key to manually activate all silenceable outputs and Notification Appliance Circuits. To prevent accidental activation, you must press the DRILL key for 2 seconds. When pressed, the control panel does the following:

- Turns on all silenceable NACs
- Turns off the SIGNALS SILENCED LED
- Sends a Manual Evacuate message to the History buffer and installed printers, CRT-2 terminals, and FDU-80 annunciators

NOTE: If Local Control is set to "0" (No Control) or "2" (Partial Control), the FACP will not respond to DRILL.

2.3.5 Lamp Test

Use the LAMP TEST key to test the control panel LEDs and the panel sounder. When pressed and held, the control panel does the following:

- Lights all control panel LEDs
- Turns on the panel sounder
- Lights all segments of the LCD display. When the LAMP TEST key is held for longer than five seconds, the LCD will display the Software Revisions.

2.4 Programming Keypad

The programming keypad includes:

- Function keys: DETECTOR, MODULE, OUTPUT, BATTERY LEVELS, NEXT SELECTION, PREVIOUS SELECTION, RECALL LAST ENTRY, and INCREMENT NUMBER
- ENTER key
- Cursor movement keys: ESC/LEFT ARROW key, UP key, RIGHT key, DOWN key
- Alphabetic and numeric keys, with LOWER CASE selection key

Shown below is the Programming Keypad, with descriptions for the keys.

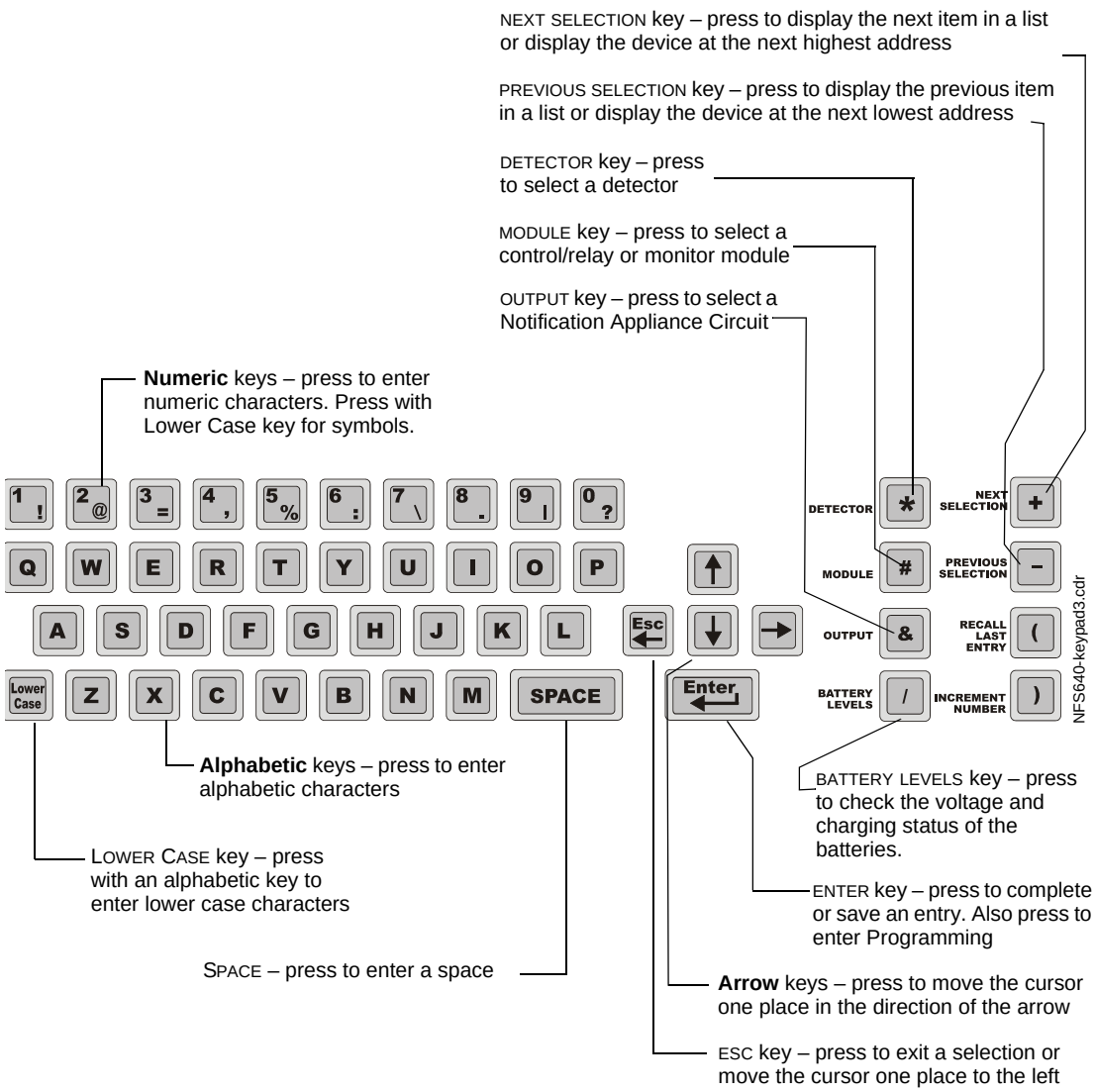


Figure 2.2 Programming Keypad

Section 3: Operation of the Control Panel

3.1 Overview

This section contains instructions for operating the control panel. Listed below are the topics detailed in this section:

Section	Refer to Page
3.2, "Normal Mode of Operation"	page 18
3.3, "Fire Alarm Mode of Operation"	page 18
3.4, "Mass Notification Mode of Operation"	page 21
3.5, "System Trouble Mode of Operation"	page 25
3.6, "Security Alarm Mode of Operation"	page 27
3.7, "Active Supervisory Signal Mode of Operation"	page 28
3.8, "Pre-Alarm Warning Mode of Operation"	page 31
3.9, "Disabled Points Mode of Operation"	page 32
3.10, "Non-Alarm Mode of Operation"	page 32
3.11, "CO Alarm Mode of Operation"	page 33
3.12, "Active Trouble Monitor Mode of Operation"	page 35
3.12, "Active Trouble Monitor Mode of Operation"	page 35
3.13, "Output Circuit Trouble Mode of Operation"	page 36
3.14, "Operation of Special System Timers"	page 38
3.15, "Waterflow Circuit Operation"	page 40
3.16, "Style 6 and Style 7 Operation"	page 40

This manual also contains information on operating the control panel in the appendixes, listed as follows:

- Appendix A, “Special Zone Operation”, on page 56
- Appendix B, “Intelligent Detector Functions”, on page 66
- Appendix C, “Remote Terminal Access”, on page 67
- Appendix D, “Point and System Troubles Lists”, on page 76

WARNING:
WHEN USED FOR CO_2 RELEASING APPLICATIONS, OBSERVE PROPER PRECAUTIONS AS STATED IN NFPA 12. DO NOT ENTER THE PROTECTED SPACE UNLESS PHYSICAL LOCKOUT AND OTHER SAFETY PROCEDURES ARE FULLY COMPLETED. DO NOT USE SOFTWARE DISABLE FUNCTIONS IN THE PANEL AS LOCKOUT.

3.2 Normal Mode of Operation

The system operates in Normal mode when no alarms or troubles exist. In Normal mode, the control panel displays a System Normal message as follows

```
SYSTEM NORMAL          01:56P 041515 Sat
```

Figure 3.1 Sample System Normal Message

In Normal mode, the control panel does the following functions at regular intervals:

- Polls all SLC devices and the four NACs to check for valid replies, alarms, troubles, circuit integrity, supervisory signals, etc.
- Checks power supply troubles and batteries at 10-second intervals
- Sends a supervisory query on the optional FDU-80 and verifies proper response
- Refreshes the LCD display and the optional FDU-80 display and updates time
- Scans for any keypad or Control Key entries
- Performs a detector automatic test operation
- Tests system memory
- Monitors for microcontroller failure

3.3 Fire Alarm Mode of Operation

3.3.1 How the Control Panel Indicates a Fire Alarm

When an initiating device (detector or monitor module) activates, the control panel does the following:

- Produces a steady audible tone
- Activates the System Alarm relay (TB4)
- Flashes the FIRE ALARM LED
- Displays a Type Code that indicates the type of device that activated the fire alarm
- Displays ALARM in the status banner on the LCD display, along with information specific to the device, as shown below:

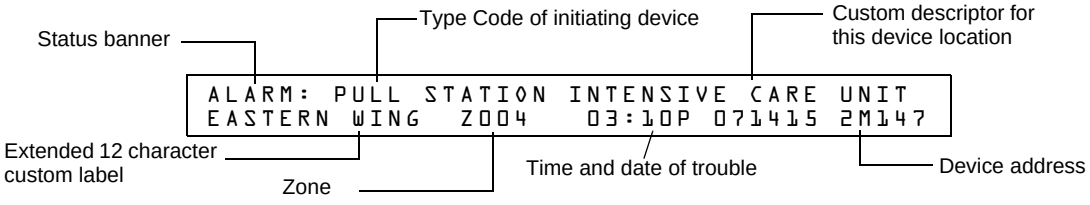


Figure 3.2 Sample Fire Alarm Display

- Sends an Alarm message to the LCD display, remote annunciators, History buffer, installed printers, and CRT-2s.
- Latches the control panel in alarm. (You can not return the control panel to normal operation until you correct the alarm condition and reset the control panel)
- Initiates any Control-By-Event actions
- Starts timers (such as Silence Inhibit, Auto Silence)
- Activates the general alarm zone (Z00)

3.3.2 How to Respond to a Fire Alarm

If the control panel indicates a fire alarm, you can do the following:

- To silence only the panel sounder:

  Press the ACKNOWLEDGE/SCROLL DISPLAY key. The local sounder will silence and the FIRE ALARM LED will change from flashing to steady.

  The control panel will send an acknowledge message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s.

- To silence the panel sounder and any activated outputs that are programmed as silenceable:

  Press the SIGNAL SILENCE key. The FIRE ALARM LED and SIGNALS SILENCED LED light steady.

  The control panel sends an Signal Silenced message to the remote annunciators, history buffer, installed printers, and CRT-2s. The figure below shows a sample Alarm Silenced message.

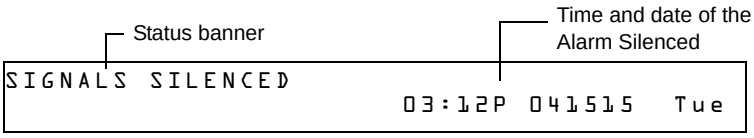


Figure 3.3 Sample Alarm Silenced Message

1. Check the Alarm message for the location and type of trouble.
2. Correct the condition causing the alarm.
3. When you finish correcting the alarm condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.3.3 Interpreting Fire Alarm Type Codes

The Type Code that displays in the Alarm message indicates the function of the point that initiates the fire alarm. For example, a monitor module with a PULL STATION Type Code means that the monitor module connects to a manual pull station. The table below lists the Type Codes that can appear in an alarm message:

Type Code	Latching (Y/N)	Purpose	What it does
Monitor Modules			
Blank	Y	Indicates activation of a device with no description	Lights FIRE ALARM LED and activates CBE
HEAT DETECT	Y	Indicates activation of a conventional heat detector	Lights FIRE ALARM LED and activates CBE
MONITOR	Y	Indicates activation of an alarm-monitoring device	Lights FIRE ALARM LED and activates CBE
PULL STATION	Y	Indicates activation of a manual fire-alarm-activating device, such as a pull station.	Lights FIRE ALARM LED and activates CBE
RF MON MODUL	Y	Indicates activation of a wireless alarm-monitoring device	Lights FIRE ALARM LED and activates CBE
RF PULL STA	Y	Indicates activation of a wireless manual fire-alarm-activating device, such as a pull station	Lights FIRE ALARM LED and activates CBE
SMOKE CONVEN	Y	Indicates activation of a conventional smoke detector attached to an FZM-1	Lights FIRE ALARM LED and activates CBE
SMOKE DETECT	Y	Indicates activation of a conventional smoke detector attached to an FZM-1	Lights FIRE ALARM LED and activates CBE
WATERFLOW	Y	Indicates activation a waterflow alarm switch	Lights FIRE ALARM LED and activates CBE
EVACUATE SW	N	Performs Drill function.	Activates all silenceable outputs

Table 3.1 Fire Alarm Type Codes (1 of 3)

Type Code	Latching (Y/N)	Purpose	What it does
MAN. RELEASE	Y	Indicates activation of a monitor module programmed to a releasing zone to perform a releasing function.	Lights FIRE ALARM LED and activates CBE
MANREL DELAY	Y	Indicates activation of a monitor module programmed for a release output	Lights FIRE ALARM LED and activates CBE
SECOND SHOT	N	Provides second activation of releasing zone after soak timer has expired.	Indicates ACTIVE and activates CBE
CO MONITOR*	Y	Indicates activation of a CO conventional detector	Activates CBE, does not light an indicator at the control panel.
Detectors			
SMOKE(ION)	Y	Indicates activation of an ion smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(DUCT I)	Y	Indicates activation of a duct ion smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(PHOTO)	Y	Indicates activation of a photo smoke detector	Lights FIRE ALARM LED and activates CBE
RF_PHOTO	Y	Indicates activation of a wireless photoelectric smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(DUCTP)	Y	Indicates activation of a duct photo smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(HARSH)*	Y	Indicates activation of a HARSH smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(LASER)	Y	Indicates activation of a laser smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(DUCTL)	Y	Indicates activation of a duct laser smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(BEAM)	Y	Indicates activation of a beam smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(DUCTL)	Y	Indicates activation of a duct laser smoke detector	Lights FIRE ALARM LED and activates CBE
AIR REF	Y	Indicates activation of a laser air reference detector.	Lights FIRE ALARM LED and activates CBE
HEAT	Y	Indicates activation of a 190^{o}F intelligent thermal detector	Lights FIRE ALARM LED and activates CBE
HEAT+	Y	Indicates activation of a 190^{o}F adjustable threshold intelligent thermal detector	Lights FIRE ALARM LED and activates CBE
HEAT(ANALOG)	Y	135^{o}F intelligent thermal sensor	Lights FIRE ALARM LED and activates CBE
HEAT (ROR)	Y	15^{o}F per minute rate-of-rise detector	Lights FIRE ALARM LED and activates CBE
Acclimate			
SMOKE ACCLIM	Y	Indicates activation of detector (Acclimate Plus™, FSC-851 IntelliQuad), without freeze warning	Lights FIRE ALARM LED and activates CBE
SMOKE (ACCL+)	Y	Indicates activation of detector (Acclimate Plus™, FSC-851 IntelliQuad), with freeze warning	Lights FIRE ALARM LED and activates CBE
SMOKE MULTI*	Y	Multisensor smoke detector	Lights FIRE ALARM LED and activates CBE
ACCL (P SUP)	Y (see note below)	Combination Photoelectric/Heat detector. Photo element activation generates a supervisory condition.	Lights FIRE ALARM LED and activates CBE FlashScan only. No Pre-Alarm.
ACCL+ (P SUP)	Y (see note below)	Combination Photoelectric/Heat detector with low temperature warning. Photo element activation generates a supervisory condition.	Lights FIRE ALARM LED and activates CBE FlashScan only. No Pre-Alarm.
NOTE: For ACCL/ACCL+ detectors: Detectors programmed as ACCL (P SUP) or ACCL+ (P SUP), the heat element will latch and require a system reset to clear. The Photo element will latch or track, depending on the ACCL (P SUP) latching setting.			
PHOTO/CO*	Y	Indicates activation of the Photo, Heat, or CO element of a detector.	Lights FIRE ALARM LED for photo and heat, no LED will light for a CO alarm. Photo and heat will activate CBE, CO alarm activates special function zone FC and sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools)

Table 3.1 Fire Alarm Type Codes (2 of 3)

Type Code	Latching (Y/N)	Purpose	What it does
PHOTO/CO (P SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector.	Lights FIRE ALARM LED for heat, no LED will light for a CO alarm, supervisory LED will light for photo alarm, heat and photo will activate CBE, CO alarm activates special function zone FC and sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools). FlashScan only. No Pre-Alarm
PHOTO/CO (C SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector.	Lights FIRE ALARM LED for heat and photo alarms, will light supervisory LED for CO alarm, photo and heat alarms will activate CBE, CO alarm will activate sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools). FlashScan only. No Pre-Alarm.
NOTE: For Photo/CO detectors: Detectors programmed as P/CO (P SUP), the heat and CO elements will latch and require a system reset to clear. The Photo element will latch or track, depending on the Photo/CO (Photo SUP) setting. Detectors programmed as P/CO (C SUP), the heat and Photo elements will latch and require a system reset to clear. The CO element will latch or track depending on the Photo/CO (CO SUP) setting.			
*FlashScan only			

Table 3.1 Fire Alarm Type Codes (3 of 3)

3.4 Mass Notification Mode of Operation

3.4.1 How the Control Panel Indicates a Mass Notification Alarm

When an initiating device activates, the control panel does the following:

- Produces a steady audible tone
- Does not activate any alarm relays or devices programmed as Alarm Pending or General Pending
- Does not flash any panel LEDs
- Displays a Type Code that indicates the type of device that activated the MN alarm
- Displays MN ALARM in the status banner on the LCD display, along with information specific to the device, as shown below:

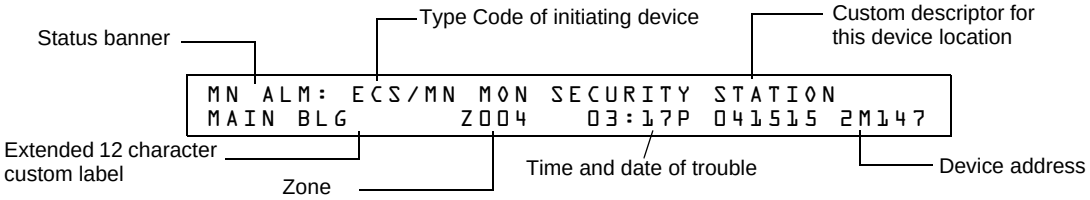


Figure 3.4 Sample MN Alarm Display

- Sends an Alarm message to the LCD display, remote annunciators, History buffer, installed printers, and CRT-2s.
- Latches the control panel in MN alarm. (You can not return the control panel to normal operation until you correct the alarm condition and reset the control panel)
- Initiates any Control-By-Event actions
- Activates special zone ZFD (Not applicable for First Command applications)
- Sends an Alarm message to the proprietary receiver via the network, if applicable

3.4.2 How to Respond to an MN Alarm

If the control panel indicates an MN alarm, you can do the following:

- To silence only the panel sounder:

  Press the ACKNOWLEDGE/SCROLL DISPLAY key. The local sounder will silence. The control panel will send an acknowledge message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s. If multiple MN alarms are present on the fire panel, the ACKNOWLEDGE/SCROLL DISPLAY key must be pressed for each alarm.

- To silence the panel sounder and any activated outputs that are programmed as silenceable:

  Press the SIGNAL SILENCE key. The FIRE ALARM LED and SIGNALS SILENCED LED light steady.

  The control panel sends an Signal Silenced message to the remote annunciators, history buffer, installed printers, and CRT-2s. The figure below shows a sample Alarm Silenced message.

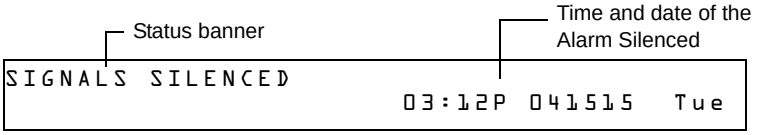


Figure 3.5 Sample MN Alarm Silenced Message

1. Correct the condition causing the MN alarm.
2. When you finish correcting the MN alarm condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.4.3 How the Control Panel Indicates a Mass Notification Supervisory

When an initiating device activates, the control panel does the following:

- Produces a warbling audible tone
- Activates any supervisory relays and devices programmed as Supervisory Pending, General Supervisory or General Pending
- Flashes the panel's Supervisory LED
- Displays a Type Code that indicates the type of device that activated the MN supervisory
- Displays MN SUP in the status banner on the LCD display, along with information specific to the device, as shown below:

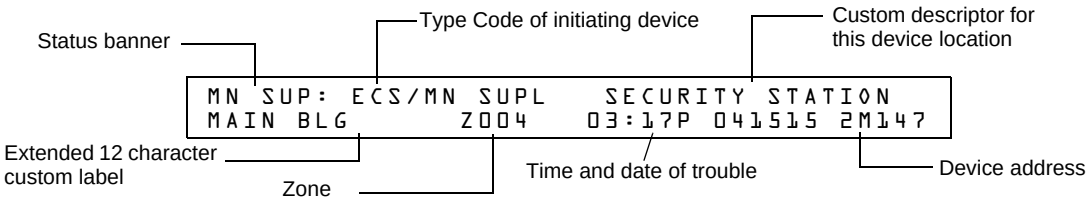


Figure 3.6 Sample MN Supervisory Display

- Sends an MN Supervisory message to the LCD display, remote annunciators, History buffer, installed printers, and CRT-2s.
- Initiates any Control-By-Event actions
- Activates special zone ZFE
- Sends an MN Supervisory message to the proprietary receiver via the network, if applicable

3.4.4 How to Respond to an MN Supervisory

If the control panel indicates an MN supervisory, you can do the following:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SUPERVISORY LED from flashing to steady. An Acknowledge message is sent to the remote annunciators, history buffer, installed printers, and CRTs. Pressing the ACKNOWLEDGE/SCROLL DISPLAY will acknowledge all MN supervisory events on the fire panel.
2. Correct the condition that activated the MN supervisory point.
3. For a Latching event, press the system reset key to return the control panel to normal operation. For a Non-latching event, the panel will return to normal operation once the supervisory condition is corrected.
   The control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, remote annunciators, and CRT-2s.

3.4.5 How the Control Panel Indicates a Mass Notification Trouble

When an initiating device activates, the control panel does the following:

- Produces a pulsed audible tone
- Activates any trouble relays and devices programmed as Trouble Pending, General Trouble or General Pending
- Flashes the panel's Trouble LED
- Displays a Type Code that indicates the type of device that with a trouble
- Displays MN TBL in the status banner on the LCD display, along with information specific to the device, as shown below:

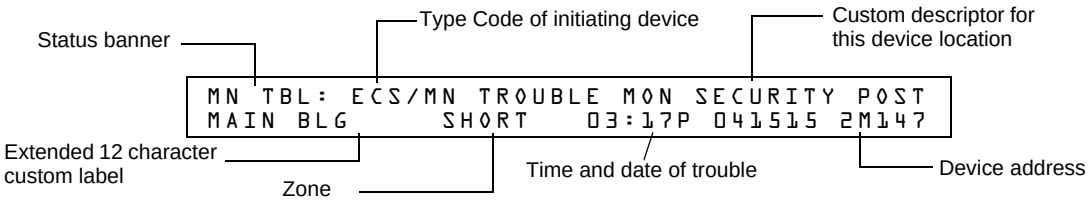


Figure 3.7 Sample MN Trouble Display

- Sends an MN trouble message to the LCD display, remote annunciators, History buffer, installed printers, and CRT-2s.
- Initiates any Control-By-Event actions
- Activates special zone ZFF
- Sends an MN Trouble message to the proprietary receiver via the network, if applicable

3.4.6 How to Respond to an MN Trouble

If the control panel indicates an MN trouble, you can do the following:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the TROUBLE LED from flashing to steady. An Acknowledge message is sent to the remote annunciators, history buffer, installed printers, and CRTs. Pressing the ACKNOWLEDGE/SCROLL DISPLAY will acknowledge all MN trouble events on the fire panel.
2. Check the trouble message for location and type of trouble.
3. Correct the condition causing the trouble condition. If the trouble clears, the panel sends a Clear Trouble message to the History Buffer and installed printers, annunciators and CRT-2s. (troubles will clear from the fire panel even if they are not acknowledged.)

4. If no other events are present on the fire panel, a “System Normal” message is sent to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s and the fire panel returns to normal operation.

3.4.7 Interpreting MN Type Codes

The Type Code that displays in the fire panel message indicates the function of the point that initiates the activation. The table below lists the Type Codes that can appear in an mass notification message:

Type Code	Latching (Y/N)	Purpose	What it does
Monitor Modules			
ECS/MN MONITOR[1]	Y	Indicates activation of a mass notification device	Activates CBE, does not light any LEDs, overrides existing fire event[2], shuts off silenceable outputs and all fire activated strobes
ECS/MN SUPL[1]	Y	Indicates activation of a mass notification device	Lights SUPERVISORY LED and activates CBE
ECS/MN SUPT[1]	N	Indicates activation of a mass notification device	Lights SUPERVISORY LED and activates CBE
ECS/MN TROUBLE MON[1]	N	Indicates trouble on a mass notification device	Monitors mass notification devices. Will generate a trouble condition for both open and short conditions.
[1]This Type Code is not compatible with First Command applications.			

Table 3.2 Mass Notification Type Codes

3.5 System Trouble Mode of Operation

3.5.1 How the Control Panel Indicates a System Trouble

The system goes into system trouble when the control panel detects an electrical fault. If no fire alarms exist, the control panel does the following:

- Produces a pulsed audible tone
- Activates the Trouble relay (TB4)
- Flashes the SYSTEM TROUBLE LED
- Displays a Type Code that indicates the type of device with a trouble.
- Displays TROUBL in the status banner on the LCD display as well as the type of trouble and information specific to the device, as shown in Figure 3.8 below.
- Sends a Trouble message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s.

NOTE: If a fire alarm exists when a trouble exists, the SYSTEM TROUBLE LED lights, but the Alarm message appears in the LCD display.

Typical Trouble message that appears on the LCD display:

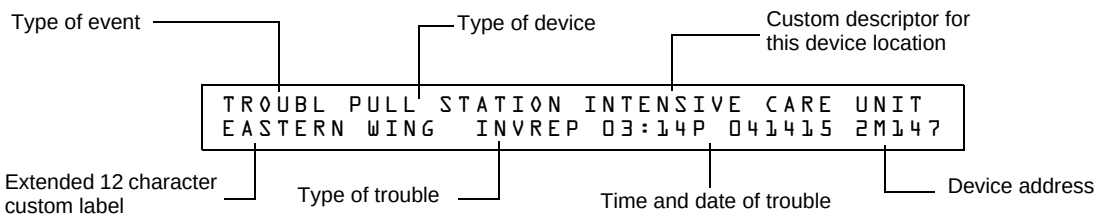


Figure 3.8 Sample Trouble Message

3.5.2 How to Respond to a System Trouble

If the control panel indicates a trouble, you can do the following:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SYSTEM TROUBLE LED from flashing to steady—regardless of the number of troubles, alarms, security and supervisory signals.

NOTE: Pressing the SIGNAL SILENCE key when only troubles exist, gives the same result as pressing the ACKNOWLEDGE/SCROLL DISPLAY key. The SIGNALS SILENCED LED does not light unless an alarm exists in the system.

2. The control panel sends an Acknowledge message to the remote annunciators, history buffer, installed printers, and CRT-2s.

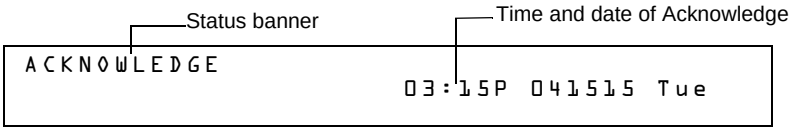


Figure 3.9 Sample Acknowledge Message

3. Check the trouble message for the location and type of trouble.

```
TROUBL MONITOR        MODULE ADDRESS  M021 ZOO OPEN CIRCUIT  08:10A 042115 2M021
TROUBL MONITOR        MODULE ADDRESS  M022 ZOO OPEN CIRCUIT  08:12A 042115 2M022
```

Figure 3.10 Sample Trouble Messages on CRT-2 or Printer

4. Correct the condition causing the trouble. If the trouble clears, the control panel sends a Clear Trouble message to the History buffer and installed printers FDU-80 annunciators, and CRT-2s.

If all troubles clear and no supervisory signals or fire alarms exist, the control panel does the following:

- Returns to Normal operation (indicated by the “System Normal” message)
- Sends a “System Normal” message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Restores troubles automatically - even if troubles are not acknowledged

If multiple trouble conditions exist in the system, the LCD and optional CRT-2 and FDU-80s automatically step through each trouble every 3 seconds in the following order:

1. Alarms, in order of address
2. Supervisory, in order of address
3. Troubles, in order of address

Press the ACKNOWLEDGE/SCROLL DISPLAY key and the display stops on the current trouble event for 1 minute, then begins to automatically step through remaining troubles. To manually step through remaining troubles, press the ACKNOWLEDGE/SCROLL DISPLAY key.

Refer to Appendix D, “Point and System Troubles Lists”, on page 76 for explanations of troubles that appear on the display.

3.6 Security Alarm Mode of Operation

3.6.1 How the Control Panel Indicates a Security Alarm

The system goes into Security mode when a monitor module point programmed with a Security Type Code activates. If no fire alarm exists, the control panel does the following:

- Produces a warbling audible tone
- Turns on the Security relay (TB5)
- Flashes the SECURITY LED (blue)
- Displays a Type Code that indicates the type of security alarm being generated
- Displays ACTIVE in the status banner on the control panel, along with information specific to the device
- Sends a Security message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s.
- Sends a Security message to the proprietary receiver via the network, if applicable.

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Security alarm will resound the panel sounder.

A Typical security message that appears on LCD display:

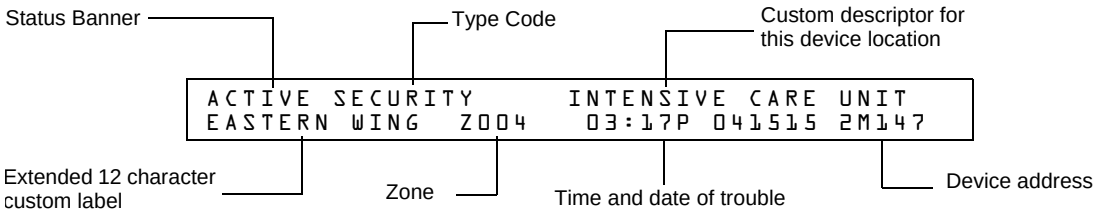


Figure 3.11 Sample Security Alarm Message

3.6.2 How to Respond to a Security Alarm

A Security Type Code latches the control panel. To return the control panel to normal operation, you must correct the condition causing the security condition, then reset the control panel. If the control panel indicates a security alarm, take the following action:

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Security alarm will resound the panel sounder.

1. Press the ACKNOWLEDGE/SCROLL display key to silence the panel sounder and switch the SECURITY LED from flashing to steady—regardless of the number of troubles, alarms, supervisory, and security signals. The control panel sends a Security message to the remote annunciators, history buffer, installed printers, and CRT-2s.
2. Correct the condition that activated the Security point.
3. When you finish correcting the Security condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s.

3.6.3 Interpreting Security Type Codes

The Type Code that displays in the security alarm message indicates the type of security alarm being generated by the monitor module that initiates the alarm. For example, a monitor module with a Type Code of AREA MONITOR indicates an intruder in a protected premises area. The table below lists the Type Codes that can appear in a security alarm message.

Monitor Modules			
Type Code	**Latching (Y/N)**	**Purpose**	**What it does**
AREA MONITOR	Y	Monitors area surveillance equipment, such as motion detectors	Lights SECURITY LED, activates CBE
SECURITY	Y	Monitors security switches for tampering	Lights SECURITY LED, activates CBE
SYS MONITOR	Y	Monitors critical equipment for security	Lights SECURITY LED, activates CBE

Table 3.3 Security Type Codes

3.7 Active Supervisory Signal Mode of Operation

3.7.1 How the Control Panel Indicates an Active Supervisory

The system goes into Supervisory mode when a monitor module point programmed with a Supervisory type code activates. When a Supervisory point activates, the control panel does the following:

- Produces a warbling audible tone
- Turns on the Supervisory relay (TB5)
- Flashes the SUPERVISORY LED (yellow)
- Displays one of the Type Codes listed in Table 3.4.
- Displays ACTIVE in the status banner on the control panel, along with information specific to the device
- Sends a Supervisory message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s.

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Supervisory alarm will resound the panel sounder.

A Typical Supervisory message that appears on LCD display:

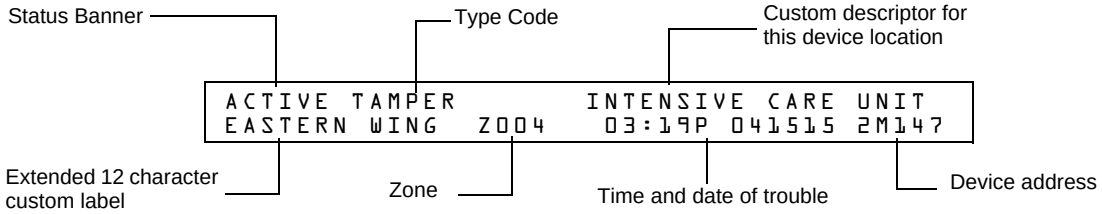


Figure 3.12 Sample Supervisory Signal Message

3.7.2 How to Respond to an Active Supervisory

If a Latching Supervisory Type Code Displays

Some Supervisory Type Codes latch the control panel (Refer to Table 3.4 for a list of these type codes). To return the control panel to normal operation, you must correct the condition causing the supervisory condition, then reset the control panel. Take the following action:

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Supervisory alarm will resound the panel sounder.

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SUPERVISORY LED from flashing to steady—regardless of the number of troubles, alarms, and supervisory signals. The control panel sends a Supervisory message to the remote annunciators, history buffer, installed printers, and CRT-2s.
2. Correct the condition that activated the supervisory point.
3. When you finish correcting the latching supervisory condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s.

If Non-latching Type Code Displays

Some Supervisory Type Codes do not latch the control panel. (Refer to Table 3.4 for a list of these type codes). The control panel automatically returns to normal operation, when you correct the condition that activates the supervisory point. If the control panel indicates a non-latching supervisory point, take the following action:

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Supervisory alarm will resound the panel sounder.

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SUPERVISORY LED from flashing to steady—regardless of the number of troubles, alarms, and supervisory signals. The control panel sends a Supervisory message to the remote annunciators, history buffer, installed printers, and CRT-2s.
2. Correct the condition that activated the supervisory point.
3. The control panel automatically returns to normal operation (indicated by the "System Normal" message) and the control panel sends a "System Normal" message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s.

3.7.3 How to Interpret Supervisory Type Codes

The Type Code that displays in the Supervisory message indicates the function of the point that initiates the Supervisory. For example, a monitor module with a TAMPER Type Code means that the monitor module connects to a tamper switch.

Type Codes that can appear in an Supervisory message:

Monitor Modules			
Type Code	**Latching (Y/N)**	**Purpose**	**What it does**
WATERFLOW S	Y	Indicates supervisory condition for activated waterflow switch	Lights SUPERVISORY LED and activates CBE
RF SUPERVSRY	N	Monitors a radio frequency device	Lights SUPERVISORY LED and activates CBE
LATCH SUPERV	Y	Indicates latching supervisory condition	Lights SUPERVISORY LED and activates CBE
TRACK SUPERV	N	Indicates tracking supervisory condition	Lights SUPERVISORY LED and activates CBE
SPRINKLR SYS	Y	Indicates activation of sprinkler system	Lights SUPERVISORY LED and activates CBE
TAMPER	Y	Indicates activation of tamper switch	Lights SUPERVISORY LED and activates CBE
Detectors			
SUP.T(DUCTI)	N	Ion detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(DUCTI)	Y	Ion detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUPT(DUCTL)	N	Laser detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUPL(DUCTL)	Y	Laser detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.T(DUCTP)	N	Photo detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(DUCTP)	Y	Photo detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUPT(PHOTO)	N	Photo detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(PHOTO)	Y	Photo detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.T(ION)	N	Ion detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(ION)	Y	Ion detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(LASER)	Y	Laser detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.T(LASER)	N	Laser detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
PHOTO/CO (C SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector.	Activation of the Heat or Photo elements will light an indicator at the control panel. Activation of the CO element will light the SUPERVISORY LED. Activates CBE.
PHOTO/CO (P SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector. FlashScan only. No Pre-Alarm.	Activation of the Heat element will light an indicator at the control panel. Activation of the CO element will not light and indicator at the control panel. Activation of the Photo element will light the SUPERVISORY LED. Activates CBE.
NOTE: For Photo/CO detectors: Detectors programmed as P/CO (P SUP), the heat and CO elements will latch and require a system reset to clear. The Photo element will latch or track, depending on the Photo/CO (Photo SUP) setting. Detectors programmed as P/CO (C SUP), the heat and Photo elements will latch and require a system reset to clear. The CO element will latch or track depending on the Photo/CO (CO SUP) setting.			
ACCL (P SUP)	Y (see note below)	Combination Photoelectric/Heat detector. Photo element activation generates a supervisory condition FlashScan only. No Pre-Alarm.	Lights SUPERVISORY LED and activates CBE
ACCL+ (P SUP)	Y (see note below)	Combination Photoelectric/Heat detector with low temperature warning. Photo element activation generates a supervisory condition. FlashScan only. No Pre-Alarm.	Lights SUPERVISORY LED and activates CBE
NOTE: For ACCL/ACCL+ detectors: Detectors programmed as ACCL (P SUP) or ACCL+ (P SUP), the heat element will latch and require a system reset to clear. The Photo element will latch or track, depending on the ACCL (P SUP) latching setting.			
*FlashScan only			

Table 3.4 Supervisory Type Codes

3.8 Pre-Alarm Warning Mode of Operation

3.8.1 How the Control Panel Indicates a Pre-Alarm Warning

The control panel activates a Pre-Alarm Warning if a detector exceeds the programmed Pre-Alarm Alert or Action level. When a detector activates a Pre-Alarm, the control panel does the following:

- Pulses the panel sounder
- Flashes the PRE-ALARM LED
- Activates the Pre-Alarm zone (F9)
- Sends a Pre-Alarm message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Displays a PREALARM status banner, the Type Code of the detector, and the Pre-Alarm level (Alert or Action) on the LCD display, along with information specific to the device as shown in Figure 3.13.

3.8.2 How to Respond to a Pre-Alarm Warning

Pre-Alarm Alert and Action Levels

The Pre-Alarm function is a programmable option which determines the system's response to real-time detector sensing values above the programmed setting. Use the Pre-Alarm function if you want to get an early warning of incipient or potential fire conditions. The Pre-Alarm function provides one of two levels of Pre-Alarm as follows:

NOTE: For detailed information on Pre-Alarm applications, refer to the *NFS2-640 Programming Manual*.

- Alert – a non-latching condition that causes a Pre-Alarm when a detector reaches the programmed Pre-Alarm level.
- Action – a latching condition that causes a Pre-Alarm when a detector reaches the programmed Pre-Alarm level.

Responding to a Pre-Alarm Warning

The Pre-Alarm screen display is the same for both alert and action conditions. Following is a sample screen for a Pre-Alarm message.

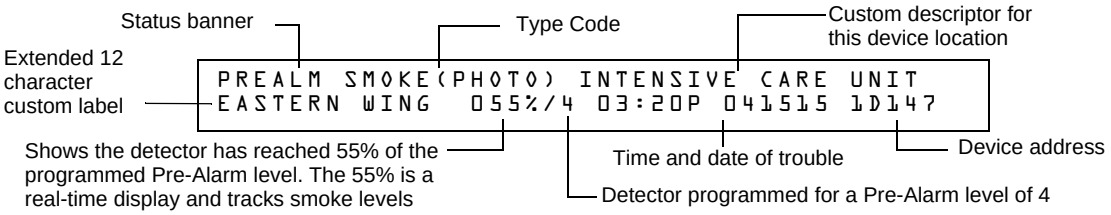


Figure 3.13 Sample of an Alert Pre-Alarm Message

An Alert Pre-Alarm automatically restores to normal when the detector sensitivity, programmable to one of nine settings, drops below the programmed Alert level. Zone F09 automatically clears when no Pre-Alarm conditions exist.

An Action Pre-Alarm latches until you reset the system - even if the detector sensitivity drops below the Action level. Zone F09 activates - but Zone Z00 (general alarm) and the trouble and alarm relays do not activate. The fifth zone programmed, not the first four, in the detector's CBE activates. A subsequent alarm condition for this detector clears the Action indication from the LCD display.

Interpreting Pre-Alarm Type Codes

The Type Code that displays in the Pre-Alarm warning indicates the function of the point that initiates the Pre-Alarm warning. Refer to the Detectors section of Table 3.1 for the Type Codes that can appear in a Pre-Alarm warning, and for descriptions of those Type Codes.

3.9 Disabled Points Mode of Operation

The control panel indicates disabled points by displaying a screen for each disabled detector, monitor module, and control/relay module. Disabled points do not cause an alarm or any Control-by-Event activity. If more than one point is disabled, the control panel displays by priority, mimicking the alarms.

CAUTION:
DISABLING A ZONE DISABLES ALL INPUT AND OUTPUT DEVICES ASSOCIATED WITH THE ZONE.

When one or more points are disabled, the control panel does the following:

- Holds all disabled output points in the off-state
- Flashes the SYSTEM TROUBLE LED
- Lights the POINT DISABLED LED
- Sends a Disabled Point message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Displays a message for each disabled point

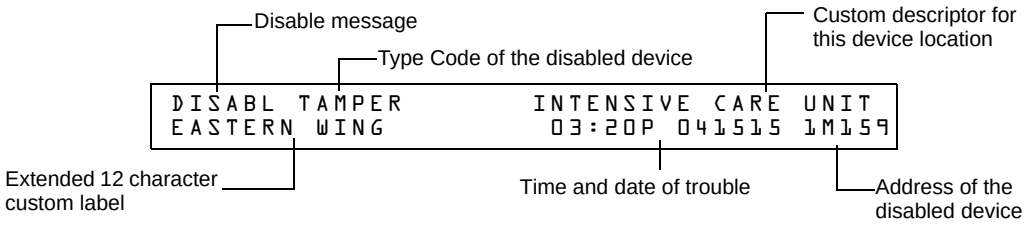


Figure 3.14 Sample Disabled Point Message

3.10 Non-Alarm Mode of Operation

3.10.1 Purpose of Non-Alarm Points

Non-Alarm points are addressable monitor modules programmed with one of the Non-Alarm Type Codes listed in Table 3.5. Non-Alarm points, except Non-Fire, operate like monitored system functions that can produce troubles—but with the differences shown in the following sections.

Monitor Modules			
Type Code	**Latching (Y/N)**	**Purpose**	**What it does**
ACCESS MONTR	N	Used for monitoring building access	Activates CBE

Table 3.5 Non-Alarm Type Codes (1 of 2)

ACK SWITCH	N	Performs Acknowledge function	Silences panel sounder, gives an Acknowledge message on the panel LCD
ALLCALL PAGE	N	Activates all speaker circuits for paging	Activates speakers
DRILL SWITCH	N	Performs Drill function (Not for use in Canadian applications.)	Activates silenceable outputs
FIRE CONTROL	N	Used for air handler shutdown, intended to override normal operating automatic functions	Activates CBE, does NOT light an indicator at the control panel
NON-FIRE	N	Used for energy management or other non-fire situations. Does not affect operation of the control panel	Activates CBE, does NOT light an indicator at the control panel
PAS INHIBIT	N	Inhibits Positive Alarm Sequence	Inhibits Positive Alarm Sequence
RESET SWITCH	N	Performs Reset function	Resets control panel
SIL SWITCH	N	Performs Signal Silence function	Turns off all activated silenceable outputs
TELE PAGE	N	Performs function of Page Button on FFT-7	Allows remote paging to a fire area
ABORT SWITCH	N	Indicates Active at the panel	Aborts activation of a releasing zone

Table 3.5 Non-Alarm Type Codes (2 of 2)

3.10.2 How the Control Panel Indicates an Active Fire Control

Activation of a FIRE CONTROL point causes the control panel to do the following:

- Initiate the monitor module Control-by-Event
- Send a message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Display an ACTIVE status banner and FIRE CONTROL Type Code on the LCD display, along with information specific to the device

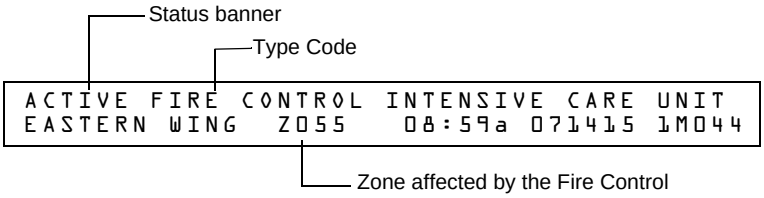


Figure 3.15 Sample Fire Control Point Display

3.10.3 How the Control Panel Indicates an Active Non-Fire Point

Non-Fire point operation does not affect control panel operation, nor does it display a message at the panel LCD. Activation of a Non-Fire point activates CBE—but does not cause any indication on the control panel. For example, you can program a Non-Fire point to turn lights in a zone to a lower setting when activated. In this case, when the point activates the control panel activates the point's CBE to turn the lights down without any audio or visual indication on the control panel.

3.11 CO Alarm Mode of Operation

3.11.1 How the Control Panel Indicates a CO Alarm

When an initiating device (detector or monitor module) activates due to a CO alarm event, the control panel does the following:

- Produces a pulsed audible tone
- Displays a CO alarm event that indicates the type of device that activated the fire alarm

- Displays ALARM in the status banner on the LCD display, along with information specific to the device, as shown below:

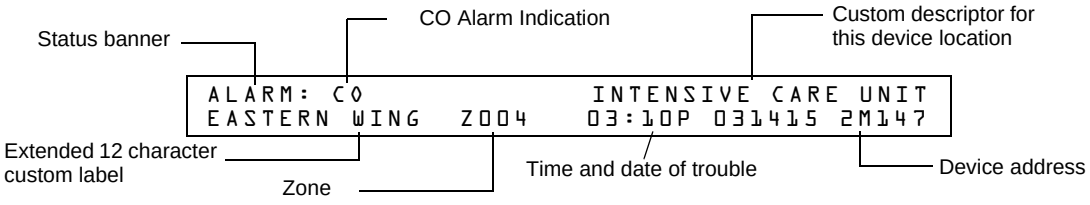


Figure 3.16 Sample CO Alarm Display

- Sends a CO Alarm message to the LCD display, remote annunciators, History buffer, installed printers, and CRT-2s.
- Latches the control panel in CO alarm. (You can not return the control panel to normal operation until you correct the CO alarm condition and reset the control panel)
- Initiates any Control-By-Event actions—activiates ZFC.

3.11.2 How to Respond to a CO Alarm

If the control panel indicates a CO alarm, you can do the following:

- To silence only the panel sounder:

  Press the ACKNOWLEDGE/SCROLL DISPLAY key. The local sounder will silence.

  The control panel will send an acknowledge message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s.
- To silence the panel sounder and any activated outputs that are programmed as silenceable:

  Press the SIGNAL SILENCE key. The SIGNALS SILENCED LED will light steady.

  The control panel sends an Signal Silenced message to the remote annunciators, history buffer, installed printers, and CRT-2s. The figure below shows a sample Alarm Silenced message.

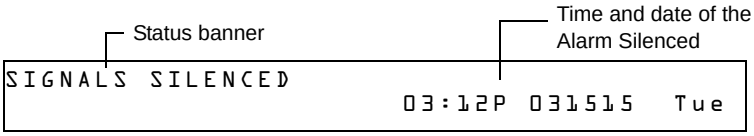


Figure 3.17 Sample Alarm Silenced Message

1. Check the Alarm message for the location and type of trouble.
2. Correct the condition causing the CO alarm.
3. When you finish correcting the CO alarm condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the “System Normal” message). The control panel sends a “System Normal” message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.11.3 Interpreting CO Alarm/Supervisory Type Codes

The Type Code that displays in the CO Alarm message indicates the function of the point that initiates the CO alarm. For example, a monitor module with a CO MONITOR Type Code means that the monitor module monitors a conventional CO detector. The table below lists the Type Codes that can appear in an alarm message:

Type Code	Latching (Y/N)	Purpose	What it does
Monitor Modules			
CO Monitor*	Y	Indicates activation of a CO conventional detector	Activates CBE, does not light an indicator at the control panel.
Detectors			
PHOTO/CO*	Y	Indicates activation of the Photo, Heat, or CO element of a detector.	Lights FIRE ALARM LED for photo and heat, no LED will light for a CO alarm. Photo and heat will activate CBE, CO alarm activates special function zone FC and sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools)
PHOTO/CO (P SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector.	Lights FIRE ALARM LED for heat, no LED will light for a CO alarm, supervisory LED will light for photo alarm, heat and photo will activate CBE, CO alarm activates special function zone FC and sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools)
PHOTO/CO (C SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector.	Lights FIRE ALARM LED for heat and photo alarms, will light supervisory LED for CO alarm, photo and heat alarms will activate CBE, CO alarm will activate sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools)
*FlashScan mode only			

Table 3.6 CO Alarm Type Codes

3.12 Active Trouble Monitor Mode of Operation

3.12.1 How the Control Panel Indicates an Active Trouble Monitor

Trouble Monitor Points are monitor modules programmed with the following Type Codes:

Type Code	Latching (Y/N)	Device Function	Point Function
AUDIO SYSTEM	N	Used for monitoring audio equipment audio amplifiers or associated equipment	Indicates trouble
EQUIP MONITR	N	Used for recording access to monitored equipment	Activates CBE
POWER MONITR	N	Used to monitor remote power supplies or other external equipment	Indicates trouble
TROUBLE MON	N	Used to monitor remote power supplies or other external equipment	Indicates trouble

Table 3.7 Trouble Monitor Type Codes

These types of monitor modules operate like monitored system functions that can produce troubles—but with the following differences:

- The LCD display status banner displays ACTIVE as shown:

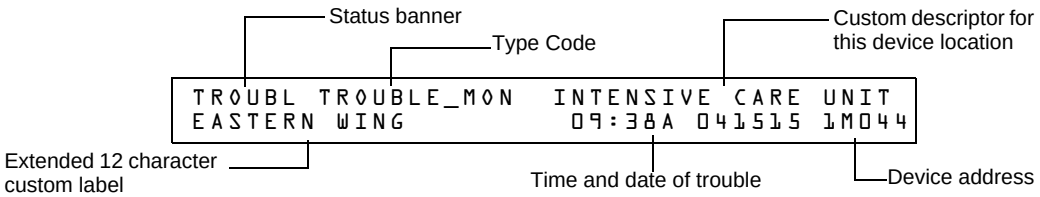


Figure 4 Sample Trouble Monitor Point Message

- The monitor module is non-latching: the module will return to normal when the trouble condition no longer exists.
- The monitor modules activate Control-by-Event
- The panel trouble relay transfers (TB4)

3.12.2 How to Respond to an Active Trouble Monitor

If the control panel indicates an active Trouble Monitor Point, take the following action:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SYSTEM TROUBLE LED from flashing to steady—regardless of the number of troubles, alarms, and supervisory signals.
2. The control panel sends an Acknowledge message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s. Check the trouble message for the location and type of trouble.
3. Correct the condition causing the trouble.
4. When the trouble condition is corrected, the panel will return to normal operation (indicated by the “System Normal” message).
5. The control panel sends a “System Normal” message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.13 Output Circuit Trouble Mode of Operation

3.13.1 Overview

Output circuits include NACs, Control/Relay Modules, and Transponder Points. This section contains a description of control panel operation for each type of output circuit.

- Four NACs are included on the control panel
- Control/Relay Modules connected to the control panel on an SLC
- Transponder Points: XPC-8 (CLIP only), or XP6-C (CLIP or FlashScan)

Trouble Type Codes for Control Modules and NAC Circuits

Type Code	Silenceable (Y/N)	Configuration	Device Function
CONTROL	N	NAC	Supervised NAC
RELAY	N	FORM-C relay	Relay Output
BELL CIRCUIT	N	NAC	Supervised NAC for notification appliance
STROBE CKT	N	NAC	Supervised NAC for notification appliance
HORN CIRCUIT	N	NAC	Supervised NAC for notification appliance
AUDIBLE CKT	N	NAC	Supervised NAC for notification appliance
SPEAKER	N	NAC	Supervised NAC for speaker circuit
REL END BELL	N	NAC	Supervised NAC for notification appliance
blank	N	NAC	Supervised NAC for undefined device

Table 3.8 Control Module and NAC Circuit Trouble Type Codes (1 of 2)

RELEASE CKT	N	NAC	Directs outputs to perform a releasing function.
REL CKT ULC	N	NAC	Directs outputs to perform a release function as required by ULC.
REL AUDIBLE	N	NAC	NAC, activated upon release
NONRESET CTL*	N	NAC	Relay output, unaffected by “System Reset” command
TELEPHONE	N	NAC	Standard Telephone circuit
REL CODE BELL**	N	NAC	Supervised NAC (NFS2-640 NAC only)
INSTANT RELE	N	NAC	NAC, short = normal; supervised for open circuits and ground faults. Always non-silenceable and switch-inhibited.
ALARMS PEND	N	NAC	Output that will activate upon receipt of an alarm condition, and remain in the alarm state until all alarms have been acknowledged.
CONTROL NAC**	N	NAC	Supervised NAC
GEN ALARM	Y		Control Module, an XPC-8 circuit, or an XP6-C configured as a Municipal Box Transmitter for NFPA 72 Auxiliary Fire Alarm Systems application. This Type ID can also be used for general alarm activation.
GEN SUPERVIS	Y		Control Module, an XPR-8 relay, or an XP6-R activated under any Supervisory condition (includes sprinkler type).
GEN TROUBLE	Y		Control Module, an XPR-8 relay, or an XP6-R activated under any System Trouble condition.
GENERAL PEND	Y		Control Module, an XPC-8 circuit, or an XP6-C that will activate upon receipt of an alarm and/or trouble condition, and remain in the ON state until all events have been ACKNOWLEDGED.
TROUBLE PEND	N		Control Module, an XPC-8 circuit, or an XP6-C that will activate upon receipt of a trouble condition, and remain in the ON state until all troubles have been ACKNOWLEDGED.
MNS GENERAL[1]	N	NAC	Mass Notification supervised output
MNS CONTROL[1]	N	NAC	Mass Notification supervised output
MNS STROBE[1]	N	NAC	Mass Notification supervised output
MNS SPEAKER[1]	N	NAC	Mass Notification supervised output for speaker circuits
MNS RELAY[1]	N	Relay	Mass Notification supervised output

* Type Code is Control Module type code only.
** Type Code is NAC Circuit type code only.
[1]This type code is not compatible for First Command applications.

Table 3.8 Control Module and NAC Circuit Trouble Type Codes (2 of 2)

3.13.2 How the Control Panel Indicates a NAC Trouble

A Trouble occurring on a NAC causes the control panel to do the following:

- Produce a pulsed audible tone
- Flash the SYSTEM TROUBLE LED
- Turn on the Trouble relay (TB4)
- Send a message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Display a TROUBL status banner and a CONTROL Type Code on the LCD display, along with information specific to the device

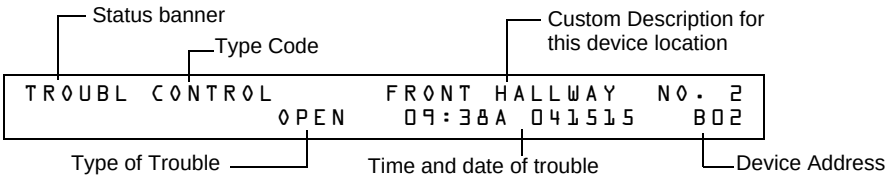


Figure 3.1 Sample of a NAC in Trouble Message

3.13.3 How the Control Panel Indicates a Control/Relay Trouble

A trouble occurring on a control/relay module or control/relay transponder causes the control panel to do the following:

- Produce a pulsed audible tone
- Flash the SYSTEM TROUBLE LED
- Turn on the Trouble relay (TB4)
- Send a message to the LCD display, History buffer and installed printers FDU-80 annunciators, and CRT-2s
- Display a TROUBL status banner and CONTROL Type Code on the LCD display, along with information specific to the device

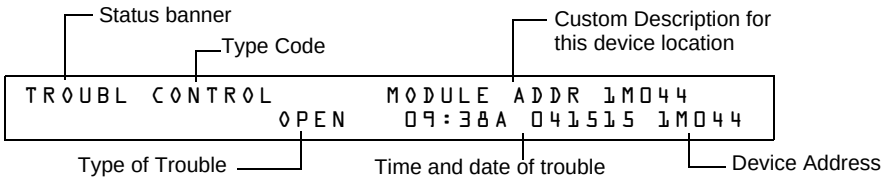


Figure 3.2 Sample of a Control/Relay Module in Trouble Message

3.13.4 How to Respond to a NAC or Control/Relay Trouble

If the control panel indicates an active NAC or Control/Relay Trouble, take the following action:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SYSTEM TROUBLE LED from flashing to steady—regardless of the number of troubles, alarms, and supervisory signals.
2. The control panel sends an Acknowledge message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s. Check the trouble message for the location and type of trouble.
3. Correct the condition causing the trouble.
4. When the trouble condition is corrected, the panel will return to normal operation (indicated by the "System Normal" message).
5. The control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.14 Operation of Special System Timers

3.14.1 What are System Timers?

There are user-programmable time delays for three specific functions: the Auto Silence Timer, the Alarm Verification Timer, and the Silence Inhibit Timer. Figure 3.3 shows a sample System Function Selection screen with system timer settings. For instructions on changing system functions, refer to the *NFS2-640 Programming Manual.*

3.14.2 How to View System Timer Selections

You can use the Read Status Entry option (explained in Chapter 4) to view the current selection for the System Timers. To do so, press the keys shown below in sequence:

Enter 2 @ 0 ? Enter Z S 0 ? Enter

The LCD display shows the current selections for System Functions, which includes the three system timers.
Sample LCD display of a System Function screen with system timer selections:

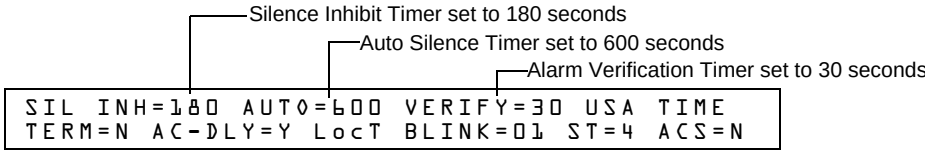


Figure 3.3 Sample System Function Selection Screen

3.14.3 How System Timers Work

The control panel can operate with special system timers: Auto Silence Timer, Alarm Verification Timer and Silence Inhibit Timer.

Auto Silence Timer

A timer that functions like pressing the SIGNAL SILENCE key. When the Auto Silence Timer reaches its programmed value (600-1200 seconds), the control panel automatically shuts off all active outputs programmed as silenceable.

When Auto Silence activates, special function zone ZF40 will activate and remain active until a system reset alarm resound or drill (alarm signal for Canadian applications) is initiated.

Activation of Auto Silence will activate the Signal Silence LED on the fire panel display and any ACM LED point programmed for Auto Silence.

NOTE: In Canadian applications, if auto silence is enabled, the value must be set to 20 minutes. An ACS point is required to monitor special function zone ZF40.

Alarm Verification Timer

A timer that directs the control panel to ignore a fire alarm for a smoke detector, programmed for Alarm Verification, while the Alarm Verification Timer is counting. Table 3.9 contains a summary of how the Alarm Verification Timer works.

If	The control panel does this
A second fire alarm occurs while the Alarm Verification Timer is counting	Ignores the Alarm Verification Timer
The Alarm Verification Timer elapses and a fire alarm still exists	Activates the fire alarm
The Alarm Verification Timer expires and a fire alarm no longer exists	Increments the Alarm Verification counter (up to 99) for the device and returns to normal operation

Table 3.9 Alarm Verification Timer Operation

Silence Inhibit Timer

A timer that disables the SIGNAL SILENCE key function and inhibits reset during countdown for the programmed time (0-300 seconds) when a fire alarm occurs. A Silence Inhibit Timer starts at the first fire alarm. Subsequent alarms will not restart the timer until the alarm condition is completely resolved and a panel reset is performed.

3.15 Waterflow Circuit Operation

If a monitor module programmed with a WATERFLOW Type Code initiates a fire alarm, the control panel disables the SIGNAL SILENCE key and the Auto Silence Timer. Refer to the *NFS2-640 Installation Manual* for information on Waterflow circuits.

NOTE: In firmware version 18.x (or higher), silenceable outputs activated from a WATERFLOW type code activation can be silenced if the silenceable waterflow option is enabled via VeriFire Tools.

3.16 Style 6 and Style 7 Operation

Style 6 and Style 7 are supervised methods of communicating with addressable devices. If the control panel detects a trouble (open or short), it will attempt to drive both ends of the loop, maintaining communication in an unsupervised method. The trouble will display on the panel as a Style 6 trouble until you correct the condition. Style 7 configuration of the SLC requires the use of ISO-X isolator modules.

Section 4: Read Status Operation

4.1 Introduction

This section contains instructions and sample screens to show how to access all Read Status functions and menus. For information on Read Status using a CRT-2 refer to “Remote Terminal Access” on page 67.

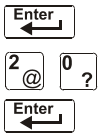
4.2 What is Read Status?

Read Status is a control panel function that lets you view system program information—but not change any programmed settings. The Read Status function lets you do the following:

- View Read Status information without entering a password.
- Enter and operate Read Status functions while the control panel provides full fire protection.
- View Read Status information while a fire alarm or trouble condition exists.

NOTE: If a fire alarm or trouble occurs while you are in Read Status, the control panel automatically exits Read Status operation and displays the new fire alarm or trouble.

4.2.1 Quick Reference Key Sequences



For quick reference, in the left margin next to each Read Status option is a block that shows the key sequence needed to view that option.

For example, the block to the left shows how to display the “Read Point” screen:

4.3 Entering Read Status

To enter Read Status, follow these steps:

1. From the “System Normal” screen, press the ENTER key. The control panel displays the “Entry” screen as shown below;

```
1=PROGRAMMING        2=READ STATUS ENTRY
 (ESCAPE TO ABORT)
```

2. From the “Entry” screen, press the **2** key. The control panel displays the “Read Status Options” screen as shown below:.

```
READ POINT=0 HIST=2 ALARM HIST=4 <ENTER>
PRNT POINT=1 HIST=3 ALARM HIST=5 <ENTER>
```

4.4 Viewing and Printing a Read Status

To view or print Read Status information follow the instructions below:

Option	Press	Lets you
Read Point	**0** key, ENTER key	View information for a detector, module, NAC or zone
Print Points	**1** key, ENTER key	Print information for all installed points in the system
Read History	**2** key, ENTER key	Display the total number of events in the History buffer and step through each event in sequence
Print History	**3** key, ENTER key	Print the contents of the History buffer (up to 800 events)
Read Alarm History	**4** key, ENTER key	View a display of the number of alarms in the Alarm History buffer, then scroll through each alarm event
Print Alarm History	**5** key, ENTER key	Print the contents of the Alarm History buffer (up to 200 events)

NOTE: If attempting to read a point that is not installed, the control panel displays "Not Installed".

During all Read Status operations (except print operations) the control panel starts a 2-minute timer each time you press a key. If the control panel does not detect a key press for 2 minutes, the control panel exits Read Status and returns to the "System Normal" display.

In Read Status, you can also do the following:

- Press the ESC key to delete the previous entry.
- Press the SYSTEM RESET key to abort Read Status.

4.4.1 How to View Read Status of Devices, Zones, & System Settings

Overview

Read Point options 0, 2, and 4 in the Read Status Screen let you display and view information for devices and zones programmed into the control panel, as well as view system and annunciator settings. This section provides instructions and sample displays so you can view Read Status.

Topics covered in this section:

To view Read Status for	Refer to
Intelligent Detectors	"How to View Read Status for a Detector" on page 43
Control/relay and Monitor modules	"How to View Read Status for a Control/Relay or Monitor Module" on page 44
NAC	"How to View Read Status for a NAC" on page 45
Software Zones (Z01-Z99)	"How to View Read Status for a Software Zone (Z01-Z99)" on page 46
Special Zones (F0-F9, FA- FC)	"How to View Read Status for a Special Zone (F0-F9, FA-FC)" on page 46
Releasing Zones (R0-R9)	"How to View Read Status for a Releasing Zone (R0-R9)" on page 47
System Functions	"How to Read Status for System Functions" on page 47
Annunciator Selections	"How to Read Status for Annunciator Selections" on page 48

How to Display the Total of Installed Devices

Enter 2 @ A

To view the total number of installed devices, enter the "Read Status" screen by pressing the ENTER key, then **2**, then **A**. A screen similar to the following will appear:

```
L1:159Dets, 159Mods  L2:055Dets, 047Mods
Panel Outputs: 64  Bells: 04
SB L1:000          SB L2:000
```

How to Display a Point or Zone for Read Status

Enter 2 @ 0 ? Enter

From the "Read Status" screen, press 0**,** then press the ENTER key to display the "Read Point Entry" screen as shown below:

```
ZONE=Z,AA,E          DETECTOR=*,LDAAA,E
MODULE=#,LMAA,E       OUTPUT CKT=&,AA,E
```

- To view a detector, press DETECTOR *, SLC number, detector SLC address, ENTER.
- To view a zone, press Z, zone number, ENTER.
- To view a monitor or control/relay module, press MODULE #, SLC number, module SLC address, ENTER.
- To view a NAC, press OUTPUT &, two-digit address, (for example 01 for B01, etc.), ENTER.

When you select a device or a zone, the control panel displays information for the device or zone, but does not send this information to the serial ports or the History buffer.

How to View Read Status for a Detector

Enter 2 @ 0 ? Enter *

SLC number followed by three digit address

\+ next device

\- previous device

From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a detector as follows: press DETECTOR, enter the SLC number followed by the three digit address, then press the ENTER key. For example, to read the status of detector 1D002: press DETECTOR, enter the SLC number (1), enter address 002, then press the ENTER key. The control panel now displays information about the detector, as shown in Figure 4.1.

The display and descriptions of the fields are shown below:

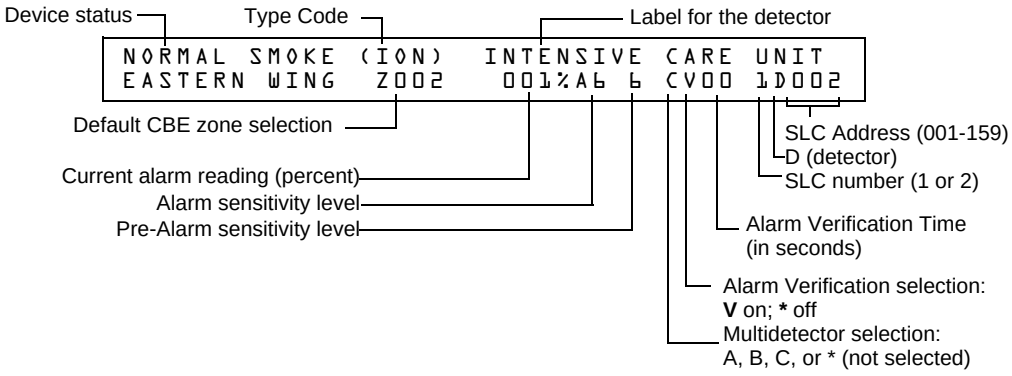


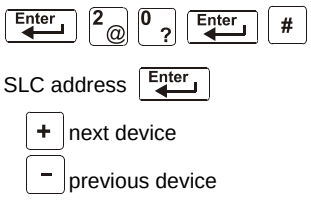
Figure 4.1 Sample Detector Read Status Display

- **Device Status** The status of the detector: Normal, Alarm, or Test.
- **Type Code** The software Type Code that identifies the type of detector. (Refer to "Point Programming" in the *NFS2-640 Programming Manual*.)
- **Default CBE Zone Selection** This is the first zone in the 5 zone CBE list. Defaults are Zone 001 (Heat detectors) Zone 002 (Ion detectors) Zone 003 (Photo detectors) Zone 004 (Laser detectors) Zone 005 (Multisensor). Values may differ depending on point programming.
- **Current alarm reading** (xxx%) The current alarm reading of the detector, as a percentage of the alarm sensitivity setting.
- **Alarm sensitivity level** (Ax) The alarm sensitivity (x=1-9) entered in the Detector Sensitivity Screen.
- **Pre-Alarm sensitivity level** The Pre-Alarm Sensitivity (1-9; 0 = Pre-Alarm not used) entered in the Detector Settings Screen.

NOTE: Refer to "Detector Sensitivity Settings" in the *NFS2-640 Programming Manual* for more information on the Pre-Alarm and Alarm Sensitivity settings

- **Cooperative Multi-Detector selection** A smoke detector programmed to evaluate readings from nearby detectors in making Alarm or Pre-Alarm decisions. Cooperative Multi-Detector sensing also allows the combination of ionization with photoelectric technology in reaching an alarm decision.
  ***** – Multi-not used.
  A – combines the detector's alarm decision with the next SLC address above.
  B – combines the detector's alarm decision with the next SLC address below.
  C – combines the detector's alarm decision with the next SLC address above and the next SLC address below.
- **Alarm Verification** (***** or **V**)
  ***** – Alarm Verification not programmed for this detector.
  V – Alarm Verification enabled.
  Alarm Verification is a user-defined global time function that can reduce the number of nuisance alarms. Refer to page page 39 for more information.
- **Device SLC Address** The SLC address of the detector.

How to View Read Status for a Control/Relay or Monitor Module



From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a monitor or a control/relay module as follows: press MODULE, enter the SLC address, then press the ENTER key. For example, to read the status of a FCM-1 module 2M147: press MODULE, enter 2 then 147, then press the ENTER key. The control panel now displays information about the module as shown in Figure 4.2.

The display and descriptions of the fields are shown below:

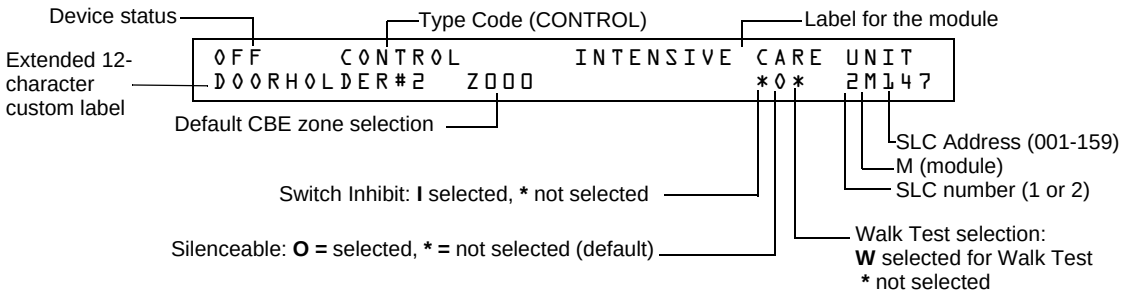


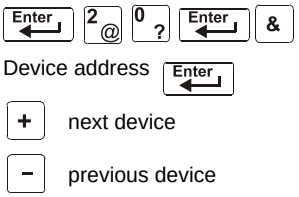
Figure 4.2 Sample Control/Relay or Monitor Module Read Status Display

- **Device Status** The status of the module: control/relay module [On (device active) OFF (device not active] or monitor module (Normal, Alarm, or Test).
- **Type Code** The software Type Code that identifies the type of module. (Refer to "Point Programming" in the *NFS2-640 Programming Manual*.)
- **CBE list** Only the first zone in the device's CBE list will be displayed.
- **Device SLC Address** The SLC address of the module.
- **Switch Inhibit (control/relay module only)** Displays whether the remote ON/OFF capability of the device is inhibited. (I=on; *=off).
- **Silenceable (control/relay module only)** A selection that specifies if the device can be silenced during an alarm by pressing the signal silence key. Possible values are:
  ***** = output nonsilenceable
  F = silenceable, resound by fire alarm
  U = silenceable, resound by supervisory alarm
  B = silenceable, resound by security alarm
  T = silenceable, resound by trouble
  O = silenceable, does not resound

NOTE: If the "Strobe" Type ID is used with System Sensor Strobe synchronization, F, U, B, T, or O will silence the entire circuit, "*" will silence the horn portion only.

Walk Test (control/relay module only) A selection that specifies if the device will activate during a Walk Test.

How to View Read Status for a NAC



From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a NAC as follows: press OUTPUT, enter the device address, then press the ENTER key. For example, to read the status of NAC 0-2: press OUTPUT, enter 02, then press the ENTER key. The control panel now displays information for a NAC as shown in Figure 4.3.

The display and descriptions of the fields are shown below:

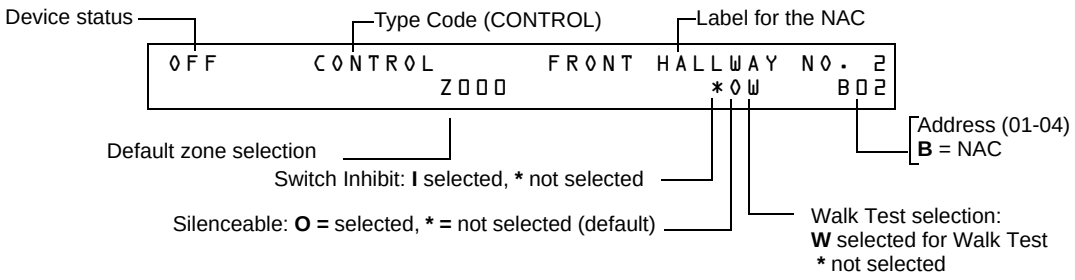


Figure 4.3 Sample NAC Read Status Display

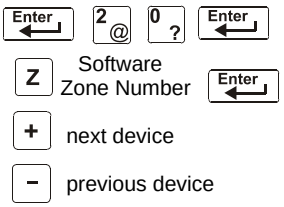
- **Device Status** The status of the device: ON (device active) OFF (device not active).
- **Type Code** The software Type Code that identifies the type of NAC. Refer to "Appendix F - Type Codes" in *NFS2-640 Programming Manual*.
- **CBE List** Only the first zone in the NAC's CBE list will be displayed here.
- **Device Address** The address of the NAC (01-04)
- **Switch Inhibit** A selection for disabling the switch function for the control/relay or transponder output circuit. (**I**=on; *****=off).

- **Silenceable** A selection that specifies if the device can be silenced during an alarm by pressing the SIGNAL SILENCE key. Possible values are:
  ***** = output nonsilenceable
  F = silenceable, resound by fire alarm
  U = silenceable, resound by supervisory alarm
  B = silenceable, resound by security alarm
  T = silenceable, resound by trouble
  O = silenceable, does not resound

NOTE: If the "Strobe" Type ID is used with System Sensor Strobe synchronization, F,U, B, T, or O will silence the entire circuit, "*****" will silence the horn portion only.

- **Walk Test** A selection that specifies if the device will activate during a Walk Test.

How to View Read Status for a Software Zone (Z01-Z99)



From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a Software Zone as follows: press **Z**, enter the zone number (01-99), then press the ENTER key. For example, to read the status of Software Zone 07: press **Z**, enter **07**, then press the ENTER key. The control panel now displays information for a Software Zone as shown below.

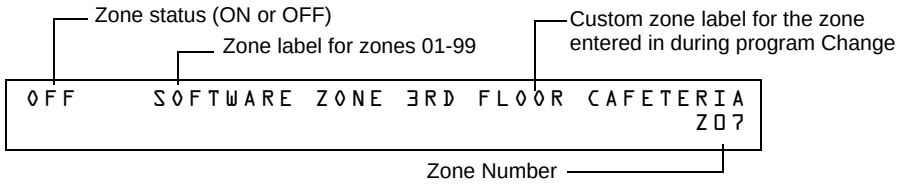
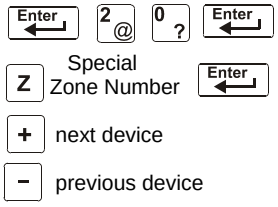


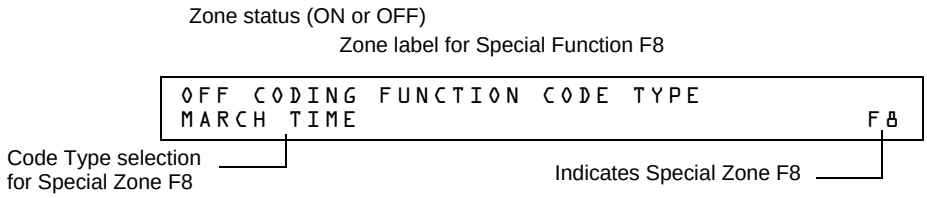
Figure 4.4 Sample Software Zone Read Status Display

How to View Read Status for a Special Zone (F0-F9, FA-FC)



From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a Special Zone as follows: press **Z**, enter the zone number (F0-F9, FA-FC), then press the ENTER key. For example, to read the status of Special Zone F8: press **Z**, enter **F8**, then press the ENTER key. The control panel now displays information for a Special Zone as shown below.

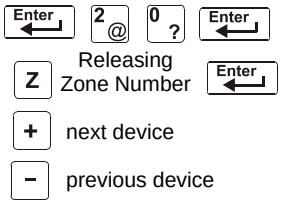
NOTE: The zone label depends on the type of Special Zone. For example, CODING FUNCTION CODE TYPE for F8.



NOTE: Special Function Zones FA, FB, and FC are represented in VeriFire Tools as ZF10, ZF16, and ZF18, respectively.

Figure 4.5 Sample Special Zone Read Status Display

How to View Read Status for a Releasing Zone (R0-R9)



From the "Read Status" screen, press **0**, then press the ENTER key. You can now view the Read Status of a Releasing Zone as follows: press **Z**, enter the zone number (R0-R9), then press the ENTER key. For example, to read the status of Releasing Zone R0, enter **Z**, enter R0, then press the ENTER key. The control panel now displays information for a Releasing Zone as shown below.

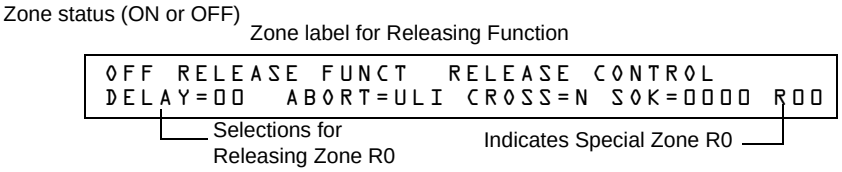
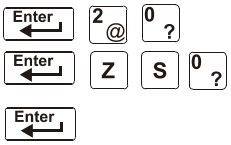


Figure 4.6 Sample Releasing Zone Read Status Display

How to Read Status for System Functions



The "System Functions" screen specifies global settings for the control panel. From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for System Functions as follows: press Z, enter **S0**, press the ENTER key. Shown below is a sample display and description of items for the Read Status of System Functions:

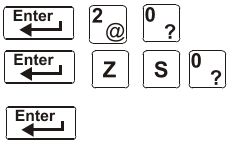
Parameter	Description	Settings
SIL INH=000	Silence Inhibit timer in seconds. Required in Canada and some areas of the USA.	000 = no timer; or the timer duration in seconds up to 300.
AUTO=000	Auto Silence Timer in seconds.	000 = no timer; 600-1200 seconds.
VERIFY=30	Alarm Verification Timer	00 = no timer; 00-30 seconds.
USA TIME	Time and date display format	USA TIME or EUR TIME
TERM=N	Terminal supervision	YES – To supervise the wiring of an FDU-80. NO – No FDU-80 supervision.
AC_DLY=N	Delays AC loss reporting	YES - AC loss reporting is delayed for approximately 3 hours. NO - No AC loss delay.

Table 4.1 System Function Parameters (1 of 2)

Parameter	Description	Settings
LocT	One of three operating modes of a PC or terminal connected to the control panel (through TB12 PC Terminal)	LocT – terminal connected to control panel and located in the same room as the control panel. LocM – terminal connected to control panel but requires password for operation. RemT – terminal connected through a modem for Read Status operations only.
BLINK=01	The rate at which all intelligent control or all monitor modules blink during polling	BLINK=00: No blink BLINK=01: Devices blink on every poll. BLINK=16: Devices blink every 16th poll.
ST=4	NFPA wiring style operation for the SLC	4 – Style 4 SLC or 6 – both Style 6 and Style 7 SLC
ACS=N	Use ACS Selection Groups	N – No annunciator selected or Y – Select and display ACS Selection Groups

Table 4.1 System Function Parameters (2 of 2)

How to Read Status for Annunciator Selections



Annunciator Selection screens specify the information that displays on ACS annunciators. From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for System Functions as follows: press **Z**, enter **S**, enter annunciation selection number (1-4 for annunciator, 5-8 for other settings), press the ENTER key. Sample LCD displays for the Read Status of Annunciator Selection are shown below:

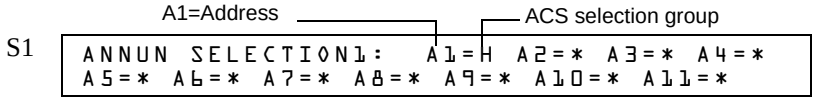


Figure 4.7 Annunciator Selection 1 Screen

To view the next three annunciator selection screens, press the + (NEXT SELECTION) key.

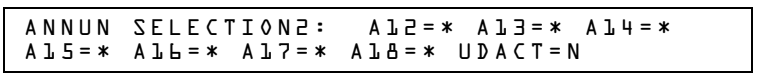


Figure 4.8 Annunciator Selection 2 Screen

If UDACT=N, the control panel displays the Annunciator Selections 3 and 4 screen, addresses A20-A32, as shown below:

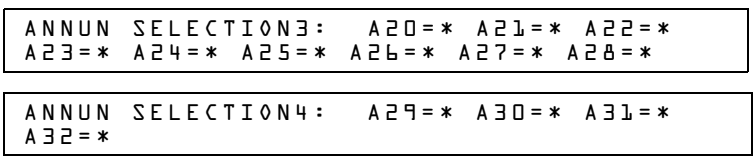


Figure 4.9 Annunciator Selections 3 and 4 Screens

See page 42 and 43 of the NFS2 640 Programming Manual.

S5

```
REGION=0    TBL.REMIND=2    ALA.SCROLL=Y
LOCAL CONTROL=1  IP ACCESS=0  DCC-MODE=N
```

Figure 4.10 System Function Selection 5 Screen

See page 44 of the NFS2 640 Programming Manual.

S6

```
FLASHSCAN  L1DET   L1MOD  L2DET   L2MOD
             Y       Y      Y       Y
```

Figure 4.11 System Function Selection 6 Screen

See Page 42 of the NFS2 640 Programming Manual.

S7

```
NODE: 000.XXX, STYLE7:N
THRESHOLD CHANNEL A:H, CHANNEL B:H
```

Figure 4.12 System Function Selection 7 Screen

- SEC_RLY and SUP_RLY (0= turn on by Fire Alarm, 1= turn on by Security, 2= turn on by Supervisory).
- BAT_SIZE (1= battery size is greater than 26 Ahr, 0= less than 26 Ahr).
- C_DRILL (custom drill N= No custom drill, Y= Yes).
- TERM_DATA (0= LCD80 Terminal using 7 bit data, 1= LCD80 Terminal using 8 bit data).
- PRT_BAND (0= 2400, 1= 4800, 2= 9600).

S8

```
SEC_RLY:1 SUP_RLY:2 BAT_SIZE:0 C_DRILL:N
TERM_DATA:0   PRT_BAUD:2  CHARGER:Y
```

Figure 4.13 System Function Selection 8 Screen

NOTE: Please refer to the VeriFire Tools help file for information on programming the above screen.

An Annunciator Selection screen shows the information that will display on the ACS annunciators.

1 through 9	Programmable Annunciator #1 through #9
0	Programmable Annunciator #10

A	8 Systems points + Zones 1-56
B	Zones 57-99, 9 F zones, 8 R zones, 4NAC
C	Loop 1, Modules 1-64
D	Loop 2, Modules 1-64
E	Loop 1, Modules 65-128
F	Loop 2, Modules 65-128
G	Loop 1, Modules 129-159 & Loop 2, Modules 129-159
H	Loop 1, Detectors 1-64
I	Loop 2, Detectors 1-64
J	Loop 1, Detectors 65-128
K	Loop 2, Detectors 65-128
L	Loop 1, Detectors 129-159 & Loop 2, Detectors 129-159
M	Programmable for use with FireVoice NFV-25/50ZS
N	8 Systems points + Zones 1-56, used for remote station communicator (TM-4)
O	8 Systems points + Zones 1-56, used for municipal box trip output (TM-4)
P	Loop 1, Modules 65-100, Loop 1, Detectors 1-14 (Detector Maintenance Reporting)
Q	Loop 2, modules 65-100, Loop 2, Detectors 1-14 (Detector Maintenance Reporting)
R	Loop 1, detectors 15-46 (Detector Maintenance Reporting)
S	Loop 2, Detectors 15-46 (Detector Maintenance Reporting)
T	Loop 1 Detectors 47-78 (Detector Maintenance Reporting)
U	Loop 2, Detectors 47-78 (Detector Maintenance Reporting)
V	Loop 1, Detectors 79-100 (Detector Maintenance Reporting)
W	Loop 2, Detectors 79-100 (Detector Maintenance Reporting)

Annunciator addresses 1 to 19 can be programmed to any one of the above selections. If there is a UDACT or UDACT-2, selections A-M will be sent to Annunciator addresses 20 to 32 respectively.

Table 4.2 ACS Selection Groups (2 of 2)

The table above contains the ACS display selections. Annunciators set to annunciator address 1 to 19 can be programmed to any one of the above selections. If t here is a UDACT or UDACT-2, selections A-M will be sent to Annunciator addresses 20 to 32 respectively.

An example of ACS selections in Annunciator Selection Screen 1:

```
ANNUN SELECTION:   A1=H  A2=C  A3=*  A4=*
A5=*   A6=*   A7=*   A8=*   A9=*   A10=*   A11=*
```

Figure 4.14 Annunciator Selection Screen 1 Example

NOTE: An ACS selection marked with an asterisk (*) indicates no annunciator selection.

The figure above shows annunciator selections for addresses A1-A2 (addresses A3-A10, marked with asterisks, are not selected).

- Annunciators set to annunciator address 1 (A1) display the status of detectors 1-64 on SLC 1 (ACS Selection Group H)
- Annunciators set to annunciator address 2 (A2) display the status of intelligent modules 1-64 on SLC-1 (ACS Selection Group C).

How to Read Status for Battery Levels

Pressing the BATTERY LEVEL key on the NFS2-640 keyboard displays information concerning the state of the battery.

A sample LCD display is shown below.

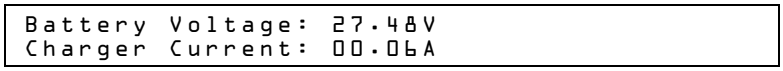


Figure 4.15 Battery Levels

4.4.2 How to View Read Status for Event and Alarm History

Overview

The control panel maintains a History buffer of the last 800 events, each with a time and date stamp. History events include the following:

- All alarms, troubles and operator actions, such as: Acknowledge, System Reset, Signal Silence, Drill, and Walk Test.
- Programming entries (Program Change and Status Change, but not Read Status), along with a number (0-9) indicating the programming submenu (for example, 0=Clear). For an example, see Figure 4.18.

You can view events from the History buffer in two forms: by displaying all events (option 2, HIST=2) or by displaying alarm events only (option 4, ALARM HIST=4).

NOTE: The History buffer contains 800 events total, including the alarm events that display for Alarm history. The control panel generates Alarm history from the alarm events that exist in the 800-event History buffer.

How to View Read Status for Event History

Enter, 2 @

2 @, Enter

\+ next event

\- previous event

Option 2 (HIST=**2**) lets you view the total number of events in the History buffer (up to 800 events), then view each event in chronological sequence. From the "Read Status" screen, press **2**, then press the ENTER key to display the "Event History" screen. A sample of the Event History screen is shown below:

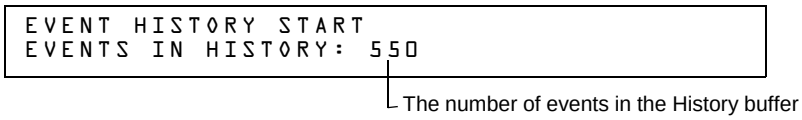


Figure 4.16 Sample Event History Display

To display events in the History buffer, do the following:

- Press the NEXT SELECTION key to step through each event from the first entry (oldest event first) in the History buffer, or
- Press the PREVIOUS SELECTION key to step through each event from the most recent entry in the History buffer.

NOTE: The NEXT SELECTION key will show the most recent event first, and then move to its normal function of displaying the oldest events first.

A sample LCD display for a trouble event:

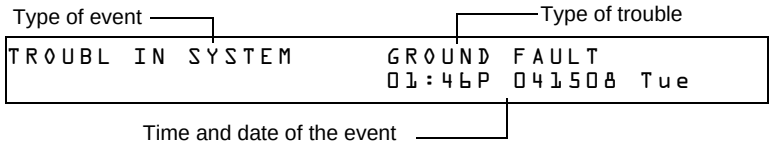


Figure 4.17 Sample Trouble Event Display

A sample LCD display for a Program Change event:

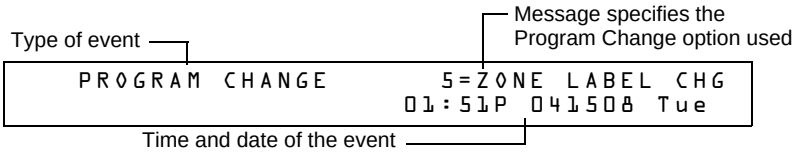


Figure 4.18 Sample Program Change Event Display

How to View Read Status for Alarm History

Enter, 2 @

4 , Enter

\+ next event

\- previous event

Option 4 (ALARM HIST=4) lets you view the total number of alarms in the History buffer (up to 200), then view each alarm in chronological sequence. From the "Read Status" screen, press **4**, then press the ENTER key to display the "Event History" screen. A sample Alarm History screen is shown below:

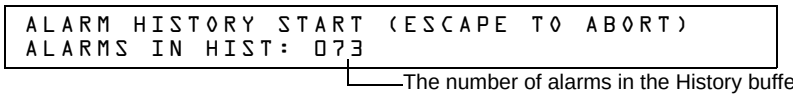


Figure 4.19 Sample Alarm History Display

To display alarms in the buffer, do the following:

- Press the NEXT SELECTION key to step through each alarm from the first entry (oldest alarm first) in the buffer, or
- Press the PREVIOUS SELECTION key to step through each alarm from the most recent entry in the buffer

NOTE: The NEXT SELECTION key will show the most recent event first, and then move to its normal function of displaying the oldest events first.

A sample display for an alarm event:

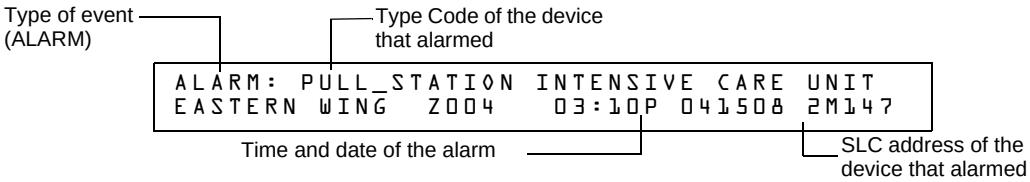


Figure 4.20 Sample Alarm Event Display

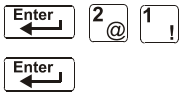
4.4.3 How to Print Points, Event and Alarm History

Overview

Read Point options 1, 3, and 5 in the "Read Status" screen let you print points, event history, and alarm history. This section contains instructions for printing, as well as sample point, event history, and alarm history printouts.

NOTE: Before printing, make sure your control panel is connected to a compatible printer and the printer is configured according to the manufacturer's specifications, and that the correct baud rate is selected at the panel.

How to Print Points



Option 1 (PRNT POINT=1) lets you print a list of all points programmed into the system. From the "Read Status" screen, press **1**, then press the ENTER key to print a list of installed points. A sample Print Point screen is shown below:

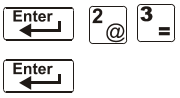
```
                                STATUS PRINT
```

Figure 4.21 Sample Print Point Display

A sample printout of three points using the Print Point option:

```
NORMAL SMOKE(PHOTO) DETECTOR ADDR 1D043                Z003  000%AB 8 **   1D043
NORMAL SMOKE(PHOTO) DETECTOR ADDR 1D044                Z003  000%AB 8 **   1D044
NORMAL SMOKE(PHOTO) DETECTOR ADDR 1D045                Z003  000%AB 8 **   1D045
```

How to Print Event History



Option 3 (HIST=3) lets you print a list of all events in the History buffer (up to 800). From the "Read Status" screen, press **3**, then press the ENTER key to print a list of events. A sample History Print screen is shown below:

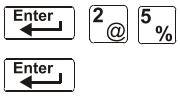
```
                                HISTORY PRINT
```

Figure 4.22 Sample History Print Screen

A sample printout of three events in history using the History Print option:

```
******************** EVENT HISTORY START*****************************************
 SYSTEM RESET                                                 02:28P 042408 Thu
ALARM: SMOKE (ION)  DETECTOR ADDR 1D075               Z002   02:28P 042408 1D075
ALARM: SMOKE (ION)  DETECTOR ADDR 1D076               Z002   02:28P 042408 1D076
 ACKNOWLEDGE                                                  02:28P 042408 Thu
```

How to Print Alarm History



Option 5 (ALARM HIST=5) lets you print a list of alarm events in the History buffer (up to 200). From the "Read Status" screen, press **5**, then press the ENTER key to print a list of alarm events. A sample Print Alarm History screen is shown below:

```
                          ALARM HISTORY PRINT
```

Figure 4.23 Sample Print Alarm History Display

A sample printout of two alarm events in the History buffer using the Print Alarm History option.

```
********************ALARM HISTORY START ***************************************
ALARM: SMOKE (ION)  DETECTOR ADDR 1D075               Z002   02:28P 012208 1D075
ALARM: SMOKE (ION)  DETECTOR ADDR 1D076               Z002   02:28P 012208 1D076
********************      PRINT END      ***************************************
```

4.4.4 How to View and Print Hidden Event and Alarm History

The control panel maintains a copy of the History buffer. For instance, if someone clears the History buffer using Status Change programming option 4, the control panel retains a copy of the History buffer. The copy of the preceding History buffer is called a Hidden History buffer and a copy of the preceding Alarm History is called a Hidden Alarm History buffer.

If you attempt to view or print history and the control panel displays one of the screens shown below you can use the options listed in the table below to view the contents of a Hidden History buffer.

```
HISTORY EMPTY      (ESCAPE TO ABORT)
**************************************
```

Figure 4.24 History Empty Display

```
ALARM HISTORY EMPTY  (ESCAPE TO ABORT)
**************************************
```

Figure 4.25 Alarm History Empty Display

Options for viewing and printing Hidden History and Hidden Alarm History do not appear in the LCD display when in Read Status. You can view and print the contents of these Hidden History buffers using the options listed in the table below. You read and print Hidden History and Hidden Alarm History the same way you read and print history using the options that appear on the "Read Status" screen. The table also contains references to the sections that contain instructions for reading and printing history.

To	Press	Refer to
Read Hidden Alarm History	Enter, 2 @, 6 :, Enter	"How to View Read Status for Alarm History" on page 53
Print Hidden Alarm History	Enter, 2 @, 7 \, Enter	"How to Print Alarm History" on page 54
Read Hidden History	Enter, 2 @, 8 ., Enter	"How to View Read Status for Event History" on page 52
Print Hidden History	Enter, 2 @, 9 |, Enter	"How to Print Event History" on page 54

Table 4.3 Hidden History Selections

Appendix A: Special Zone Operation

A.1 Overview

This section contains information for operating the control panel as detailed in the topics listed below:

Section	Special Zone	Refer to Page
A.2, "Releasing Zones (R0-R9)"	R0-R9	page 56
A.3, "Time, Date, and Holiday Functions"	F5, F6, F7	page 59
A.4, "NAC Coding"	F8	page 61
A.5, "Presignal and Positive Alarm Sequence (PAS) Operation"	F0	page 62

A.2 Releasing Zones (R0-R9)

A.2.1 Purpose of Releasing Zones

WARNING: WHEN USED FOR CO_2 RELEASING APPLICATIONS, OBSERVE PROPER PRECAUTIONS AS STATED IN NFPA 12. DO NOT ENTER THE PROTECTED SPACE UNLESS PHYSICAL LOCKOUT AND OTHER SAFETY PROCEDURES ARE FULLY COMPLETED. DO NOT USE SOFTWARE DISABLE FUNCTIONS IN THE PANEL AS LOCKOUT.

The control panel provides ten Releasing Zones (R0-R9). These are special zones that you can use for up to ten independent releasing operations. This section contains descriptions of each Releasing Function option and an example of how Releasing Zone options work.

For instructions on programming Releasing Functions, refer to the *NFS2-640 Programming Manual*.

Each Releasing Zone includes the following releasing options:

Option	Description
Cross Zone	Cross Zones let you program the control panel to activate a Releasing Zone when two or more detectors or modules are alarmed. Cross Zone selections are: **Y** Two or more detectors are alarmed that are mapped to one of the ten Releasing Zones (R0-R9) **Z** Two or more detectors are alarmed that are mapped to two different Software Zones and mapped to one of the ten Releasing Zones (R0-R9). **H** At least one smoke detector mapped to one of the ten Releasing Zones (R0-R9) is alarmed *and* at least one heat detector mapped to the same Releasing Zone as the smoke detector is alarmed. **N** Cross Zones not used
Delay Timer	Select a 0–60 second delay before activating a zone.
Abort	An Abort Switch Type Code used to abort activation of a zone.
Manual Release	Allows immediate zone activation by overriding the abort function, cross-zone function, and delay timer.
Soak Timer	Automatically shuts off the releasing device after a preprogrammed period of time. Select 0001-9999 seconds for a Soak Timer or 0000 seconds for no Soak Timer.

Table A.1 Releasing Options

A.2.2 How to View Releasing Zone Selections

You can use the Read Status Entry option to view the current selections for a Releasing Zone. For example, to view selections for Releasing Zone R1, press the keys in sequence:

Enter, 2 @, 0 ?, Enter, Z, R, 1 !, Enter

A sample LCD display of a Releasing Function selected for Releasing Zone R1:

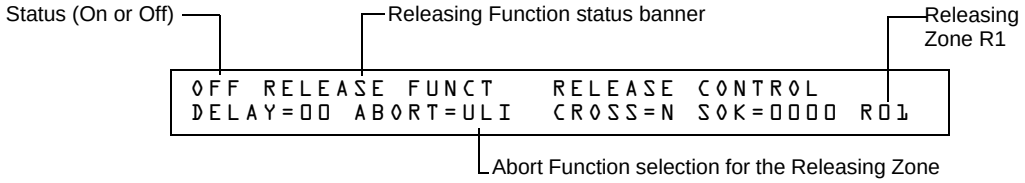
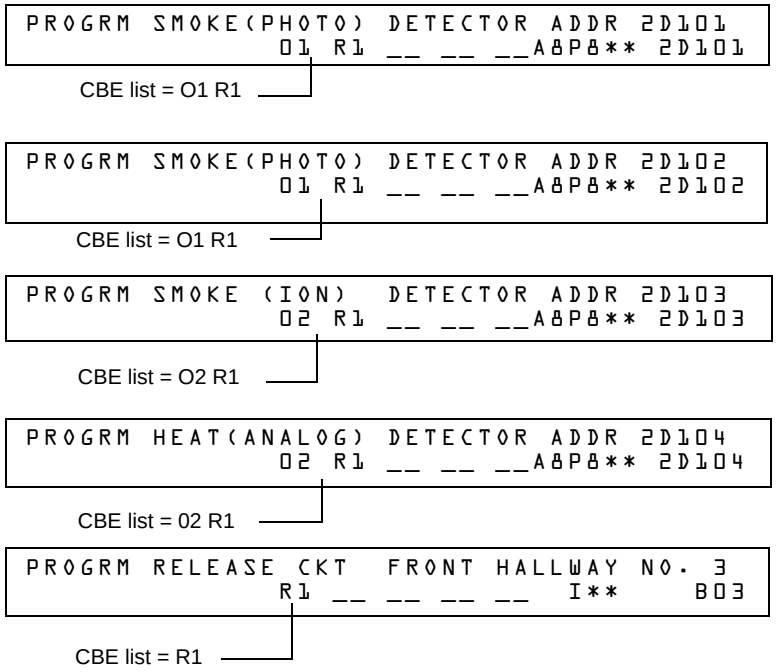


Figure A.1 Sample Read Status for a Releasing Zone

A.2.3 How Releasing Zones Operate

The figure below contains an illustrated example of how Releasing Zones work, using cross zone selections with four detectors and a NAC mapped to Releasing Zone 1 (listed as ZR1 in the CBE list). Table A.2 lists the cross zone selections and the conditions that activate the Releasing Zone:



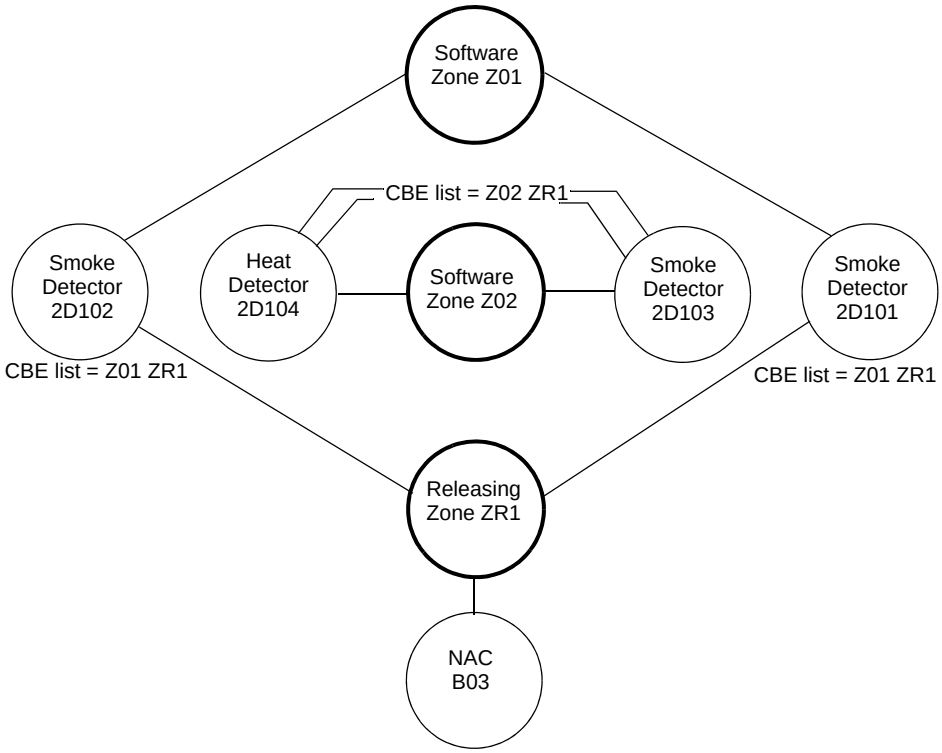


Figure A.2 Illustrated Example of Cross Zone Programming

Listing of each Cross Zone option and the conditions required to activate the Releasing Zone, according to the example shown in Figure A.2.

Cross Zone Selection (Cross=)	Condition(s) Required to Activate the Releasing zone
Cross=**N**	An alarm from any detector or module activates the releasing circuit.
Cross=**Y**	An alarm from any two detectors or modules activates the releasing circuit.
Cross=**Z**	An alarm from two detectors or modules mapped to different Software Zones, but mapped to the same Releasing Zone. • An alarm from 2D101 and 2D103 – detectors mapped to different zones, but both list ZR1 in their CBE. • An alarm from 2D102 and 2D104 – detectors mapped to different zones, but both list ZR1 in their CBE. • An alarm from 2D101 and 2D104 – detectors mapped to different zones, but both list ZR1 in their CBE. • An alarm from 2D102 and 2D103 – detectors mapped to different zones, but both list ZR1 in their CBE.
Cross=**H**	Activation of heat detector 2D104 and one smoke detector (2D101, 2D102, or 2D103).

Table A.2 Example of Cross Zone Selections

A.3 Time, Date, and Holiday Functions

A.3.1 Overview

The control panel includes a real-time clock that displays the time-of-day, the date, and the day-of-week. The clock includes a lithium battery backup. Time displays in a USA format (12-hour time format with month/day/year) or a EUR (European) format as shown below:

```
TROUBL CONTROL        MODULE ADDR 1M159
                OPEN    03:48P 041515 1M159
```

USA Time and Date format (default)

```
TROUBL CONTROL        MODULE ADDR 1M159
                OPEN    15:48  140415 1M159
```

EUR Time and date format

Figure A.3 Sample USA and EUR Time/Date Formats

The control panel also provides Time Control zones F5 and F6 for time and date control functions and zone F7 for holiday functions.

A.3.2 How to View Time Control Selections

You can use the Read Status Entry option to view the current selection for the Time function. To do so, press the following keys in sequence:

Enter, 2 @, 0 ?, Enter, Z, F, 5 %, Enter

or

Enter, 2 @, 0 ?, Enter, Z, F, 6 :, Enter

NOTE: For instructions on programming the Time function, refer to the *NFS2-640 Programming Manual.*

The LCD display shows the current selections for the Time Control function. The figure below shows a sample LCD display of a Time Control function:

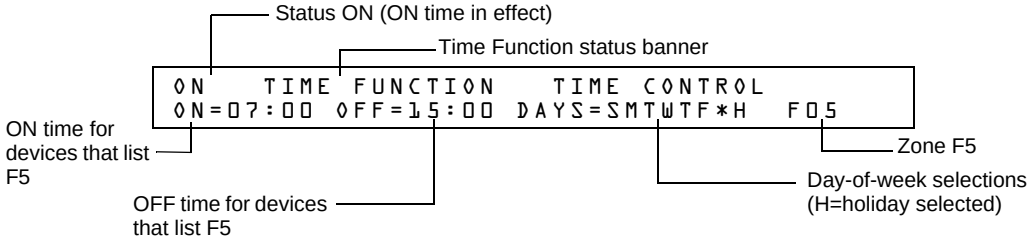


Figure A.4 Sample Read Status for Time Function

A.3.3 How to View Holiday Function Selections

You can use the Read Status Entry option to view the current selection for the Holiday function. To do so, press the following keys in sequence:

Enter 2 @ 0 ? Enter Z F 7 \ Enter

NOTE: For instructions on programming the Holiday function, refer to the *NFS2-640 Programming Manual.*

The LCD display in Figure A.5 gives an example of an LCD display of a Holiday function:

Status ON (holiday function not in effect)
Holiday Function status banner

```
ON HOLIDAY FUNCTION 12/15 **/** **/**
**/** **/** **/** **/** **/** **/**
```

Holiday selections (for zone F7)

Figure A.5 Sample Read Status for Holiday Function

A.3.4 How Time Control and Holiday Functions Work

Time and Holiday activation occurs automatically and does not require operator intervention. All outputs with a CBE list containing F5 or F6 activate within the times specified for the days of the week listed in F5 or F6. All smoke detectors with a CBE list containing F5 or F6 switch to their lowest sensitivity (AL:9) within the times specified for the days of the week listed in ZF5 or ZF6. Refer to "Intelligent Sensing Applications" in the *NFS2-640 Programming Manual* for details on setting detector sensitivity.

Time Control is active for all days of the week listed in F5 or F6. Holidays listed in F7 are excluded unless you list Holidays (H) in the day-of-week selection of F5 and F6 (shown in Figure A.4). Enter the time functions in a 24-hour format with the OFF time later than the ON time. After changing programming using Time Control, always reset the control panel.

NOTE: You can turn a NON FIRE control point on and off, by listing zone F5 or F6 in the CBE list of a control/relay module.

You can use Time Control zones F5 and F6 to program non-fire applications such as turning lights on and off, setting a thermostat, and so on. For example, you can program zones F5 and F6 to activate outputs at one time of day and deactivate outputs at later time, on specified days of a week. Table A.3 contains descriptions of additional Time Control applications:

Application	Requirement
Control day and night sensitivity of intelligent, addressable detectors	List zone F5 or F6 in the detector CBE. This automatically sets the detector sensitivity to the minimum setting (AL:9) during the day and automatically returns detector sensitivity to programmed sensitivity during the evening.
Control a specific date of year	Input up to nine date in the Holiday selection screen for Special Zone F7, then list zone F7 (Holiday) in the CBE of a device.

Table A.3 Time Control Applications

A.4 NAC Coding

A.4.1 Overview of Coding

A Coding selection is the Code Type that pulses when the control panel activates a NAC mapped to Special Zone F8. Special Zone F8 provides coding selections (see Table A.4) that you can list in the CBE of a NAC. To use a Code Type, program a NAC to list Zone F8 (reserved for a Code Type) in the NAC CBE list.

NOTE: Control modules (FCM-1, FRM-1) cannot be coded.

The table below contains descriptions of the signals that correspond to each NAC Code Type:

Coding Selection	Signal	Notes
March Time (default)	120 PPM (pulses Per minute)	Default selection for NACs mapped to F8.
Two-Stage	Alert signal (20 PPM) or General Alarm signal (Temporal pattern)	Alert signal – When an alarm occurs and not activated by another zone, the output pulses at 20 PPM. General Alarm signal – If not acknowledged within 5 minutes, the control panel switches from 20 PPM to Temporal pattern.
California	10 sec. On, 5 sec. Off, repeats	n/a
Temporal	0.5 on, 0.5 off, 0.5 on, 0.5 off, 0.5 on, 1.5 off, repeats	Used as a standard general EVAC signal.
Two-Stage Canada (3 minutes)	Alert signal (20 PPM) Drill Switch (Alarm Signal Mode for Canadian Applications) activation switches to Temporal pattern	Operates the same as Two-Stage except it will only switch to second stage: • by activation of Drill Switch, or • the three minute timer expires, or • through a CBE event (General Alarm Z00 plus Zones 1-99 or Logic Zones 1-20) NOTE: In Canadian applications ACM-24AT control point is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage Timer. NOTE: For Canadian applications using Two-Stage with the ACPS-610, see the ACPS-610 manual for additional programming instructions.
Two-Stage Canada (5 minutes)	Alert signal (20 PPM) Drill Switch (Alarm Signal Mode for Canadian Applications) activation switches to Temporal pattern	Operates the same as Two-Stage except it will only switch to second stage: • by activation of Drill Switch, or • the five minute timer expires, or • through a CBE event (General Alarm Z00 plus Zones 1-99 or Logic Zones 1-20) NOTE: In Canadian applications ACM-24AT control point is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage Timer. NOTE: For Canadian applications using Two-Stage with the ACPS-610, see the ACPS-610 manual for additional programming instructions.
Two-Stage Canada Manual	Alert signal (20 PPM) Drill Switch (Alarm Signal Mode for Canadian Applications) activation or CBE switches to Temporal pattern	Operates the same as Two-Stage except it will only switch to second stage: • by activation of Drill Switch, or • through a CBE event (General Alarm Z00 plus Zones 1-99 or Logic Zones 1-20)
System Sensor Strobe		Synchronizes System Sensor ADA horn/strobes.
Gentex Strobe		Synchronizes Gentex Horn/Strobes (Applies to NAC on CPU2-640 only)
Wheelock Strobe		Synchronizes Wheelock Horn/Strobes (Applies to NAC on CPU2-640 only)

Table A.4 F8 Code Types and Audio Signals

A.4.2 How to View Coding (F8) Selections

You can use the Read Status Entry option to view the current selection for the Coding function. To do so, press the following keys in sequence:

Enter 2 @ 0 ? Enter Z F 8 . Enter

NOTE: For instructions on programming the Coding function, refer to the *NFS2-640 Programming Manual.*

The LCD display shows the current selections for the Code Type. Figure A.6 shows a sample LCD display of a Code Type selection of March Time:

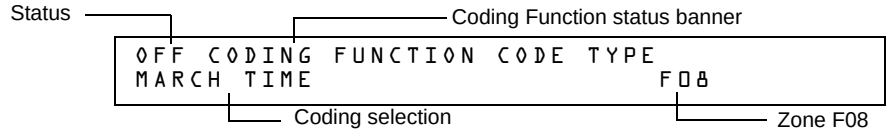


Figure A.6 Sample Read Status for Coding Function

A.4.3 How to Respond to an Alarm with Coding

If an alarm occurs with a Coding selection, the control panel latches the control panel in alarm and pulses outputs mapped to F8 at the pulse specified by the Coding selection (see Table A.4). To silence the outputs, press the SIGNAL SILENCE key.

A.5 Presignal and Positive Alarm Sequence (PAS) Operation

A.5.1 Overview

This section describes the Presignal and PAS selection, and provides instructions on how to do the following:

- View Presignal and PAS selections
- Respond to an alarm with Presignal
- Operate the control panel with a Presignal Delay Timer only
- Operate the control panel with a Presignal Delay Timer and PAS

A.5.2 What is Presignal and PAS?

Presignal is a feature that initially causes alarm signals to only sound in specific areas, monitored by qualified persons. This allows delay of the alarm from 60 to180 seconds after the start of alarm processing. The control panel Presignal feature provides two selections:

NOTE: Presignal differs from the Alarm Verification Timer which does not require human intervention.

- A Presignal Delay Timer (60-180 seconds) that delays activation of all outputs with a CBE that includes Special Zone F0.
- A PAS selection, in addition to the Presignal Delay Timer, that allows a 15-second time period for acknowledging an alarm signal from a fire detection/initiating device. If the alarm is not acknowledged within 15 seconds, all local and remote outputs activate immediately and automatically.

An illustration of Presignal and PAS timing.

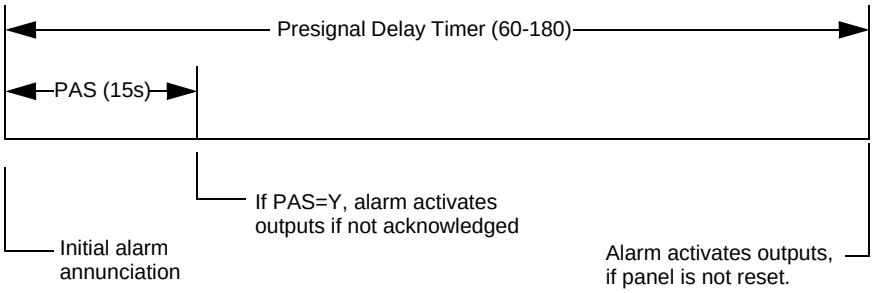


Figure A.7 Presignal and PAS Time

A.5.3 How to View Presignal and PAS Selections

You can use the Read Status Entry option to view the current selection for the Presignal function. To do so, press the keys in sequence:

Enter, 2 @, 0 ?, Enter, Z, F, 0 ?, Enter

NOTE: For instructions on programming the Presignal function, refer to the *NFS2-640 Programming Manual.*

The LCD display shows the current selections for the Presignal function. The figure below shows a sample LCD display of a Presignal function selected for PAS and a Presignal Delay Timer of 60 seconds:

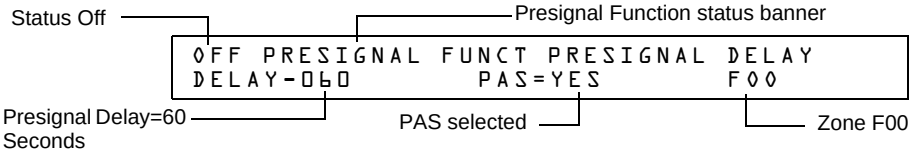


Figure A.8 Sample Read Status for Presignal Function

NOTE: If any monitor modules are programmed with a PAS INHIBIT Type Code and a fire alarm occurs, zone F0 goes false and aborts the Presignal Delay Timer.

A.5.4 How to Respond to an Alarm with Presignal Delay Timer (no PAS)

If an alarm occurs with a Presignal Delay Timer (60-180 seconds), the control panel displays the type of device and the SLC address of the device causing the alarm. If a second alarm occurs during the Presignal Delay Timer, the control panel aborts the Presignal Delay Timer and activates all programmed outputs. A sample Alarm screen for a monitor module is shown below:

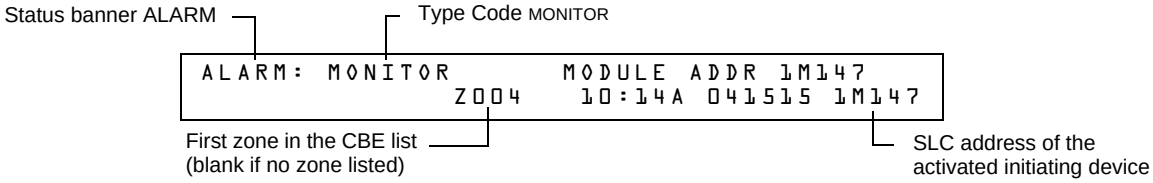


Figure A.9 Sample Alarm Display Screen

The FIRE ALARM LED flashes and the panel sounder pulses a steady tone. The control panel latches until the alarm is corrected and you press the SYSTEM RESET key to reset the control panel. You have the duration of the Presignal Delay Timer (60-180 seconds) to respond to the alarm before the control panel automatically activates all outputs programmed to F0. You can take the following actions:

- To silence the panel sounder and change the FIRE ALARM LED from flashing to steady, press the ACKNOWLEDGE/SCROLL DISPLAY key.
- To abort the Presignal Delay Timer, press the SYSTEM RESET key.
- To manually activate all outputs programmed to F0, press the DRILL key (Alarm Signal for Canadian applications). The Manual Evacuate screen appears, the panel sounder pulses and the FIRE ALARM LED changes from flashing to steady. The Manual Evacuate screen and Alarm screen display alternately at 3-second intervals.

If the Presignal Delay Timer reaches its programmed value, without operator intervention, the control panel activates all outputs programmed to F0.

A.5.5 How to Respond to an Alarm with Presignal Delay Timer (PAS selected)

If an alarm occurs with a Presignal Delay Timer (60-180 seconds) and PAS selected, the control panel displays an Alarm screen that shows the type of device and the SLC address of the device causing the alarm. When an alarm comes from an initiating device with a CBE list that includes F0 (with PAS selected), the control panel delays the following outputs:

- System Alarm relay
- TM-4 Polarity Reversal Alarm output
- TM-4 Municipal Box output

NOTE: These outputs do not delay for Presignal operations without PAS selected.

If a second alarm occurs during the Presignal Delay Timer, the control panel aborts the Presignal Delay Timer and activates all programmed outputs.

A sample Alarm screen for a monitor module:

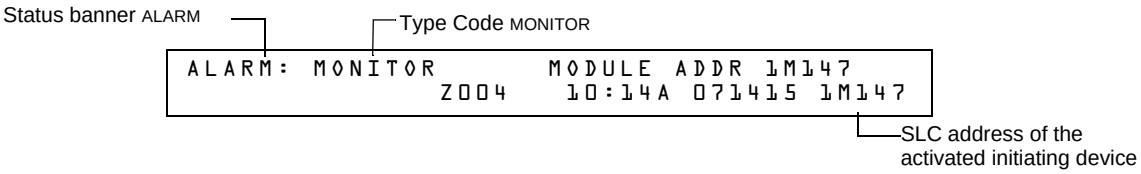


Figure A.10 Sample Alarm Display Screen

The FIRE ALARM LED flashes and the panel sounder pulses a steady tone. The control panel latches until the alarm is corrected and you press the SYSTEM RESET key to reset the control panel. You have 15 seconds to acknowledge the alarm or the control panel automatically activates all outputs programmed to F0. If you acknowledge the alarm within 15 seconds, the control panel increases the delay time to the full Presignal Delay Timer (60-180 seconds). You have the duration of the Presignal Delay Timer to respond to the alarm before the control panel activates all outputs programmed to F0. You can take the following actions:

- To increase the delay to the full programmed Presignal Delay Timer, press the ACKNOWLEDGE/SCROLL DISPLAY key. The panel sounder goes silent and the FIRE ALARM LED changes from flashing to steady.
- To abort the Presignal Delay Timer, press the SYSTEM RESET key.
- To manually activate all outputs programmed to F0, press the DRILL (Alarm Signal in Canadian applications) key. The Manual Evacuate screen appears, the panel sounder pulses and the FIRE ALARM LED changes from flashing to steady. The Manual Evacuate screen and Alarm screen display alternately at 3-second intervals.

If the Presignal Delay Timer reaches its programmed value, without operator intervention, the control panel activates all outputs programmed to F0.

Appendix B: Intelligent Detector Functions

NOTE: For instructions on selecting Intelligent Detector Functions, refer to the *NFS2-640 Programming Manual*.

Descriptions for Intelligent Detector Functions

Function	Description
Analog Display	The control panel reads and displays analog information from the 318 analog detectors (159 per SLC). The display shows the sensed air at the detector as a percentage of the alarm threshold for each detector.
Sensitivity Adjust	Nine selections for manually setting intelligent detector alarm levels within the UL range. *If using ionization detectors in duct applications, set Sensitivity Adjust to Level 1.* Refer to the *NFS2-640 Programming Manual* for detector sensitivity information.
Day/Night Sensitivity Operation	You can program the system to automatically force smoke detectors to minimum sensitivity during the day. Refer to “Time, Date, and Holiday Functions” on page 59.
Maintenance Alert	When compensation reaches the limit of the amount of drift compensation that can be safely applied, the control panel reports a trouble condition, according to National Fire Alarm Code standards. This condition also activates if the detector remains at very high or very low measured air levels for an extended time.
Automatic Test Operation	The control panel performs an automatic test of each detector every 320 minutes. Failure to meet the test limits causes an Auto Test Fail trouble.
Type Code Supervision	The control panel monitors hardware device Type Codes for each installed device at regular intervals (an interval can take up to 40 minutes for a full capacity system). If a mismatch of type compared to the program occurs, the control panel generates a point trouble labeled Invalid Type.
LED Control Operation	A global program selection to prevent detector LEDs from blinking as a result of polling during normal operation. A typical application is a sleeping area where a blinking light can distract people. As a standard function, independent of this programming selection, the control panel allows all LEDs to turn on in alarm.
Alarm Verification Timer and Verification Counter Operation	The control panel performs alarm verification on programmed intelligent smoke detectors. The Alarm Verification Timer is a global program selection of 0–240 seconds (ULC installations can not exceed 30 seconds/ Can not exceed 60 seconds for UL 864). Each detector includes a Verification Counter, which displays the number of times that a detector entered verification but did not time-out to alarm. The Verification Counter increments to 99 and holds.

Table B.1 Intelligent Detector Functions

Appendix C: Remote Terminal Access

C.1 General Description

The control panel can communicate with a remote terminal or computer connected to the EIA-232 PC/Terminal port. Refer to the *NFS2-640 Installation Manual* for installation information.

NOTE: See the *NFS2-640 Programming Manual* for instructions on enabling the CRT.

This port may be set up for interactive operation or for monitoring only. Interactive operation requires that all equipment be UL-listed under UL Standard for Safety UL 864 and be installed and set up as directed under Local Terminal Mode (LocT) or Local Monitor Mode (LocM).

ITE (Information Technology Equipment) equipment listed under UL 1950 is allowed for ancillary system monitoring when the system is installed and set up as directed under Remote Terminal Mode (RemT).

C.2 Operating Modes

The control panel provides three operating modes for the CPU EIA-232 PC/Terminal port:

- Local Terminal - LocT
- Local Monitor - LocM
- Remote Monitor - RemM

You select the operating mode during control panel programming (Global System Functions). For more information, refer to the *NFS2-640 Programming Manual*.

The following subsections outline the functions, password requirements, and additional information for each operating mode.

C.2.1 Local Terminal Mode (LocT)

Functions, passwords, and special requirements of Local Terminal Mode (LocT) are:

Functions:	Read Status, Alter Status, and Control Functions (Table C.1).
Passwords:	User-defined password for Alter Status functions.
Requirements:	The terminal must be mounted in a UL 864 listed enclosure or positioned to provide equivalent protection against unauthorized use.

Functions available with the Local Terminal Mode:

Function	Lets you...
Read Status	• Display the status of an individual point (Detector, Module, or Zone). • Display a list of all the points in Alarm or trouble. • Display a list of all programmed points in the system. • Step through the History buffer event by event. • Display the entire History buffer. • Step through Alarm History • Display the entire Alarm History
Alter Status	• Disable/Enable an individual point. • Change the sensitivity of a detector. • Clear the verification counter of all detectors. • Clear the entire History buffer. • Set the Intelligent Sensing alert and action levels.

Table C.1 Local Terminal Mode Functions (1 of 2)

Function	Lets you...
Control Functions	• Acknowledge. • Signal Silence. • System Reset. • Drill.

Table C.1 Local Terminal Mode Functions (2 of 2)

C.2.2 Local Monitor Mode (LocM)

Functions, passwords, and special requirements of Local Monitor Mode (LocM) are:

Functions: Read Status, Alter Status, and Control Functions (Table C.2).

Passwords: User-defined password for Alter Status and Control functions.

Requirements: Password security feature for Control Functions eliminates the need for mounting the CRT-2 in an enclosure.

Functions available with the Local Monitor Mode:

Function	Lets you...
Read Status	• Display the status of an individual point (Detector, Module, or Zone). • Display a list of all the points in Alarm or trouble. • Display a list of all programmed points in the system. • Step through the History buffer event by event. • Display the entire History buffer. • Step through Alarm History • Display the entire Alarm History
Alter Status	• Disable/Enable an individual point. • Change the sensitivity of a detector. • Clear the verification counter of all detectors. • Clear the entire History buffer. • Set the Intelligent Sensing alert and action levels.
Control Functions	• Acknowledge • Signal Silence • System Reset • Drill

Table C.2 Local Monitor Mode Functions

C.2.3 Remote Terminal Mode (RemT)

Functions, passwords, and special requirements of Remote Terminal Mode (RemT) are:

Functions: Read Status only. See Table C.3.

Passwords: None

Requirements: Use with UL ITE-listed terminals, including personal computers with the VeriFire™ Tools or terminal emulation software. Intended for terminals connected through modems, including FSK modems connected through a public switched telephone network.

Functions available with the Remote Terminal Mode:

Functions	Lets you...
Read Status	• Display the status of an individual point (Detector, Module, or Zone). • Display a list of all the points in Alarm or trouble. • Display a list of all programmed points in the system. • Step through the History buffer event by event. • Display the entire History buffer. • Step through Alarm History • Display the entire Alarm History
Alter Status	• N/A
Control Functions	• N/A

Table C.3 Remote Terminal Mode Functions

C.3 Using the CRT-2 for Read Status

C.3.1 Overview

This section shows how to perform Read Status functions from a CRT-2.

NOTE: See the *NFS2-640 Programming Manual* for instructions on enabling the CRT port.

For more information see the “Read Status” section of this manual.

Function	Lets you...
Read Point	Read the status of any point in the system (detectors, modules, software zones, and system parameters).
Alm/Tbl Status	Display a list of all devices in the system that are in Alarm or trouble.
Read All Points	Display a list of all points programmed in the system. This list will display the status of all addressable detectors, modules, system parameters and software zones.
History Step	Step through the History buffer one event at a time.
History All	Send the entire History buffer to the CRT, from the most recent event to the oldest event.
Alarm History Step	Step through Alarm History one alarm at a time.
Alarm History All	Display a history list of all alarms.

Table C.4 Read Status Functions

C.3.2 Accessing Read Status Options

Access the Read Status function from the CRT-2 by following these steps.

1. Turn on the CRT-2, which is connected to the control panel.
2. Press the Read Status function key. The control panel displays the “Read Status” menu options:

```
Rd Point=1, Rd Alm/Tbl=2, All Points=3, Hist:Step=4/All=5, Ala-Hist:Step=6/All=7
```

From the Read Status menu, you can select options 1-7.

C.3.3 Read Point

From the Read Status menu, select option **1** - Read Point. The CRT-2 displays the following:

Press <**1**> <**ENTER**>

```
Type (n)D(nnn), (n)M(nnn), Z(nn), F(n),, R(n), Ex, Lx or S(n) then hit Enter
```

Address (01-159)
SLC number
Number

Enter the following:

1. Enter the SLC number “1” or “2”.

NOTE: Press **F5** to scroll forward through a list of devices. Press **F6** to scroll back through a list of devices.

2. Enter the first letter of the device, using upper case letters.
   - Detector = “D”
   - Module = “M”
   - Zone = “Z”
   - Special Function = “F”
   - Releasing Zone = “R”
   - E Zone = “E”
   - L Zone = “L”
   - System Parameter = “S”
3. Enter the address or number of the device.
4. Press “ENTER”.

Example Read points for detectors 1D001 and 1D002 on SLC 1:

Press <**1**> <**D**> <**0**> <**0**> <**1**> <**ENTER**>

```
NORMAL SMOKE(PHOTO) INTENSIVE CARE UNIT NURSE LOUNGE  ZONE   020%AL L CV30 1D001
```

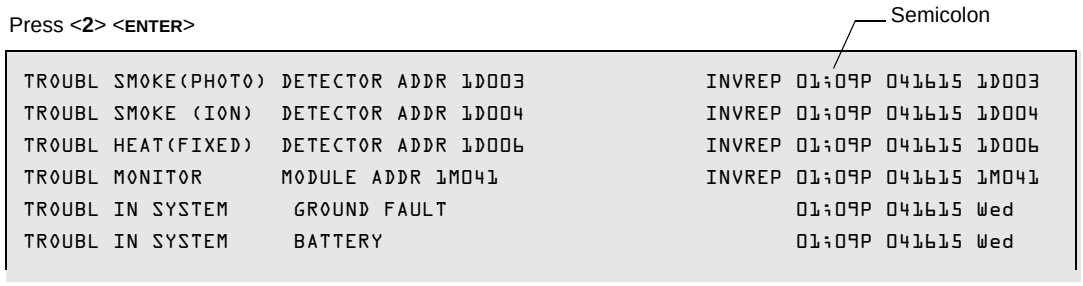
Press <**NEXT**>

```
NORMAL SMOKE (ION)  DETECTOR ADDR 1D002              ZONE   000%AL L **   1D002
```

C.3.4 Display Devices in Alarm or Trouble

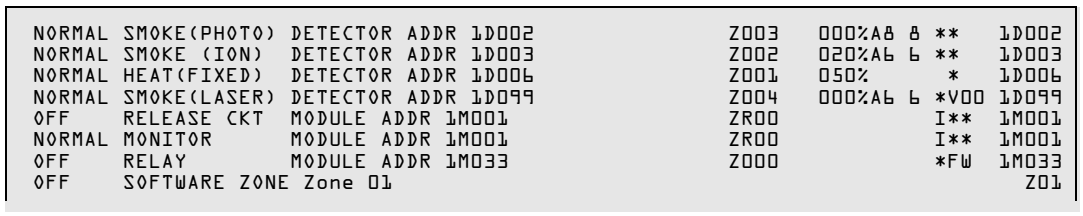
From the “Read Status” menu, select option **2** - Read Alarms/Troubles. The CRT-2 will display the alarm and trouble history.

The semicolon, a control character in networking applications, separates the hour and minute of events displayed from history. If events display as they occur, a colon separates the hour and minute.



C.3.5 Display All Programmed Points

From the "Read Status" menu, select option **3** - All Points. This option lets you view the status of all addressable detectors, modules, system parameters, and software zones.



C.3.6 Step-through History

From the "Read Status" menu, select option **4** - Step-through History. This option lets you step through all history events one at a time.

C.3.7 View All History

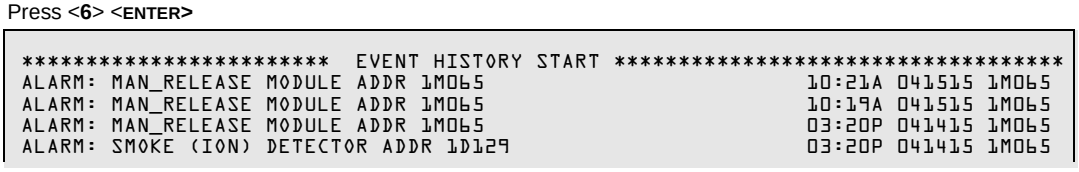
From the "Read Status" menu, select option **5** - History ALL. The entire history of events will display on the screen.

C.3.8 Step-through Alarm History

From the "Read Status" menu, select option **6** - Step-through Alarm History. This option lets you step through the panel's alarm history one event at a time.

C.3.9 View All Alarm History

From the "Read Status" menu, select option **7** - Alarm History All. The entire history of alarm events will display on the screen, from most recent to oldest.



Step through the Alarm History buffer one event at a time by pressing the Next **F5** or Prior **F6** function keys.

C.4 Using the CRT-2 for Alter Status

C.4.1 Overview

This section shows how to Alter Status functions from a CRT-2.

NOTE: The panel must be in Local Terminal Mode (LocT) or Local Monitor Mode (LocM).

NOTE: See the *NFS2-640 Programming Manual* for instructions on enabling the CRT port.

Function	Lets you...
Disable	Enable or disable detectors or modules.
Alarm/Pre-Alarm	Change the Alarm and Pre-Alarm levels of any addressable detector in the system.
Clear Verification	Clear the verification counter for all the addressable detectors in the system.
Clear History	Clear the contents of the History buffer.
Set Action/Alert	Set the Pre-Alarm for Alert or Action.

Table C.5 Alter Status Functions

C.4.2 Accessing Alter Status Options

Access **Alter Status** function from the CRT-2 by following these steps.

1. Turn on the CRT-2 connected to the control panel.
2. Press the Alter Status function key. The control panel displays the Password screen.

Press <**ALTER STATUS**>

```
Enter Status CHange Password or Escape to Abort
```

3. Enter the Status Change Password. The factory default Status Change Password is 11111.The password does not display on the CRT-2. Five asterisks will appear in place of the password.

Press <**1**><**1**><**1**><**1**><**1**><**ENTER**>

```
*****
```

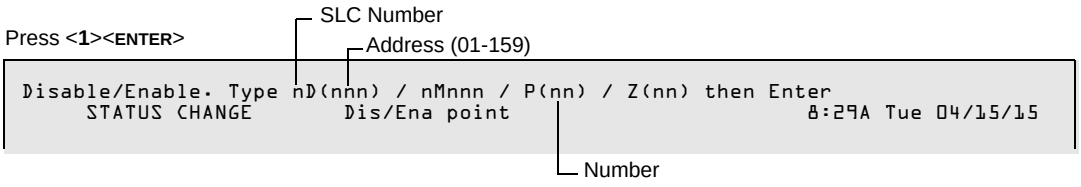
The Alter Status Options menu appears.

```
1=Disable 2=Alarm/Prealarm 3=Clear Verification 4=Clear History 5=Alert/Action
```

From the Alter Status Options menu, you can select **1**-**5**.

C.4.3 Enable or Disable Detectors, Modules or Zones

From the "Alter Status" menu select option **1** - Disable. Disable lets you enable or disable detectors, modules, or zones.



Enter the following:

1. Enter the SLC loop number **1** or **2**.
2. Enter the first letter to read one of the following, using upper case letters:
3. Detector = **D**
   Module = **M**
   NAC = **P**
   Zone - **Z**
4. Enter the address or number of the device.
5. Press ENTER and a display similar to the following will appear.

EXAMPLE Disable Detector address 101 on SLC1:

Press <**1**><**D**><**1**><**0**><**1**><**ENTER**>

```
D101 Now Enabled, Enter E(Enable) / D(Disable) or Esc. to Abort
```

Press **D** to Disable (**E** to Enable); then press ENTER.

Press <**D**><**ENTER**>

```
Device now disabled
TROUBL SMOKE(PHOTO) DETECTOR ADDR 101 ZO3 DEVICE DISABLED 08:29A Tue 04/15/15 D101
```

C.4.4 Change Alarm and Pre-Alarm Levels

This option lets you change the Alarm and Pre-alarm levels of any addressable detector in the system. Follow these steps.

1. From the "Alter Status" menu select option **2** - Alarm/Pre-alarm.

Press <**2**><**ENTER**>

```
Det. Alarm/Prealarm level, type address D(
TROUBL SMOKE(PHOTO) DETECTOR ADDR 101 ZO3 DEVICE DISABLED 08:29A Tue 04/15/15 D101
```

2. Enter the address of the detector you wish to change. For example, change alarm and pre-alarm levels for detector 102 on SLC 1 to Alarm Level 4 & Pre-alarm Level 2.

Press <**1**><**D**><**1**><**0**><**2**><**ENTER**><**A**><**5**><**P**><**2**><**ENTER**>

```
STATUS CHANGE   Alarm/Prealarm level                08:29A Tue 04/15/15
D102 sens. at level 5, Prealarm at level 3, Enter AxPx to change, Esc. to Abort
D102 now set at new Alarm level 5 and new Pre-alarm level 2
```

C.4.5 Clear Verification Counter

Clear verification lets you clear the verification counter for all the addressable detectors in the system.

Press <**3**><**ENTER**>

```
STATUS CHANGE   Clear verify count                    08:29A Tue 04/15/15
```

C.4.6 Clear the Entire History Buffer

Clear History lets you clear the entire History buffer.

Press <**4**><**ENTER**>

```
***************History Clear*************************
```

C.4.7 Set the Pre-Alarm for Alert or Action

Set Action/Alert lets you set the Pre-alarm for Alert or Action. For example, change Pre-alarm from “Alert” to “Action” as follows:

Press <**5**><**ENTER**>

```
Set Pre-alarm Alert (NO)/Action(YES). Type N or Y then Enter
     STATUS CHANGE   Change Alert/Action                  08:29A Tue 04/15/15
```

Press <**Y**><**ENTER**>

```
Pre-alarm now set for ACTION
```

Notes

Appendix D: Point and System Troubles Lists

There are a variety of point or system trouble types that may appear in a trouble message. The tables below give lists of the troubles and indications of their cause.

D.1 Point (Device) Troubles

A message from the "Trouble Type" column in the following table will appear in the upper right corner of the panel display when a point (device) trouble occurs. Use this table to help determine what the trouble is.

POINT TROUBLES		
TROUBLE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
AC FAILURE	The auxiliary power supply has lost AC power.	Determine whether there is an AC power loss or whether the power supply and wiring is correct.
ADRFLT	.Detector and new sounder base address doesn't match. Or the ACPS address is incorrect.	Readdress the incorrect device.
ALIGN	A beam detector is in configuration mode.	No action is necessary, as the trouble will clear when the configuration is complete. However, the detector will not detect a fire while this trouble exists.
BLOCK	Something has come between the detector's beam and its reflector.	Investigate and clear the blockage.
CHGFLT*	The power supply's battery charger is not working properly.	Correct the fault.
CO 6MN	The CO (carbon monoxide) detection element on a detector has six months left to expiration. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error, if applicable.)	Replace the detector.
CO EXP	The CO (carbon monoxide) detection element on a detector has reached the expiration date. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error, if applicable.)	Replace the detector.
CO TBL	The CO element on a detector is not working properly. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error, if applicable.)	Replace the detector.
DIRTY 1	The detector is dirty and needs cleaning	Clean the detector.
DIRTY 2	The detector requires cleaning immediately. It is a false alarm risk.	Clean the detector immediately.
DISABL	The point has been disabled.	Service and re-enable the point.
DUAL ADDRESS	There is more than one device of a single type (detector or module) with the same SLC address. A detector and a module can share the same address on an SLC, but two detectors, or two modules, can not. Not that some addressable devices (e.g. certain power supplies and RFXs) may not appear to be detectors or modules, but are addressed on the SLC as such.	Readdress the incorrect device.
GNDFLT	There is a ground fault on the main or auxiliary power supply.	Correct the fault.
HI BAT	The auxiliary power supply's battery charge is too high.	Check the batteries for problems. Replace batteries if necessary.
INVREP	The device has returned a response to the panel that the panel did not expect.	Check the device for functionality, addressing and wiring.
IR TBL	The infrared element is not working properly on an FSC-851 IntelliQuaddetector. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error.)	Replace the detector.
LO BAT	The auxiliary power supply's battery charge is low.	Check the batteries for problems. Replace batteries if necessary.
LO TEMP	The temperature read by a Heat+ or Acclimate™+ detector is too low.	Raise the heat in the area of the detector.
LO VAL	The detector chamber reading is too low; the detector is not operating properly. Or (CLIP Mode only) the thermistors, CO element, or infra-red element on an FSC-851 IntelliQuad detector is not working properly, or the FSC-851 IntelliQuad is experiencing a freeze warning.	The detector must be removed and replaced by an authorized service representative.
NO ANS	The device (module or detector) is not responding to the poll. Either the device is not working or it is not connected properly.	Determine whether the device is functional, and connected and addressed properly on the SLC.
NO SIG	The device (module or detector) is not responding to the poll. Either the device is not working or it is not connected properly.	Determine whether the device is functional, and connected and addressed properly on the SLC.
OPEN	The module device has an open circuit on its supervised wiring.	Check the connections from the module to the input or output device to which it is wired.
OPEN ON x	There is an open on speaker circuit x.	Locate the open and fix.
PSFAIL	The power supply is not working properly.	Check the battery for problems. Replace battery if necessary.

Table D.1 Point (Device) Troubles (1 of 2)

POINT TROUBLES		
TROUBLE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
PRLOSS	The output module or new sounder base lost power.	Turn power back on.
SHORT	The module device has a short circuit on its supervised wiring.	Check the connections from the module to the input or output device to which it is wired.
SHORT ON x.	There is a short on speaker circuit x.	Locate the short and fix.
TEST F	This detector has failed the FACP's periodic detector test for alarm capabilities.	The detector should be removed and replaced by an authorized service representative.
THERM	The thermistors are not functioning properly on an FSC-851 IntelliQuad detector. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error.)	Replace the detector.
VER HI	This detector, which has been programmed to participate in alarm verification, has gone into and come out of verification its programmed limit without going into alarm. Either something is wrong with the detector or there is a condition nearby (such as someone smoking) that causes it to go into verification frequently.	Check the detector and the nearby conditions to determine the problem.
XP TBL	XPIQ general trouble.	Check the XPIQ point for problems.
* This trouble may be fire panel or backup battery related. Test and replace backup batteries if necessary.		

Table D.1 Point (Device) Troubles (2 of 2)

D.2 System Troubles

A message from the "Trouble Type" column in the following table will appear in the panel display when a system trouble occurs. Use this table to help determine the cause of the trouble.

SYSTEM TROUBLES		
TROUBLE MESSAGE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
AC FAIL	The main power supply has lost AC power.	Investigate whether there is an AC power loss, or whether the PS is correctly installed and wired.
ADV WALK TEST	There is an Advanced Walk Test in progress.	No action is required.
ANNUN x NO ANSWER	The annunciator at address x is not responding.	Determine whether the device is functional, and connected and addressed properly.
ANNUN x TROUBLE	The annunciator at address x is in trouble.	Determine if the ACS module is functional, correctly installed, and configured properly.
AUXILIARY TROUBLE	An auxiliary device connected to the CPU2-640 at J6 is in trouble or the cable is missing.	Check the wiring and source.
BASIC WALK TEST	A Basic Walk Test is in progress.	No action is required.
BATTERY	The main power supply's battery charge is too high or too low.	Check batteries, replace if necessary.
BAT.BACKUP RAM	RAM battery backup is low.	Replace battery.
CHARGER FAIL*	The main power supply's battery charger is not working properly.	Correct the fault.
CORRUPT LOGIC EQUAT	The database that houses the panel's logic equations is corrupt.	The database must be re-downloaded, or all programming must be cleared and re-entered.
DRILL ACTIVATED	Drill has been activated.	No action is required.
DVC ANALOG OUT x TBL	A trouble has occurred on DVC-AO analog output x (1-4). The analog output is configured for style 7, but no audio signal is returned.	Investigate and fix.
DVC AUDIO LIB. CORRUP	The audio library is corrupt.	The library must be re-downloaded, or all programming must be cleared and re-entered. If the trouble still does not clear, contact Technical Services.
DVC AUDIO LIB. INCOMP	The audio library is not compatible with the programming database.	Check the version using VeriFire Tools. Correct and re-download the database and audio library.
DVC BUZZER OFF-LINE	The piezo is disabled.	Re-enable the piezo at switch 5 on the DVC.
DVC DAA DOWNLOADING	A DAA download is in progress.	No action is required.
DVC DATABASE CORRUPT	The database that houses the DVC's programming is corrupt.	The database must be re-downloaded, or all programming must be cleared and re-entered. If the trouble still does not clear, contact Technical Services.

Table D.2 System Troubles

SYSTEM TROUBLES		
TROUBLE MESSAGE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
DVC DBASE INCOMPAT	The programming database version is not compatible with the application version.	The correct application or database version must be downloaded.
DVC DVC AUX TROUBLE	This trouble is generated when the auxiliary input is supervised (as determined in VeriFire Tools programming) and no signal is coming from the input.	Check the wiring and source.
DVC EXT RAM ERROR	The external RAM test failed.	Service is required.
DVC FFT TROUBLE	There is a short or open on the FFT riser.	Check that the 4-wire switch is correctly set and that there is an end-of-line resistor in place for 2-wire operation. Investigate for a break or short on the wiring.
DVC FLASH IMAGE ERR	The DVC software is corrupt.	Re-download the panel code software from VeriFire tools. If the trouble still does not clear, call Technical Services.
DVC LOADING NO SERV	A program or database download is in progress. The panel is NOT providing fire protection during the download.	Proper authorities should be notified while a download is in progress so that other means of fire protection can be supplied.
DVC LOCAL MIC. TBL	The local microphone is in trouble. There is no communication, or paging has been enabled for over 28 seconds and no signal has been received.	Investigate whether the mic is plugged into the DVC or whether there is a problem with the local mic.
DVC LOCAL PHONE TBL	The local FFT handset is in trouble. There is no communication, or paging has been enabled for over 28 seconds and no signal has been received.	Investigate whether the handset is plugged into the DVC or whether there is a problem with the local handset.
DVC NVRAM BATT TBL	Battery backup and/or clock backup is low.	Replace the battery. Refer to the *DVC Series Manual* for replacement instructions.
DVC PROGRAM CORRUPT	The database that houses the DVC's programming is corrupt.	The database must be re-downloaded, or all programming must be cleared and re-entered. If the trouble still does not clear, contact Technical Services.
DVC REM. MIC. TBL	The remote microphone is in trouble. It is installed and supervised, but no signal is coming from it.	Check wiring and connections.
DVC SELF TEST FAIL	The diagnostic test failed on the DVC.	Reboot the unit. If the problem does not clear, call Technical Services.
DVC SOFT. MISMATCH	One or more DAL device has a software revision that does not match other DAL device software revisions.	Update the DAA software to match.
EPROM ERROR	The application and/or boot code is corrupt.	Service is required.
EXCEEDED CONN. LIMIT	More than two panels have been connected to a high-speed network communications module.	Remove extra panel(s).
EXTERNAL RAM ERROR	The external RAM test failed.	Service is required.
GROUND FAULT	A ground fault has occurred within the panel.	Locate the ground fault and repair.
GROUND FAULT LOOP x	There is a ground fault on loop x.	Locate the ground fault and repair.
HS-NCM SNIFFER ACTIV	The panel is in a diagnostic mode.	No action is required.
INTERNAL RAM ERROR	The internal RAM test failed.	Service is required.
LCD80 SUPERVISORY	Communication has been lost with the LCD-80.	Check connections to the LCD-80 Annunciator.
LOADING.NO SERVICE	A program or database download is in progress. The panel is *NOT* providing fire protection during the download.	Proper authorities should be notified while a download is in progress so that other means of fire protection can be supplied.
MASTER BOX TROUBLE	A TM-4 connected to a municipal box is in trouble.	Reset the master box.
MASTER BOX NO ANSWER	A TM-4 connected to a municipal box is not responding.	Determine whether the device is functional and connected properly.
NCM COMM FAILURE	Communication is lost between the CPU2-640 and the network communications module or DVC.	Check to see if the NUP cable is properly installed and the network communications module or DVC is functional.
NETWORK FAIL PORT x	Communication lost between NCM Port x and corresponding node.	Check wiring and verify the node is online.
NETWORK INCOMPATIBLE	The brand of this panel is incompatible with this network.	Verify all nodes are branded for the same OEM.
NFPA 24HR REMINDER	This message occurs every day at 11 AM if any troubles exist.	Resolve any troubles on the system.
NO DEV. INST ON L1	No devices are installed on the system.	Install SLC and run autoprogram.

Table D.2 System Troubles

SYSTEM TROUBLES		
TROUBLE MESSAGE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
PANEL DOOR OPEN	The panel door is open.	Close door.
POWER SUPPLY COMM FAIL	There has been a communication failure with the power supply.	Service is required.
PROGRAM CORRUPTED	The database that houses the panel's programming is corrupt.	The database must be re-downloaded, or all programming must be cleared and re-entered. If the trouble still does not clear, contact Technical Services.
PROGRAM MODE ACTIVATED	A user is currently accessing the panel's programming menus.	No action is required / Exit the Programming mode.
RELEASE DEV. DISABLE	Releasing devices have been disabled.	Enable the devices.
SELF TEST FAILED	Diagnostic test failed.	Call Technical Services.
STYLE 6 POS. LOOP x	There is an open circuit on the positive side of loop x. Style 6 and Style 7 are supervised methods of communicating with addressable devices. If the control panel detects a trouble (open), it will drive both ends of the loop, maintaining communication in an unsupervised method. The latching trouble will display on the panel as a Style 6 trouble until you correct the condition and press RESET. Style 7 configuration of the SLC requires the use of ISO-X isolator modules.	
STYLE 6 NEG. LOOP x	There is an open circuit on the negative side of loop x. Style 6 and Style 7 are supervised methods of communicating with addressable devices. If the control panel detects a trouble (open), it will drive both ends of the loop, maintaining communication in an unsupervised method. The latching trouble will display on the panel as a Style 6 trouble until you correct the condition and press RESET. Style 7 configuration of the SLC requires the use of ISO-X isolator modules.	
STYLE 6 SHORT LOOP x	Style 6 and Style 7 are supervised methods of communicating with addressable devices. If the control panel detects a trouble (open or short), it will drive both ends of the loop, maintaining communication in an unsupervised method. The latching trouble will display on the panel as a Style 6 trouble until you correct the condition and press RESET. Style 7 configuration of the SLC requires the use of ISO-X isolator modules.	
SYS INITIALIZATION	The devices are initializing.	No action is required, as the trouble will clear when initialization is completed. However, devices will not report off-normal events while this trouble exists.
TERM. SUPERVISORY	There is a communication error with the CRT-2.	Check connections to the CRT-2 terminal.
UDACT NO ANSWER	The UDACT or UDACT-2 is not responding.	Determine whether the UDACT/UDACT-2 is functional, and connected and addressed properly.
UDACT TROUBLE	The UDACT or UDACT-2 is in trouble.	Determine if the UDACT/UDACT-2 is functional and wired correctly.
* This trouble may be fire panel or backup battery related. Test and replace backup batteries if necessary/		

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Manufacturer Warranties and Limitation of Liability

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Network Control Annunciator
NCA-2
Instruction Manual

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P/N 52482:M3 ECN 16-0219

Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premises to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

Limit-D-1-2013

Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Overtightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

Precau-D1-9-2005

FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are 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 his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

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Section 1: About this Manual

1.1 Standards and Specifications

The NCA-2 has been designed to comply with standards set forth by the following regulatory agencies:

- Underwriters Laboratories Standard UL 864
- Underwriters Laboratories Standard UL 2017 for General-Purpose Signaling Devices and Systems
- Underwriters Laboratories Standard UL 2572 for Mass Notification Systems
- NFPA 72 National Fire Alarm Code
- ULC-S527-11 Standard for Control Units for Fire Alarm Systems
- ULC S524 Standard for the Installation of Fire Alarm Systems

The contents of this manual are important and must be kept in close proximity of the hardware. If building ownership is changed, this manual and all other testing and maintenance information must also be passed to the current owner of the facility. A copy of this manual was shipped with the equipment and is also available from the manufacturer.

WARNING:
Improper installation, maintenance, or lack of routine testing could result in system malfunction.

CAUTION:
Read all bundled documentation for detailed instructions on upgrade/downgrade installation information.

1.2 UL 864 Ninth Edition Compliance

This product has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864 9th Edition.

The following products have not received UL 864 9th Edition certification and may only be used in retrofit applications. Operation of the NCA-2 with products not tested for UL 864 9th Edition has not been evaluated and may not comply with NFPA 72 and/or the latest edition of UL 864. These applications will require the approval of the local Authority Having Jurisdiction (AHJ).

- NCA Network Control Annunciator
- NFS-640/E Fire Alarm Panel
- NFS-3030 Fire Alarm Panel
- AM2020/AFP1010 Fire Alarm Panel
- AFP-300/400 Fire Alarm Panels
- AFP-200 Fire Alarm Panel
- PRN-4 and PRN-5 Printers
- Keltron Printer

1.3 Programming Features Subject to AHJ Approval

This product incorporates field-programmable software. The features and/or options listed below must be approved by the local AHJ.

This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864/ULC-S527, certain programming features or options must be limited to specific values or not used at all as indicated below.					
Program Feature or Option	**Permitted in UL 864? (Y/N)**	**Permitted in ULC-S527? (Y/N)**	**Possible Settings**	**Settings Permitted in UL 864**	**Settings Permitted in ULC-S527**
IP downloads over a local area network (LAN) or the internet (Wide Area Network - WAN)	No	No	Yes No Timed	No	No
AC Fail Delay Timer	Yes	Yes	0, or 1-12 hours	0, or 1-3 hours	0, or 1-3 hours
Regional Settings	Yes	Yes	Singapore Chicago Australia China Canada	Chicago	Canada

1.4 Related Documentation

The table below provides a list of documents referenced in this manual, as well as documents for selected other compatible devices.

Compatible Conventional Devices (Non-addressable)	**Document Number**
Device Compatibility Document	15378
Off-line Programming Utility	**Document Number**
VeriFire™ Tools CD help file	VERIFIRE-TCD
Cabinets & Chassis	**Document Number**
CAB-3/CAB-4 Series Cabinet Installation Document	15330
Battery/Peripherals Enclosure Installation Document	50295
BMP-1 Blank Module Plate Installation Document	51008
NCA/640-2-KIT	52893
NCA-2 RETRO Kit	52152
ABS-2D PID	52032
ABS-4D PID	15073
Heat Dissipation for Cabinets with Digital Audio Products	53645
CHS-RL-MP Product Installation Document	53215
Control Panels and Power Supplies	**Document Number**
NFS2-3030 Installation, Programming and Operations Manuals	52544, 52545, 52546
NFS2-640/E Installation, Programming and Operations Manuals	52741, 52742, 52743
NFS-320 Installation, Programming and Operations Manual	52745, 52747, 52746
NFS-3030 Installation, Programming and Operations Manuals	51330, 51345, 51344
NFS-640 Installation, Programming and Operations Manuals	51332, 51333, 51334
AMPS-24/E Power Supply Manual	51907
ACPS-610 Addressable Power Supply Manual	53018
Networking	**Document Number**
Noti•Fire•Net Manual, Network Version 5.0 & Higher	51584

Table 1 Related Documentation

High Speed Noti•Fire•Net Manual	54013
NCM-W/F Installation Document	51533
HS-NCM High Speed Network Communications Module Installation Document	54014
ONYXWorks Manual	52342
NCS Network Control Station Manual, Network Version 5.0 & Higher	51658
NCA Network Control Annunciator	51482
System Components	**Document Number**
DVC Digital Voice Command Manual	52411
DAL Devices Reference Sheet	52410
DS-DB Digital Series Distribution Board and Amplifier Manual	53622
DVC-RPU UL Listing Document	50107424-001
AA Series Audio Amplifier Manual	52526
DAA2 and DAX Amplifiers Manual	53265
Mass Notification Systems Configuration, Programming and Operations Manual	LS10063-000NF-E
Annunciator Control System Manual	15842
LCD-160 Liquid Crystal Display Manual	51850
LCD-80 Liquid Crystal Display Manual	15037
LCD2-80 Liquid Crystal Display Manual	53242
ACM-8R Annunciator Control Module Manual	15342
LDM Series Lamp Driver Annunciator Manual	15885
SCS Smoke Control (Smoke and HVAC Control Station) Manual	15712
TM-4 Installation Document (Reverse Polarity Transmitter)	51490
UDACT Manual (Universal Digital Alarm Communicator/Transmitter)	50050
UDACT-2 (Universal Digital Alarm Communicator/Transmitter) Listing Document	54089LD
UZC-256 Universal Zone Coder Manual	15216
UZC-256 Programming Manual	15976

Table 1 Related Documentation

1.5 Notes, Cautions, and Warnings

This manual contains notes, cautions, and warnings to alert the reader as follows:

NOTE: Supplemental information for a topic, such as tips and references.

CAUTION:
Information about procedures that could cause programming errors, runtime errors, or equipment damage.

WARNING:
Indicates information about procedures that could cause irreversible equipment damage, irreversible loss of programming data or personal injury.

1.6 Conventions

This manual uses the following conventions as listed below:

When you see	Specifies	Example
text in small caps	the text as it appears in the LCD display or on the control panel	MARCH TIME is a selection that appears in the LCD display; or Press the ENTER key
text in quotes	a reference to a section or a LCD menu screen	"Status Change" specifies the Status Change section or menu screen
bold text	In body text, a number or character that you enter	Press **1**; means to press the number "1" on the keypad
italic text	a specific document	*NCA-2 Installation Manual*
a graphic of the key	In a graphic, a key as it appears on the control panel	Press  means to press the Escape key

NOTE: Where used in this manual, NFS2-640 refers to both the NFS-640/E and the NFS2-640/E unless otherwise noted.
The term NFS2-3030 refers to both the NFS-3030 and the NFS2-3030/E unless otherwise noted.
The term NFS-320 refers to the NFS-320, NFS-320E, and NFS-320C unless otherwise noted.

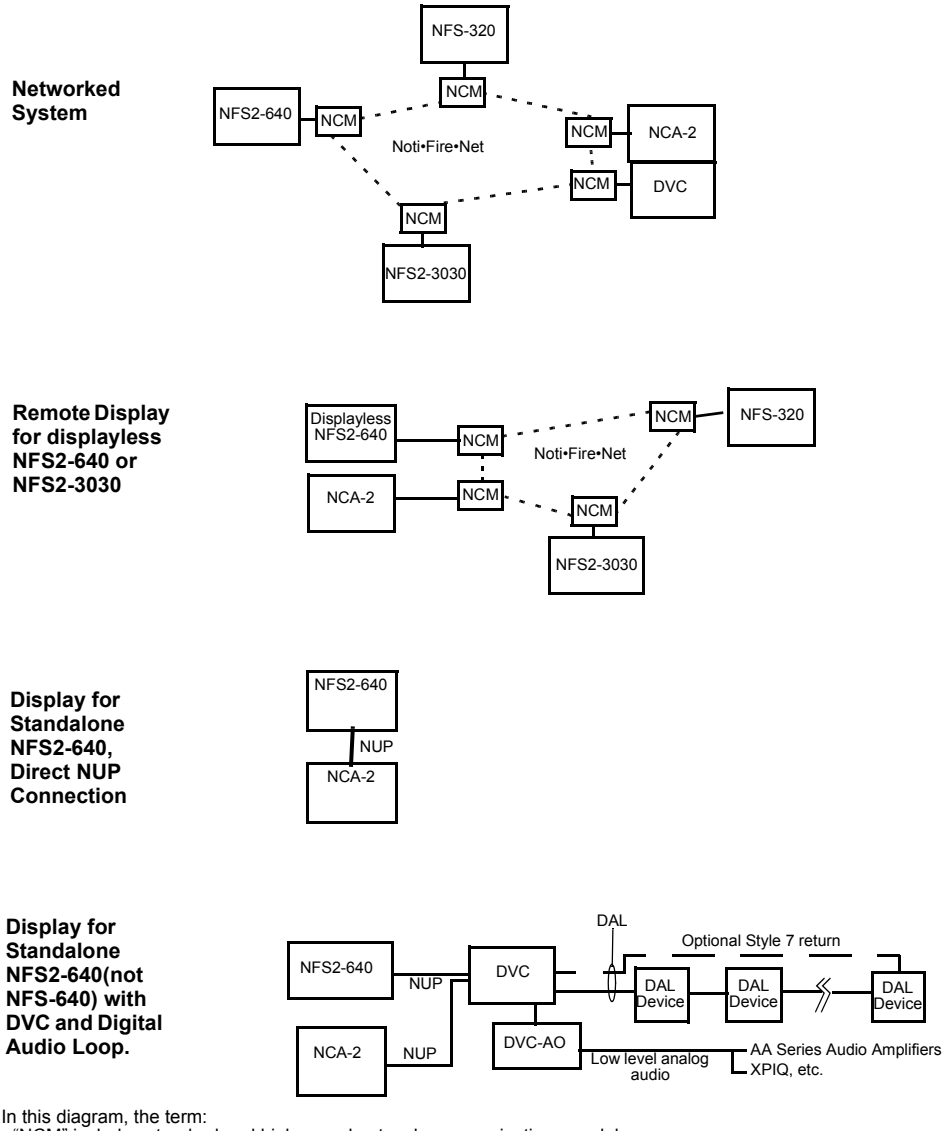
Section 2: Overview

2.1 General Description

The NCA-2 Network Control Annunciator provides a text-based display and control device for a NOTI•FIRE•NET™ or High-Speed NOTI•FIRE•NET™ system. The NCA-2 uses a 640-character LCD (16 x 40), a high-speed 32-bit microprocessor, flash memory and a rubberized QWERTY keypad. It can display all events from a NOTI•FIRE•NET™ or High-Speed NOTI•FIRE•NET™ system and can co-exist with other NCA-2s, DVC Series, DVC-RPU, DVC configured as a DVC-RPU, ONYXWorks, and NFS2-3030, NFS2-640, and NFS-320 fire alarm control panels (FACPs).

NOTE: The NCA-2 is compatible with NOTI•FIRE•NET™ version 5.0 and higher, and with the High-Speed NOTI•FIRE•NET™.

Figure 2.4 gives simplified overview illustrations of typical applications for the NCA-2.



In this diagram, the term:
- "NCM" includes standard and high-speed network communications modules.
- "Noti•Fire•Net" includes standard and high-speed network versions.

Figure 2.1 Block Diagram, Typical NCA-2 Applications

2.1.1 NCA-2 Features

- Notifier Universal Protocol (NUP) compatible
- Optically isolated EIA-232 printer interface
- EIA-485 ACS annunciator interface
- Piezo electric sounder
- 640-character, 16 row X 40 column Liquid Crystal Display (LCD)
- Ten “soft keys” that point to current choices on the LCD.
- 11 Status LEDs indicate:
  - Power
  - Fire Alarm
  - Pre-Alarm
  - Security
  - Supervisory
  - System Trouble
  - Other Event
  - Signals Silenced
  - Point Disabled
  - CPU Failure
  - Controls Active
- Support for a custom “system-normal” bitmap graphic
- Support for a 160-character display
- Nonvolatile Real-Time Clock (RTC)
- Power supply supervision with AMPS-24 power supply
- Acknowledge (Local, Network-wide or single node)
- Signal Silence (Network-wide or single node)
- System Reset (Network-wide or single node)
- Lamp Test (Local to NCA-2)
- Read Status (any point on a node)
- Alter Status (any point or selected node)
- 4000 Event History capacity
- 1000 Alarm History capacity
- Display and Control Center participation/indication
- Support for Remote Text Display (LCD-160, LCD-80)
- Support for Mass Notification Systems

2.1.2 Compatibility with NOTI•FIRE•NET™ Panel Nodes

FACP	Network Board
NFS2-640, NFS-640	NCM-W/F, HS-NCM-W/SF/MF/WSF/WMF/MFSF
NFS-320	NCM-W/F, HS-NCM-W/SF/MF/WSF/WMF/MFSF
NFS2-3030, NFS-3030	NCM-W/F, HS-NCM-W/SF/MF/WSF/WMF/MFSF
DVC Series	NCM-W/F, HS-NCM-W/SF/MF/WSF/WMF/MFSF
Note: To be compatible with the NCA-2, all networked nodes must be running NOTI•FIRE•NET™ version 5.0 or higher or a high-speed NOTI•FIRE•NET™.	

Table 2.1 NOTI•FIRE•NET™ Compatible Fire Panels

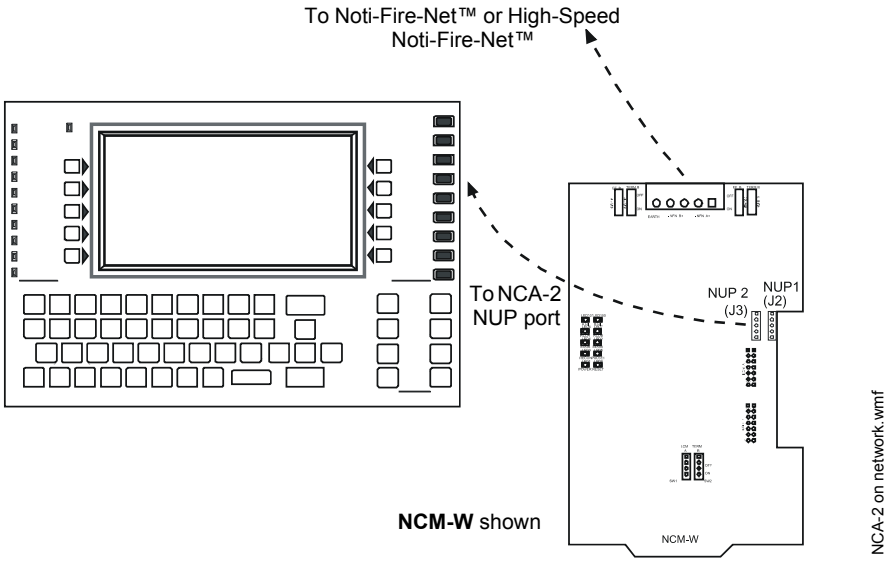


Figure 2.2 NCA-2 Network Connection Overview

2.2 NCA-2 and Displayless Panels

When there is a displayless NFS2-640 or NFS2-3030 on a Noti•Fire•Net™, the NCA-2 acts as a remote display.

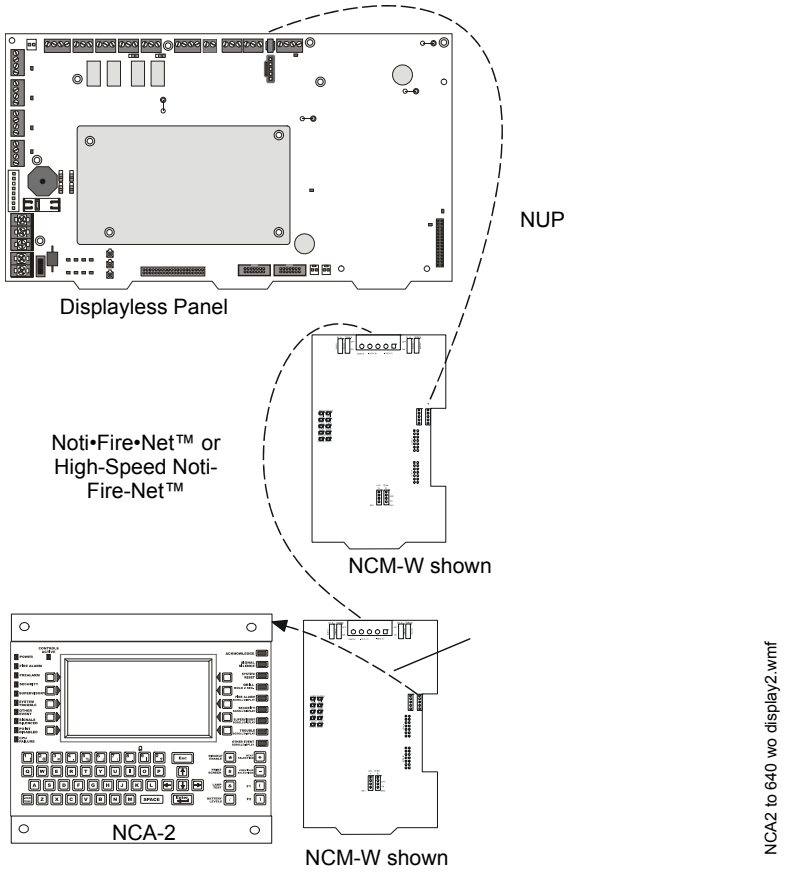


Figure 2.3 NCA-2 and Displayless Panels

2.3 NCA-2 / NFS2-640 Standalone Application

The NCA-2 can mount in a chassis in the same cabinet as the NFS2-640 panel and connect directly to it via the NUP ports using the NUP cable (P/N 75577); with this option, NCMs are unnecessary. Refer to Section 3.7, "NCA-2 / NFS2-640 Standalone", on page 28 for instructions on how to use the NCA/640-2-KIT for this installation.

Connect the NUP cable from J1 on the NCA-2 to J1 on the NFS2-640 panel. Make this connection only when using the NCA-2 as the NFS2-640 display. Refer to Figure 2.4.

If the NCA-2 and NFS2-640 are used as a stand-alone pair, each device must be programmed separately using VeriFire® Tools in its off-line programming mode. Because the VeriFire® Tools computer also uses the NUP port, the NFS2-640 and NCA-2 must be temporarily disconnected for programming. If the NFS2-640/NCA-2 pair is connected to a network, there are two additional options for programming: either connect the VeriFire® Tools programming PC to the NUP port on the NCM board, or program the NFS2-640 through another network node. Refer to the VeriFire® Tools on-line help for details.

NOTE: Use a NUP cable to connect the two NUP ports (J1 on the NCA-2 and J1 on the NFS2-640). Make this connection only when using the NCA-2 as the NFS2-640 display.

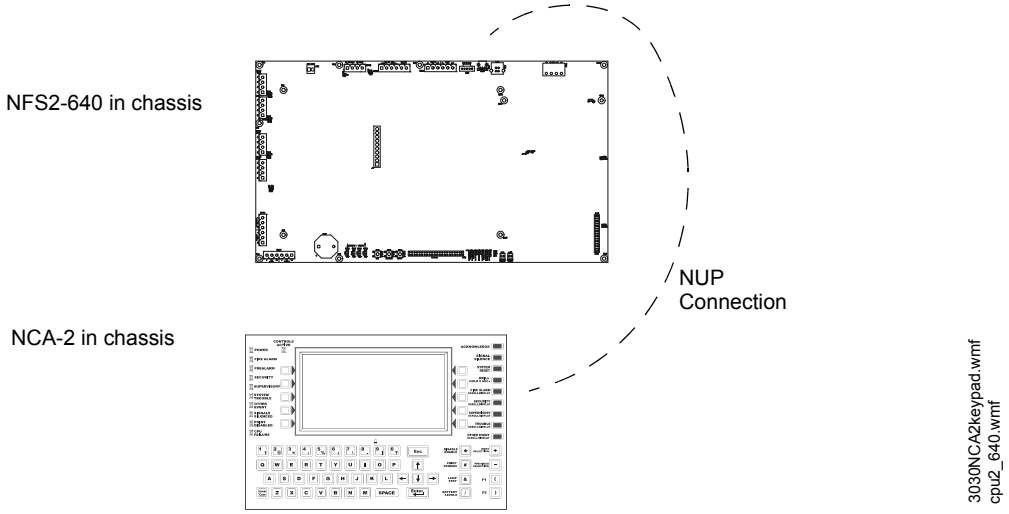


Figure 2.4 The NCA-2 as the NFS2-640 Display

NOTE: This system design is required for Canadian standalone applications.

2.4 NCA-2 Board Layout

Figure 2.5 shows NCA-2 circuit board layout; descriptions of the components follow in the next sections.

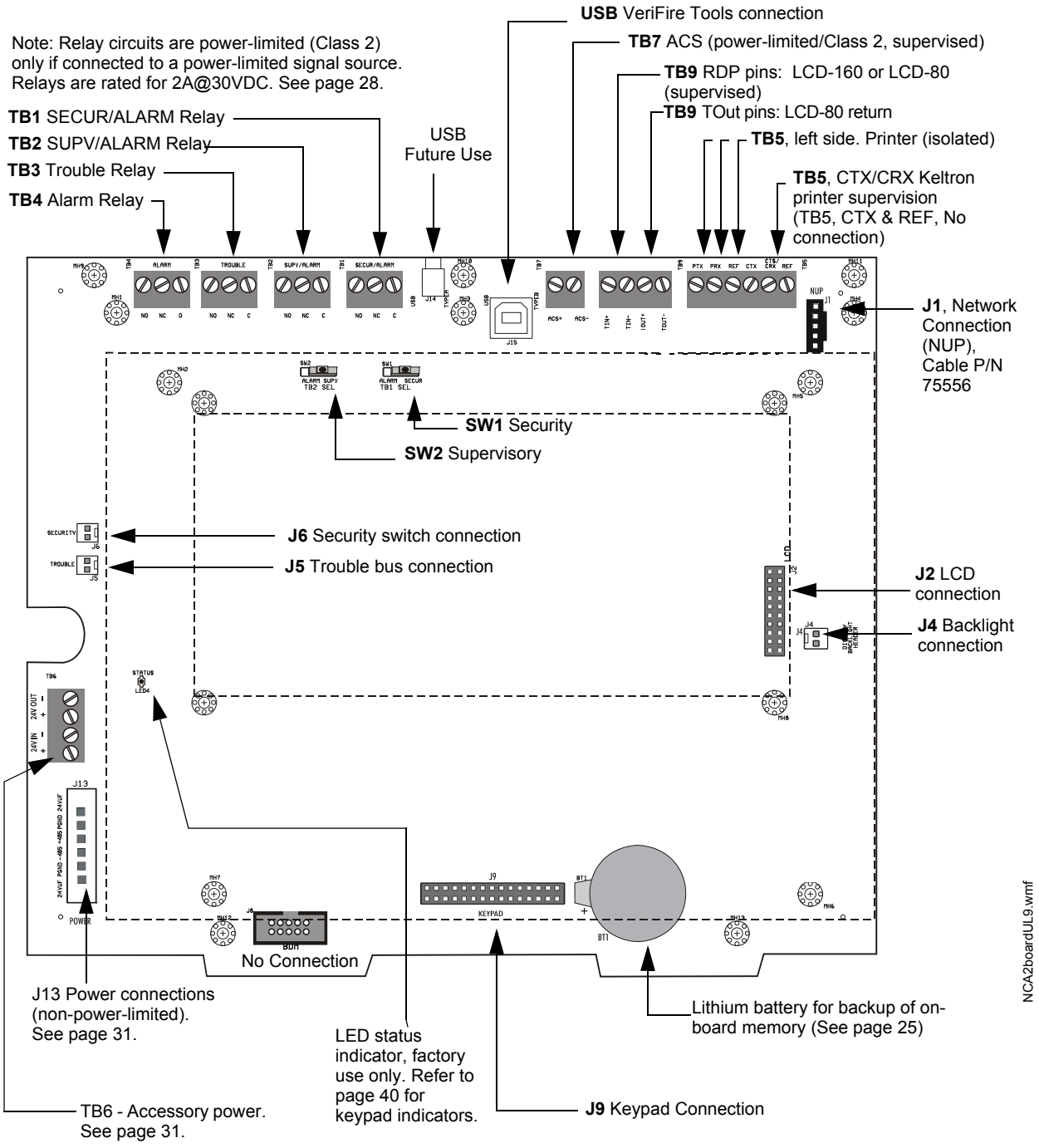


Figure 2.5 NCA-2 Board Layout

2.5 NCA-2 Keypad Layout

The keyboard figure below illustrates the basic layout. The keypad is described in detail in the operation section of this manual, in "The Keypad" on page 40.

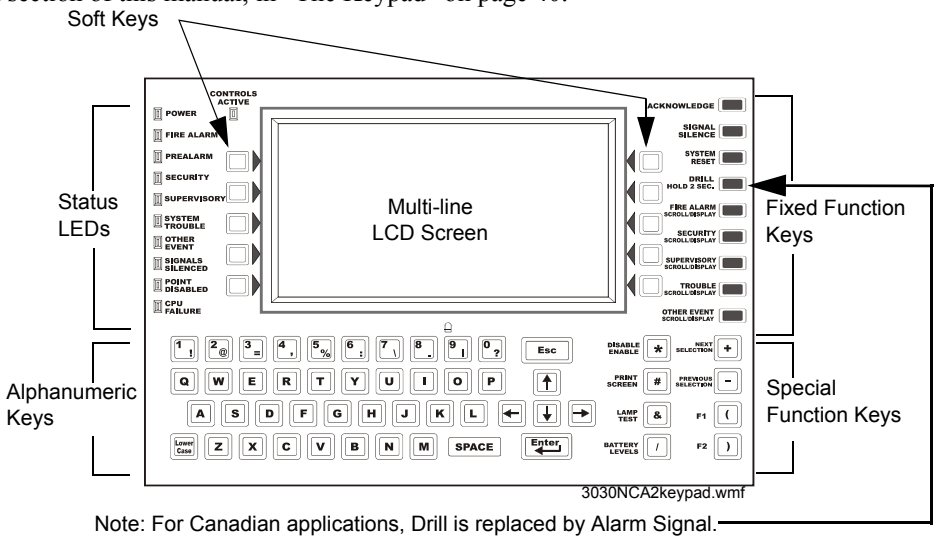


Figure 2.6 The NCA-2 Keypad

2.6 NCA-2 Components

2.6.1 NCA-2 Basic Components

The NCA-2 assembly includes the following components: NCA-2 motherboard, QWERTY keypad with LCD display, and NUP communications cables (#75577) used when connecting the NCA-2 to other NUP-compatible devices.

2.6.2 EIA-232 Optional Devices

The NCA-2 supports the following optional printer and display devices: PRN series printers and Keltron printer connecting to the NCA-2 via EIA-232 interfaces.

PRN Series Printer. This is an 80-column, 9" x 11" tractor-feed printer that can be located up to 50 feet (15.24 m) from the Fire Alarm Control Panel (FACP). The PRN series prints a record of all system events and status changes within the network monitoring system. It also time-stamps the printout with the current date and time.

Keltron Printer. The VS4095 is a two-color (red/black), 40-column, 24 VDC printer that mounts in a separate cabinet next to the FACP. The VS4095 meets UL fire and security requirements for an ancillary device.

NOTE: Refer to the appropriate manual for detailed information on any of the above EIA-232 devices.

2.6.3 EIA-485 Annunciator Devices

The NCA-2 can be used to monitor annunciator devices and Annunciator Control System (ACS) modules. ACS modules connect to the NCA-2 using an EIA-485 ACS Mode connection. The NCA-2 can support up to 32 annunciator devices. ACS devices use LED arrays to show the status

of points or zones within the network monitoring system. Annunciator points are programmable from the NCA-2 interface. The following annunciator modules (and their corresponding expander modules) are supported by the NCA-2:

ACM-8R. The Annunciator Control Module-8R provides the control panel with a mappable relay control module. Relays can be selected for mapping anywhere in the system memory (in groups of eight). The ACM-8R provides eight Form-C relays with 5A @125 VAC (resistive) or 5A @30 VDC (resistive) or 2A @125 VAC (inductive) contacts. It tracks any group of eight zones within the system.

ACM-16AT and AEM-16AT. The Annunciator Control Module-16AT has 16 red alarm and 16 yellow trouble LEDs. The Annunciator Expander Module-16AT expands the ACM-16AT by 16 annunciator points. Up to three of these expander modules can be supported by an ACM-16AT, for a maximum of 64 annunciator points.

ACM-24AT and AEM-24AT. The Annunciator Control Module-24AT has 24 color programmable on/alarm LEDs (set to red, green, or yellow) and 24 yellow trouble LEDs. An ACM-24AT can support up to three Annunciator Expander Modules (AEM-24AT) for a maximum of 96 points.

ACM-32A and AEM-32A. The Annunciator Control Module-32AT has 32 red alarm LEDs and a system trouble LED. The Annunciator Expander Module-32A expands the ACM-32A by 32 annunciator points, for a maximum of 64 points.

ACM-48A and AEM-48A. The Annunciator Control Module-48A has 48 color programmable on/alarm LEDs (set to red, green, or yellow). The corresponding expander module expands the ACM-48A by 48 points for a maximum of 96 points.

LDM-32 and LDM-R32. The Lamp Driver Annunciator Module-32 provides 32 alarms or 16 alarm and 16 trouble lamp driver outputs, corresponding to 32 annunciator points that can be connected to external devices like custom graphic annunciators. The Lamp Driver Annunciator Module expander module expands the LDM-32 by 32 annunciator points, for a maximum of 64 points.

SCS-8 and SCE-8. The Smoke Control Station (SCS-8) module uses eight groups of four annunciator points for fan shutdown control or other heating, ventilation or air conditioning functions. The Smoke Control Expander (SCE-8) module expands the SCS-8 by eight groups of four annunciator points.

SCS-8L and SCE-8L. The Smoke Control Lamp Driver Station (SCS-8L) module uses eight groups of four annunciator points for fan shutdown control or other heating, ventilation or air conditioning functions. The SCS-8L must be mounted in a custom graphic annunciator panel. The Smoke Control Expander (SCE-8L) is used to expand the SCS-8L by eight groups of four annunciator points.

UDACT and UDACT-2. The Universal Digital Alarm Communicator/Transmitters transmit system status to UL listed Central Station Receivers via the public switched telephone network.

TM-4. The Transmitter Module provides a means for an FACP to control Alarm, Trouble and Supervisory reverse polarity outputs (15mA, 24VDC nominal) or a Fire Municipal Box Trip output. All output circuits are supervised. The TM-4 mounts easily in standard module locations within the cabinet or external boxes. Refer to the Transmitter Module TM-4 installation document for further information and installation instructions.

NOTE: For details on any of the above annunciator modules, refer to the appropriate manual.

2.6.4 Other Optional Devices

NCM-W and NCM-F. The network communications module provides a means for connecting specific control panels to a standard NOTI•FIRE•NET™. There are two types of network communications modules available: NCM-W for connecting nodes with twisted pair wire and NCM-F for connecting nodes with fiber-optic cable. A network communications module is required when networking the NCA-2.

HS-NCM-W/MF/SF/WMF/WSF/MFSF. A high-speed network communications module provides a means for connecting specific control panels to a high-speed network. There are two categories of modules available for this purpose: wire versions for connecting nodes with twisted-pair wire, and fiber versions for connecting nodes with fiber-optic cable. A network communications module is required for networking the NCA-2. High-speed modules may also be used as network repeaters, extending the communication distance between nodes on a high-speed network.

VeriFire® Tools. VeriFire® Tools is an off-line programming and test utility that is Windows® based. The installer can create the program for a control panel from any PC running the VeriFire® Tools software, test the program, store a backup file, then bring it to the site and download from a laptop into the panel. VeriFire® Tools can also be used to create a custom graphic for the main screen of the NCA-2.

NCS Network Control Station. The NCS is a PC application with text and graphics display capability of all network events and points. It is compatible with release 5.0 and higher of a standard NOTI•FIRE•NET™ system.

ONYXWorks Workstation. This workstation provides a PC-based graphical interface for monitoring and controlling activity of multiple nodes on a network. It allows the user to program network nodes, display network information, and display the network in desirable groups of nodes. Compatible with standard and high-speed networks.

LCD-160 Display. The LCD-160 is a remote display that can mimic the top half of the panel's display, or display custom messages or graphics. It has the capability to store character sets for multiple languages.

LCD-80 Display. The LCD-80 is a remote alphanumeric display module that, when set to terminal mode, operates as a simplified version of this panel's display, with Acknowledge, Signal Silence, and Reset.

LCD2-80 Display. The LCD-80 is a remote alphanumeric display module that operates as a simplified version of this panel's display, with Acknowledge, Signal Silence, Reset, Drill, and Lamp Test.

UZC-256. The Universal Zone Coder is a circuit board, used for NAC coding applications, that provides three NAC output circuits and up to 256 zone codes. Refer to the *UZC-256 Universal Zone Coder* and *UZC-256 Programming manuals* for further information and installation instructions.

STS-1. A Security Tamper Switch can be connected to the NCA-2 and installed in its cabinet (e.g., CAB-4 series backbox). The STS-1 can then be used to monitor the door and indicate a door tamper condition whenever the door is opened.

RKS-1. The Remote Key Switch provides external access security for the control switches on the NCA-2.

AKS-1B. The Annunciator Keyswitch enables/disables the NCA-2 keypad.

Section 3: Installation

3.1 Preparing for Installation

Choose a location for the NCA-2 that is clean, dry, and vibration-free with moderate temperature. The area should be readily accessible with sufficient room to easily install and maintain it. There should be sufficient space for cabinet door(s) to open completely.

Carefully unpack the system and inspect for shipping damage. Count the number of conductors needed for all devices and find the appropriate knockouts. (Refer to Section 3.13 “UL Power-limited Wiring Requirements” for selection guidelines.)

Before installing the fire alarm system, read the following:

- Review the installation precautions at the front of this manual.
- Installers should be familiar with the standards and codes specified in Section 1.1 “Standards and Specifications”.
- All wiring must comply with the National and Local codes for fire alarm systems.
- Do not draw wiring into the bottom 9 inches (22.86 cm) of the cabinet except when using a separate battery cabinet; this space is for internal battery installation.
- Review installation instructions in Section 3.2 “Installation Checklist”.

WARNING: Risk of irreparable equipment damage
Make sure to install system components in the sequence listed below. Failure to do so can damage the control panel and other system components.

WARNING: Risk of irreparable equipment damage
Wear a static discharge strap on wrist to prevent equipment damage.

3.2 Installation Checklist

The checklist that follows contains references to information included in other manuals; see Section 1.4 “Related Documentation” for document part numbers.

	Task	Refer to:
1.	Mount the cabinet backbox to the wall.	Section 3.3 “CAB-4 Series Cabinet” and Section 3.4 “ABS-2D, ABS-4D Cabinets”
Note: For Canadian Applications, only the ABS-2DC and ABS-4DC backboxes and the CAB-4 Series Cabinets are approved for NCA-2 installation.		
2.	Attach NCA-2 to chassis	Section 3.4 “ABS-2D, ABS-4D Cabinets”, Section 3.5 “CHS-M3 Chassis”, and Section 3.6 “CA-2 Chassis Assembly”
3.	Attach option boards (e.g. network communications modules and other devices of the same size) to chassis.	• Section 3.5.4 “Option Boards” and Section 3.4 “ABS-2D, ABS-4D Cabinets” • Installation document for the specific device
4.	Complete backbox/chassis mounting.	Section 3.4 “ABS-2D, ABS-4D Cabinets”, Section 3.5 “CHS-M3 Chassis”, and Section 3.6 “CA-2 Chassis Assembly”
5.	Wire Relays	Section 3.9 “Form-C Relays” on page 28
6.	Attach & wire other system components	
	☐ Digital Voice components	*Digital Voice Control Manual,* etc.
	☐ Annunciators and other ACS devices	*ACS Manual*, etc.
	☐ Remote Data Port devices	*LCD-160 Manual, LCD-80 Manual (Terminal Mode)*
	☐ Printer or other output device(s)	Section 3.14 “Installing Printers”
	☐ Network devices	*Noti•Fire•Net Version 5.0 & Higher Manual*, or *High-Speed Noti•Fire•Net Manual* and/or Installation document for specific device(s)
7.	Calculate the proper battery rating.	Main Power Supply Manual
8.	Install main power supply & batteries. Run cable to main & optional power supplies, DC power outputs, relays, etc.	Section 3.12 “Connecting Power Sources and Outputs” Section 3.13 “UL Power-limited Wiring Requirements”
	WARNING: Do not activate power at this time. Do NOT connect batteries.	
	☐ Main power supply.	Main Power Supply Manual *BB-100/200 Cabinet Installation Instructions*
9.	Check that all mounting holes are secured to insure a proper Earth Ground connection.	
10.	Connect wire shielding to Earth Ground.	
11.	Remove insulator from lithium battery on NCA-2.	Section 3.5.3 “Memory-Backup Battery”
12.	Apply AC power to the control panel by placing the external circuit breaker to the ON position. **Do NOT connect batteries until AC power is checked (see next step).**	
13.	Check AC power.	Section 3.12.3 “Checking AC Power”
14.	Connect the batteries using interconnect cable as described in power supply manual.	
15.	Install the dress panels, doors and covers.	CAB-3/CAB-4 Series Cabinet Installation Document
16.	Program the NCA-2.	Section 5, “Programming”, on page 63
17.	Field test the system.	

Table 3.1 Installation Checklist

3.3 CAB-4 Series Cabinet

This section provides instructions for mounting the CAB-4 Series backbox to a wall. Follow these guidelines when mounting the backbox:

Locate the cabinet backbox on a surface that is in a clean, dry, vibration-free area. The top should be located so that all operational buttons, switches, displays, etc. are easily accessible and/or viewable to the operator - usually no more than 66 inches (1.7m.) above the floor. Allow sufficient clearance around the cabinet for the door to swing freely, and for easy installation and maintenance of equipment.

- Use the four holes in the back surface of the backbox to provide secure mounting (See Figure 3.1).
- Mount the backbox on a surface that is in a clean, dry, vibration-free area.

CAUTION:
Unless you are familiar with the placement of components within this backbox, only use the knockout locations provided for conduit entry.

Follow the instructions below.

1. Mark and pre-drill holes for the top two keyhole mounting bolts.
2. Select and punch open the appropriate knock-outs. (For selection guidelines, see Section 3.13 “UL Power-limited Wiring Requirements”.)
3. Using the keyholes, mount the backbox over the two screws.
4. Mark the location for the two lower holes, remove the backbox and drill the mounting holes.
5. Mount the backbox over the top two screws, then install the remaining fasteners. Tighten all fasteners securely.
6. Feed wires through appropriate knockouts.
7. Install NCA-2 and other components according to this section, before installing hinges and door (see *CAB-3/CAB-4 Series Cabinet Installation Document).*

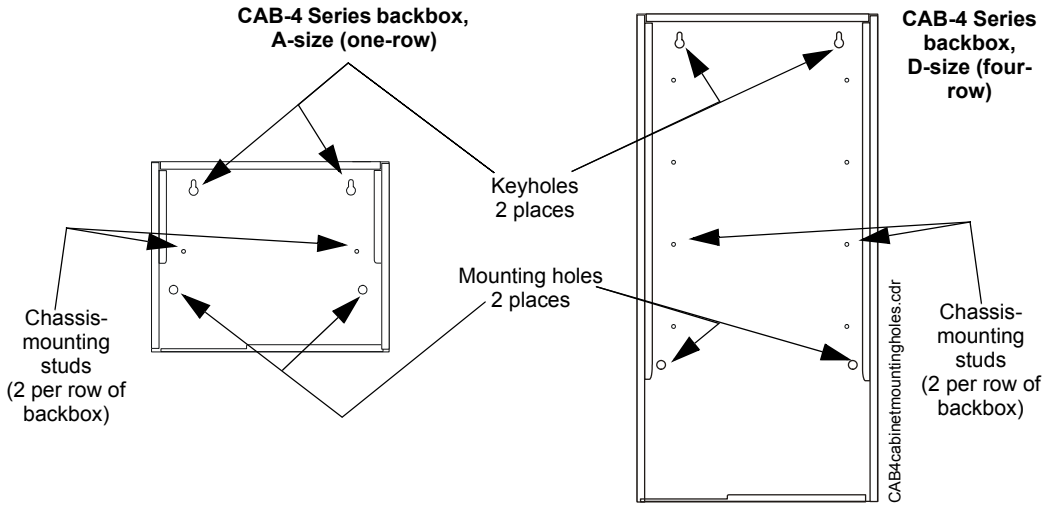
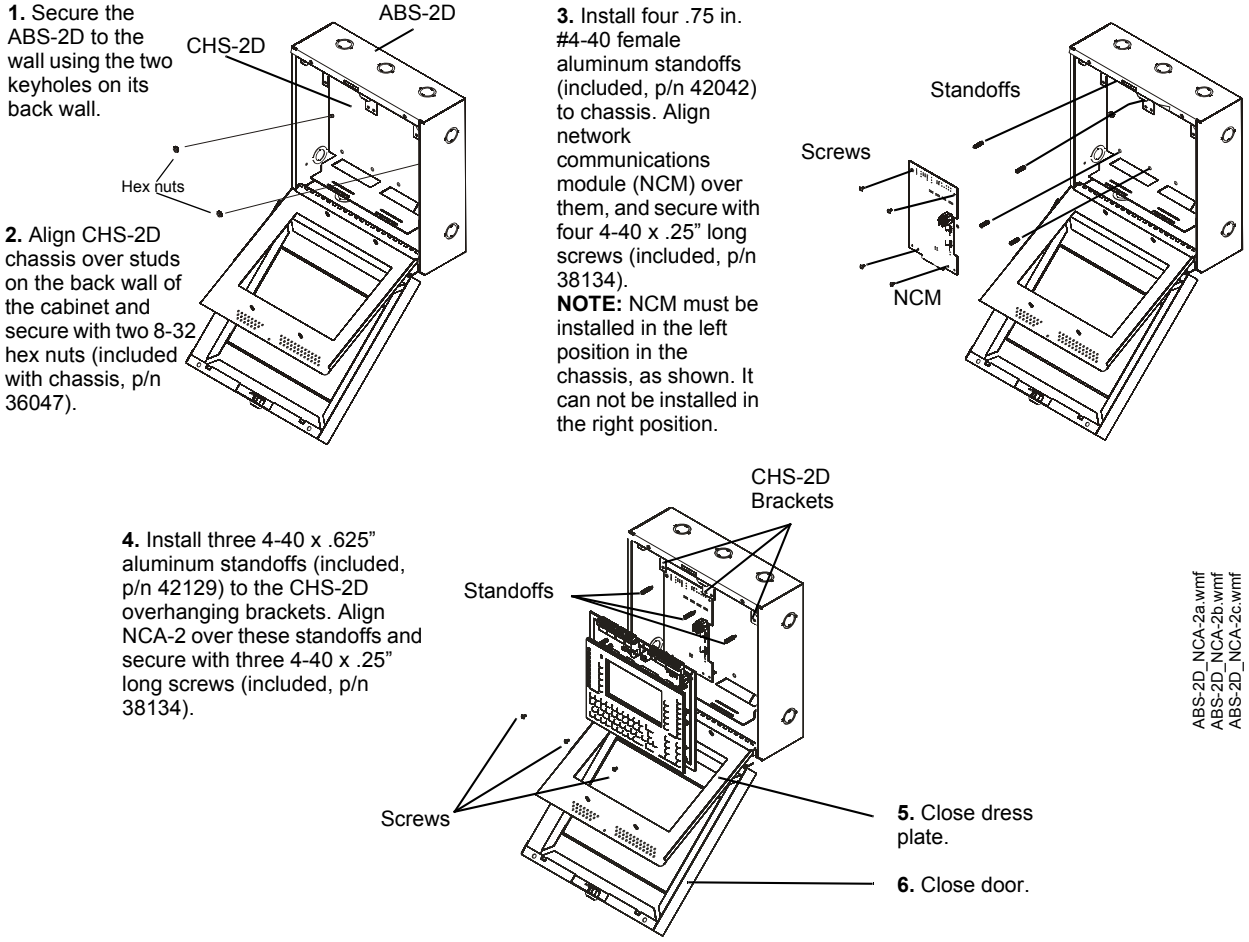


Figure 3.1 Backbox-Mounting Holes and Chassis-Mounting Studs

3.4 ABS-2D, ABS-4D Cabinets

ABS-2D

To mount an NCA-2 in an ABS-2D cabinet, follow the directions in the illustration below.



NOTE: When installing a fiber connection network control module, use the CHS-RL-MP chassis Refer to the *CHS-RL-MP Product installation Document* for additional information.

Figure 3.2 NCA-2 Mounting in ABS-2D Cabinet

ABS-4D

An NCA-2 Retro Kit will be required to mount the NCA-2 in an ABS-4D cabinet. Refer to the NCA-2 Retro Kit Product and ABS-4D Installation Documents for installation instructions. Note that the NCA-2 must be mounted in the center position of the ABS-4D, and blank plates or modules must surround it.

3.5 CHS-M3 Chassis

3.5.1 Layout

The NCA-2 mounts in chassis CHS-M3 in the top row of the cabinet. The NCA-2 occupies the left half of the chassis (positions 1 and 2, see Figure 3.3).

Positions 3 and 4 of CHS-M3 can hold up to four layers of equipment including annunciators and option boards. See Figure 3.4 for possible configurations of these four layers.

The BMP-1 Blank Module Plate covers unused positions and also provides a location to door-mount some option boards (see *BMP-1 Product Installation Drawing* for details).

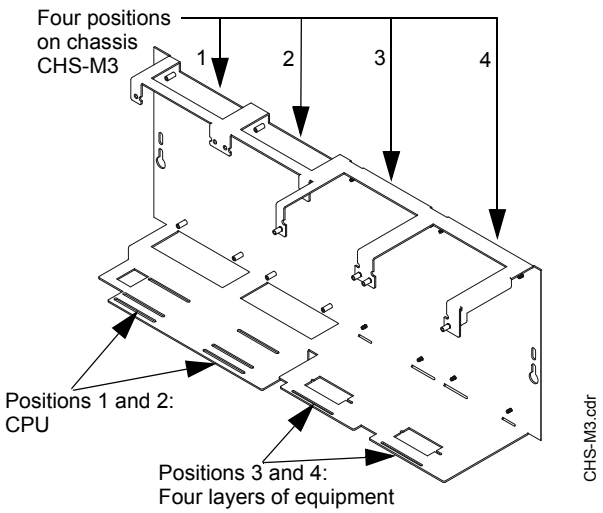


Figure 3.3 Chassis CHS-M3

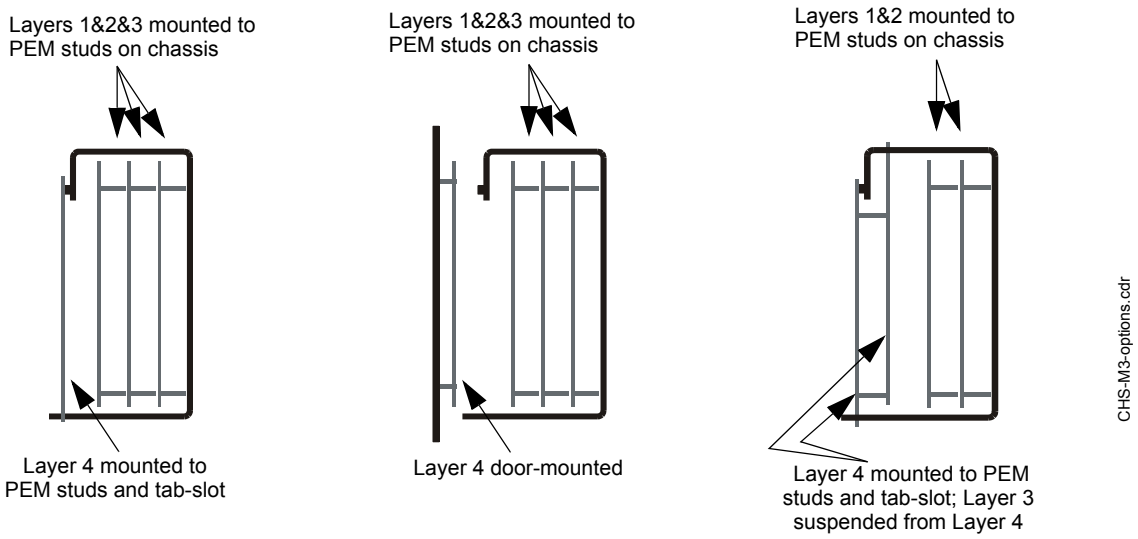


Figure 3.4 Configuring Equipment in Chassis Positions 3 and 4 of CHS-M3 (Side View)

3.5.2 NCA-2 Mounting

Mount NCA-2 into positions 1 and 2 of CHS-M3 as follows; equipment may be mounted to the chassis before or after the chassis is mounted in the backbox.

1. Attach three 1-15/16” (4.92 cm) aluminum male/female 4-40 standoffs (P/N 42076, included with NCA-2) to chassis as shown in Figure 3.5.
2. Slide circuit-board tabs into slots on chassis as shown in Figure 3.5.
3. Place the board over the stand-offs so that mounting holes line up with those on the chassis. Secure all stand-offs with 4-40 screws provided (P/N 38134).

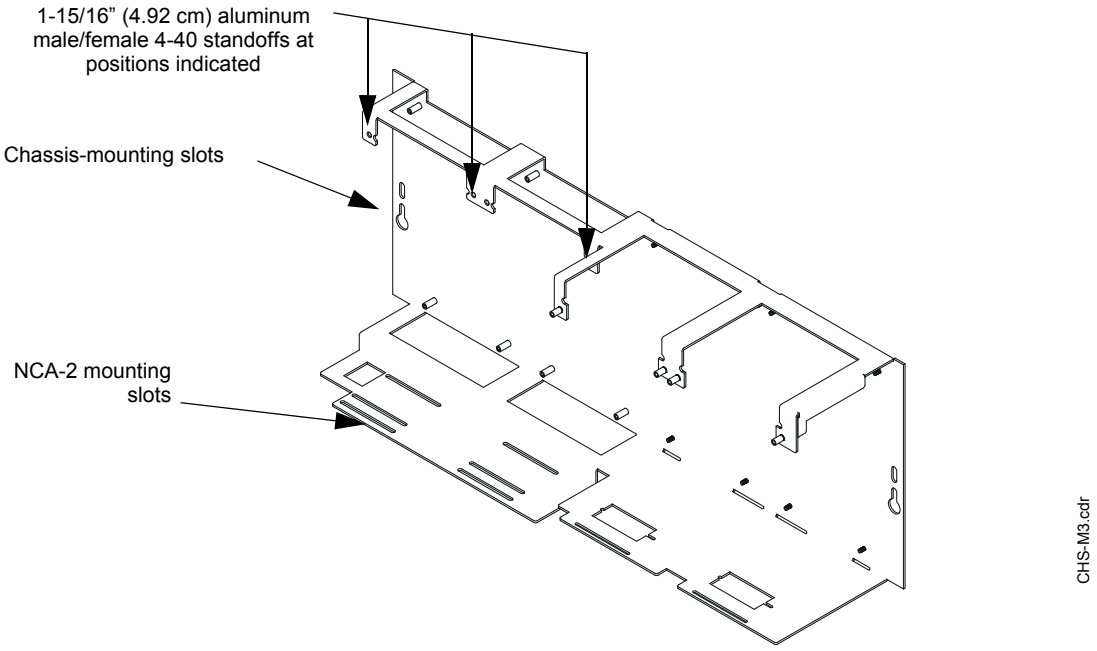


Figure 3.5 Standoffs on Chassis CHS-M3

CAUTION:
It is critical that all mounting holes of the NCA-2 are secured with a screw or stand-off to insure continuity of Earth Ground.

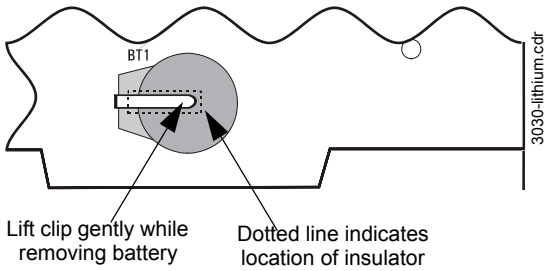
Mounting Chassis in Backbox

Align chassis-mounting slots with chassis-mounting studs (see Figure 3.1 and Figure 3.5 for locations). Secure with nut & lock-washer provided with chassis.

3.5.3 Memory-Backup Battery

The lithium battery on the CPU provides backup of the NCA-2’s on-board memory during power loss. The NCA-2 ships with an insulator to prevent the battery from discharging. To preserve the battery, the insulating tube should be left in place as long as possible before applying AC power.

If the insulator is *not* removed before applying AC power, the control panel will show a trouble situation.



This battery’s shelf-life should exceed 10 years, but if for some reason it fails, the control panel will show a trouble when powered up. To replace the lithium battery (P/N 31004, RAYOVAC Lithium 3V BR 22335):

1. Make a full backup of all system settings to prevent loss of all programming data.
2. Disconnect all power sources.
3. Disconnect wiring and remove NCA-2 from backbox (3 screws at top, lift board tabs out of slot) and remove keypad (4 screws on back, LCD display stays attached).

4. Remove battery from under clip (use fingers, because screwdriver could damage components) and insert new battery.

CAUTION:
The battery used in this device may present a risk of fire or chemical burn if mistreated. Do not recharge, disassemble, heat above 212°F (100°C), or incinerate. Replace battery with Notifier P/N 31004 only. Use of another battery may present a risk of fire or explosion.

5. Replace keyboard, reinstall NCA-2 into chassis, and reconnect wiring.
6. Follow system power-up procedures.
7. Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

3.5.4 Option Boards

If installing option boards on the CHS-M3, connect them at this time. As described in Section 3.5.1 "Layout", up to eight option boards can be mounted in CHS-M3 to the right of the NCA-2.

There are no slots in the first (back) two layers, but option boards with tabs (such as NCM-W) will still fit in those positions.

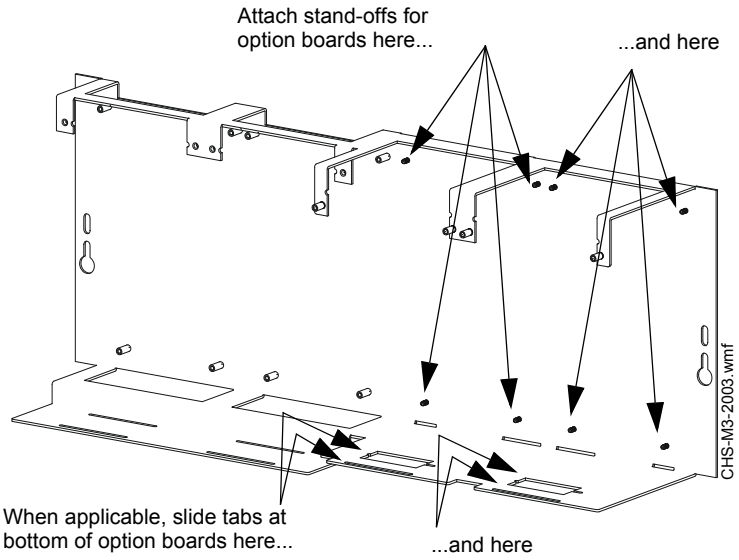


Figure 3.6 Mounting Option Boards in CHS-M3

Mounting Procedures

1. Install four 1 inch (25.4 mm) female stand-offs onto the chassis (P/N 42040, included with chassis) as shown in Figure 3.6.
2. Place the first option board over the stand-offs so that holes line up.
3. If no more option boards will be mounted in that position, securely fasten all stand-offs with screws (provided with module). If mounting a second or third option board, attach another layer of stand-offs and repeat steps 2-3. **Note:** Set the switches on an option board before mounting another layer in front of it.
4. For the top (fourth) layer of option boards, slide the tab at the bottom of the board into the slots on the chassis, and lay the board back onto the top of the chassis so that the studs line up with mounting holes on the option board. Securely fasten all stand-offs with screws provided with module.

3.6 CA-2 Chassis Assembly

The NCA-2 will mount into a CA-2 chassis assembly - along with a DVC-EM, microphone and optional telephone handset - as part of an audio command center installation.

The CA-2 is a two-row assembly consisting of

- a back plate that attaches to the backbox
- two half-chassis, each of which takes up the left half of a backbox row
- a microphone and telephone handset well
- a microphone.

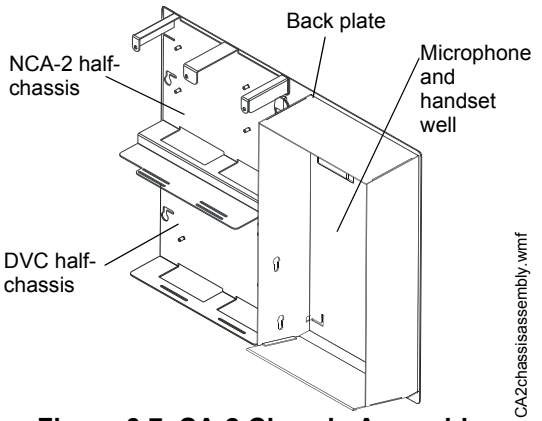


Figure 3.7 CA-2 Chassis Assembly

The NCA-2 mounts in the upper left corner. (Refer to Figure 3.7 and Figure 3.8.) Mount the NCA-2 to its half-chassis without removing the half-chassis from the back plate. Refer to “Memory-Backup Battery” on page 25 for removal of insulator.

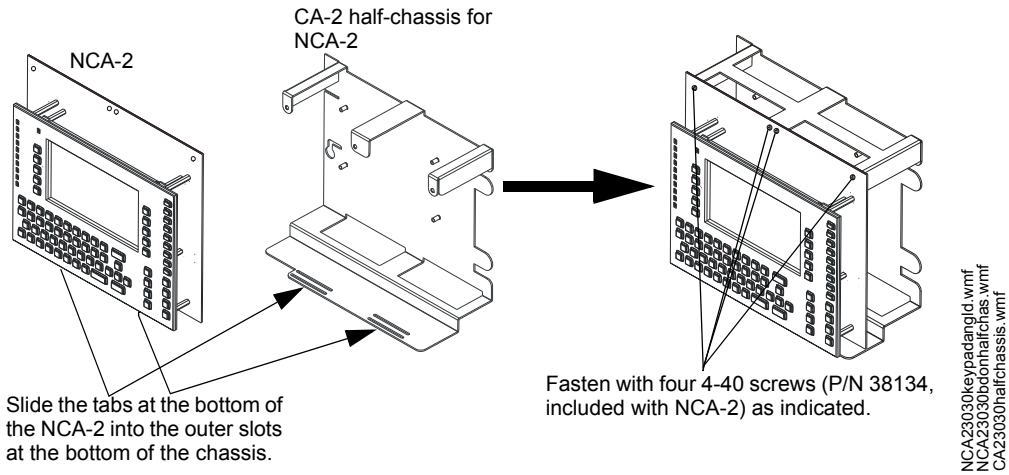


Figure 3.8 Mounting the NCA-2 onto the CA-2 Half-chassis

Refer to the *DVC Manual* and CA-2 product installation document for installation of the DVC-EM, microphone and handset into the CA-2.

3.7 NCA-2 / NFS2-640 Standalone

The NCA-2 may be mounted over a displayless NFS2-640 using the hardware from attachment kit p/n NCA/640-2-KIT. Refer to Figure 3.9.

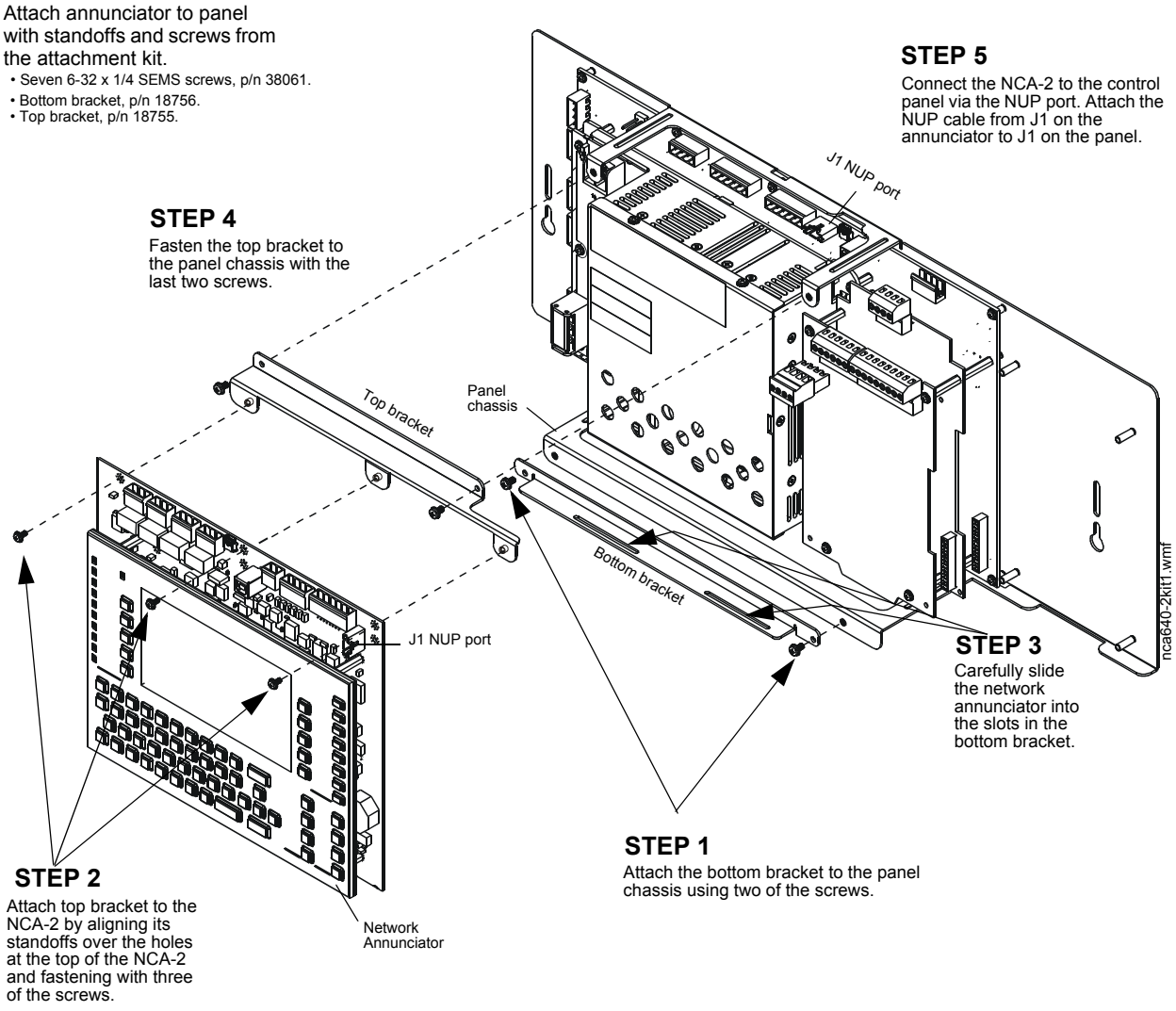


Figure 3.9 NCA-2 on a Displayless Panel

3.8 Retrofits

The NCA-2 RETRO kit provides hardware to change the footprint of an NCA-2 to fit on older dress panels. Refer to the *NCA-2RETRO Production Installation Document*.

3.9 Form-C Relays on the NCA-2

The panel provides a set of Form-C relays. These are rated for 2 A at 30 VDC (resistive):

- Alarm - TB4
- Trouble - TB3
- Supervisory - TB2
- Security - TB1

The Supervisory and Security contacts can also be configured as Alarm contacts by setting switches SW1 and SW2 away from the factory default positions shown in Figure 3.10.

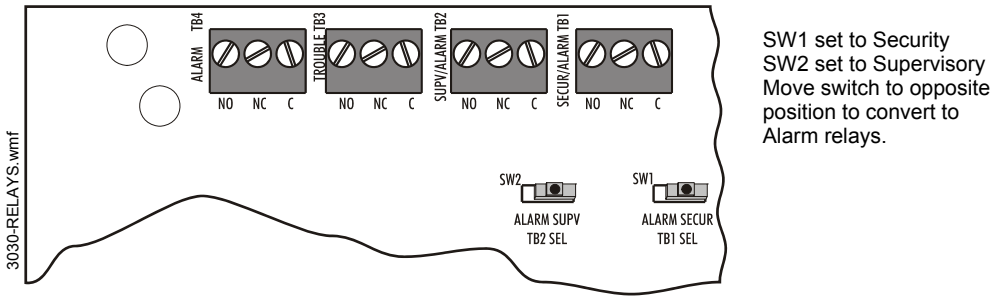


Figure 3.10 Form-C Relay Connections

3.10 Network Communications Module

Standard Network Communications Module, NCM-W/F

If networking two or more control panels on a standard NOTI•FIRE•NET™ (including NCA-2s):

- One standard network communications module is required per NOTI•FIRE•NET™ node.
- Do not share a network communications module with an NCA-2 and an FACP.
- Do not connect two network communications modules together via NUP ports (NUP to NUP).

High-Speed Network Communications Module, HS-NCM-W/SF/MF/WSF/WMF/MFSF

If networking two or more control panels on a High-Speed NOTI•FIRE•NET™ (including NCA-2s)

- One high-speed network communications module may be used for up to two nodes.
- Do not connect two network communications modules together via NUP ports (NUP to NUP).

Installation

The standard or high-speed network communications module can be installed in the CHS-M3 immediately to the right of the main circuit board.

It can also be installed in a CA-2 behind the DVC-EM, as described in the *DVC Digital Voice Command*. Note that if your network is not high-speed, two network communications modules are necessary - one each for the NCA-2 and the DVC - so the second NCM-W/F must be installed in a separate chassis within the cabinet. (A DAA chassis provides a slot for a network communications module to the right of the DAA board. Refer to the *DVC manual*.)

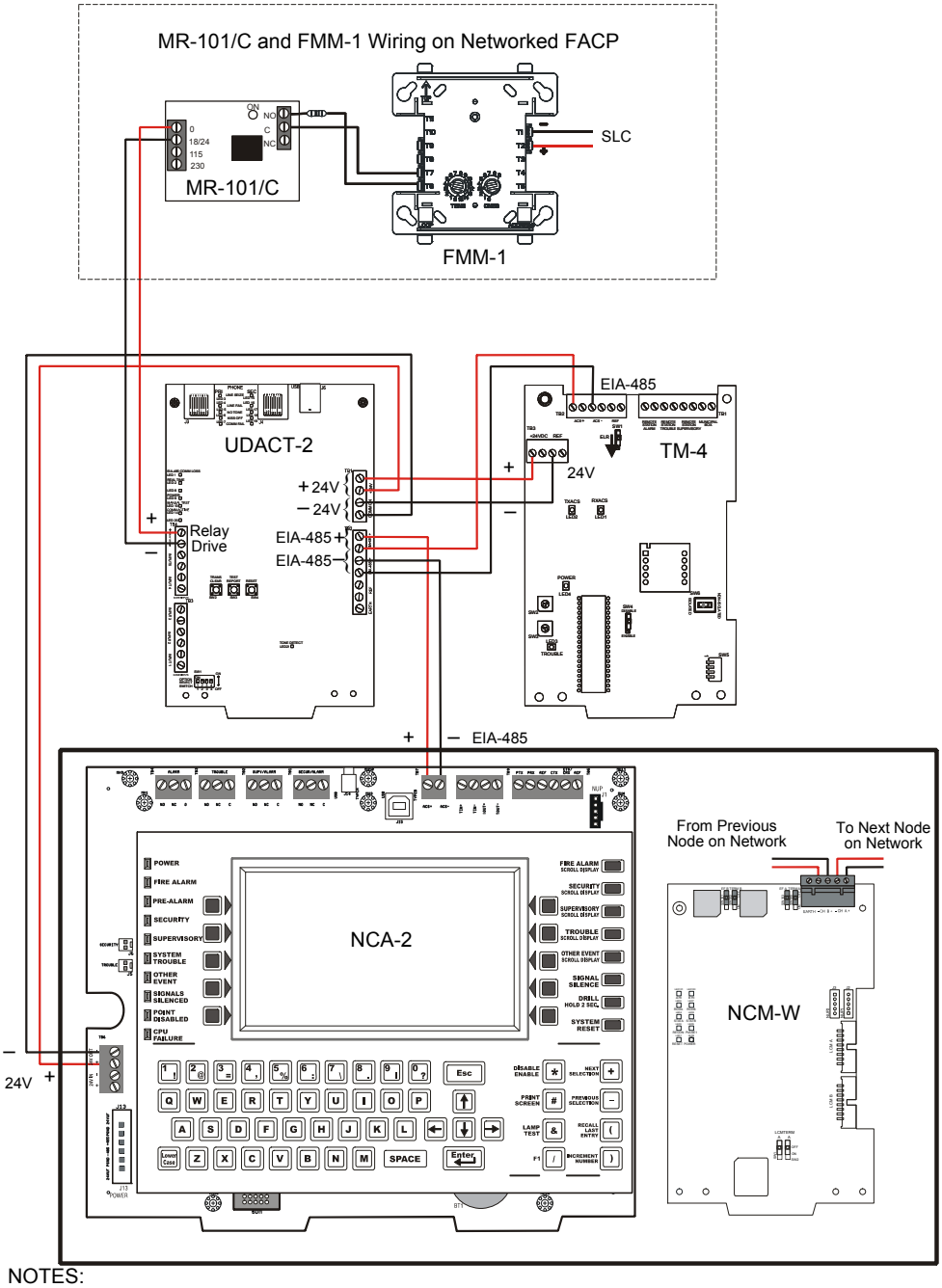
See the *NOTI•FIRE•NET™ Manual* and *NCM Installation Document* or *High-Speed NOTI•FIRE•NET™ Manual* and *High-Speed NCM Installation Document* for system configuration information.

1. Mount the module in the selected position. If another board is going to be mounted in the slot immediately in front of it, use stand-offs to secure it in place. Otherwise use the screws provided.
2. Connect J1 on the NCA-2 (Figure 2.5 on page 16) to J2 or J3 on the standard network communications module (whichever is closest) or to J6 on the high-speed network communications module, using the network cable provided (P/N 75556). Do not connect two network communications modules via NUP ports (aka NUP to NUP).
3. Connect Channel A and/or Channel B as described in the appropriate Network Control Module installation document.

See the BMP-1 Product Installation Drawing if considering mounting the module (wire version) behind a blank module plate in a dress plate or annunciator backbox.

3.11 Central Station Fire Alarm System Canadian Requirements

For Canadian applications requiring a second dial-out option, refer to the following illustration for UDACT/UDACT-2 and TM-4 setup:



NOTES:

- Drawing is not to scale.
- The UDACT/UDACT-2 should be set for “Receive Only” for this configuration. For additional UDACT/UDACT-2 setup information, refer to the *UDACT Installation Manual*. or *UDACT-2 Instruction Manual*.
- This illustration is show with the NCM-W. For other NCM or HS-NCM setup, refer to the *NCM Installation* or *HS-NCM Installation* documents.
- For additional setup information on the TM-4, refer to the *TM-4 Instruction Manual*.

Figure 3.11 Central Station Canadian Requirements for Second Dial-Out Connection

3.12 Connecting Power Sources and Outputs

WARNING:
Remove all power sources to equipment while connecting electrical components. Leave the external, main power breaker OFF until installation of the entire system is complete.

WARNING:
Several sources of power can be connected to the control panel. Before servicing the control panel, disconnect all sources of input power *including the battery*. While energized, the control panel and associated equipment can be damaged by removing and/or inserting cards, modules, or interconnecting cables.

3.12.1 Overview

Complete all mounting procedures and check all wiring before applying power. Electrical connections include the following:

- **Primary power source.** +24VDC, delivered through:
  - AMPS-24/AMPS-24E main power supply. If AMPS-24/E is mounted in a separate cabinet, power-supply wiring must be in conduit (for cabinet placement information see the AMPS-24/E manual.
  - the NFS2-640 or NFS-320 on-board power supply.
  - a *supervised* +24VDC power supply that is UL/ULC-listed for fire protective service.
- **Secondary power source.** +24 VDC from batteries, installed in the cabinet with the NCA-2's power supply (or in an optional battery cabinet). Secondary (battery) power is required to support the system during loss of primary power.
- **Accessory power for peripheral devices.** When the NCA-2 is not powered by the NFS2-640, TB6 can be used to supply +24 VDC power to devices within the same enclosure as the NCA-2. If those devices have outputs, the outputs must be power-limited (Class 2).

NOTE: The NCA-2 ships with an insulator to prevent its lithium battery from discharging. To preserve the battery, this insulator should be left in place as long as possible before applying AC power. Refer to "Memory-Backup Battery" on page 25. Some installers may find it convenient to remove the insulator before mounting all equipment.

NOTE: If using multiple power supplies with one set of batteries, refer to main power supply manual for connection requirements.

NOTE: Use 0 (zero) ohm impedance when testing wire-to-wire faults.

3.12.2 Connecting the Power Supply

AMPS-24/E

Connect J13 Power on the NCA-2 to MAIN 24V connection on AMPS-24/E with Cable 75637 (see Figure 3.12). This cable is 20 feet long, and must run in conduit between the backbox containing the fire alarm control panel and the backbox containing the AMPS-24/E. See AMPS-24/E manual for full details and installation precautions.

In order to conserve batteries, connect AC power and check it before connecting batteries. Follow the procedures specified in the power supply manual.

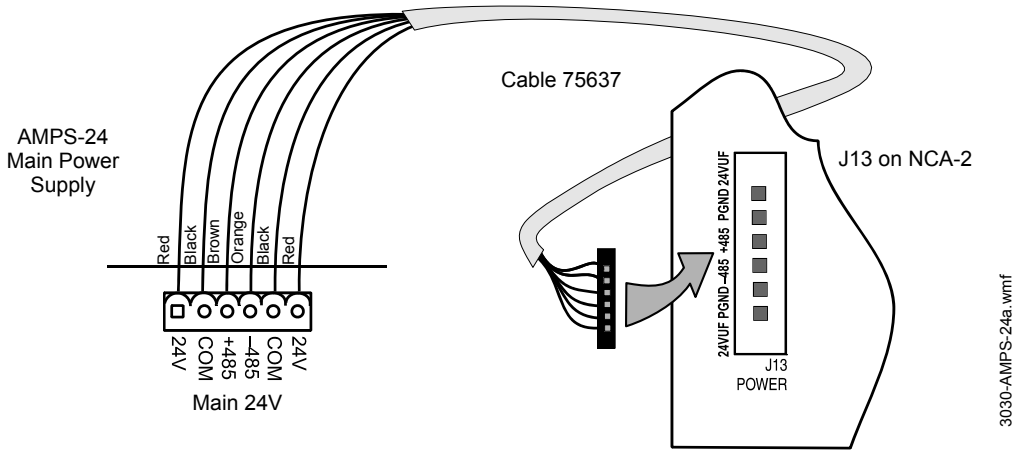


Figure 3.12 DC Power Connections: Main Power Supply

NFS2-640 or NFS-320 Power Supply

To power the NCA-2 using the NFS2-640 or NFS-320, make the power connections according to Figure 3.13. Set NCA-2 power-supply supervision to the NFS2-640 or NFS-320 node number, as described in Section 5.5.7 “Supervision”.
Note that the NCA-2 will report AC power failure from the NFS2-640 or NFS-320 power supply.

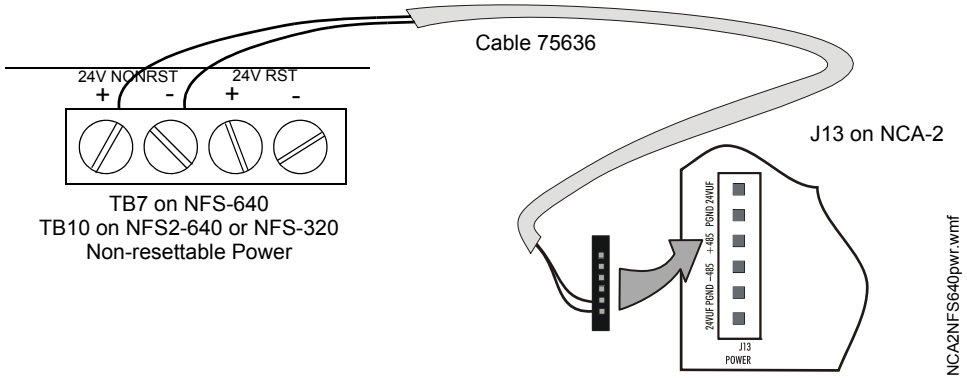


Figure 3.13 Connecting Power from the NFS2-640

3.12.3 Checking AC Power

Table 3.2 contains a checklist for checking the system with AC power applied to the main power supply:

CAUTION:
While checking AC power, make sure batteries are not connected.

Component	Status
NCA-2	The green Power indicator will come on when power is coming from the main power supply. The yellow Trouble indicator will come on until batteries are connected.
Main power supply	The green AC indicator will come on when AC is supplied. The yellow Trouble indicator will come on until batteries are connected.

Table 3.2 AC Power Checklist

3.12.4 Power Considerations When Servicing

When servicing the NCA-2, perform the following steps before removing or connecting any power or supervisory cables:

- Remove battery/secondary power.
- Remove AC power.
- Wait 60 seconds.
- Remove all EIA-485 connections.

WARNING:
Several different sources of power can be connected to the NCA-2. Disconnect all sources of power before servicing. This device and associated equipment may be damaged by removing and/or inserting cards, modules or interconnecting cables while this unit is powered. This damage may adversely affect the operation of this control unit, but its effect may not be readily apparent.

3.13 UL Power-limited Wiring Requirements

Power-limited (Class 2) and non-power-limited circuit wiring must remain separated in the cabinet. All power-limited circuit wiring must remain at least 0.25 inches (6.35 mm) from any non-power-limited circuit wiring. All power-limited and non-power-limited circuit wiring must enter and exit the cabinet through different knockout and or conduits. To maintain separations easily, it is recommended that non-power-limited modules are grouped together. For example, use a separate row or designated side of the enclosure so that power-limited and non-power-limited wiring do not cross. Install tie wraps and adhesive squares to secure the wiring.

For a quick reference to control panel circuits, refer to Figure 2.5 at the start of this manual. The power-limiting label inside your cabinet door identifies which compatible modules have power-limited or non-power-limited wiring.

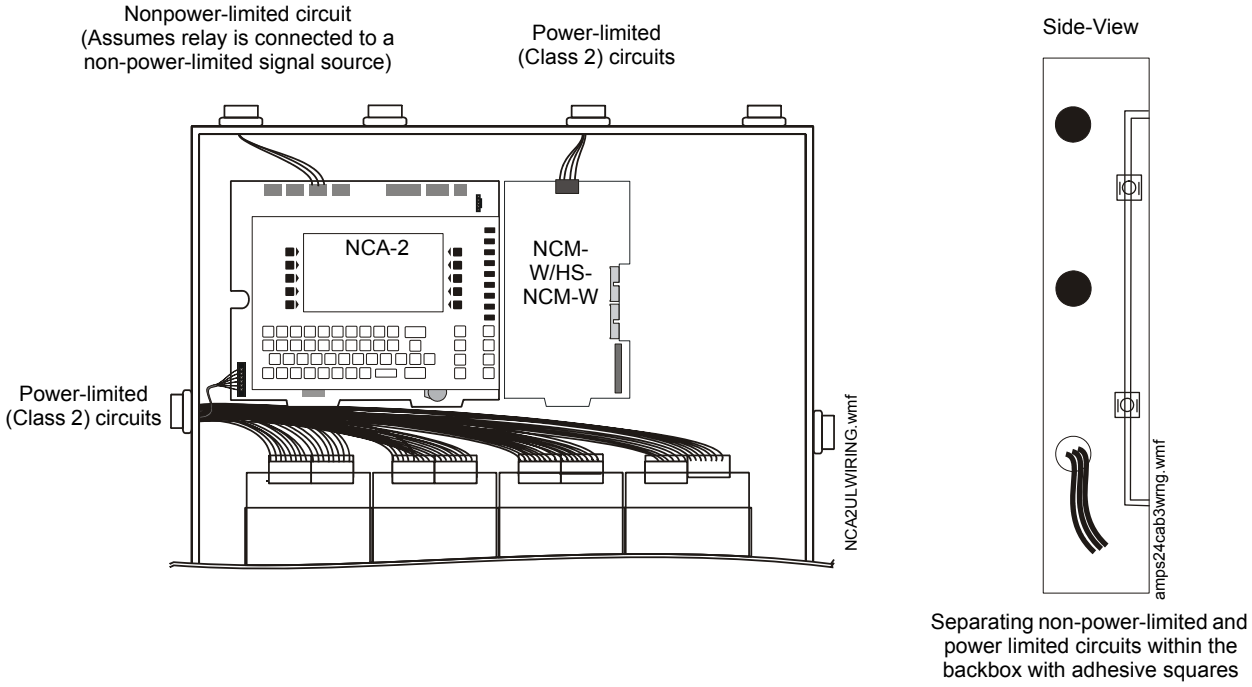


Figure 3.14 Typical Wiring in a Four-row Backbox

Some devices (such as the ACM-8R) are power-limited only when connected to power-limited sources. When one of these devices is connected to a non-power-limited source, the power-limited marking must be removed, and at the time of installation, each non-power-limited circuit connected to these modules must be identified in the space provided on the cabinet door label.

NOTE: Relays are power-limited only when connected to power-limited sources for the relay outputs.

3.14 Installing Printers

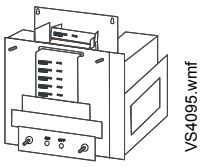
This section contains information on connecting a printer to the CPU and for setting the printer options. The basic steps are as follows:

1. Make custom cable & connect it from printer to EIA-232 terminal on the NCA-2.
2. Connect printer's power supply.
3. Configure printer settings as described in printer documentation.

■ Overview: PRN Printer

The PRN provides a printed record (80 columns on standard 9" x 11" tractor-feed paper) of all system events (alarm, trouble) and status changes within the system. The control panel can be configured to time-stamp the printout with the current time-of-day and date for each event. The equipment must be located in the same room within 20 feet (6.10 m) from the control panel. Installation and configuration instructions follow.

■ Overview: Keltron Remote Printer (Model VS4095)



The VS4095 is a two-color (red and black), 40-column, 24 VDC printer that can print up to 50 messages in 90 seconds. This printer connects to the EIA-232 TB5 on the CPU and to the +24V screw on TB3 of AMPS-24/E, and mounts in a separate cabinet next to the control panel. The VS4095 meets UL fire and security requirements for an ancillary device per UL 864, 8th Edition (Refer to "UL 864 Ninth Edition Compliance" on page 8 for more information); it is not ULC-listed. For more information on the Keltron printer, contact the manufacturer (Keltron Corp., Waltham, MA). Installation and configuration instructions follow.

NOTE: Depending on which version of the AMPS-24/E is used, the terminal block designations may differ from those listed here. Please refer to the AMPS-24/E manual if that is the case.

3.14.1 Printer Installation Sequence

1. Fabricate a custom cable to connect a printer to the system. Length of the cable will vary with each installation, but should not exceed a maximum length of 50 feet (15.24 meters). Printer must be installed in the same room within 20 feet (6.10 meters) of the panel. Using overall foil/braided-shield twisted-pair cable, properly connect one end to the DB-25 or DB-9 Connector (provided) using the wiring specifications shown in Figure 3.15.
2. Tighten clamp on connector to secure cable. Connect the four open leads of the custom cable to the TB5 terminal block on the CPU as shown in Figure 3.15.

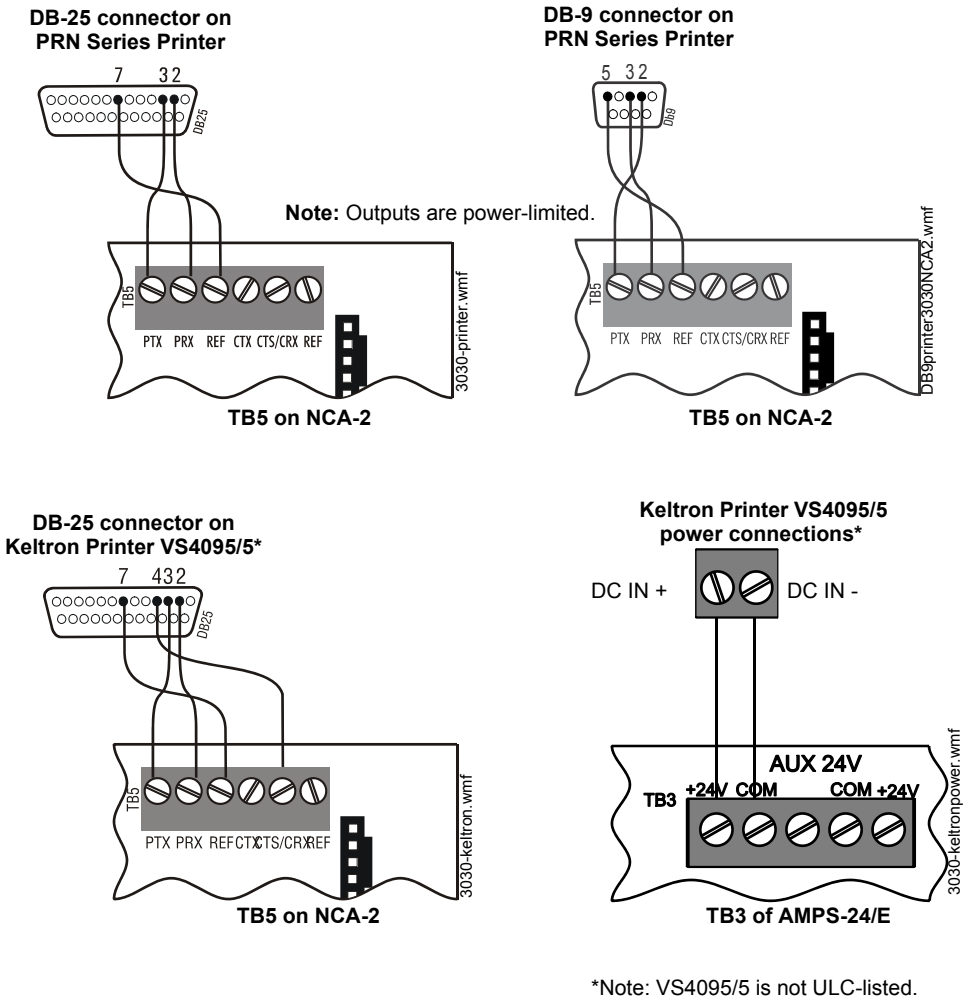


Figure 3.15 Printer Connections

3. If installing a Keltron Printer VS4095/5, connect 24 VDC non-resettable power from a UL-listed power supply to the Keltron printer as shown in Figure 3.15 (14 AWG).
4. If installing a PRN series printer, plug it into your AC power source.
   Note: The PRN series of printers require a primary AC power source. Refer to the Manufacturer's Installation Guide for additional information.
   If required for the fire alarm system configuration (for example, a Proprietary Fire Alarm System), a remote printer requires a secondary power source (battery backup). Because a secondary power source is not provided, use a separate Uninterruptable Power Supply (UPS) that is UL-listed for Fire Protective Signaling.
5. Plug the DB-25 or DB-9 connector end of the custom cable into the EIA-232 port of your printer. Tighten securely.
6. Configure the printer as described in Section 3.14.2 "Configuring the Printer".

3.14.2 Configuring the Printer

Refer to the documentation supplied with your printer for instructions on configuring your printer.

PRN Printer Settings

Set the printer options (under the menu area) according to the settings listed in Table 3.3.

Option	Setting for Printer Model	
	PRN-6 and previous models	PRN-7
L/R Adjust	0	0
Font	HS Draft	HS Draft
CPI	10 CPI	10 CPI
LPI	6 LPI	6 LPI
Skip	0.0	0.0
ESC Character	ESC	ESC
Emulate	FX-850	LQ-2550
Bidirectional Copy	ON	ON
I/O		
Interface	Serial	Serial
Buffer	40K	64K
Serial		
Baud	9600, 4800, 2400	9600, 4800, 2400
Format	8 Bit, None, 1 Stop	8 Bit, None, 1 Stop
Protocol *	ENQ/STX	ENQ/STX
CG-TAB	Graphic	Graphic
Character Set	Standard	Standard
Country	E-USA ASCII	E-USA ASCII
Select Zero	ON	ON
Auto-CR	OFF	OFF
Auto-LF	OFF	OFF

Option	Setting for Printer Model	
	PRN-6 and previous models	PRN-7
Menu Lock	ON	All
Language	English	English
Paper		
Single		
Form Adjust	12/72	12/72
Trac 1		
Form Adjust	12/72	12/72
Trac 2		
Form Adjust	12/72	12/72
Auto Sheet Feeder		
Form Adjust	12/72	12/72
Auto Tear	OFF	OFF
F-Eject	OFF	Top
Form Length		
Trac 1		
Lines	66	66
Standard	10.5"	11"
Trac 2		
Lines	66	66
Standard	10.5"	11"
Barcode	Off	Off
Barmode	Unsecured	Unsecured

*Protocol: When printing in graphics mode, set I/O Serial Protocol to "Robust XON/OFF".

Table 3.3 PRN Setup Options

Keltron Printer VS4095/5 Settings

The printer communicates using the following protocol:

- Baud Rate
  - Supervised mode: 2400
  - Unsupervised mode: 300

  (Supervision is a programmed setting; refer to the Panel Programming section of the Programming Manual for instructions.)
- Data bits: 8
- Parity: None
- Stop bits: 1

Set the printer DIP switches SP1 and SP2 according to settings in Table 3.4.

Supervised			Unsupervised			Supervised and Unsupervised		
SP1	On	Off	SP1	On	Off	SP2	On	Off
1		X	1	X		1		X
2	X		2		X	2		X
3		X	3	X		3		X
4		X	4		X	4		X
5	X		5	X		5	X	
6		X	6		X	6		X
7	X		7	X		7	X	
8	X		8	X		8	X	

Table 3.4 Keltron DIP Switch Settings

3.15 Connecting a PC for Programming

A PC running the VeriFire® Tools programming utility can upload and download the operating program of the control panel when attached to J1 Network/Service Connection (NUP) or to the second Network/Service connection on an attached network communications module. Refer to the VeriFire® Tools CD for instructions.

NOTE: Download operations that change the basic program of the control panel must be performed by responsible service personnel in attendance at the control panel. After downloading a program, test the control panel in accordance with NFPA 72.

3.16 Annunciator Key Switch (AKS-1B)

Some jurisdictions allow one node on a network to control the network at a time; one way to meet this requirement uses AKS-1B or Connector J6. For details, refer to Section 5.1 “Security Access” and your local Authority Having Jurisdiction.

The AKS-1B can provide access security for the control switches on the NCA-2. When key switch monitoring is enabled as described in the Programming Section 5.5.7 “Supervision”, the NCA-2 keypad can only be used when the AKS-1B key is inserted and unlocked.

AKS-1B

The AKS-1B kit includes a key switch and hardware for mounting to the ABF-4B. The AKS-1B switch mounts to the ABF-4B trim plate as shown in Figure 3.16. Plug the switch leads from the AKS-1B into Connector J6 on the NCA-2. When an AKS-1B is installed and enabled, the key must be inserted and turned for the keypad to be used.

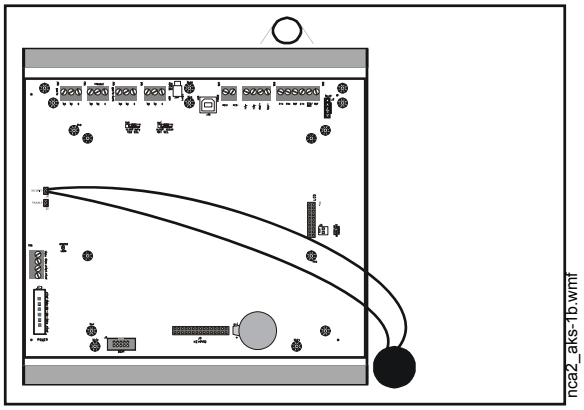


Figure 3.16 Connecting AKS-1B on J6

3.17 Security Tamper Switch

A security tamper switch (STS-1) installed in the cabinet door will indicate a door tamper condition whenever the door is open. If the NCA-2 indicates a Security alarm, you can acknowledge, silence or reset the condition from the NCA-2.

There are two options regarding the tamper switch:

- If the NCA-2 is in its own cabinet, the tamper switch can be installed on the cabinet and connected directly to the NCA-2.
- If the NCA-2 is mounted in the same cabinet as the control panel, the tamper switch can be connected to the FACP.

3.18 ACS Devices and the NCA-2

The NCA-2 can be used to monitor Annunciator Control System (ACS) modules and can support up to 32 ACS annunciators. ACS devices use LED arrays to show the status of points or zones within the network monitoring system. Annunciator points are programmable from the NCA-2 interface.

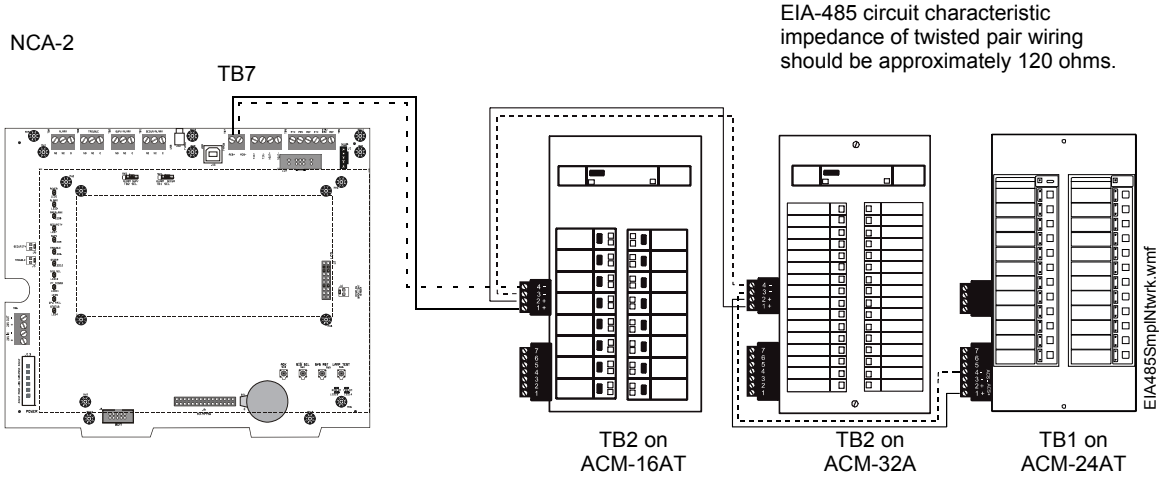


Figure 3.17 NCA-2-to-ACS Connection

Refer to the appropriate ACS manual for EIA-485 circuit ratings and limitations.

NOTE: Some ACS devices will have two 2-pin connectors adjacent to each other, one for NCA-2 connections and one for connecting to the next ACS device.

3.19 LCD-160, LCD-80, LCD2-80 and NCA-2

LCD-160 - The NCA-2 connects to the LCD-160 via the two RDP pins on TB9: T IN+ and T IN-. If it is the last device on the RDP bus, the LCD-160's end-of-line resistor must be enabled. Refer to the LCD-160 manual for connection information.

LCD-80 - The NCA-2 connects to the LCD-80 at TB9, using all four pins. Refer to the LCD-80 manual for connection information.

LCD2-80 - The NCA-2 connects to the LCD2-80 at TB2, using all four pins. Refer to the LCD2-80 manual for connection information.

Section 4: Operation

This chapter covers basic operation of the NCA-2 and control features available to the operator using the NCA-2's keypad and 640-character LCD display.

4.1 The Keypad

The keypad includes the Status LED indicators, soft keys, alphanumeric keys, fixed and special function keys. The alphanumeric portion of the keypad is in standard QWERTY format. This keypad is functional mainly when an entry is requested by the system. Otherwise, pressing the keys results in no entry.

NOTE: Key functions are as described below unless the Display and Control Center (DCC) option is enabled and the DCC is at another location. When this panel is not the DCC on a network, permission must be granted from the DCC before Signal Silence, System Reset, Acknowledge or Drill (Alarm Signal for Canadian applications) can be performed at this panel. Pressing one of these keys will automatically send a permission request to the DCC.

NOTE: When key switch monitoring is enabled, the keypad is usable when the AKS-1B is unlocked.

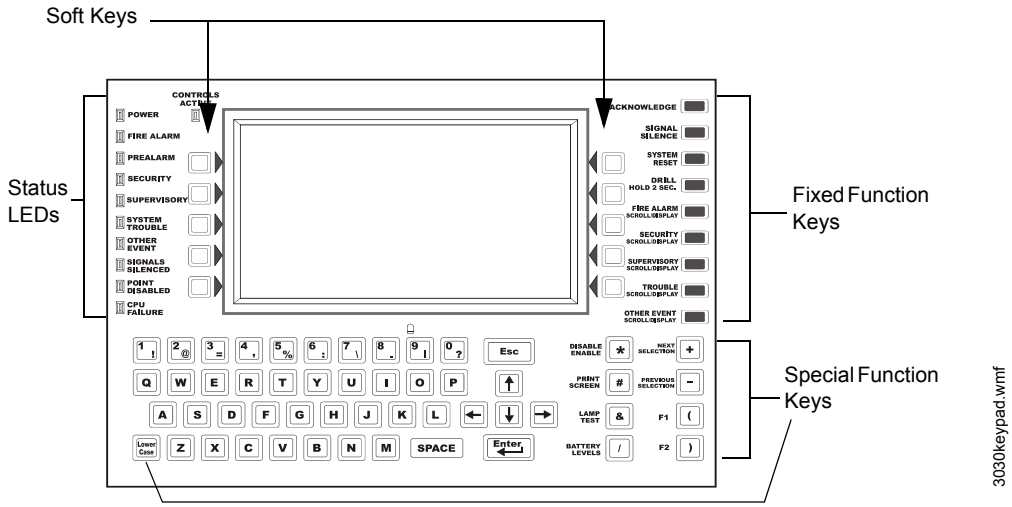


Figure 4.1 The QWERTY Keyboard Interface

4.1.1 Fixed Function Keys

The nine keys aligned along the upper right edge of the keypad/display are fixed function keys.

ACKNOWLEDGE - Press this key to acknowledge an off-normal event displayed on the screen. Use to respond to a new alarm or event.

SIGNAL SILENCE - Press this key to turn off all control modules that have been programmed as silenceable. (all nodes mapped to NCA-2).

SYSTEM RESET - Press this key to clear all latched alarms and other events as well as turn off event LEDs. If alarms or other off-normal events exist after reset, they will resound the system and relight the LEDs. Unacknowledged events will not prevent reset from functioning.

The System Reset key will not immediately silence active outputs. If the Control-by-event programming

conditions for the output are not met after reset, the output will deactivate. (Typically 30 seconds local, 60 seconds network.)

If Fire and MNS alarms exist on the network at the same time, a second System Reset needs to be performed to fully reset the network. The NCA-2 will display MN SYSTEM RESET or FIRE SYSTEM RESET, depending on which event type has priority.

DRILL (**ALARM SIGNAL** for Canadian applications) **HOLD 2 SEC.** - Press this key, holding it down for 2 seconds, to activate all silenceable fire output circuits (all nodes mapped to NCA-2).

LAMP TEST - Press this key to test the LED indicators on the left of the keypad and the piezo. Pressing the key longer than 5 seconds will display firmware version numbers on the display screen.

BATTERY LEVELS - Press this key to display battery voltage.

FIRE ALARM SCROLL/DISPLAY
SECURITY SCROLL/DISPLAY
SUPERVISORY SCROLL/DISPLAY
TROUBLE SCROLL/DISPLAY
OTHER EVENT SCROLL/DISPLAY

Scroll through a list of events of these types, each of which will appear on the display once the associated button is pushed. The **OTHER EVENT SCROLL/DISPLAY** key also scrolls between prealarm and disabled events.

4.1.2 Special Function Keys

At the bottom of the keypad are the special function keys.

Arrow Keys - Pressing these keys navigates through the programming fields on a display screen by advancing or reversing the cursor position.

+, – Keys - Use these keys to scroll forward to the next selections (+) or back to previous selections, on the display screen. The keys are used when setting parameters in NCA-2 data fields, such as choosing a device type as a filter for requesting a Node History.

4.1.3 Soft Keys

The ten keys to the right and left of the display function to select commands that appear on the display. Each soft key points to a line of text on the LCD screen; a particular soft key will select the item in that corresponding line of text. The currently selected item will flash, serving as a cursor. Each screen has different information, and each key changes function to suit the screen. Beneath each screen in this manual is a description of the function of each soft key.

4.1.4 Diagnostic Indicators and Controls

The NCA-2 keypad has eleven LED status indicators that light to annunciate conditions. Refer to Table 4.1 for the list of LED indicators and their descriptions.

Indicator	Color	Description
CONTROLS ACTIVE	Green	Fire applications: Illuminates when the NCA-2 assumes control of the network as primary display. (See Appendix D, “Display and Control Center (DCC)”. Mass Notification applications: Illuminates when control is available.
POWER	Green	Illuminates when AC power is within normal operating limits.
FIRE ALARM	Red	Illuminates when at least one fire alarm event exists. It flashes when any of these events remain unacknowledged.
PRE-ALARM	Red	Illuminates when at least one prealarm event exists. It flashes when any of these events remain unacknowledged.

Table 4.1 Status LED Indicator Descriptions

Indicator	Color	Description
SECURITY	Blue	Illuminates when at least one security event exists. It flashes when any of these events remain unacknowledged.
SUPERVISORY	Yellow	Illuminates when at least one supervisory event exists. It flashes when any of these events remain unacknowledged.
SYSTEM TROUBLE	Yellow	Illuminates when at least one trouble event exists. It flashes when any of these events remain unacknowledged.
OTHER EVENT	Yellow	Illuminates when an MNS alarm, process monitor, CO alarm, CO Pre-alarm, hazard alert, or weather alert occurs. It will flash if any of these events remain unacknowledged.
SIGNALS SILENCED	Yellow	Illuminates if the NCA-2 Signal Silence key has been depressed or if any other node sends a Network Silence command. It flashes if some points on a node are silenced.
POINT DISABLED	Yellow	Illuminates when at least one disabled device exists.
CPU FAILURE	Yellow	Illuminates if there is an abnormal hardware or software condition. The panel is out of service when this LED is illuminated or flashing. Contact technical support.

Table 4.1 Status LED Indicator Descriptions

4.2 The LCD Display

The home screen is displayed when no alarms or troubles exist. It will display a message at the top which says “SYSTEM NORMAL.” The LCD display is a 640-character screen, 16 lines x 40 characters. The user can customize the NCA-2 home screen.

In a System Normal message, Line one displays the local NCA-2’s 40-character custom node label saved in non-volatile memory (created under the NCA-2’s Program/Alter Status menu or downloaded from VeriFire® Tools); Line 2 states “System Normal”; and Line 4 contains the local NCA-2’s node number.

The Main Menu is accessible using the corresponding soft key in the lower right of the LCD display. A text label should be drawn into the custom bitmap graphic so that it is also visible on the graphic screen. The Main Menu screen is also selectable from any other screen unless unacknowledged events exist. This allows the user, for example, to disable a point while a fire alarm exists.

If an event occurs, the Event Counts screen will be displayed automatically, displaying a count of different acknowledged and unacknowledged events as discussed in Section 4.2.2 “Event Counts Display”. You can select Multiple Event List to instead display a list of all events, sorted as discussed in Section 4.2.3 “Multiple Event List”.

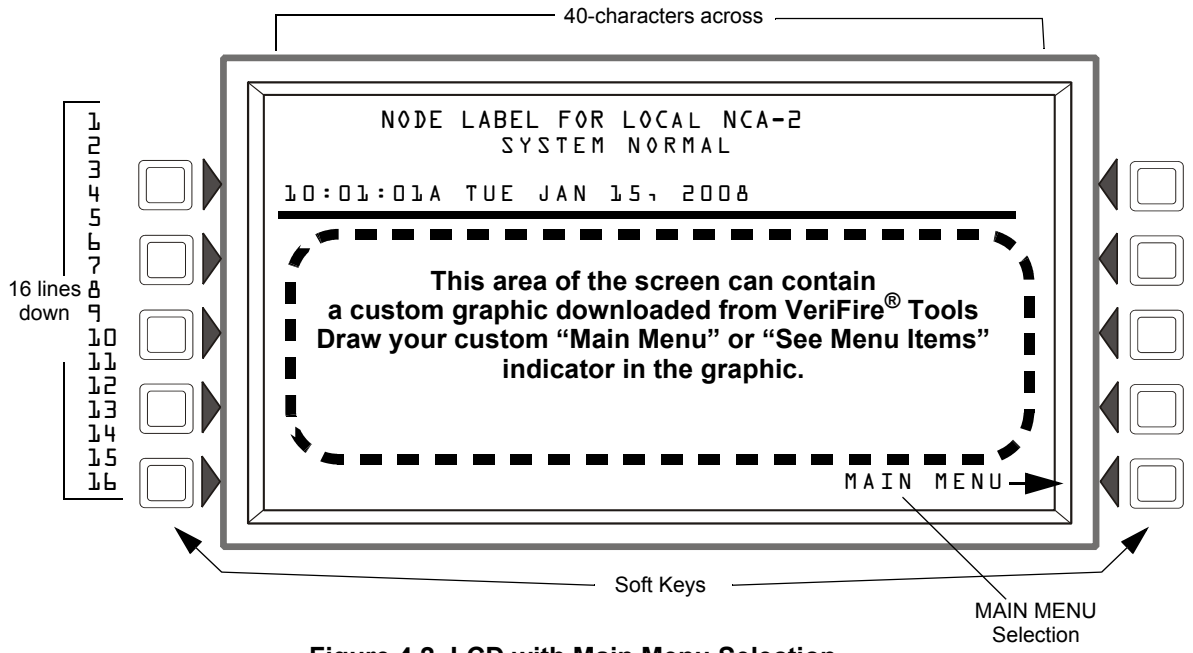


Figure 4.2 LCD with Main Menu Selection

4.2.1 Basic Screen Navigation: The Main Menu

The main menu is a navigational screen that navigates to the selected submenu. The different options are as follows:

EVENT COUNTS DISPLAY - accesses the Event Counters screen where all events are listed by event type. (See Section 4.2.2 "Event Counts Display" on page 44.)

MULTIPLE EVENT LIST - displays events simultaneously in groups of eight. These lists can be scrolled forward and back. (See Section 4.2.3 "Multiple Event List" on page 46.)

HISTORY DISPLAY - navigates to the History Main Menu screen, where the user can view the history of remote nodes on the NOTI•FIRE•NET™ system or the NCA-2 local history. (See Section 4.2.4 "Local and Node History Display" on page 47.)

READ STATUS - navigates to the Read Status Point Select screen, where you can specify a point and obtain detailed information about it. (See Section 4.2.5 "Read Status" on page 51.)

PROGRAM/ALTER STATUS - programs the system and changes fundamental configuration settings. Examples include: change time/date, disable/enable point, change detector sensitivity, and change point label. A password is required. (See Section 5, "Programming", on page 63.)

PRINTER FUNCTIONS - prints reports of events and configurations. (See Section 4.2.7 "Printer Functions" on page 57.)

There are several NCA-2 features that require the user to specify a device address or point, such as Read Status or History Display.

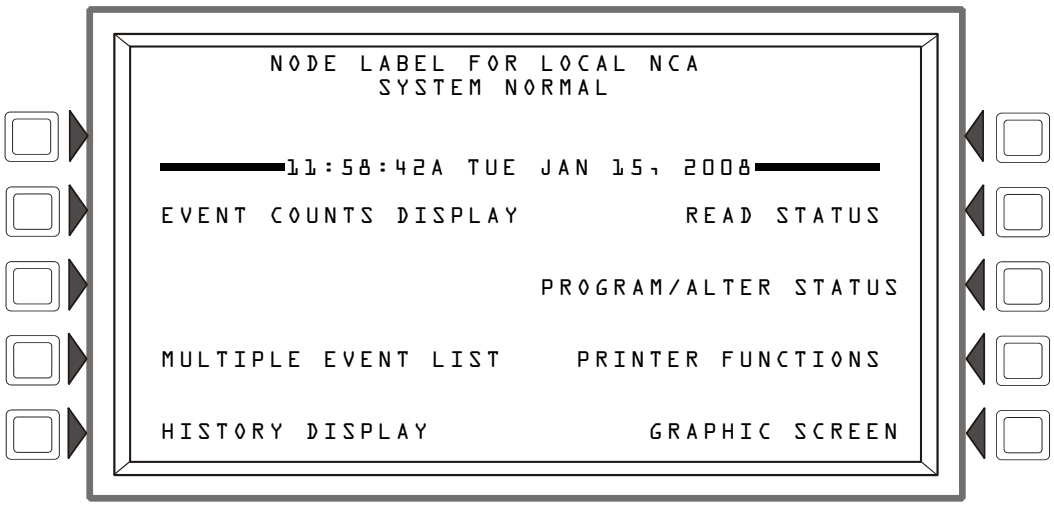
- If a device does not exist at the selected address, an "INVALID POINT" error message will display for 3 seconds and then return to the point-select screen. Press "NEXT POINT" or "PREVIOUS POINT" to read the next/previous programmed point of that type. An error message will indicate if there are no further devices of that type programmed.

NOTE: If attempting an operation on a point on an NFS-320, NFS2-640, or NFS2-3030, the NCA-2 will display the error message "INVALID POINT - SELECTING NEXT POINT" and automatically select the next valid point.

- The selected point must already be mapped in local NCA-2 programming or else the error message “NODE NOT MAPPED” will display. If the selected point is on a remote node, both that node and the local NCA-2 must be on-line or the error message “NODE OFF-LINE” will display.

↳ Main menu: System Normal

When system status is normal, Line 1 displays the local node label.



↳ Main menu: Uncleared event in system

Line 1: Event summary
Line 2: Point label for the affected hardware
Line 3: 1st position in CBE zone list.
Line 4: Date/time and point number of event.

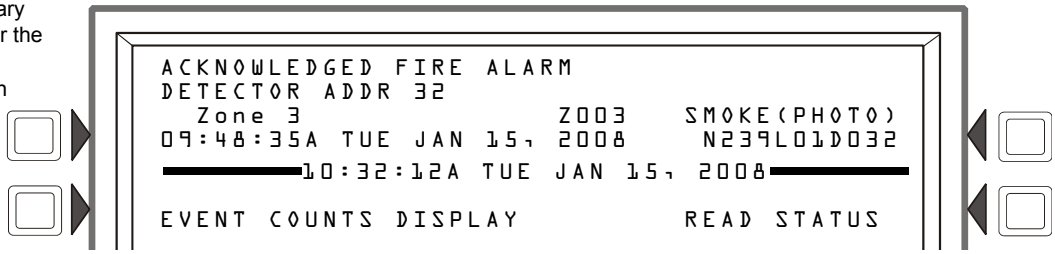


Figure 4.3 NCA-2 Main Menu

4.2.2 Event Counts Display

The Event Counts screen, accessed from the main menu, can be displayed any time regardless of whether events exist. This screen is automatically displayed whenever an off-normal event is present, unless the NCA-2 is in programming mode. However, the NCA-2 will always display a Fire Alarm, even during programming mode.

The two lines directly below the screen header display current counts of the six types of off-normal events, acknowledged and unacknowledged.In addition, a Telephone Ring-In on the NFS2-640 and NFS2-3030 panels will cause the Event Counts screen to be automatically displayed and the following message to be displayed in reverse text:

EMERGENCY PHONE - RINGING - ANSWER PHONE

When the phone message first appears, it will be flashing and the buzzer will be sounding. The Ring-In must be acknowledged to clear these conditions. Refer to on page 82 for additional information.

NOTE: In Canadian mode, the operator must press a key to display the Event Counts screen. The NCA-2 will prompt by showing the message “PRESS ANY KEY.”

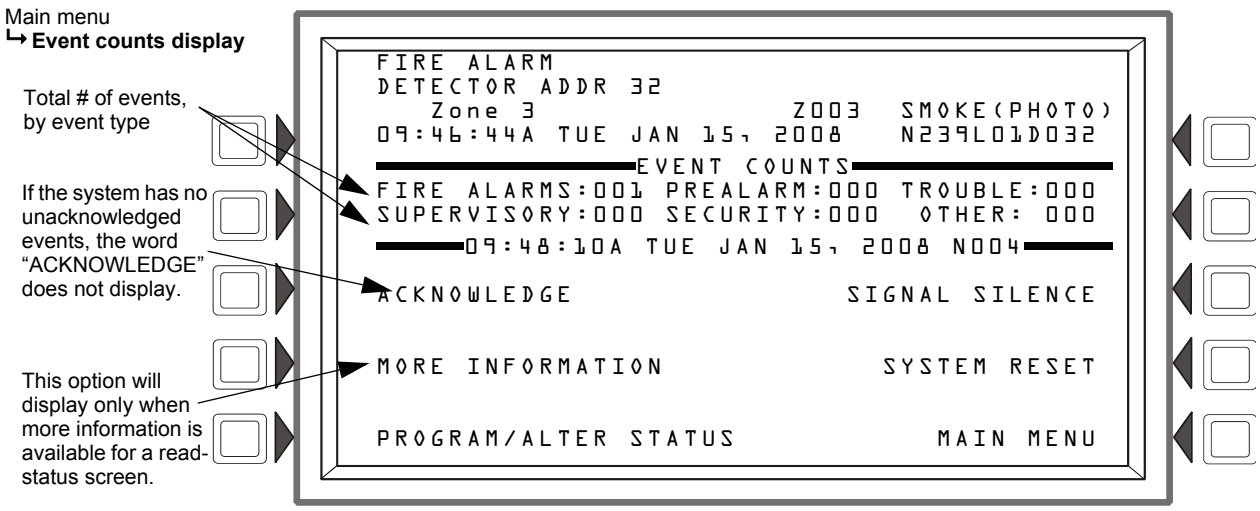


Figure 4.4 Event Counts Display

Acknowledge

If there are no unacknowledged events, the ACKNOWLEDGE soft key will not be shown. In Figure 4.4, an arrow indicates where it will appear if there are unacknowledged events.

More Information

The MORE INFORMATION option is displayed when an off-normal event occurs for an input device. It is not displayed if the event is an output point or a system trouble (that is, an event not associated with any specific point). This option is shown in Figure 4.4 to demonstrate where it is once the event occurs. Press the MORE INFORMATION soft key to navigate to the Read Status screen, which shows more detailed information about the displayed event. For details on the Read Status feature, refer to Section 4.2.5 "Read Status".

Program/Alter Status

The soft key PROGRAM/ALTER STATUS allows a user with the proper access level to change various NCA-2 settings. Examples include change time/date, disable/enable point, change detector sensitivity, and change point label. This option is not visible if an unacknowledged event is present. The PROGRAM/ALTER STATUS functions are password protected and require the proper access level as defined by the system administrator. For details on the Program/Alter Status menu option, also present in the Main Menu, refer to Section 4.2.6 "Program/Alter Status" on page 57. This option is not present if there are unacknowledged events that are higher priority system troubles (Alarm, Supervisory, Security), or Pre-alarm.

Signal Silence

Use this command to turn off all devices that are mapped to the NCA-2 and programmed as Silenceable.

System Reset

Use this command to clear all latched alarms and other events and turn off event LEDs of nodes that are mapped to the NCA-2. If both Fire and MNS alarms exist on the network, a second System Reset must be performed to clear the events from the network.

Main Menu

The soft key MAIN MENU returns user to the Main Menu screen. This option is not visible if an unacknowledged event is present.

4.2.3 Multiple Event List

To access the Multiple Event List, press the corresponding soft key option from the Main Menu. The resulting list shows all events that have occurred after the event displayed at the top of the screen, which is the most recent acknowledged event.

NOTE: If an unacknowledged event comes in, it will remain on this screen, and the NCA-2 will display "PRESS ANY KEY" on the screen header on line 5. Pressing any key, including navigational keys, will navigate to the Event Counts screen, where you must acknowledge the event(s).

Screen Navigation

- The SCROLL DISPLAY hard keys scroll through the list of active events. You can also scroll through events by pressing the up/down arrow keys directly above the <ENTER> key. The up and down arrows will scroll the cursor through the list. The event at the top will remain at the top. If the event at the top of the screen is sequenced in such a way that it would normally appear in the list, the display will skip over it, and the numbers will be out of sequence. (Figure 4.5 shows events 3-9 in sequence.)
- The NEXT SELECTION/PREVIOUS SELECTION hard keys will scroll to the next or previous event after the event shown at the top. This event will then be displayed at the top of the screen, and the list will show the events following the event just placed at the top.
- Highlight an event in the list by moving the cursor with left/right arrows, and press ENTER to bring that event to the top. The list will then show the events following the event you just placed at the top.
- Output activations are not displayed, but they are put in History if reporting is enabled. This is configured via the Programming/Alter Status option.
- To switch this screen between USA standard priority and CANADIAN priority in terms of the order of event classes displayed, select PROGRAM/ALTER STATUS, PROGRAM MENU, SETTINGS. Within an event class, events will be displayed in time order with the first listed event being the first event received. See Section 5.5.3 "Panel Settings" for more details on the NCA-2 SETTINGS menu.
- Eight events can be displayed on the screen at one time. If the first event is not displayed in the list, a FIRST EVENT soft key option will be available in the lower left of the screen which will display this first event and the next seven following.

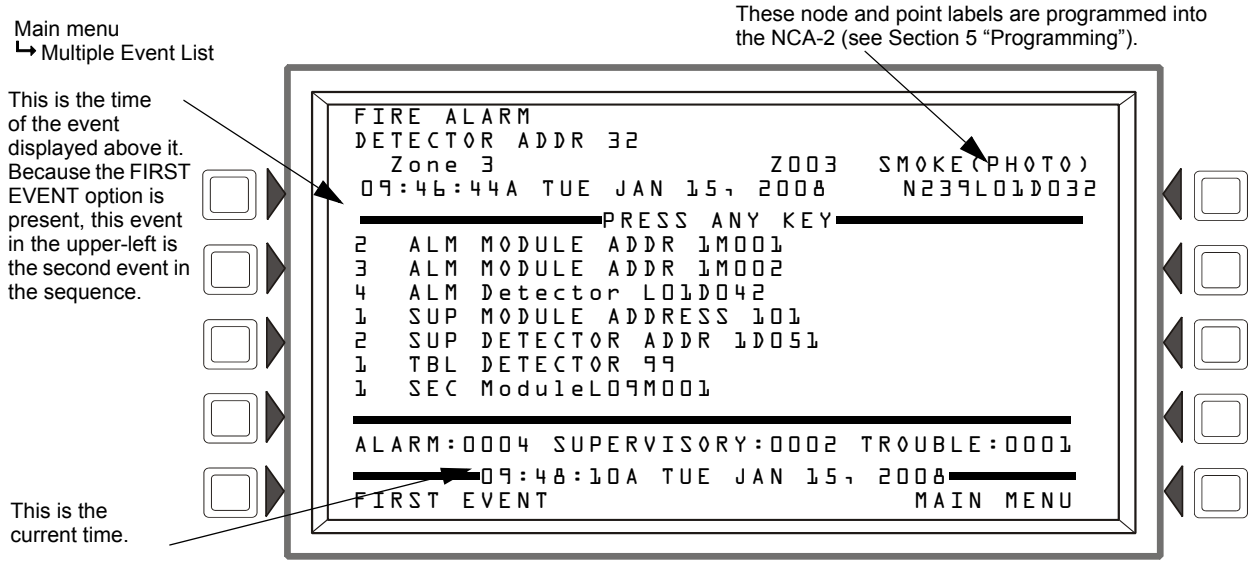


Figure 4.5 Multiple Event List - Fire Alarms Sample Screen

4.2.4 Local and Node History Display

The History Menu is accessed from the main menu screen by pressing the HISTORY DISPLAY soft key. The NCA-2 will then display the History Select menu.

Main menu
↳ History display

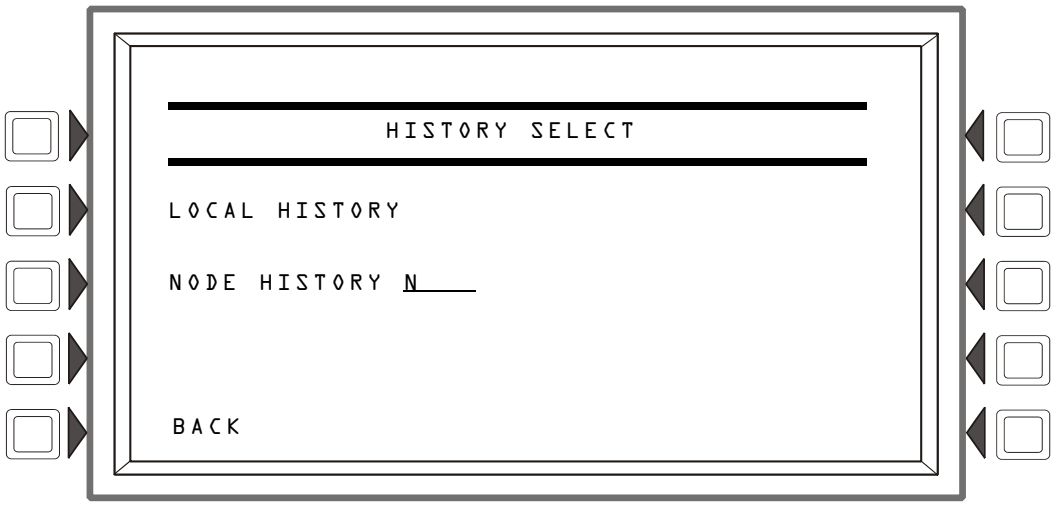


Figure 4.6 History Select Menu

NOTE: It is not possible to display or print the history for prealarms or disabled points exclusively.

Local History

When you select this option, the Local History Select menu appears (see Figure 4.7 on page 47). The soft keys ALL EVENTS, ALARMS ONLY, TROUBLES ONLY, SUPERVISORY ONLY, and SECURITY/OTHERS are used to select the type of history to be viewed. Options will not appear if their associated history queue is empty. The TIME/DATE INTERVAL and POINT RANGE options allow the user to select only events within those given parameters.

Main menu
↳ History display
↳ Local history

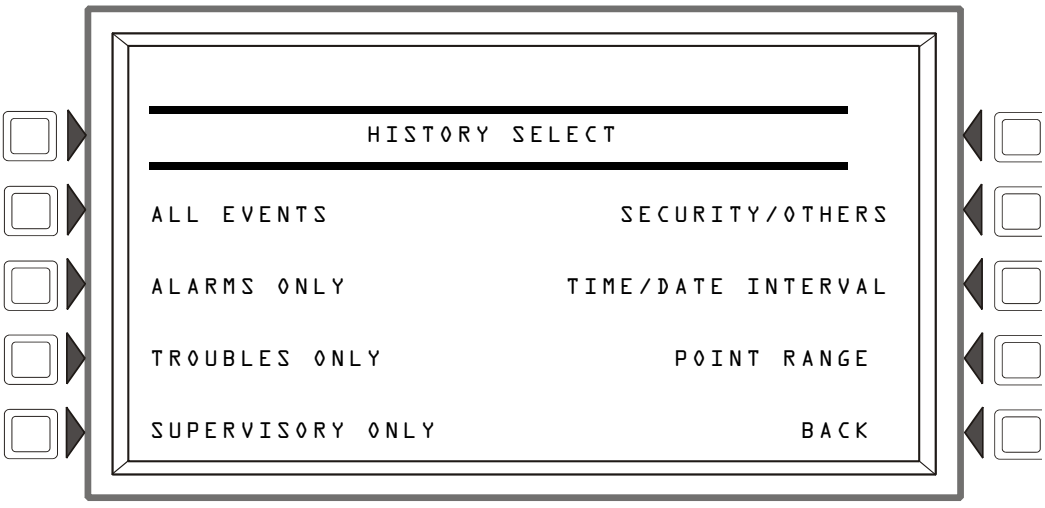


Figure 4.7 Local History Select Screen

For example, if a user selects TROUBLES ONLY, a screen similar to the full screen in at the top of Figure 4.8 may be displayed. All Trouble events are shown in descending date order (from most recent to least recent). Event details are displayed in the middle area marked off by separating lines. Details include the event type, node number, node location as defined by the operator, device type, and the date and time of the event. The user can scroll through the Trouble event history by pressing the NEXT EVENT or PREVIOUS EVENT soft keys. PRINT TROUBLE HISTORY will print the history of the selected event type. Pressing the BACK key will return to the History Main menu.

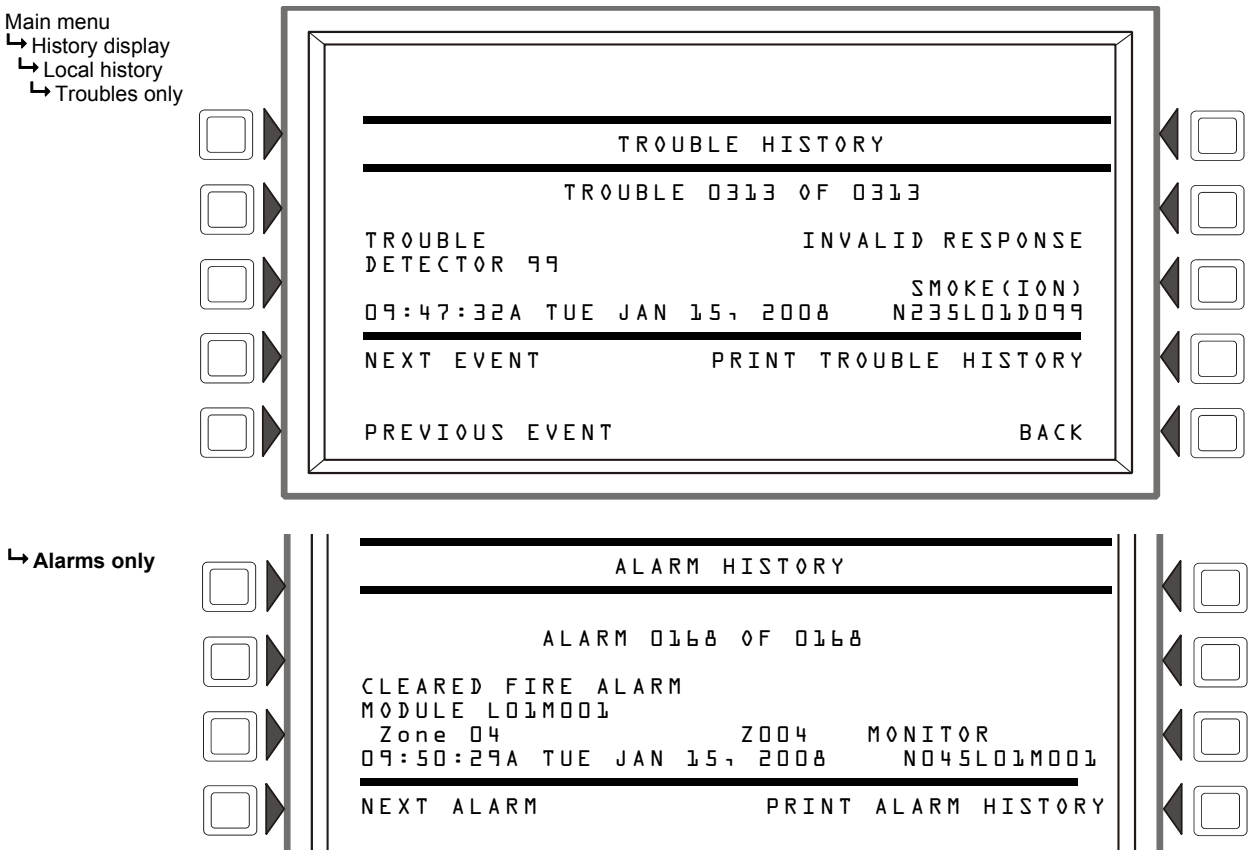


Figure 4.8 Event History Sample Display

Local History: Time/Date Interval

Selecting the **TIME /DATE INTERVAL** soft key on the Local History Select Screen filters events for display within a specified time/date interval.

- The user will be prompted to enter a start/end time and date. The keypad will be used to enter/edit the data in each field.
- The default start time is 12:00 a.m. of the current day, and the default end time is the current date and time. This allows a default printing of all events for the current day.
- The default event type is ALL EVENTS. To scroll through event types, press the EVENT TYPE soft key. Choose between ALL EVENTS, ALARMS ONLY, TROUBLES ONLY, SUPERVISORY ONLY, SECURITY ONLY, or OTHER ONLY. Once you have set the parameters, press the ACCEPT soft key. Press the <ESC> key to exit the current field without saving any changes. Press the <ESC> key twice to return to the previous menu.
- NEXT/PREVIOUS FIELD hard keys will move the cursor to the next/previous parameter field (the arrow keys will perform the same function).
- The soft key BACK will return to the History Main Menu.

Once you press the ACCEPT key, events within the set parameters will be displayed as shown in Figure 4.8. When viewing events within a time/date interval, if more than one event exists, a counter will indicate which event is displayed and the total number of events. If there are no events of the specified type available within the specified range, the message "HISTORY FILE IS EMPTY" will be displayed. The soft keys NEXT EVENT and PREVIOUS EVENT are used to scroll through events. PRINT HISTORY will print the history for the specified parameters.

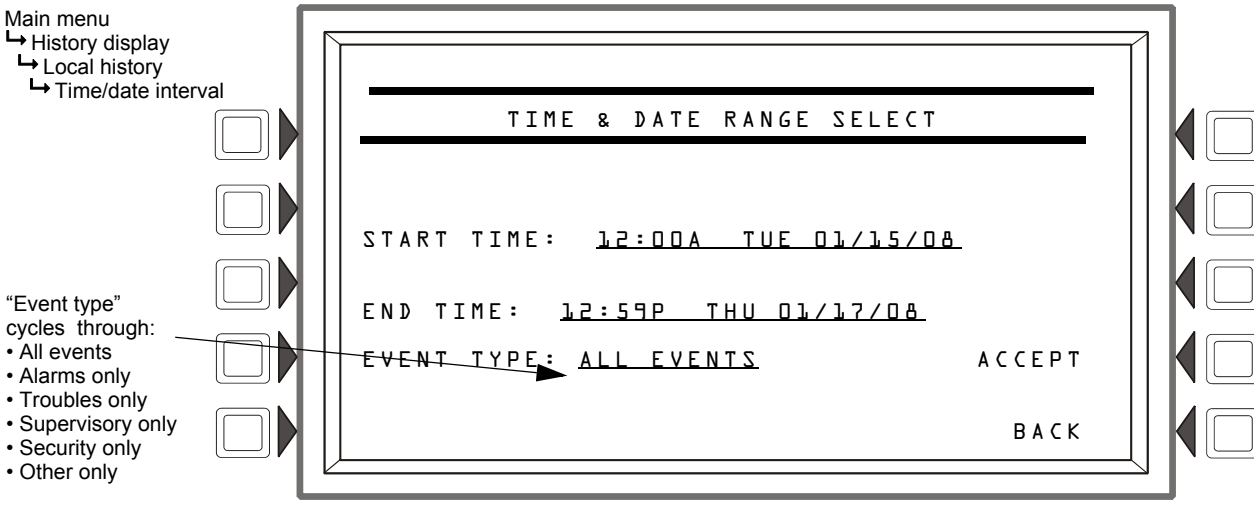


Figure 4.9 Time/Date Range Select Screen

Local History: Point Range

Selecting the **POINT RANGE** soft key on the Local History Select screen sets a range of device points for event display as shown in Figure 4.10 on page 50.

- From the Local History Select screen, press the POINT RANGE soft key (see Figure 4.10).
- Enter a start point by typing in the node identifier directly, or by pressing the corresponding soft key to toggle through device types. The four device types are Detector, Module, Panel Circuit, and Bell Circuit, in that order. Enter the end point in the same way. The default range is N001L01D001 for the start point, and N240B04 for the end point.
- The Event Type default is ALL EVENTS. To filter the history file by event type, use the EVENT TYPE soft key to scroll through event types. Once you have set desired parameters, press the ACCEPT soft key, and the NCA-2 will display all events within those parameters. Press the <ESC> key to exit the current field without saving any changes. Press the <ESC> key again to return to the previous menu.
- The soft key BACK will return to the previous menu.

As with viewing the events within a time/date interval, when viewing events within a specific point range, if more than one event exists, a counter will indicate which event is displayed and the total number of events. The user has options to PRINT EVENTS IN RANGE and view the PREVIOUS/NEXT EVENT (when multiple events exist).

The following is a sample point range inquiry:

Start Point: N001L01M001

End Point: N001L01B04

Event Type: All Events

This example requests a history of all events on Node one only, Loop one only, for all modules, panel circuits and bell circuits. Since the start point specifies module device addresses (M001), detectors would not be included in this query as they are first in the device type order. Figure 4.10 shows how this inquiry would appear on the screen.

Ordering of devices on a node:

1. Node One, Loop One Detectors, Modules, etc.
2. Node One, Loop Two Detectors, Modules, etc.
3. Node One Panel Circuits
4. Node One Bell Circuits
5. Node Two, Loop One Detectors, Modules, etc.
6. Node Two, Loop Two Detectors, Modules, etc.
7. Node Two Panel Circuits
8. Node Two Bell Circuits

etc…

NOTE: If the Start and End Point nodes are not consecutive, e.g. the Start Point is Node 1 and the End Point is Node 3 or above, the NCA-2 will display all event types on all nodes between the Start Point and End Point.

Main menu
↳ History display
↳ Local history
↳ Point range

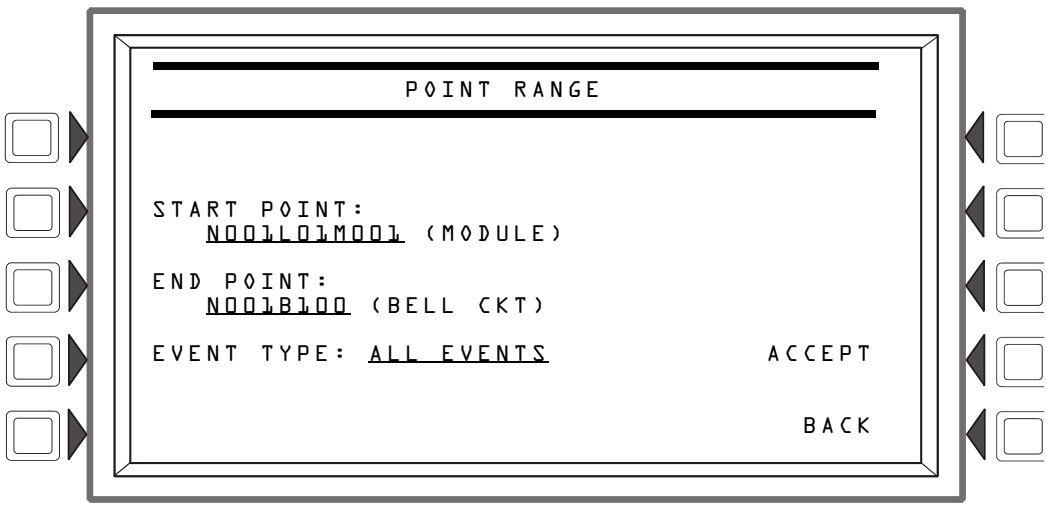


Figure 4.10 Point Range Select Screen

Node History

When you select this option from the History Select menu (see Figure 4.6 on page 47), you can display or print event details for a specified node. Enter the node number in the NODE HISTORY N____ field, then press the corresponding soft key. The local NCA-2 must be on-line, and the node selected must be mapped in the local NCA-2's programming. The choices from the Node History menu are:

- ALL EVENTS
- ALARMS ONLY

For example, if a user selects ALL EVENTS, a screen similar to that of Figure 4.11 on page 51 will be displayed. In this example, the first four lines show the System Normal message, the date and the time. The screen specifies the node on which the event or events occurred, and displays the

event counter, which in this instance would show all events in descending date order (from most recent to least recent). Event details are displayed after the event counter. Details include the event type, node address, node location (which is custom defined by the operator), device type, and the date and time of the event. The user can scroll through the event history by pressing the soft keys NEXT EVENT or PREVIOUS EVENT. Pressing the BACK key will return to the History Main menu.

NOTE: For use with NFS-320, NFS2-640, NFS2-3030, and DVC nodes.

Main menu
↳ History display
↳ Node history
for Node 003

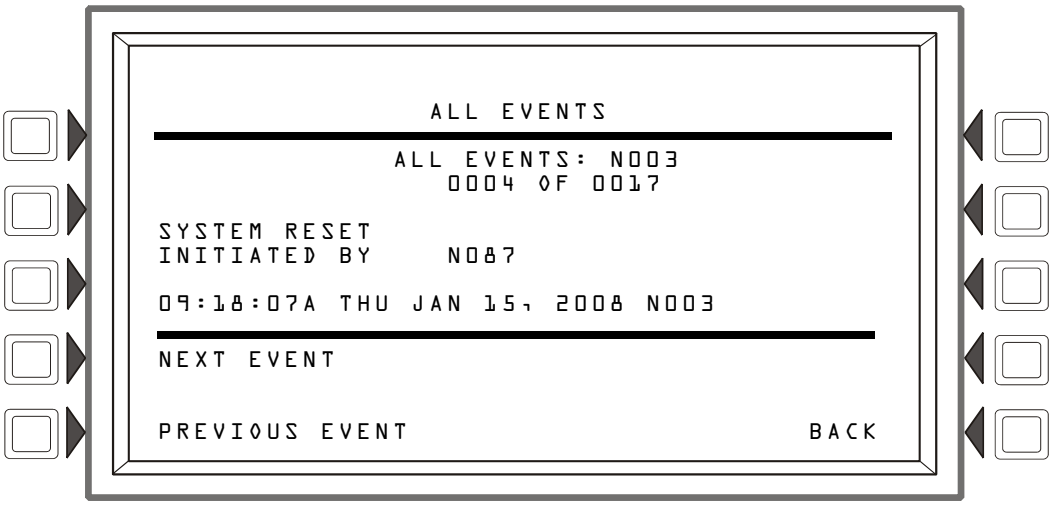


Figure 4.11 Event Details Sample Screen

4.2.5 Read Status

The Read Status menu option provides the user with status information about devices and modules attached to a remote node. It is for use across a network only. If an NCA-2 is used to perform a read status on itself, only ACS point status is valid.

To display status for a device, select Read Status from the main menu, then enter the device's address in the Point field and press Accept. If no event is present, the default format will be that of a detector (see Figure 4.12 on page 52). If there is an acknowledged event in the display area, that address will be the default. This allows the user quick access to the point being displayed.

Selecting a point is a two-step process:

1. You must first choose the device type, which is shown in parentheses. Scroll through device types by pressing the soft key corresponding to the POINT SELECT field.
2. Once you have the device type selected, enter the device address in the NxxxLyyDzzz address field.

After you have set all parameters, press the ACCEPT soft key to accept or <ESC> to cancel the request. Once the NCA-2 reads the point, it will display the Read Status screen (see Figure 4.13).

Following are the possible types from which to choose, depending on your control panel.

- Detector - i.e., smoke or heat detection.
- Module - Used for monitoring and controlling devices, SLC loops.
- Panel circuit - For direct monitoring and controlling.
- Bell circuit (NAC) - Fire panel control outputs for horns, sirens, and similar devices. (Not available to NFS2-3030.)
- Zone - A group of points.

- Logic zone - A zone based on an equation. (Available to NFS-320, NFS2-640, and NFS2-3030.) Logic Zone format is ZLxxxx, where xxxx = 0001 - 2000.
- ACS Point - A point associated with any ACS annunciator point (Available to NFS2-3030 and NCA-2.)
- PAM point - A Prioritized Audio Matrix (PAM) point (the programmed address of the intersection between an audio input and output in the PAM) in a DVC or DVC-EM - refer to the DVC manual for more information). The format is NxxxIyyyyAzzSn, where xxx = the DVC-EM node number, yyyy = the audio input number, zz = the DAA address on the Digital Audio Loop (01 through 32), and n = the DAA speaker circuit (1 through 4).
- Release zone - Used to release chemicals to aid in fire suppression. (Available to NFS-320, NFS2-640 and NFS2-3030)
- Special Zone - Special zones as provided by particular fire alarm control panels
- Trouble Zone - Zone based on an equation that includes a system trouble. (Available to NFS2-3030.)
- DAA SPEAKER CKT - ADAA digital audio amplifier speaker circuit point. The format is NxxxAyySn, where xxx = the DVC-EM (Digital Voice Command) node number, yy = the DAA address on the Digital Audio Loop (01 through 32), and n = the speaker circuit (1 through 4).

If a device does not exist at the selected address, an Invalid Point error message will display. Press "NEXT POINT" or "PREVIOUS POINT" to read the next/previous programmed point of that type. If communicating with an NFS-320, NFS2-640, or NFS2-3030, the NCA-2 will automatically proceed to the next point. In either case, an error message will indicate if there are no further devices of that type programmed.

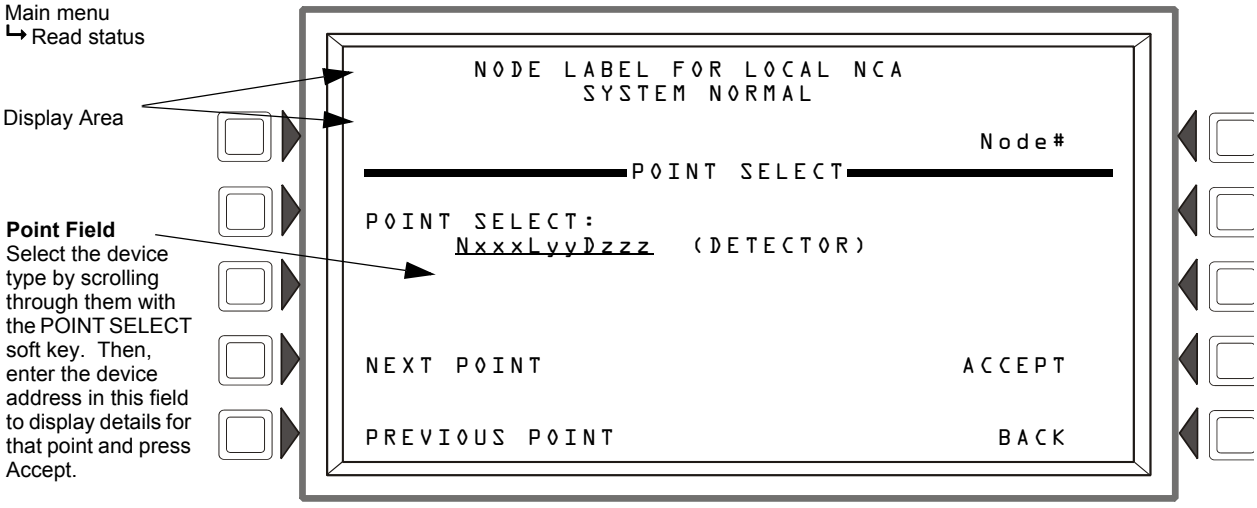


Figure 4.12 Read Status Point Select Screen

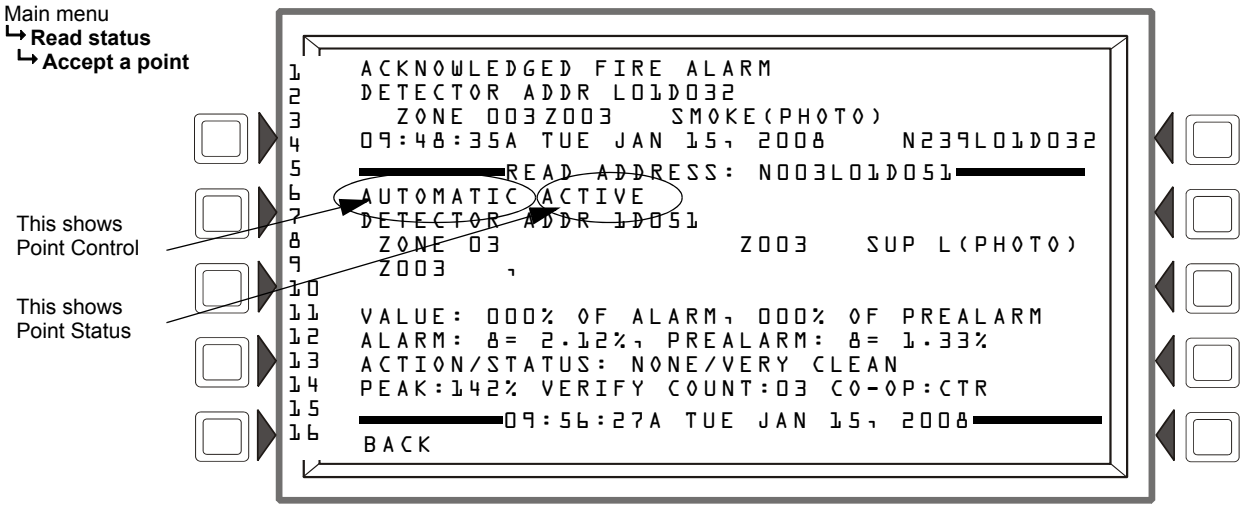


Figure 4.13 Read Status Details - Smoke Detector Point Installed on an NFS-320 or NFS2-640

Figure 4.13 shows a sample status screen for a smoke detector point. Following is an explanation of the screen elements:

- Lines 1-4 can be any present event message or the System All Normal message.
- Line 5 is the screen header. It will display the current address of the point being read.

The area between the separator lines, lines 6-14, shows all information concerning the selected point, which is N003L01D051 in the example above.

- Line 6 displays two statistics:
  —Point Control:
  Automatic - the point is being controlled automatically by the panel.
  Manual - a status change has caused the point to go off of automatic control.
  Forced - the point has been forced into another state by an outside source (such as another network node).
  Disabled - the point is disabled.
  —Point Status:
  Active - the point is currently in an off-normal state.
  Inactive - the point is currently reporting no events.
  Pre-alarm - the point is in pre-alarm.

Inputs: i.e. Detectors, Monitor Modules, Zones, etc.

If the point is in normal condition and the STATUS is Auto, the display shows:

```
AUTOMATIC      INACTIVE    (State = Normal)
AUTOMATIC      ACTIVE      (State = Active)
AUTOMATIC      PREALARM    (State = PreAlarm)
```

If the point is in normal condition and the STATUS is Disable, the display shows:

```
DISABLED       INACTIVE    (Tracking State = Normal)
DISABLED       ACTIVE      (Tracking State = Active)
DISABLED       PREALARM    (Tracking State = PreAlarm)
```

If the point is in Trouble condition, the display shows:

```
TROUBLE        <TROUBLE STATUS>
```

If the point is in Trouble condition and the STATUS is Disable, the display shows:

```
DISABLED       <TROUBLE STATUS>
```

Outputs: Control Modules, Bell Circuits, Notification Appliances, etc.

If the point is in normal condition and the STATUS is Auto, the display shows:

```
AUTOMATIC      OFF         (State = Normal)
AUTOMATIC      ON          (State = Active)
```

If the point is in normal condition and the STATUS is Disable, the display shows:

```
DISABLED       OFF        (Tracking State = Normal)
DISABLED       ON         (Tracking State = Active)
```

If the point is in Trouble condition, the display shows:

```
TROUBLE        <TROUBLE STATUS>
```

If the point is in Trouble condition and the STATUS is Disable, the display shows:

```
DISABLED       <TROUBLE STATUS>
```

If the point is in normal condition and the STATUS is Force, the display shows:

```
MANUAL         OFF         (State = Normal)
MANUAL         ON          (State = Active)
```

- Lines 7-8 specify the user defined loop, zone, and device type.
- Lines 9-10 display all the CBE zones that contain the current point being read; these lines only appear for smoke detectors.
- The percent values in Line 11 (VALUES) represent the amount of smoke detected by the device. If these values are above a certain percentage chamber value, the panel will give a prealarm warning, then an actual fire alarm.
- Line 12 (ALARM) displays detector sensitivity levels for Alarm and Prealarm, both of which range from one to nine, one being the most sensitive. These levels can be set via the NCA-2 Programming menu.

- Line 13 (ACTION/STATUS) is the maintenance status of the device. The message that appears in this field depends on the drift compensation value. A detector will automatically compensate for environmental contaminates and other factors over time, until the tolerance value has been exceeded. The FACP will signal a trouble condition when this level has been reached. When READ STATUS is performed for a detector, the displayed message is based on the percentage of the drift compensation tolerance that is used (see Table 4.2).

Message*	Drift Compensation %	Description
None/Very Clean	Less than 50	No action necessary. The detector readings are near ideal.
None/Fairly Clean	50 - 69	No action necessary. The detector will activate at the selected sensitivity level.
Needs Cleaning	70 - 79	Clean the detector soon. The detector may cause a false alarm because it has reached the drift compensation tolerance value.
Needs Immediate Cleaning	80 - 100	Clean immediately! The detector is a false alarm risk. The drift compensation tolerance value has been exceeded.

Table 4.2 Drift Compensation Messages/Actions

* For detectors in CLIP mode, the status will display as None/Very clean until it displays Needs Immediate Cleaning. No intermediate levels are displayed.

- Line 14 shows PEAKS, which is the highest value read by the device. Also shown is VERIFY COUNT, which displays how many times the panel detected an alarm. This verification aids in differentiating false alarms from actual ones by showing repeated alarm events that have come in on this device. The last element on this line is Detector Cooperation (DET CO-OP: CTR in Figure 4.13). Detector cooperation is when multiple detectors exist in close proximity and are programmed to operate together in order to make smoke detection more accurate. The text after the colon can be an abbreviation denoting detectors used together to detect smoke. Refer to Table 4.3 for detector cooperation abbreviation descriptions.
  NOTE: Verify Count is only available for detectors that support the feature.

  FSC-851 IntelliQuad detectors display the following in line 14:

  PEAKS:56% COUNT:02 CO:200PPM TEMP:100°F

  The CO figure is a carbon dioxide (200 parts per million).
- Line 15 displays the current time and date.

<+ NEXT SELECTION> and <- PREVIOUS SELECTION> hard keys will scroll to the next/previous point, respectively. To return to the previous screen, press the BACK soft key.

Abbreviation	Description
NONE	Detector used alone
ABV	Current detector and the one above (preceding)
BLW	Current detector and the one below (following)
CTR	Current detector and the ones above and below

Table 4.3 NFS-320 and NFS2-640 Detector Cooperation Abbreviations

NOTE: To print a point's status, use the PRINT SCREEN special function key located near the bottom right of the keypad.

The NFS2-3030 Read Status Screen

The Read Status screen for a point on an NFS2-3030 is similar to the NFS-320/NFS2-640 display, except in cases of an active/incoming event, lines 6-9 of the NFS2-3030 screen display an NFS2-3030 user-defined message, such as an operator response directive, and a "MORE INFORMATION" soft key will be available for the input point. The information in lines 1-4 displays the current or most recent event message. The information in lines 6-9 references a device for which information has been requested. The ACK STEP DISPLAY hard keys may be used to scroll through the details on all other off-normal points.

Lines 11-14 detail the status and settings of the device referenced in lines 6-9 with the following variations;

- Line 12 - When a Read Status is performed on an FMM-4-20 module, the current 4-20 mA sensor's reading will be displayed in the units specified in point programming.
- Line 14 - for Detector Cooperation (DET CO-OP), the NFS2-3030 uses the corresponding detector number instead of an abbreviation when this feature is in effect. In the example below, the event displayed is for Detector L01D0074 (displayed on line 7 at the left), and the detector to which it is linked for detector cooperation is detector 003 (displayed as D003 on line 14 at the right).
- Line 14 displays as follows for IntelliQuad FSC-851 detectors:

  PEAKS:56% COUNT:02 CO:200PPM TEMP:100°F

  The CO figure is a carbon dioxide (200 parts per million).

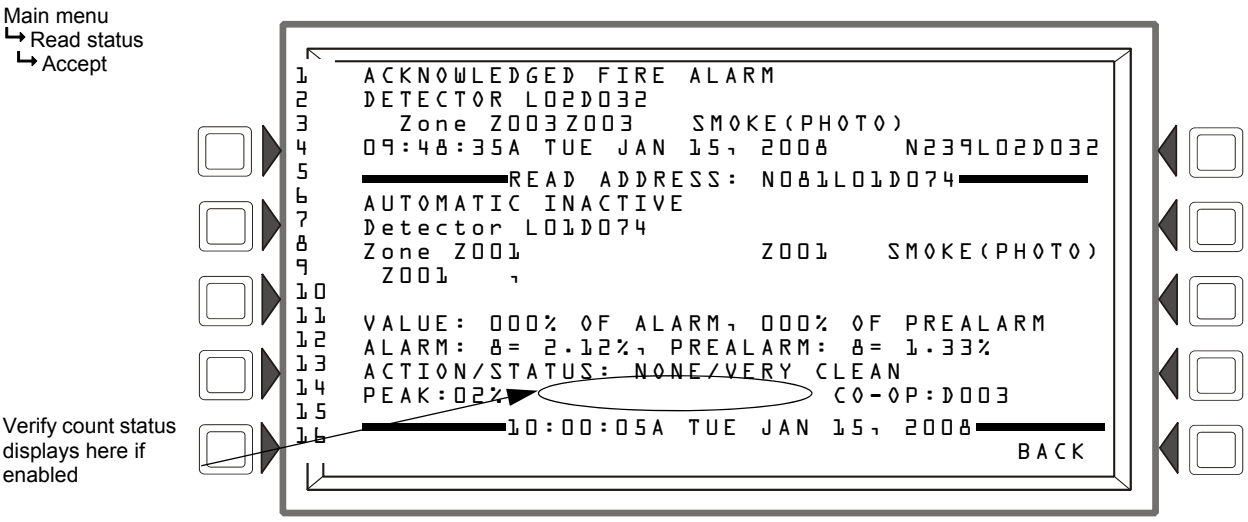


Figure 4.14 Read Status Details - Smoke Detector Point Installed on an NFS2-3030

4.2.6 Program/Alter Status

For a complete discussion of Program/Alter Status features, see “Programming” on page 63.

4.2.7 Printer Functions

Select the Printer Functions option from the main menu to print reports of current settings. Actual configuration is accomplished via the Program/Alter Status menu. For details on the actual NCA-2 programming options, refer to “Programming” on page 63.

NOTE: Pressing the Print Screen key at any time will capture the current LCD screen. If a printer is not installed on the system, the NCA-2 will return to the main menu.

Main menu
↳ **Printer Functions**

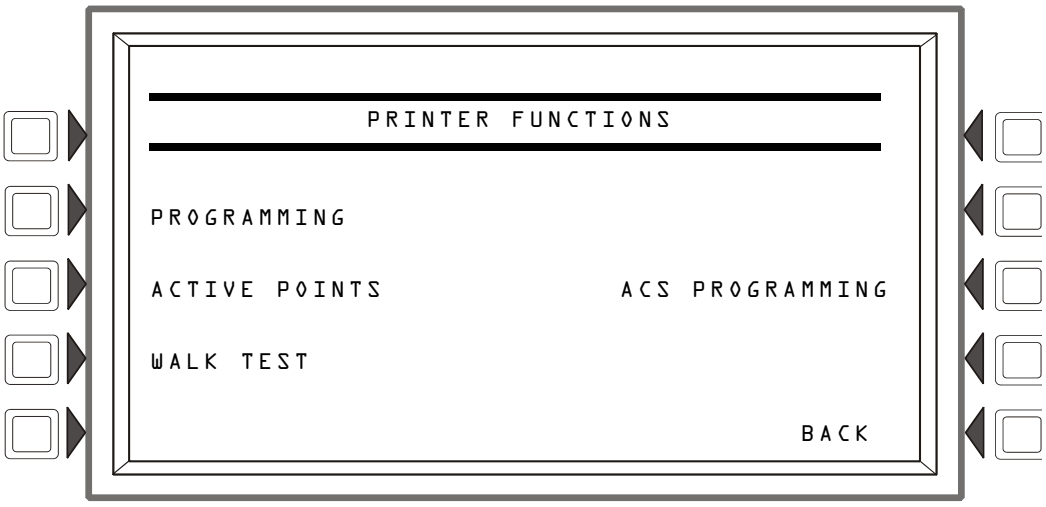


Figure 4.15 Printer Functions Menu

NCA-2 Programming Reports

This printer functions option allows the user to print a report of current NCA-2 configuration settings. When you select the PROGRAMMING soft key, the NCA-2 will bring up menu screens showing the various reports that can be printed.

Note: When you select an option and print the report, the display returns to the main menu.

Main menu
↳ Printer functions
↳ Programming

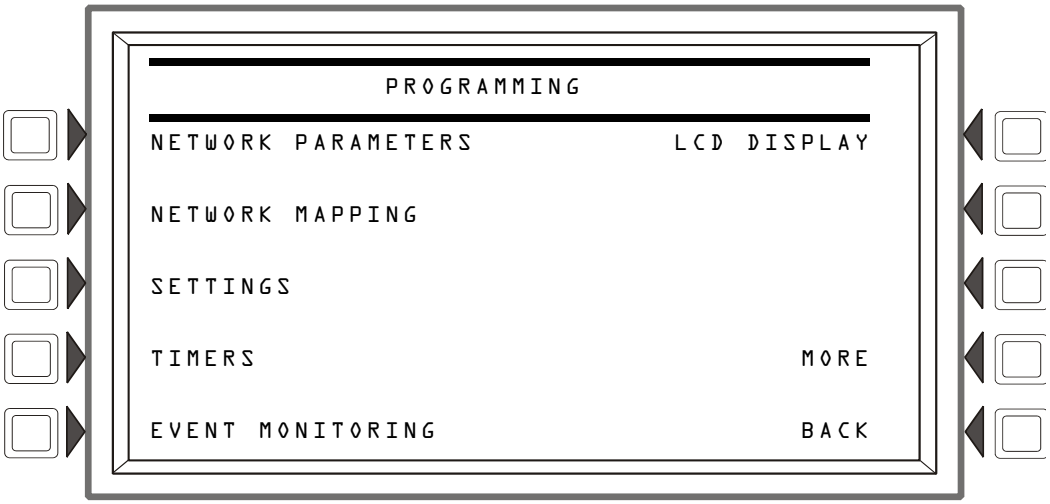


Figure 4.16 Options for NCA-2 Programming Reports (Screen 1)

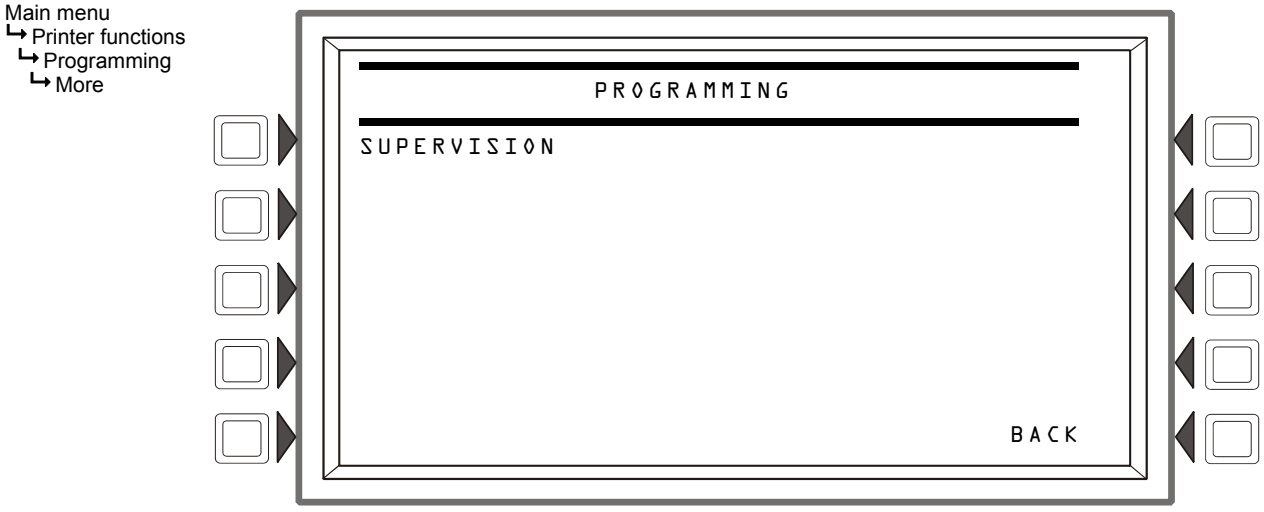


Figure 4.17 Options for NCA-2 Programming Reports (Screen 2)

Network Parameters - Prints a report containing the local NCA-2's node number, whether it is using Style 4 or 7 wiring, its node label (if defined), channel A and B thresholds, and IP ACCESS setting. (See the *NOTI•FIRE•NET™ Manual* or *High-Speed NOTI•FIRE•NET™ Manual* for an explanation of network functions.)

```
******NETWORK PARAMETERS*************************************************************
NODE:              102                  STYLE:           STYLE 4
NODE LABEL:        NCA-2
CHA A. THRESHOLD: HIGH                  CH B. THRESHOLD: HIGH
IP ACCESS:         OFF
*****************************************************************************************
```

Figure 4.18 Printer Functions: Network Parameters Report

Network Mapping - This report lists the remote nodes which this NCA-2 unit has been programmed to monitor and/or control. Remote nodes not in this list will be ignored by the NCA-2 unit.

```
******NETWORK MAPPING*****************************************************************
003 009 019 083 095 153 215 235 239
*****************************************************************************************
```

Figure 4.19 Printer Functions: Network Mapping Report

Settings - Prints a report of the NCA-2 Settings screen. (See Section 5.5.3 "Panel Settings".)

```
******SETTINGS************************************************************************
EVENT ORDERING:    USA                      DISPLAY ADDRESS:      YES
TROUBLE REMINDER:  YES                      PROPRIETARY REMINDER: YES
REMOTE REMINDER:   YES
DCC PARTICIPATION: NO
*****************************************************************************************
```

Figure 4.20 Printer Functions: NCA-2 Settings Report

Timers - Prints a report of the NCA-2 time settings for Auto Silence and AC Fail Delay.

```
******TIMERS**************************************************************************
AC FAIL DELAY: 8 HOURS
AUTO SILENCE:  OFF
*****************************************************************************************
```

Figure 4.21 Printer Functions: NCA-2 Timers Report

Event Monitoring - Prints a report of the settings for event monitoring.

```
******EVENT MONITORING************************************************************

FIRE ALARM:        YES               SECURITY:          YES
OTHER:             YES               SUPERVISORY:       YES
TROUBLE:           YES               PREALARM:          YES
DISABLED POINT:    YES
*******************************************************************************
```

Figure 4.22 Printer Functions: NCA-2 Event Monitoring Report

LCD Display - Prints a report showing the brightness settings of the display, whether its backlight is on, and language of the display.

```
******LCD DISPLAY*****************************************************************
LCD INTENSITY: 040                      BACKLIGHT:     ON
LANGUAGE:      ENGLISH
*******************************************************************************
```

Figure 4.23 Printer Functions: LCD Display Report

ACS Programming - Print a list of all installed ACS devices and their types (64-point, 96-point, UDACT, TM4, etc.)

```
******INSTALLED POINTS*******************8*********************************
  BOARD 01: 96 PT
    MONITOR             N102P01.1                                   N000A01P01
*******************************************************************************
```

Figure 4.24 Printer Functions: ACS Installed Points Report

ACS Installed Points - Print a list of installed ACS devices, their types, and their programmed points.

```
******ACS POINT PROGRAMMING*******************************************************
  BOARD 03: 64 PT
    POINT 01:  ACKNOWLEDGE                      POINT 02: SILENCE N000
    POINT 03:  RESET N000                       POINT 04:  DRILL N000
*******************************************************************************
```

Figure 4.25 Printer Functions: ACS Installed Points Report

Supervision - Print a report showing whether there is supervision for the power supply and tamper input, and what type of printer is being used. When there is power supply supervision, the power supply node will be displayed.

```
******SUPERVISION*****************************************************************
MAIN PS NODE:           N000
PRINTER:                80-COLUMN
Tamper Input:           NO
AUXILIARY TROUBLE:      NO
*******************************************************************************
```

Figure 4.26 Printer Functions: Supervision Report

Event Logging - Prints a report of the NCA-2 Event Logging settings for Non-Fire Activations and Output Activations.

```
******EVENT LOGGING***************************************************************

NON-FIRE ACTIVATIONS:NO                 OUTPUT ACTIVATIONS: NO
*******************************************************************************
```

Figure 4.27 Printer Functions: NCA-2 Output Activations Report

Active Points Reports

This printer functions option shows active points directly from the alarm queues. The SECURITY and OTHER queues are combined in one printout. Only buttons which have active events are visible. Pressing one of these buttons will print the report and return the user to the main menu. It is not possible to select all queues for printout at the same time.

Main menu
↳ Printer functions
↳ Active points

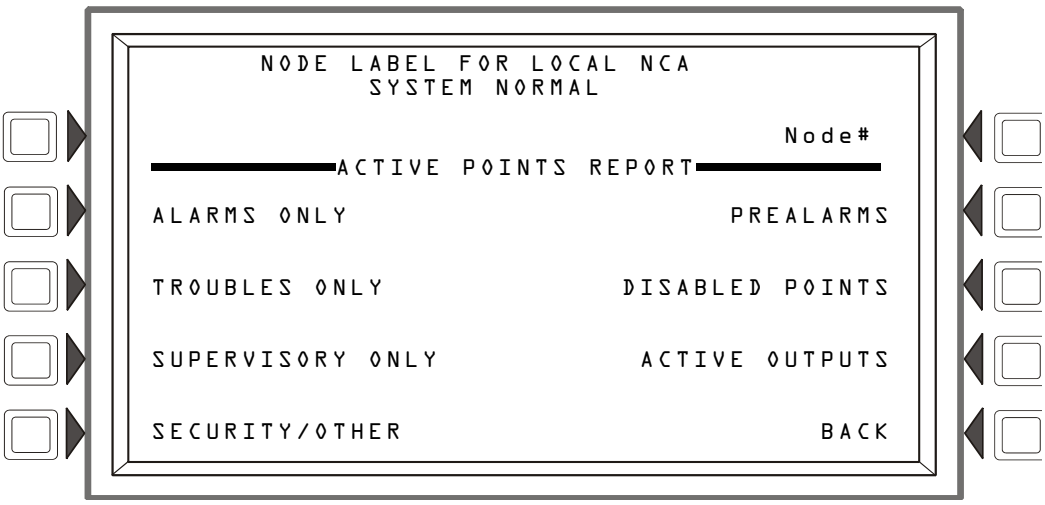


Figure 4.28 Printer Functions: Active Points Report Menu

Walk Test Reports

This printer functions prints a report of the last walk test performed.

```
******WALK TEST RESULTS*************************************************************
TEST TROUBLE          NO ANSWER          DETECTOR 73
                Z003      SMOKE(IOM)       02:54:04P TUE MAR 18,2008 N001L01D073
TEST FIRE ALARM                          ROOM 101                    1ST FLOOR
                Z001      HEAT(ANALOG)     02:54:31P TUE MAR 18,2008 N001L01D003
TEST FIRE ALARM                          ROOM 221                    2ND FLOOR
                Z001      SECURITY         02:54:59P TUE MAR 18,2008 N001L01M004
TEST ACTIVE                              LAB                         3RD FLOOR
                Z004      CONTROL          02:55:09P TUE MAR 18,2008 N001L01M005
*****EVENTS*************************************************************************
```

Figure 4.29 Printer Functions: Walk Test Report

4.3 Events

4.3.1 About Events

An event is any change in the status of a device, a transfer of information between a device and the NCA-2, or a transfer of information between two devices. Some of these events are considered background and housekeeping events and are not seen by the user under normal circumstances. These events may appear, however, during a Walk Test operation.

The events that are of primary concern to the operator are those identified as Off-Normal Events. An off-normal event is an event which indicates activity or change in condition that requires the attention and/or response of an operator. Examples of possible off-normal events are:

- Activation or change in condition of a monitoring device (Smoke Alarms, Fire Alarms, etc.).
- System troubles, such as network problems, device supervision problems, etc.

4.3.2 Types of Events

Events which come into the NCA-2 and are displayed on the LCD screen can be divided into the following fundamental categories:

- **Fire Alarm Events -** Events issued by fire alarm initiating devices such as pull stations, smoke detectors, and sprinkler systems.
- **Mass Notification Events** - Events issued by Mass Notification initiating devices. These events include MN Alarms, MN Supervisories, and MN troubles.

- **Pre-Alarm Events -** Prealarms are precursors to fire alarms; a fire detector device issues this event when its level surpasses the programmed limit.
- **Security Events -** Events issued by security devices such as motion detectors, glass break detectors, and door contacts.
- **Supervisory Events -** Supervisory alarms are special alarms to indicate an action that has functionally disabled a key device (for either fire protection or security). An example would be an event generated if the water valve is shut off for a sprinkler system.
- **Trouble Events -** Trouble events indicate a functional problem with a device on the network. Examples of trouble events include a device going off-line, a battery low or no power event, a clogged head on a smoke detector, etc.
- **Other Events -** Events which do not fit the other categories, such as Critical Process or Life Safety.
- **Disabled/Enabled Events -** Events resulting from enabling or disabling a device.

4.3.3 Event Handling

When an off-normal event is sent to the NCA-2 from an FACP or ACS device, it must be acknowledged either at the NCA-2 or locally at the panel. Acknowledging an event performs the following functions:

- Silences the Piezo sounder on the NCA-2.
- Transfers the event to the NCA-2's History buffer.
- Sends a network event to the associated panel.

How to Acknowledge an Event

When an event comes in, the NCA-2's alarm will sound a specific pattern depending on the event type. The event type will be displayed in the upper left corner of the screen. The ACKNOWLEDGE option will appear, also displaying the event type. This option will flash along with the appropriate LED indicator. Once you press the ACKNOWLEDGE soft key (or the ACKNOWLEDGE Fixed Function key, the upper left message will change to "acknowledged."

NOTE: If the device initiating the event has become disabled in such a manner that it can no longer communicate over the network, the NCA-2 message will display "Local Acknowledge" in the upper left corner, indicating the event has been acknowledged at the NCA-2 only.

For details on operator response to various events, refer to the pertinent FACP or ACS manual.

Figure 4.30 on page 62 and Figure 4.31 on page 62 are examples of screens displaying an incoming event and an acknowledged event, respectively.

Events can be scrolled by pressing the appropriate hard key. Events are displayed and logged in the history. When additional unacknowledged events exist, the first four screen lines advance to the next highest priority unacknowledged event, and this process repeats. After the history log is full, the next event that gets logged causes the least recent event in the log to be dropped.

Block Acknowledging

The default settings for all event types, with the exception of fire alarms, is Block Acknowledgment. Fire Alarms are always acknowledged on a point-by-point basis.

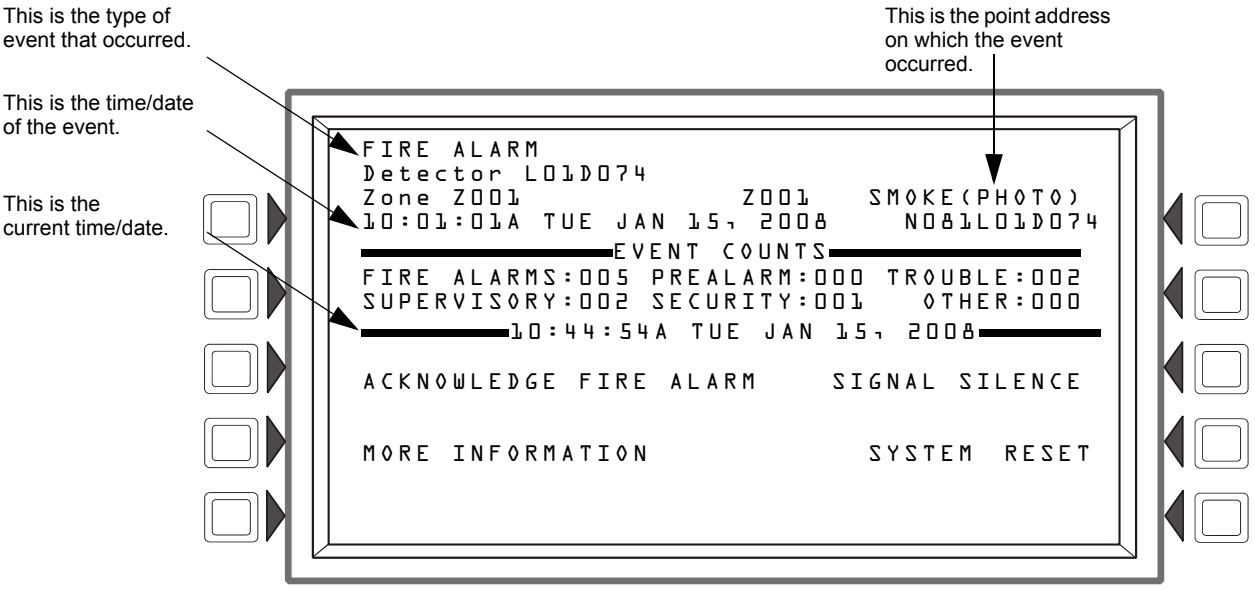


Figure 4.30 An Unacknowledged Event

NOTE: When there are no unacknowledged events or if the System is Normal, the ACKNOWLEDGE soft key will not be visible.

NOTE: For detectors, modules and panel circuits connected to the NFS2-3030, custom action messages are displayed for the “MORE INFORMATION” soft key on the events screen. Other types of points and FACPs display the “READ STATUS” soft key.

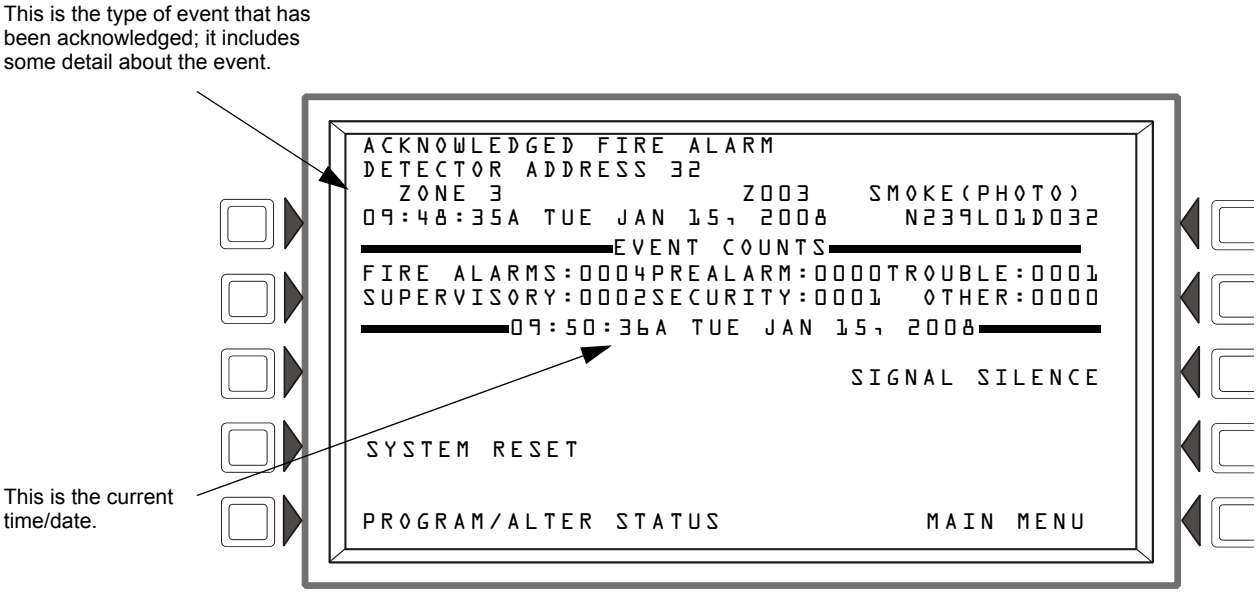


Figure 4.31 An Acknowledged Event

Section 5: Programming

5.1 Security Access

The NCA-2 has two password levels: master and user. There is one master password, which grants access to all system programming. There are nine user passwords, each of which may be assigned access to the programming change menus, the alter status menus, or both. A user password does not give access to or allow change to any password parameters, not even its own. Only the master password will allow access to all password change screens.

The panel arrives with factory default settings of 00000000 for the master password, and 11111111 for one user password. These should be changed immediately.

Follow the steps below to change the factory settings:

1. Press PROGRAM/ALTER STATUS at the Main Menu screen.
2. Using the keyboard, enter eight zeros (00000000) after ENTER PASSWORD.
3. Press the ACCEPT soft key.
4. Press the PANEL PROGRAM MENU soft key.
5. Press the PASSWORD CHANGE soft key.
6. Select MASTER PASSWORD to set the primary password, or select USER PASSWORD to set user permission levels. NOTE: Only the master password can be used to create or change passwords.

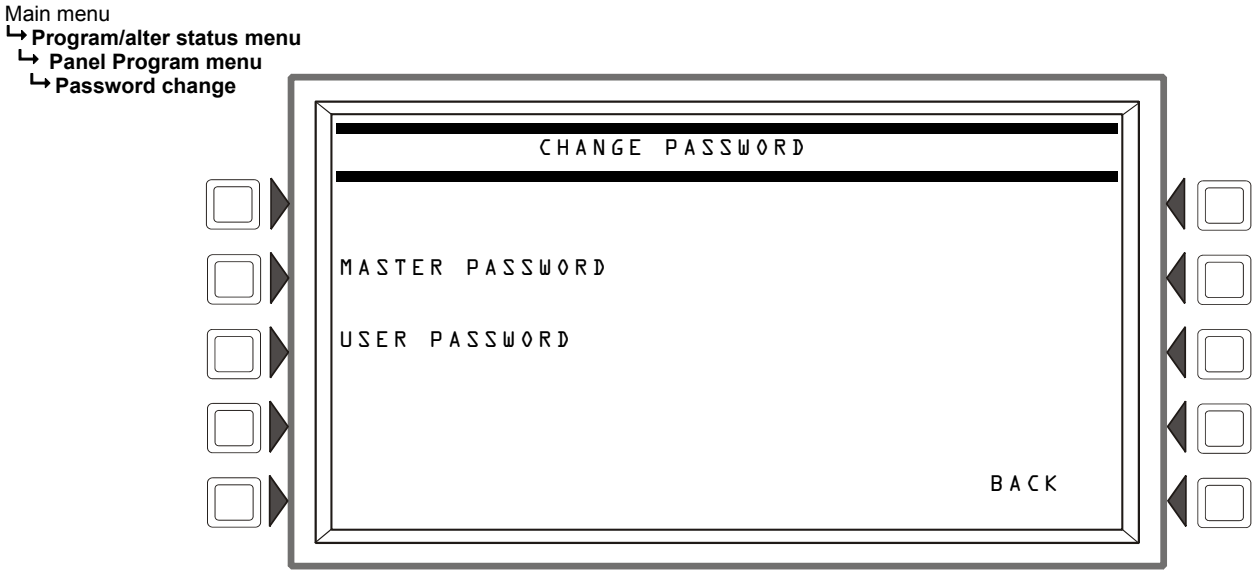


Figure 5.1 Change Password Screen

5.1.1 Master Password

Press the MASTER PASSWORD Soft Key and type in the new password that will replace the factory default password: there can be up to eight alphanumeric characters. Press the enter key on the keyboard. RE-ENTER PASSWORD will appear. Retype the password for verification. Press ACCEPT to save the new password. Press <ESCAPE> or <BACK> to exit without saving changes.

5.1.2 User Password

1. Press the USER PASSWORD soft key.
2. Press the USER soft key to scroll through the nine user password numbers. When this key is pressed, the rest of the display will update to reflect information for each new record. Stop at the password number to be updated.
3. Press the MODE soft key to select the user's level of access. Levels are as follows:
4. **PROGRAM/ALTER STATUS** Gives access to both the Program Change Menu and the Alter Status Menu.
5. **ALTER STATUS** Gives access to only the Alter Status Menu
6. **NONE** Gives no access. Use to deactivate an existing password.
7. Press the REFERENCE soft key to enter an alphanumeric label to identify the user (maximum 20 characters). This is used only as a reference and is not used by the NCA-2 for any functions.
8. Press ENTER and type in a new password at the prompt (up to 8 alphanumeric characters). Press ENTER again and re-type the password at the RE-ENTER PASSWORD prompt for verification.
9. After entering all password information and retyping the password at the prompt, press the ACCEPT soft key to save all the password information.

NOTE: Only the master password has rights to change user passwords.

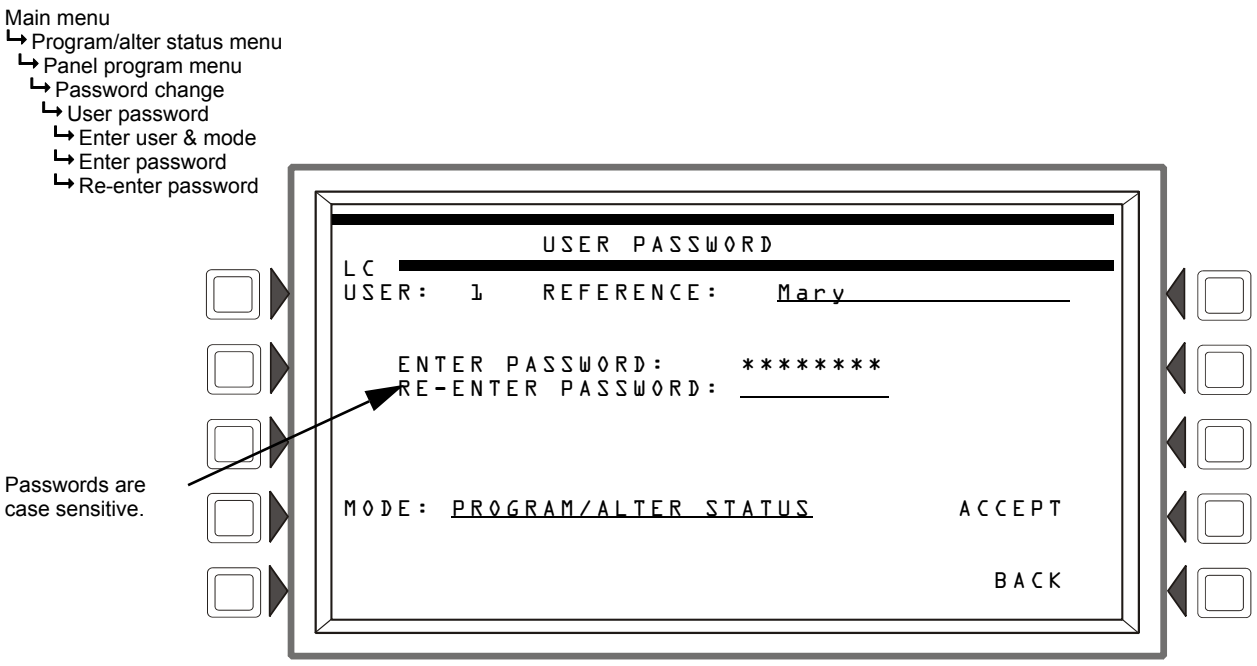


Figure 5.2 Change User Password

5.1.3 Unprotected Functions

Operators without a password can do basic tasks; if a key switch is installed on J6 and enabled, a key is required to enable the keypad. The operator can perform the following keypad or menu-displayed functions:

- Acknowledge alarms, troubles, and restorations (clears).
- View acknowledged alarms and troubles.
- Silence the sounding of fire alarm notification appliances.
- Simultaneously reset all panels which are associated through programming.
- Point Read Status for network devices and local NCA-2 annunciator points.
- Test the NCA-2 LED indicators and Liquid Crystal Display (LCD).
- View or print the event history stored in nonvolatile memory.

If the main operator of the system requires access to a function which is password protected, contact the Notifier distributor who installed the system for the required password(s).

5.1.4 Key Switches

An AKS-1B Annunciator Key Switch is required for each NCA-2 unless the NCA-2 is installed in a lockable cabinet such as a CAB-4 series backbox. The AKS-1B is used to enable and disable the NCA-2 keypad. (see Section 3.16 “Annunciator Key Switch (AKS-1B)”). In some jurisdictions, only one NCA-2 may have the keypad enabled at any given point in time; all other NCA-2 keypads must be disabled using the AKS-1B If an NCS is installed on the network, each NCA-2 keypad must be disabled by enabling key switch monitoring for the NCA-2 and locking the AKS-1B. A wiring diagram is provided in Section 3.16, “Annunciator Key Switch (AKS-1B)”, on page 37.

5.2 The Program/Alter Status Menu

Press PROGRAM/ALTER STATUS on the Main Menu screen. The user must enter a password/user ID of up to eight digits to advance to the Alter Status Menu or Program Menu.

If the password does not match a password in the database, an encrypted version of the master password will be shown.

Access to Program/Alter Status menu registers as a “Programming Mode” trouble and is tracked in event history.

NOTE: All events are annunciated during programming. If one of the annunciated events occurs, the NCA-2 will exit the Programming screen and go to the Event Counts menu with the exception of troubles. Troubles will sound the piezo, but will not cause an exit to the Events Counts Screen.

Main menu
↳ Program/alter status

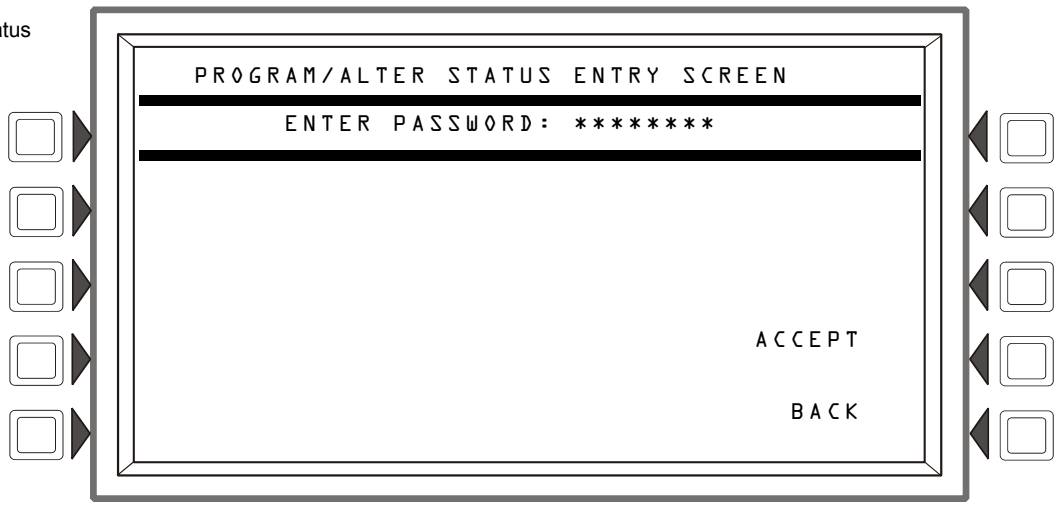


Figure 5.3 Alter-Status Password Screen

After a valid password is entered, the NCA-2 will navigate to the PROGRAM/ALTER STATUS ENTRY screen. There are three possible menus, which are detailed in the upcoming sections:

- ALTER STATUS MENU (Section 5.3 on page 67)
- NODE PROGRAM N____ (Section 5.4 on page 75)
- PANELPROGRAM MENU (Section 5.5 on page 77)
- POINT PROGRAM MENU

The password access level determines which of these menus will be displayed. For example, a user who was not set up to have programming rights, will only be allowed to access the Alter Status Menu. The master password always gives full access to all three options.

Main menu
↳ Program/alter status

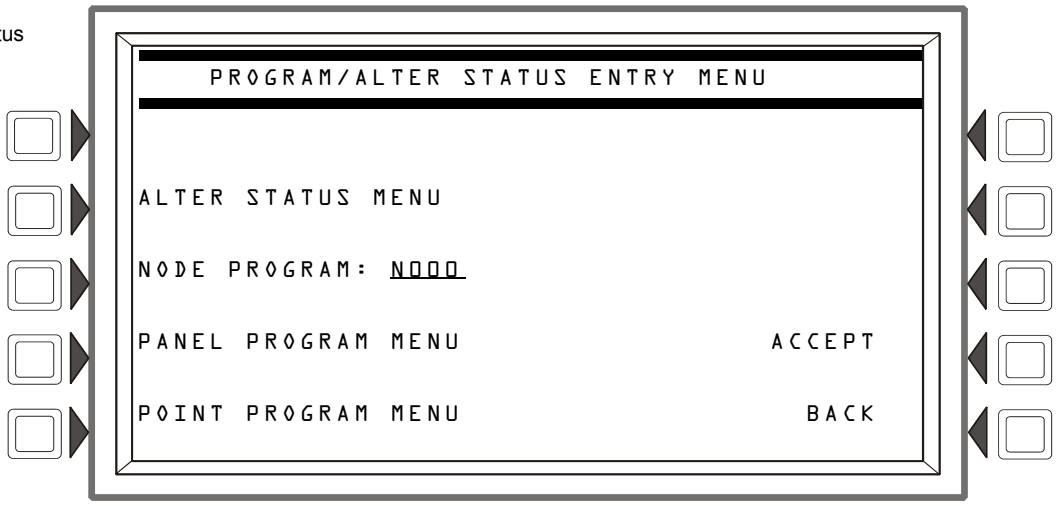


Figure 5.4 Program/Alter Status Entry Menu

NOTE: Access to ACS board label screen is by selecting local NCA-2 node only.

5.3 Alter Status Menu

5.3.1 Alter Status Menu Options

After you enter the correct password/user ID and press the ALTER STATUS soft key from the Program/Alter Status menu, the NCA-2 navigates to the screen with menu options shown in Figure 5.5. BACK or <ESC> will return to the PROGRAM/ALTER STATUS ENTRY screen discussed in "After a valid password is entered, the NCA-2 will navigate to the PROGRAM/ALTER STATUS ENTRY screen. There are three possible menus, which are detailed in the upcoming sections:" on page 66.

Main menu
↳ Program/alter status
↳ Alter status

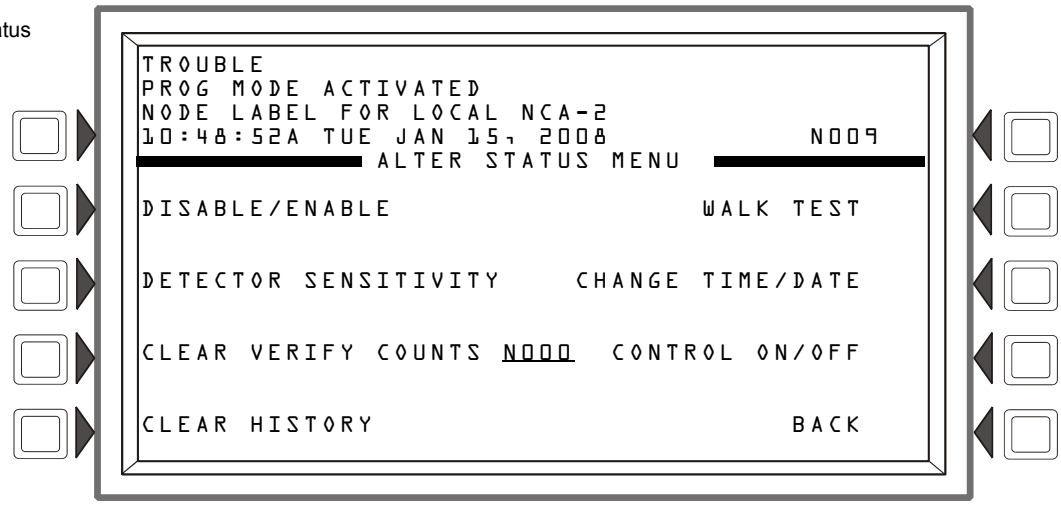


Figure 5.5 Alter Status Menu

5.3.2 Disable/Enable

Disable/enable individual control points on a remote fire panel node. It is for use across a network only; not for use with display nodes such as the NCA-2 or NCS.

Figure 5.6 is displayed when you select DISABLE/ENABLE from the Alter Status Menu. Identify which point(s) to disable/enable. If there is an event in the display area, that address will be the default. This allows you to quickly read the point being displayed. If no event is present, the default format is that of a detector. To scroll through device types, press the POINT SELECT soft key. When you have selected the desired device type, enter the device address, then press the ACCEPT soft key to accept the entry or <ESC> to exit. The soft key BACK will also exit without saving. The NCA-2 will display the Enable/Disable screen. If the point does not exist or the node is off-line, the NCA-2 will display an error screen. This screen will be displayed for three seconds and return to the previous screen.

After selecting a point, the NCA-2 will display that point and give the option of enabling or disabling it. If the point is enabled, the corresponding option is not visible, letting the user know the current setting of that point. To exit the screen without changing the enable/disable status, press BACK or the <ESC> key.

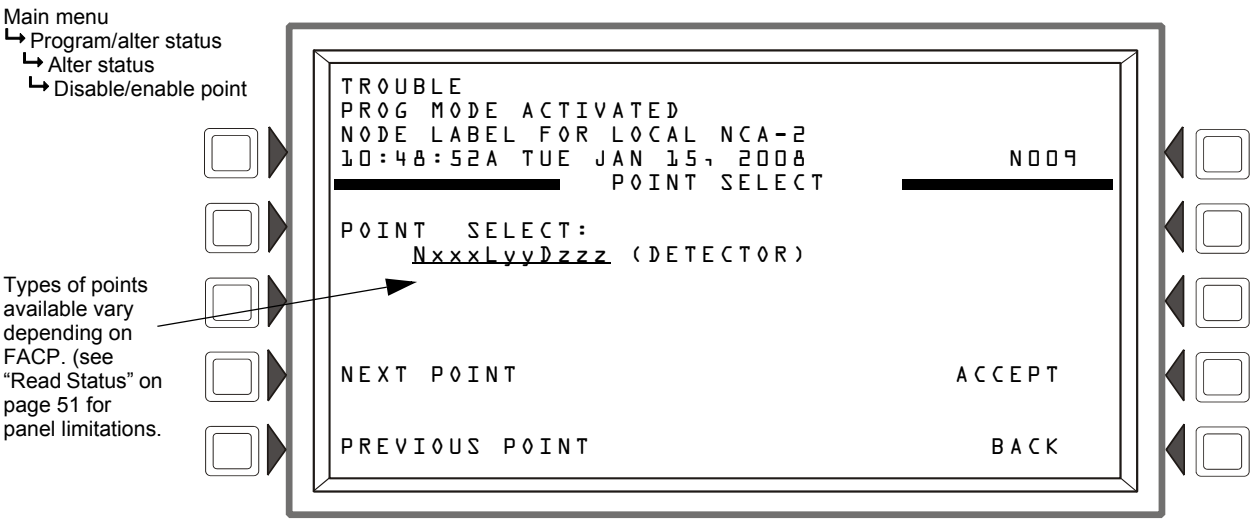


Figure 5.6 Alter Status: Disable/Enable Point, Point Select

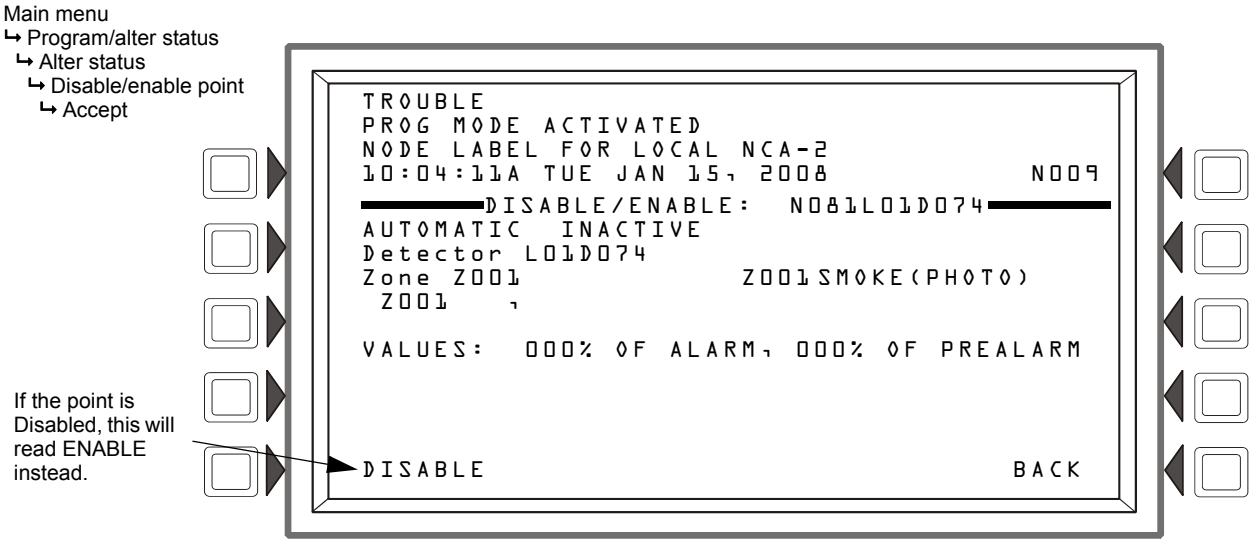


Figure 5.7 Alter Status: Disable/Enable Screen

NOTE: Disabling a point could compromise fire protection, and the system will prompt you to confirm the change.

5.3.3 Changing Detector Sensitivity

NOTE: For use with NFS-320, NFS2-640, and NFS2-3030 nodes.

Selecting DETECTOR SENSITIVITY will display the corresponding menu screen. It is identical to the Point Select screen shown in Figure 5.6, except the header will read SENSITIVITY POINT SELECT. Press the POINT SELECT soft key to scroll through and choose the desired device type. In the POINT: NxxxLyyDzzz field, enter the address of the point you wish to change. If an event for a detector is in the display area, that address will be the default. This allows you to quickly access the point being displayed. The NEXT SELECTION/PREVIOUS SELECTION soft keys will increment to the next Node # or next device on the loop. The loop number will automatically

increment when the last device on the loop is passed. After the last loop number and detector number are reached, the display will issue an informational message indicating that there are no more devices. Once you type the desired address, select ACCEPT to display the Detector Sensitivity screen, or hit <ESC> to exit.

If a device does not exist at the selected address, an Invalid Point error message will display. Press "NEXT POINT" or "PREVIOUS POINT" to read the next/previous programmed point of that type. If communicating with an NFS-320, NFS2-640, or NFS2-3030, the NCA-2 will automatically proceed to the next point. In either case, an error message will indicate if there are no further devices of that type programmed.

The selected point must already be mapped in local NCA-2 programming; if the selected point is on a remote node, both that node and the local NCA-2 must be on-line.

When the NCA-2 reads a valid point, its details are displayed in the resultant screen (Figure 5.8 on page 69). One is most sensitive; nine is least sensitive. To alter one of the four settings, press the corresponding soft key; Figure 5.9 on page 69 shows the screen's format.

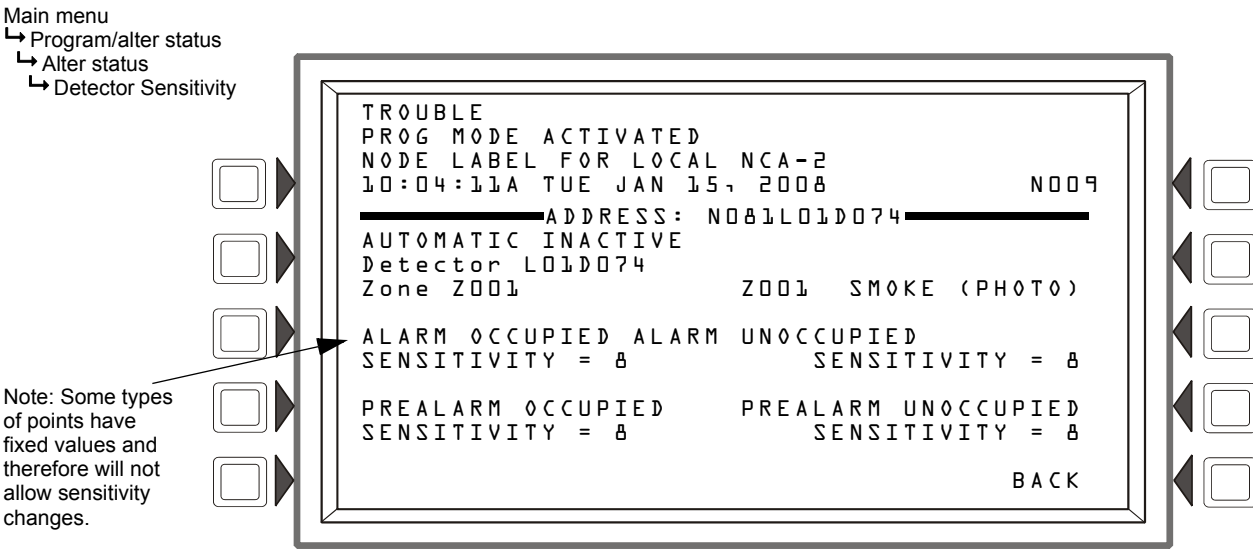


Figure 5.8 Alter Status: Detector Sensitivity

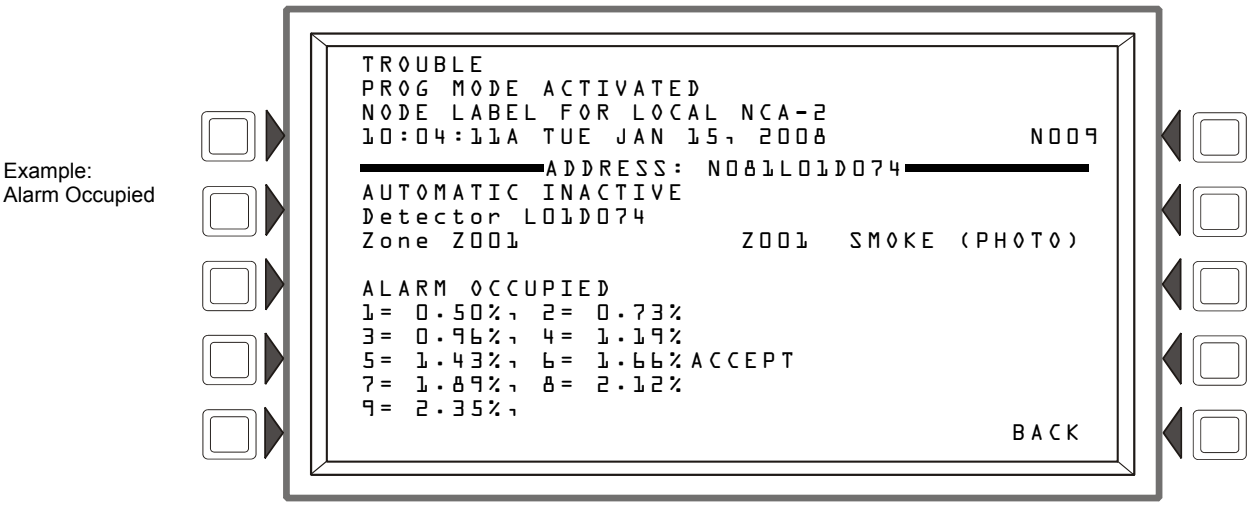


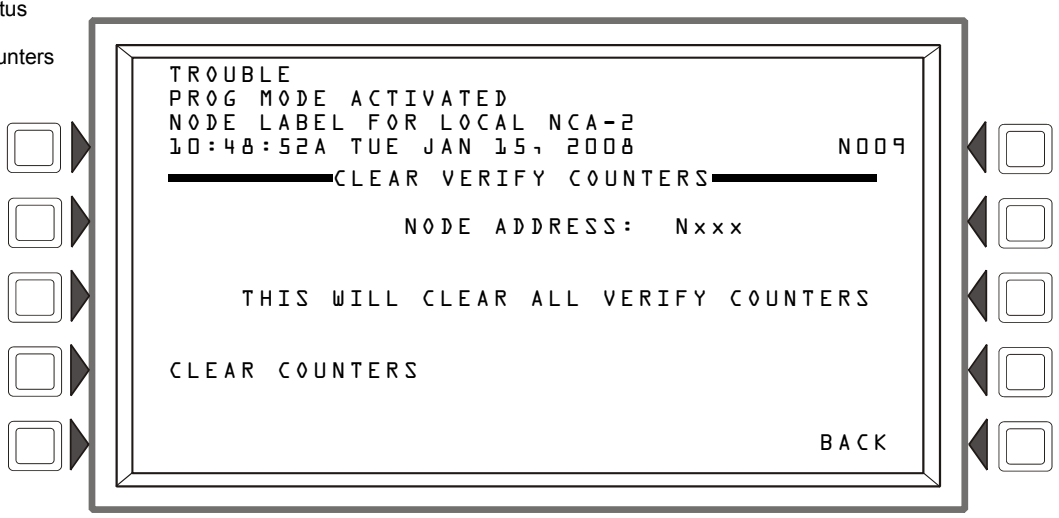
Figure 5.9 Setting Detector Sensitivity: Alarm Occupied

5.3.4 Clear Verify Counters

Prior to an alarm, a detector may go through a verification sequence to make sure it is not a false alarm. From the Alter Status menu, once you type in a node address and press the CLEAR VERIFY COUNTERS soft key, the screen in Figure 5.10 is displayed. This action will reset verification counters for that node, preventing an inaccurate verification reading if an alarm is subsequently activated.

NOTE: For use with NFS-320, NFS2-640, and NFS2-3030 nodes.

Main menu
↳ Program/alter status
↳ Alter status
↳ Clear verify counters



NOTE: For remote nodes only.

Figure 5.10 Alter Status - Clear Verify Counters

5.3.5 Clear History

Select Clear History from the Alter Status Main Menu, then choose NCA-2 HISTORY or NODE HISTORY N___. The NCA-2 will navigate to the Clear History menu, where there are three options: ALARM HISTORY, which clears only the alarm history buffer, EVENT HISTORY, which clears only non-alarm events in the history buffer, and ALL HISTORY, which clears both the alarm buffer and the event buffer. Once you clear a history buffer, the data is not recoverable. BACK or <ESC> will return the user to the Alter Status menu. Refer to Figure 5.11 on page 71.

NOTE: For use with NFS-320, NFS2-640, and NFS2-3030 nodes.

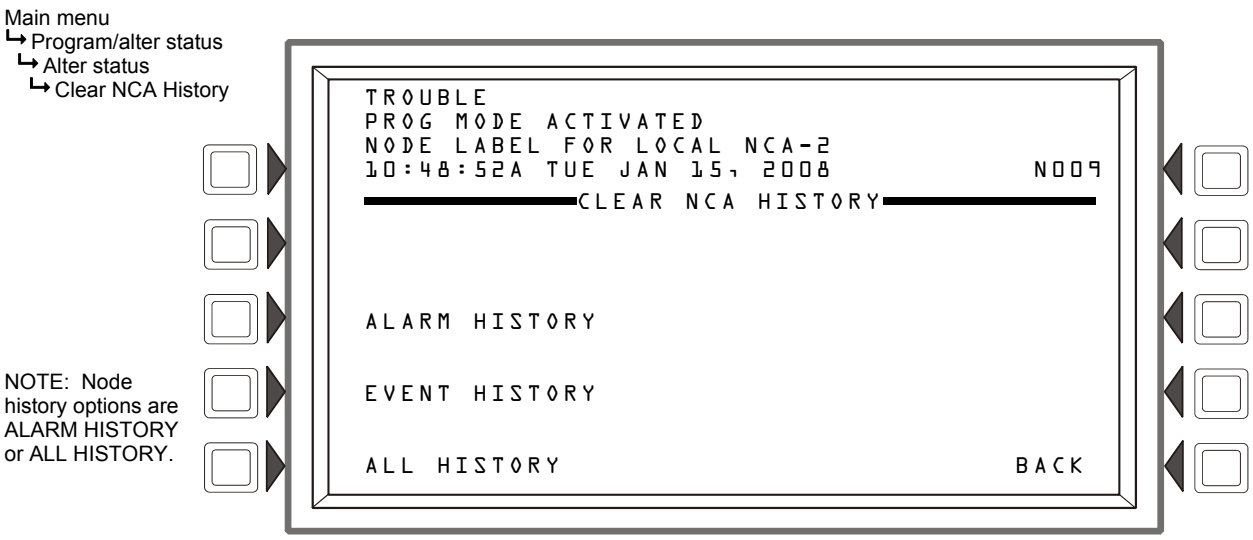


Figure 5.11 Alter Status - Clear NCA-2 History

5.3.6 Walk Test

When connected to an FACP that supports the function (e.g. NFS2-640 and NFS2-3030), the NCA-2 walk test allows you to remotely test all active alarms on the monitoring network. There are two types of tests: Basic and Advanced. The advanced test allows you to retain Control-By-Event (CBE) and Cooperative-Control-By-Event (CCBE) actions.

NOTE: Network zones and network logic zones may be used as part of a logic equation; network trouble zones may be used as part of a trouble equation. CCBE (Cooperative Control-by-event) is the term used to refer to programming over the network in this manner.

To perform a walk test, select the corresponding option from the Alter Status menu.

- **BASIC/ADVANCED -** Toggles between the basic and advanced Walk Test. When ADVANCED is selected, there is an END TEST option. END TEST is not an option for the basic test.
- **SILENT/AUDIBLE -** future use.
- **PARAMETER -** Toggles between NODES, LOOPS, DEVICES, and ZONES (LOOPS and ZONES are for use with NFS2-3030 only). Selecting NODES in this field allows multiple nodes to be tested (see Figure 5.13 on page 72). If NODE is selected, you will have an ALL NODES option, allowing you to put the entire network into Walk Test mode. NOTE: This is limited to the nodes mapped to the NCA-2.
- **DISABLE ACS BOARDS -** allows the user to disable ACS annunciation of the events generated by the walk test.
- **ACCEPT -** applies the settings and advances to the Start/End Test screen. BACK will return the user to the previous screen without performing the test.

NOTE: For use with NFS-320, NFS2-640, and NFS2-3030 nodes.

NOTE: The NCA-2 normally does not display point activations for various type codes that are unrelated to an alarm event, such as the NONFIRE type code. When in Walk Test mode, however, the NCA-2 will display activations for these types of points as TEST events.

Main menu
↳ Program/alter status menu
↳ Alter status menu
↳ Walk Test

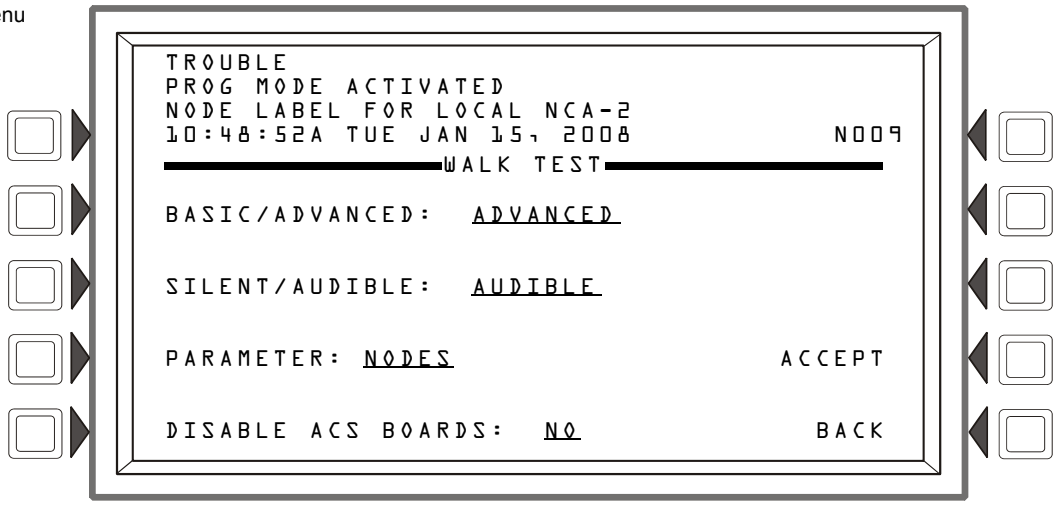


Figure 5.12 Walk Test Menu

The settings selected from the Walk Test Menu are displayed below the screen header. Up to 10 items may be selected for each test. The formats are as follows:

Nodes = Nxxx

Loop = NxxxLyy

The START TEST soft key begins the test using the parameters entered. Once a test has been started, the header will change from WALK TEST SELECT to WALK TEST IN PROGRESS. ABORT will terminate the current test and exit to the Walk Test menu. In Advanced mode, NEXT TEST will end the current test sequence and start a new one. Walk Test results are sent to the printer and to History. The event will be listed as "TEST…"

Main menu
↳ Program/alter status menu
↳ Alter status menu
↳ Walk Test
↳ Accept

This sample screen shows a walk test for two nodes.

"Next Test" is only available in Advanced mode after a Walk Test has been started.

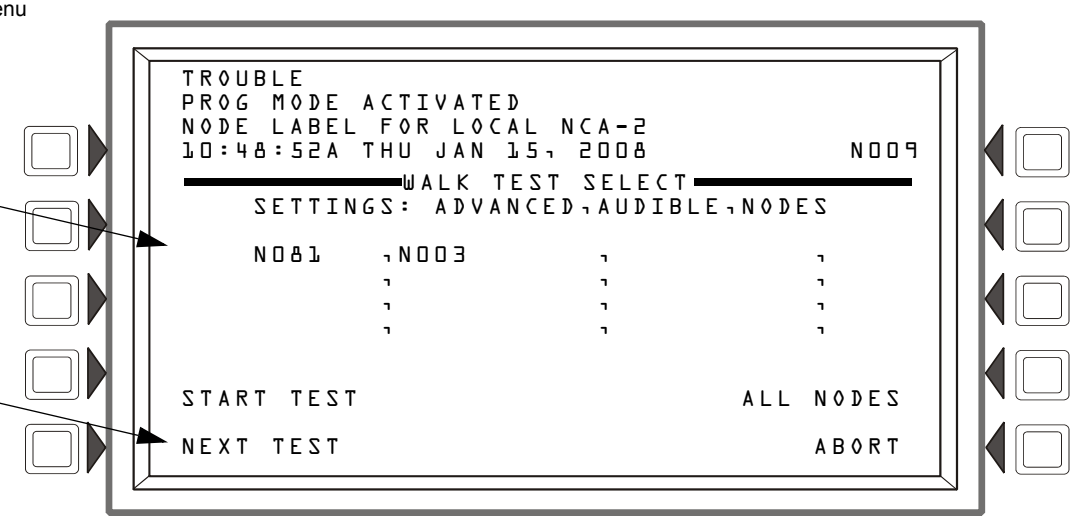


Figure 5.13 Walk Test Select Screen

The advanced test provides more information for the operator by allowing him/her to track the activation of a single input point/zone to the set of points that responded to the activation across the portion of the networked points specified at the start of testing. The operator will be allowed to set activation and response times to be included for each set of points.

5.3.7 Change Time/Date

Select the CHANGE TIME/DATE option from the alter status menu to access this feature. This allows you to change the system time and date. The current time and date will be displayed using the selected format. Use the keypad to enter the numeric values for the following fields: Hour, A.M. or P.M. (A or P), Minute, Month, and Year. The system automatically displays the day of the week regardless of format.

- The TIME FORMAT soft key will toggle between the following format choices:
  HH:MM AM/PM
  H:MM AM/PM
  HH:MM
  H:MM

Note: The H:MM format will replace leading zeros in the hour with a space character.

- The DATE FORMAT soft key will toggle between US (MM/DD/YY) and European (DD/MM/YY) format.
- The TIME ZONE soft key toggles between 34 time zone selections. The selection of time zone also has an inherent selection for whether daylight saving is in effect and the switch-over time. For example, USA EASTERN and INDIANA EAST are the same time zone, except INDIANA EAST does not change times with the Daylight Saving Time (DST) changes in the spring and fall.
- The ACCEPT key will implement the changes shown.
- The BACK soft key will return to the Alter Status Menu screen without making any changes.

Main menu
↳ Program/alter status menu
↳ Alter status menu
↳ Change time/date

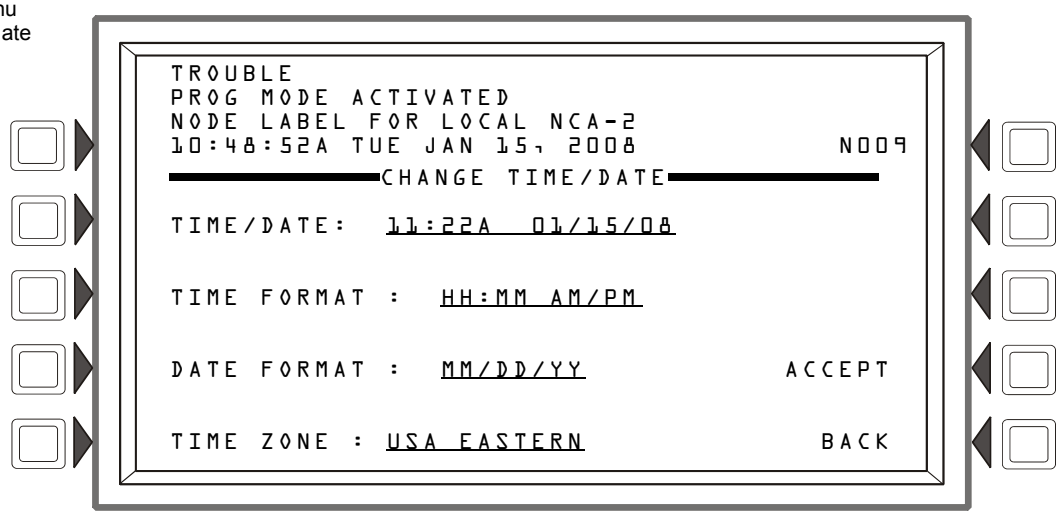


Figure 5.14 Change Time/Date

5.3.8 Control On/Off

Control On/Off enables you to control a point on a remote node. It is for use across a network only; not for use with display nodes such as the NCA-2, NCS, etc.

Press the POINT SELECT soft key to scroll through device types. The NEXT SELECTION/PREVIOUS SELECTION soft keys will increment to the next/previous Node number or device on the loop. When you have selected the desired device type, enter the device address, then press the ACCEPT soft key to accept the entry or <ESC> to exit. The soft key BACK will also exit without

saving. After selecting the point, the NCA-2 will display it and give the following options: FORCE ON and FORCE OFF. If the point is currently on, the FORCE ON option is not visible, letting the user know the current setting of that point.

NOTE: Control on/off is for use across a network only.

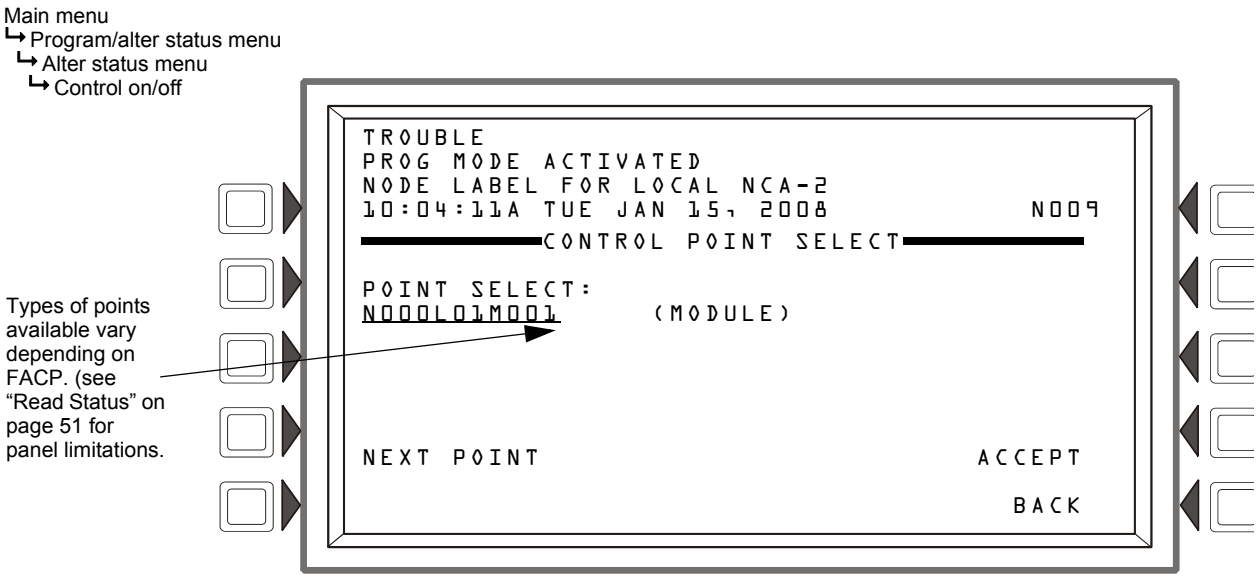


Figure 5.15 Control On/Off Point Select

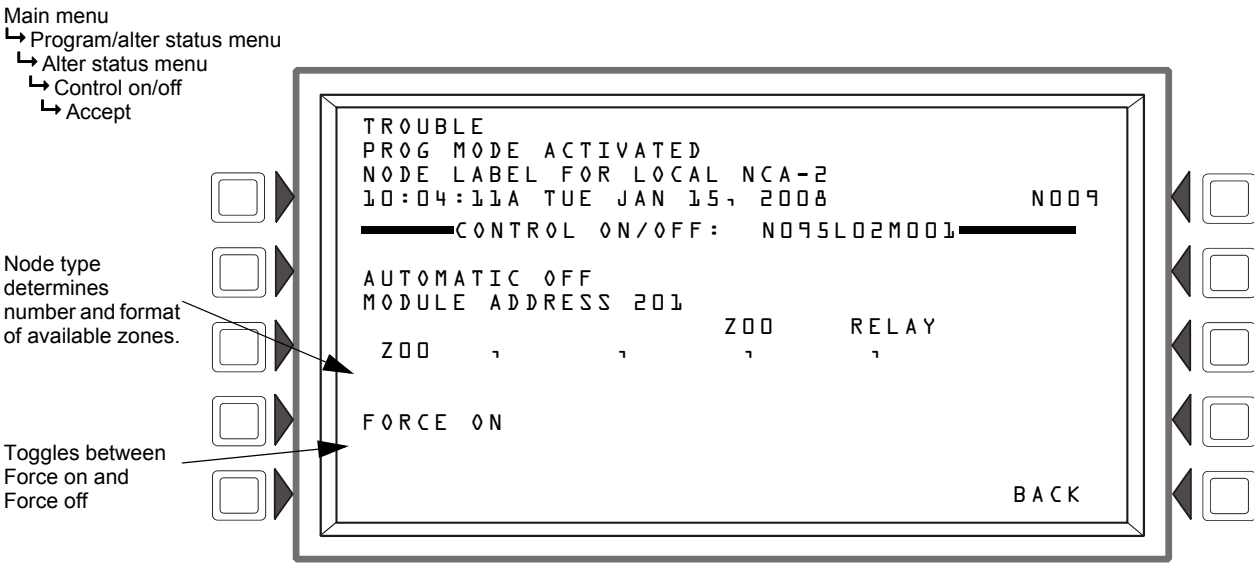


Figure 5.16 Control On/Off Screen

5.4 Node Program Menu

The NODE PROGRAM menu is available to make changes to point or node labels.

5.4.1 Node Program Menu Options

Main menu
↳ Program/alter status menu
↳ Node program menu
(Remote node selected)

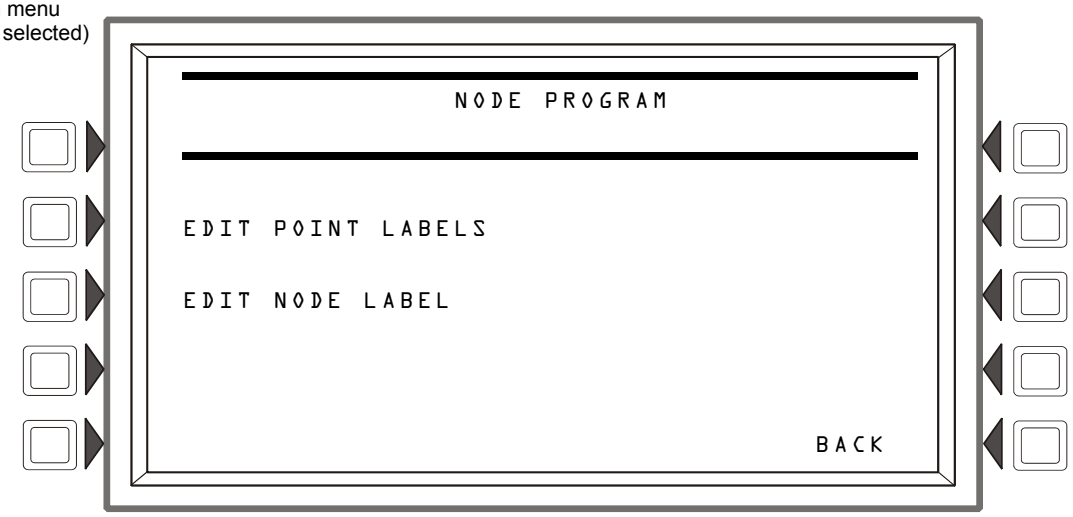


Figure 5.17 Node Program Menu, Remote Node Selected

Main menu
↳ Program/alter status menu
↳ Node program menu
(local NCA selected)

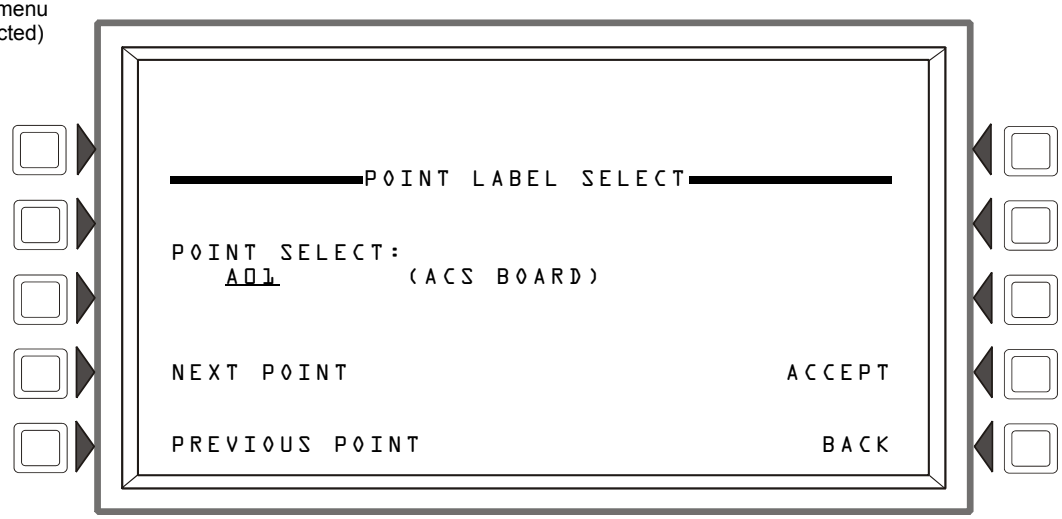


Figure 5.18 Node Program Menu, Local NCA-2 Selected

5.4.2 Edit Point Labels

This option allows you to name and/or provide an abbreviated description for individual points.

1. Select the point on the node that you wish to edit, then press the ACCEPT soft key.
2. Once the Edit screen is active, change the point label and/or the extended point label by using the alphanumeric keys to enter the desired text.
3. Press the ACCEPT key to implement the changes, or BACK to exit without changing anything.

NOTE: Not applicable for changing the label of other network annunciators on the network.

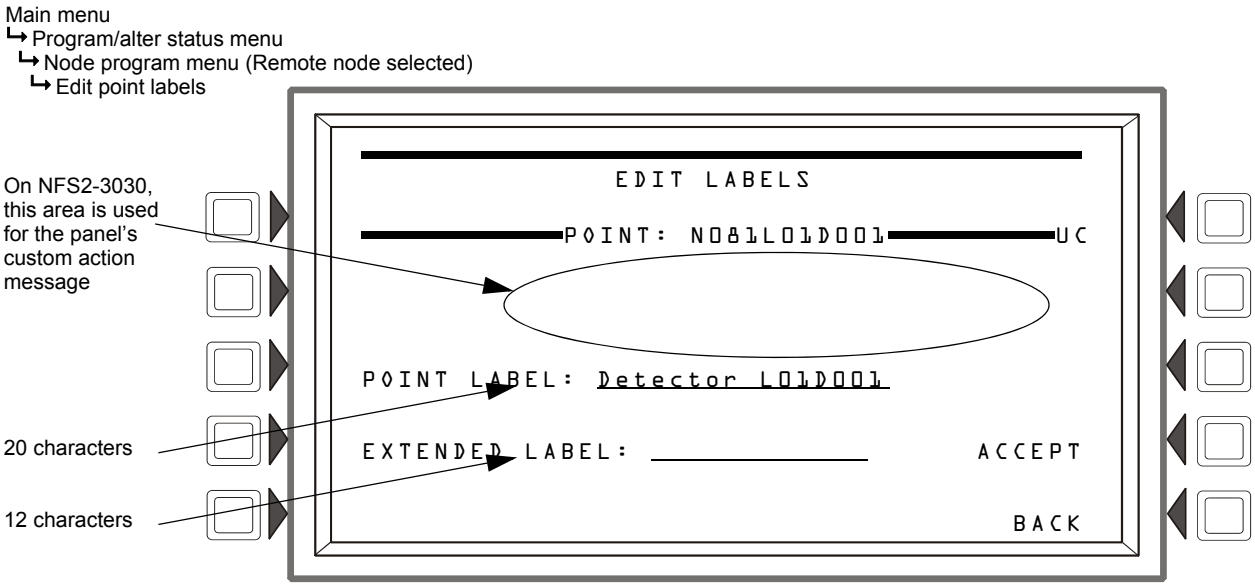


Figure 5.19 Node Program Menu: Edit Point Labels

5.4.3 Edit Node Label (for a Remote Node)

A node label is designed to give more descriptive information about a node than just its number. This label can be changed in the NCA-2 if the user has access to this menu. To access this feature, select NODE PROGRAM MENU N____ , enter the desired node number in the N field, then select EDIT NODE LABEL. Line 4 displays the node number that you will be labeling. Type in a description of up to 40 characters. Press ACCEPT to implement this, or select BACK or <ESC> to exit this screen without making any changes.

Main menu
↳ Program/alter status menu
↳ Node program menu (Remote node selected)
↳ Edit node label

When the screen comes up, this will display the current node label for a remote node. Enter the new label name, and press ACCEPT to make the change.

Figure 5.20 Node Program Menu: Edit Node Label

NOTE: To edit the node label for the local NCA-2, see Figure 5.22 on page 79.

5.5 Panel Program Menu

The Program menu options adjust the general operational settings for the local NCA-2: how it communicates over the monitoring network, how it handles events, display settings, password configurations, etc. For example, with EVENT MONITORING you can control what event types will be monitored. If multiple NCA-2s exist on the network, a user may not want all of them to monitor all types of events. In this case, one NCA-2 could monitor alarm events, and another one could monitor status events like trouble and enable/disable events. To bring up a menu, activate the keypad and press the soft key next to the option.

Main menu
↳ Program/alter status menu
↳ Panel program menu

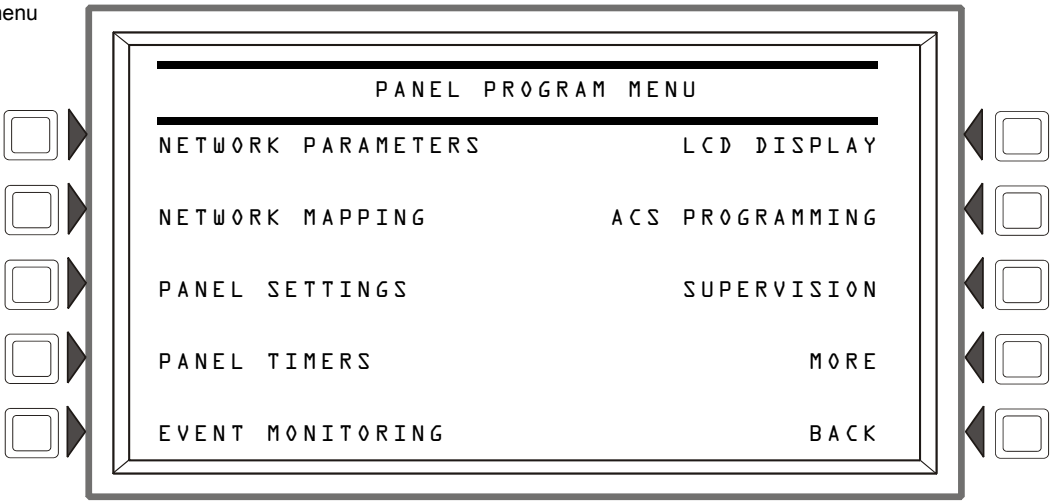


Figure 5.21 Program Menu

Event Monitoring

If any event types in Event Monitoring are set to NO, control functions such as Drill (Alarm Signal for Canadian applications), System Reset, and Signal Silence are disabled. However, Acknowledge functions are dependent on the panel's Local Control settings (Refer to Section 5.5.3, "Panel Settings", on page 81). The following table shows Acknowledge function operation with any event type set to NO in Event Monitoring.

Local Control Setting:	Acknowledge Function:
Yes	Pressing the Acknowledge softkey on the NCA-2 will locally acknowledge events and silence the piezo on the NCA-2 only. Any unacknowledged events on networked fire panels will remain unaffected.
No	The Acknowledge softkey on the NCA-2 is disabled. Local and networked events remain unacknowledged.

Table 5.1 Event Monitoring and Acknowledge Function Operation

NOTE: If Trouble and Disable events in the Event Monitoring menu are set to NO, critical information that may impact the fire system may be missed, It is suggested that Trouble and Disable events remain set to YES.

5.5.1 Network Parameters

Use the following soft keys to select the corresponding field and make changes for that NCA-2 network setting (refer to Figure 5.22 and Figure 5.23 on page 79):

- NODE NUMBER allows you to change the NCA-2 node number. NOTE: Make sure you do not assign the NCA-2 a node number already being used by another monitoring device.
- NODE LABEL allows you to edit the local NCA-2's custom label. This appears in Line 1 as part of the "all-systems normal" message when there are no active events, and in Line 3 of an active-event summary. There is a 40-character maximum. NOTE: This is the local node label; to change a remote node label, see Section 5.4.3 "Edit Node Label (for a Remote Node)"on page 76.
- STYLE: _____ selects the style as STYLE 4 or STYLE 7.
- CH A THRESHOLD sets the channel A threshold to HIGH or LOW. (See the *NOTI•FIRE•NET™ Manual* or *High-Speed NOTI•FIRE•NET™ Manual* for an explanation of this network function.)
- CH B THRESHOLD sets the channel B threshold to HIGH or LOW. (See the *NOTI•FIRE•NET™ Manual* or *High-Speed NOTI•FIRE•NET™ Manual* for an explanation of this network function.)
- IP DOWNLOAD allows you to enable VeriFire software downloads through the internet. (This setting will not affect VeriFire downloads via non-internet connections). Pressing the IP DOWNLOAD soft key will display a screen with the following options:
  IP ACCESS: OFF - disables internet access for VeriFire downloads
  IP ACCESS: ON - enables internet access for VeriFire downloads
  IP ACCESS: TIMED - enables internet access for two hours, then times out to disabled

NOTE: Enabling IP Access allows VeriFire downloads over the internet through a Noti-Fire-Net Web Server (NWS).

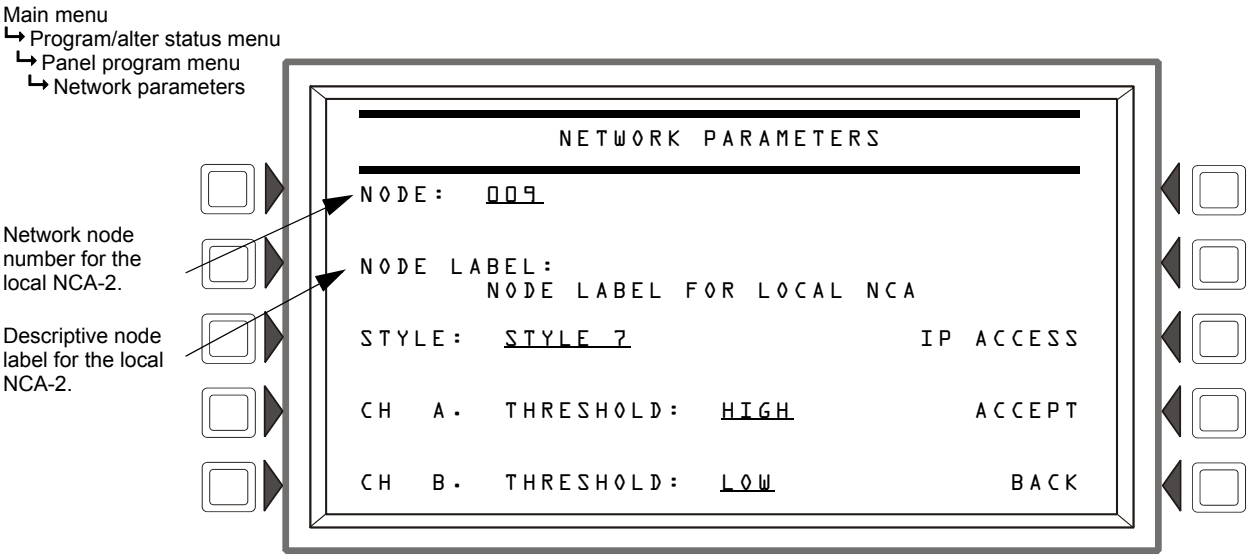


Figure 5.22 Program Menu: Network Parameters

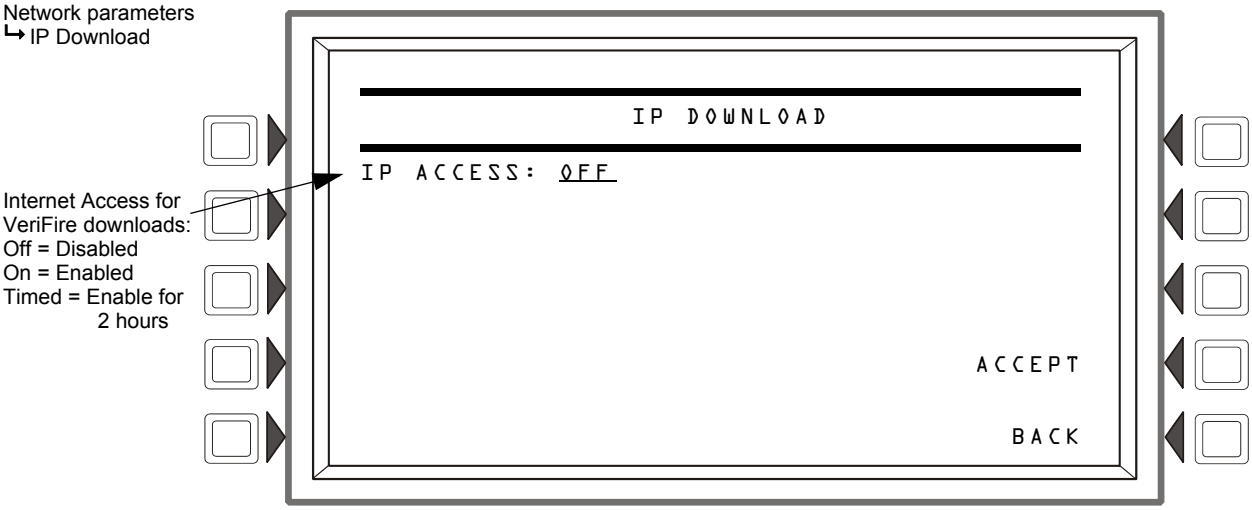


Figure 5.23 Network Parameters: IP Download

NOTE: Use of an IP Access setting other than OFF is subject to the approval of the local AHJ.

5.5.2 Network Mapping

The NCA-2 can be programmed to monitor only a select group of nodes on a standard or high-speed NOTI•FIRE•NET™ system. Consequently, the NCA-2 would only control or monitor those nodes, ignoring messages received from any other nodes on the network. This mapping feature does not affect time synchronization with the NCA-2; therefore, if the NCA-2 is the master time keeper of the network, it will transmit the time-synchronization message to all nodes on the network, whether or not they are being monitored by the NCA-2.

There are 15 of these screens covering nodes 1 through 240. Each screen will have 16 nodes on it. The up and down arrow keys are used to select which node to edit. When a field is selected, the NEXT SELECTION/PREVIOUS SELECTION keys will toggle between OFFLINE/ONLINE, MAPPED/UNMAPPED.

- **OFFLINE -** The node is not communicating on the network.
- **ONLINE -** The node is communicating on the network.
- **MAPPED -** Events are annunciated by the NCA-2.
- **UNMAPPED (blank) -** Events are ignored by the NCA-2.

NEXT navigates to the next screen in the sequence. The last screen will not have a NEXT key. BACK will go to the preceding screen in the sequence or to the Node Programming menu if the current screen is the first one in the 15-screen sequence. ACCEPT implements any changes that have been made up to this point and returns the user to the Node Programming menu. AUTO PROGRAM will consult the internal map of which nodes are on the network and automatically set all 240 Nodes according to the map, regardless of which screen is being shown. The results will not be saved to flash until the ACCEPT key is pressed.

Main menu
↳ Program/alter status menu
↳ Panel program menu
↳ Network mapping

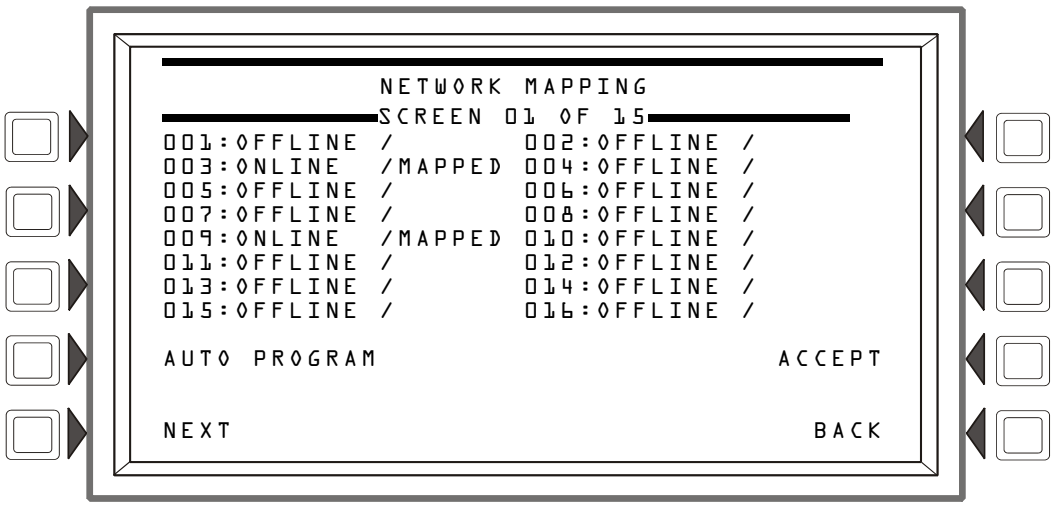


Figure 5.24 Program Menu: Network Mapping

5.5.3 Panel Settings

General NCA-2 preferences can be set from this program screen.

- **LOCAL CONTROL** - Press this soft key to toggle between Yes and No. This option disables (No) or enables (Yes) local panel control of the Signal Silence, System Reset, and Drill (Alarm Signal for Canadian applications) Fixed Function keys, as well as SIGNAL SILENCE, SYSTEM RESET, and ACKNOWLEDGE soft keys. A setting of No (disable) turns the panel piezo sounder off, overriding the next field if PIEZO is set to ON. Default: Yes.
- **PIEZO** - Press to toggle between Off and On. This option enables (On) or disables (Off) the panel piezo from sounding when alarms or troubles occur. Default: On.
- **DISPLAY ADDRESS -** Selecting NO instructs the NCA-2 not to display the node and point in the event at the top of the screen. Selecting YES displays all node and point information defined from the NCA-2 Node Program menu options.
- **EVENT ORDERING -** Switches between USA and CANADA ordering. USA priority events come in on the Event Counts screen and Canada priority events come in on the Multiple Event List screen.
- **REMINDER MENU** - These reminders occur daily at 11:00 AM (not configurable). Local reminders restart the NCA-2 piezo and require re-acknowledgment of trouble events. Proprietary reminders re-send trouble messages across the network. Remote reminders cause connected ACS devices to re-display trouble conditions.

With Fire as the highest priority:	
USA Event Order	**Canada Event Order**
Fire	Fire
CO Alarm	CO Alarm
MN Alarm	
CO Pre-alarm	CO Pre-alarm
Security	—
Supervisory	Supervisory
MN Supervisory	
Trouble	Trouble
MN Trouble	
Pre-alarm	Pre-alarm
Disabled	Disabled

With MNS as the highest priority:	
USA Event Order	**Canada Event Order**
MN Alarm	
Fire	Fire
CO Alarm	CO Alarm
CO Pre-alarm	CO Pre-alarm
Security	—
MN Supervisory	
Supervisory	Supervisory
MN Trouble	
Trouble	Trouble
Pre-alarm	Pre-alarm
Disabled	Disabled

Note: Fire/MNS priority dependent on programming.

Main menu
↳ Program/alter status menu
↳ Panel Program menu
↳ Panel settings

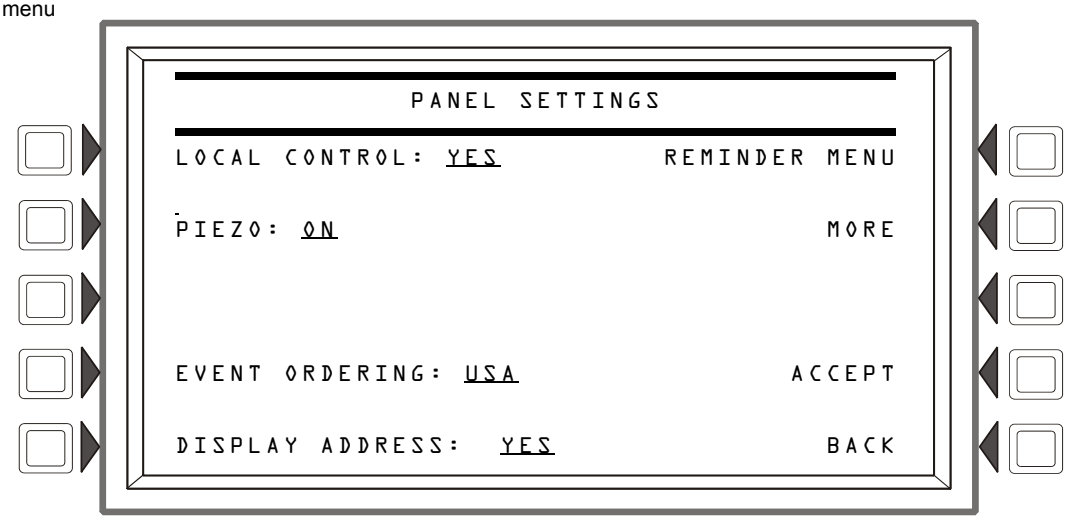


Figure 5.25 Panel Program Menu: Panel Settings

The Reminder Menu

Press the REMINDER MENU soft key to select Trouble Reminder or Telephone Ring-In Annunciation.

- **Trouble Reminder** - Press this soft key to toggle between the two possibilities:

  YES: Choose this to initiate a daily 11:00AM reminder that there are uncleared troubles in the system. The reminder will appear on the screen and will sound a piezo (if the piezo is enabled).

  NO: Choose this if no reminder is desired. Default: YES

- **Telephone Ring-In Annunciation** - toggles enable between YES and NO. If enabled, Telephone Ring-In will provide an audible and visible indication that a fire fighters telephone circuit has been activated, indicating a call-in from emergency response personnel.

NOTE: Enabling Telephone Ring-In supervision will indicate an active telephone circuit from any NFS2-640 or NFS2-3030 panel on the network.

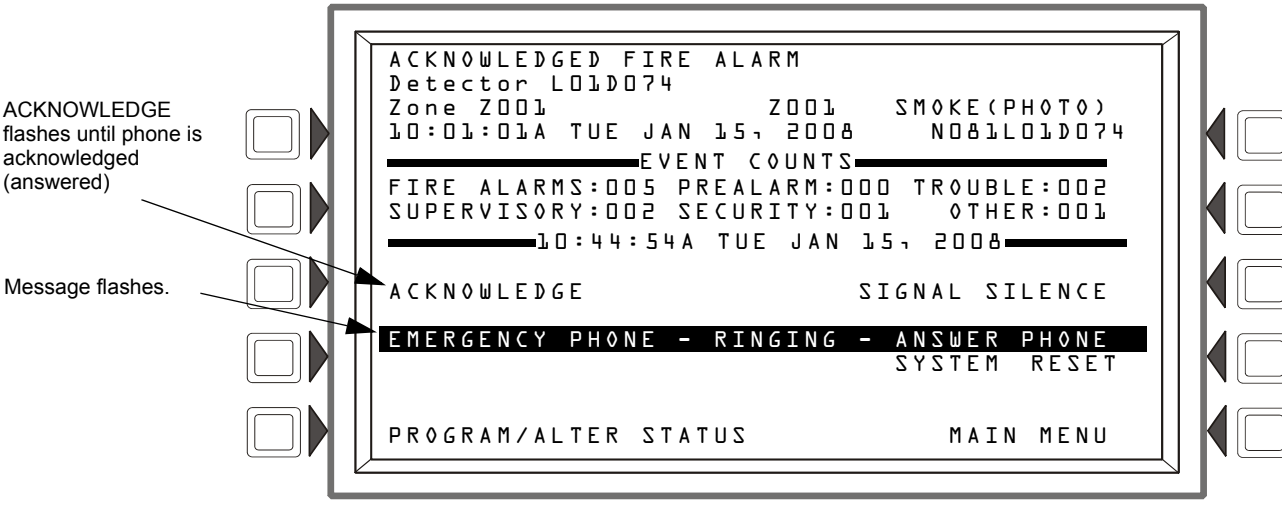


Figure 5.26 Telephone Ring-In

Panel Settings 2 (MORE) Menu

Pressing MORE at the Panel Settings screen brings up the following screen.

Main menu
↳ Program/alter status menu
↳ Panel Program menu
↳ Panel settings
↳ More

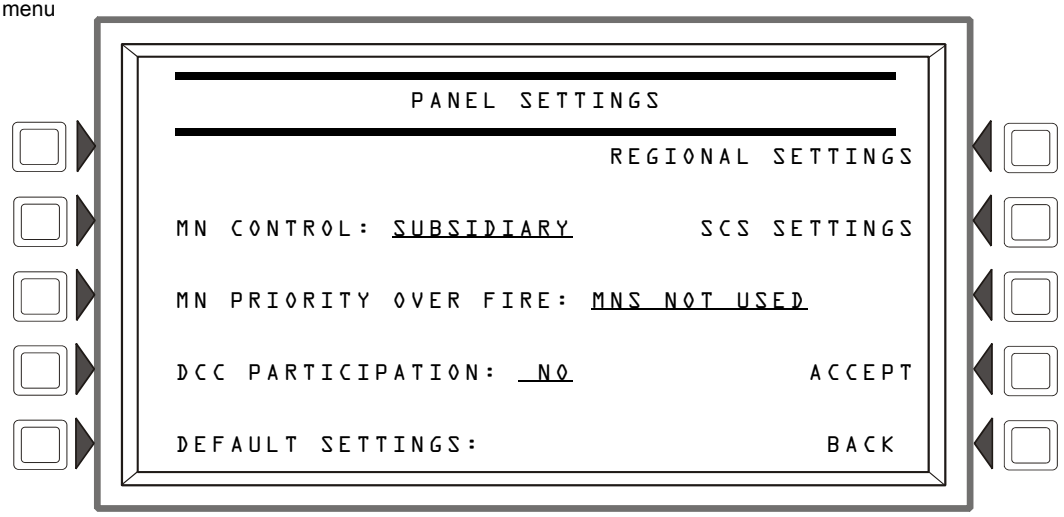


Figure 5.27 Panel Settings 2 (MORE)

MN Control - Press to toggle between SUBSIDIARY, ACU, LOC, and CCS. Set this option to subsidiary if the NCA-2 does not have an associated DVC set as an ACU, LOC or CCS. Select ACU, LOC, or CCS for this option to match the configuration programming of an associated DVC used for Mass Notification.

MN Priority Over Fire - Press to toggle between YES, NO and MN NOT USED. If the MN PRIORITY OVER FIRE option is set to NO, Fire events will have a higher priority than Mass Notification (MN) events. If set to YES, MN events will have a higher priority than Fire events. If set to MN NOT USED, this system is being used for fire protection only. Refer to Event Ordering on page 81.

NOTE: For network applications, the MN Priority Over Fire setting should be set the same for each applicable node.

DCC Participation - Toggles the Display & Control Center supervision between YES and NO. See Appendix D, “Display and Control Center (DCC)”for details.

CAUTION:
On system utilizing the DCC function, all locations that can participate in DCC should be set to YES.

Regional Settings - Press this soft key to proceed to the Regional Settings screen.

SCS Settings - Press this soft key to proceed to the SCS Settings screen.

Default Settings - Press to activate NCA-2 default settings for the following:

Program setting for:	Default:
Local Control	Yes
Piezo	On
Trouble Reminder	Yes

Table 5.2 Programming Defaults

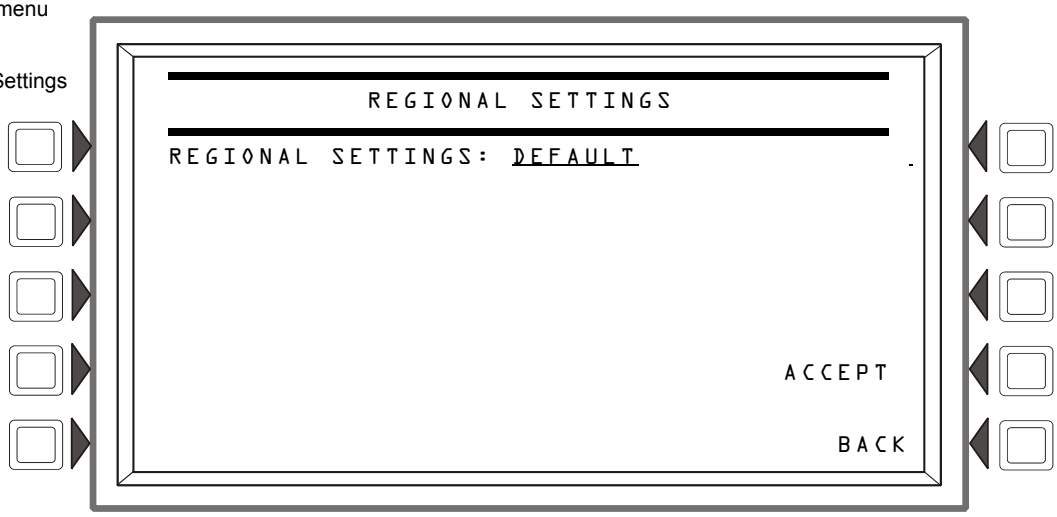
Event Ordering	USA
Display Address	Yes
DCC Participation	No
Regional Settings	Default

Table 5.2 Programming Defaults

Regional Settings

Use the Regional Settings softkey to access the Regional Settings screen:

Main menu
↳ Program/alter status menu
↳ Panel Program menu
↳ Panel settings
↳ More
↳ Regional Settings

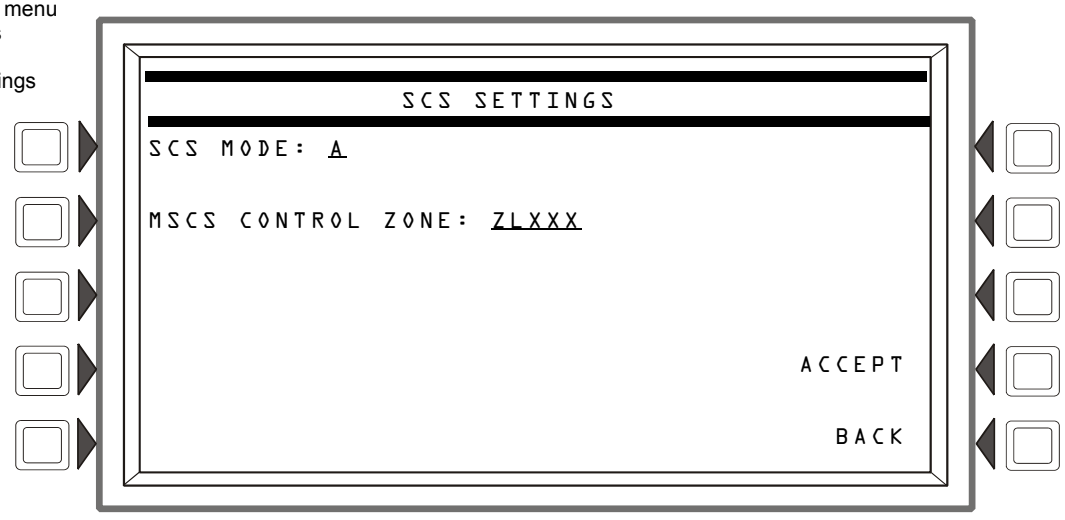


Regional Settings - Press the soft key to scroll through the selections. The Default is that there are no special local settings. Refer to Appendix E, “Regional Settings”, on page 110.

SCS Settings

Use the SCS Settings softkey to access the SCS Settings screen:

Main menu
↳ Program/alter status menu
↳ Panel Program menu
↳ Panel settings
↳ More
↳ SCS Settings



SCS Mode - Press the soft key to select mode A or B for FSCS applications. Refer to the SCS Installation manual for additional information. Default: A

MSCS Control Zone - Press the soft key to enter the logic equation associated with multiple smoke control stations. Refer to the SCS manual for an MSCS programming example. The Default is that there is not an MSCS configuration.

5.5.4 Panel Timers

Use the soft key (or the arrow keys) to select a setting to change:

- **AUTO SILENCE** changes the auto silence timer. The range is from 10, 15, or 20 minutes (OFF=disabled). Default: 0FF

NOTE: For network applications:
If Auto Silence is enabled on the NCA-2, do not enable it on the fire panel(s).
If there are multiple NCA-2s monitoring the same panels on the network, only enable Auto Silence on one NCA-2.

- **AC FAIL DELAY** changes the time delay between an AC failure event and switching of the Trouble relay. Hour settings are as follows: 1 -12 hours. Default: 8 hours

NOTE: Use of an AC FAIL DELAY setting other than 0, 1, 2, or 3 is subject to the approval of the local AHJ.

- **SILENCE INHIBIT**: Press to enter a value from 0 (disabled) to 5 minutes. This software timer disables the SIGNAL SILENCE key function for the time entered when a fire alarm occurs. The timer starts at the first alarm only; it does not restart with each new alarm. Default: 0

DEFAULT TIMERS (Press the MORE key to access) activates default settings for the following:

Program setting for:	Default:
Auto Silence	Off
AC Fail Delay	8 hours
Silence Inhibit	0

Table 5.3 Timer Defaults

Main menu
↳ Program/alter status menu
↳ Panel Program menu
↳ Panel Timers

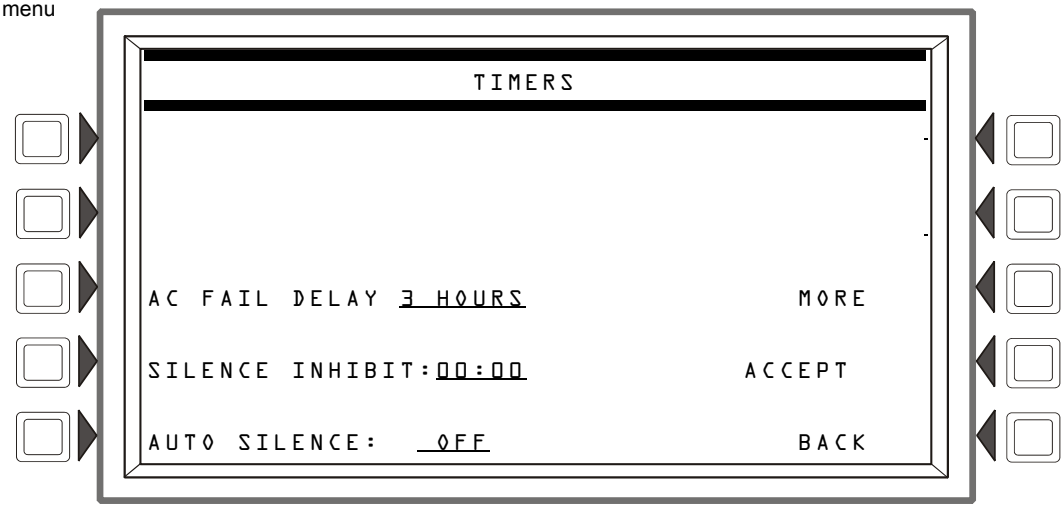


Figure 5.28 Panel Program Menu: Panel Timers

5.5.5 LCD Display

Selecting LCD DISPLAY from the Panel Programming menu will allow you to alter the display's appearance by modifying brightness (intensity) and by turning the backlight on or off. Refer to Figure 5.29 on page 86.

- **BRIGHTER -** Press this soft key to increase contrast. The intensity will increase approximately 5% with each press of the key.
- **DARKER -** Press this soft key to decrease contrast. The intensity will decrease approximately 5% with each press of the key.
- **DEFAULT -** selects the factory default setting (60%).
- **CURRENT -** selects the intensity setting that was in effect when the screen was accessed.
- **LANGUAGE -** cycles among available languages.
  (Note: For Hebrew, also set the printer for graphics mode; see Section 5.5.7 "Supervision" on page 94).
- **BACKLIGHT -** cycles among the following options: ON EXCEPT AC FAIL, OFF, or ON. The <NEXT SELECTION> and <PREVIOUS SELECTION> selection function keys will also toggle between these states.

While this screen is in effect, the intensity of the display will match the value shown on the line below the screen header. Press ACCEPT to implement changes or BACK to exit without saving.

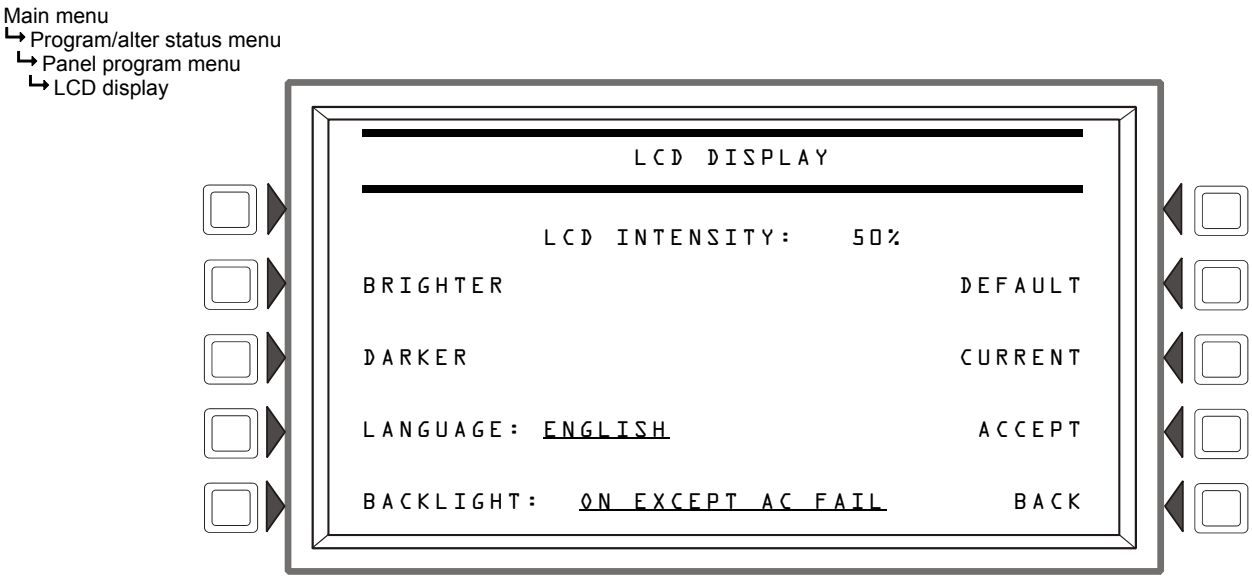


Figure 5.29 Program Menu: LCD Programming

5.5.6 ACS Programming

The ACS device is a remote, limited control device used by the NCA-2; the function of each ACS point is defined at the NCA-2. The NCA-2 can be programmed to allow an ACS device to perform a variety of tasks, such as silencing a specific node, or a network-wide function, such as silencing all panels on the network that are mapped to the NCA-2. You use an ACS device when you do not need the depth of functionality of a NCA-2, or when you wish to perform NCA-2 functions remotely without having to go to the NCA-2's physical location. ACS devices are connected to the NCA-2 via the EIA-485 ACS mode connector (TB3). Multiple ACS devices can be connected by daisy-chaining to the previous ACS device.

You can move the cursor between fields with the up and down arrows. Press the ANNUNCIATOR TYPE soft key to scroll through the following list of types. Stop at the appropriate type.

Type:	Used for:

NONE	(Nothing installed)
64 PT	64-point annunciation
64SYS	64-point annunciation, with first 8 points reserved
64SVC*	64-point service mode for Two Level Bypass
96DCC	96 point annunciation to be used with multiple Command Centers
96PT	96-point annunciation
96SYS	96-point annunciation, with first 8 points reserved
96SVC*	96-point service mode for Two Level Bypass
UDACT	UDACT or UDACT-2
TM4	TM-4. (The TM-4 has the option to program the reverse polarity/relay outputs.)
AMG**	AMG-1
FSCS	Smoke control modules set for FSCS mode
HVAC	Smoke control modules set for HVAC mode
UZC	64-point UZC programmed for monitor type only

Press ACCEPT to save any configuration changes or BACK to exit without saving. The POINT PROGRAMMING soft key navigates to the point programming menu.

***Two Level Bypass:** When an ACS board is programmed as a 64SVC or 96SVC type, the operator must enter the Program/Alter Status mode of operation before pressing any push buttons to control points on these boards. If a push button is pressed while not in the Program/Alter Status screen, and no unacknowledged events exist, the password screen will automatically be displayed so the operator can enter the Program/Alter Status mode.

****AMG Type Programming:** An AMG (Audio Message Generator) at address 32 can be programmed by the NCA-2 for only the Page function. AMGs at any other address cannot be programmed at the NCA-2.

NOTE: The local NCA-2 is not available as a target node for ACS point mapping; only remote devices can be targeted.

Smoke Control Devices

Smoke Control Devices must be set as Firefighters Smoke Control Station (FSCS) or Heating, Ventilation and Air-Conditioning (HVAC) annunciator types. In addition to its 64 smoke control points, when an SCS device is operating in FSCS mode, there are 32 additional points which function as alarm points (Points 65 through 96). They can be mapped to a zone or point to send the SCS device into a fire alarm state when any of the additional 32 points is activated. Any of the 32 alarm points

that are used must be set to MONITOR mode from the panel. Any of these points that are not used can be set to NONE. Refer to the *Smoke Control System Manual* for further information on smoke control devices.

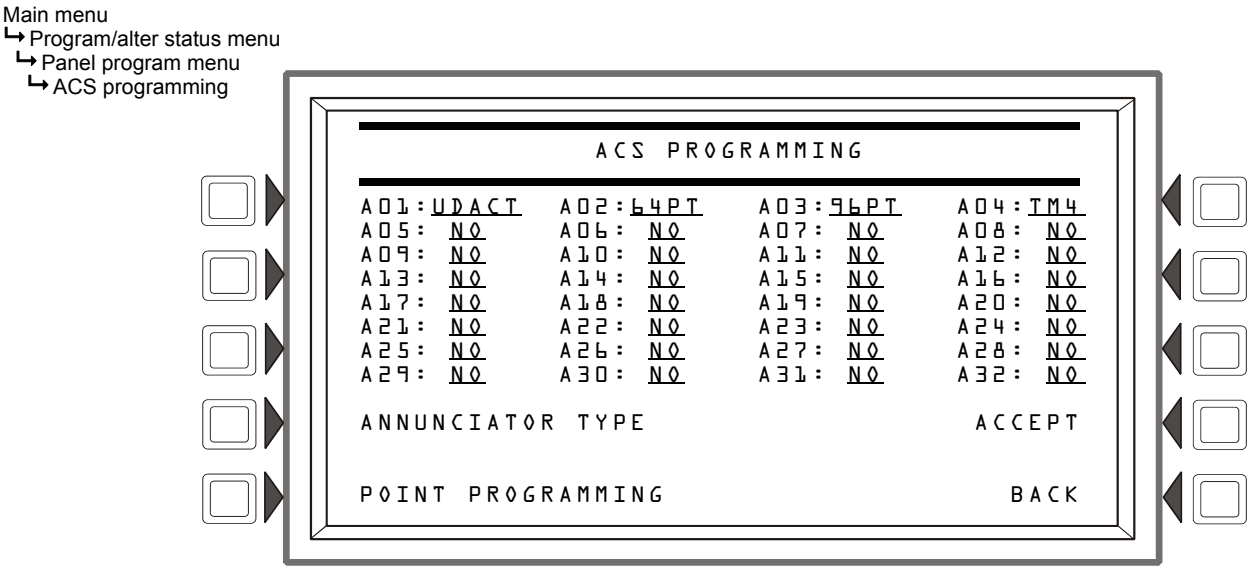


Figure 5.30 Program Menu: ACS Programming

ACS Point Programming

Press the POINT key and enter the ACS point number. The format is as follows:

AxxPyy A=ACS device number, P=point number

NEXT POINT and PREVIOUS POINT will go to the next and previous points.

Use the NCA-2 to program the ACS device's functions.

The MODE key cycles among the various ACS mapping modes. The possibilities are as follows:

ACS Point Mode	Function:	Explanation
None	The point is not programmed.	No messages are sent from or received at this point. LEDs at this point do not light.
Control	The point will change the state of up to eight control modules *OR,* (for NFS2-3030 only) up to eight general zones, when its button is pushed. Selecting this point mode will bring up the Control Point Select screen, where the points that will be controlled by this button can be selected. **NOTE:** For some board types (96PT, 96SYS, 96SVC, 64PT, 64SYS, 64SVC), up to eight outputs may be activated or deactivated with this point type.	The Point Active LED is lit if a corresponding mapped point is active. The Status (trouble) LED is lit when a point or zone is in trouble.
Monitor	The point will show the current status of a specified source point or zone.	The Point Active LED is lit if the corresponding mapped point or zone is active. The Status (trouble) LED is on if that point or zone is in trouble. If the point has a button, it has no effect when pushed.

Table 5.4 ACS Point Mapping: Explanation of Point Modes (1 of 3)

ACS Point Mode	Function:	Explanation
Telephone	This point supports telephone functionality when mapped to a telephone point on a NUP panel. Press the button to connect the mapped point with the telephone station.	Both the Point Active LED and the Status (trouble) LED will flash if a telephone has been placed in the jack at the mapped telephone point. Otherwise, the Point Active LED is lit if the corresponding point or zone is active. The Status (trouble) LED is lit if that point or zone is in trouble.
Disable	This point will enable/disable a specified point, zone or logic zone on an NFS2-3030, as well as DAA speaker circuit(s). CAUTION: When a disabled output is enabled, it will be affected by conditions existing in the system that would normally affect it. For example, when a condition exists in the system that would normally turn the output ON, the output will turn ON when it is enabled.	The Point Active LED is lit if the corresponding mapped point or zone is active. The Status (trouble) LED is lit if that point or zone is disabled.
Acknowledge	This point will act like an Acknowledge soft key or button on the panel, acknowledging a single fire alarm event or block acknowledging other events when its button is pushed. Note: Not for use in Canadian Applications.	The Point Active LED is lit when there are any fire alarms in the system. The Status (trouble) LED is lit when there are troubles in the system.
Silence	This point will silence the silenceable outputs on one panel or all panels that are mapped to the NCA-2, depending on programming. Note: Not for use in Canadian Applications.	The Point Active LED is lit if all silenceable outputs have been silenced. The Status (trouble) LED is lit if not all silenceable outputs have been silenced after the button is pushed.
System Reset	This point will reset one panel or all panels that are mapped to the NCA-2, depending on programming. Note: Not for use in Canadian Applications.	No LED will ever light at this point.
Drill	This point will initiate a fire drill when its button is pushed for one panel or all panels that are mapped to the NCA-2, depending on programming. Note: Not for use in Canadian Applications.	The Point Active LED is lit if a corresponding mapped point is active. The Status (trouble) LED is on when a point or zone is in trouble.
Enable Paging	This point will cause the associated input (a DVC's Telephone, RM-1, AUX A or AUX B) to become an active audio source on Noti•Fire•Net. The user may then choose to activate specific PAM points on remote Digital Voice Commands to use this network input, or to perform a paging function such as ALL CALL from this input.	The Point Active LED is lit if a corresponding mapped point is active. The Status (trouble) LED is on when a point or zone is in trouble.
All Call	This point will activate ALL CALL. (Speaker Circuits will be turned on according to programming.) Mapping can include either all nodes (program the node = 0) or a single node (program the node = the node number.) **NOTE:** Re: AMG-1 - If the ALL CALL function is programmed for a Node 0 ACS point in a specific NCA-2, pressing the ALL CALL button will activate the AMG-1s and Speaker circuits on nodes that are mapped into that NCA-2, or as modified by any Page functions programmed into the AMG-1 mapping at address 32.	The Point Active LED is lit if a corresponding mapped point is active. The Status (trouble) LED is on when a point or zone is in trouble.
PAGE INACTIVE	This point will, when pressed after an "Enable Paging From__" button, allow PAGE INACTIVE paging (Page Inactive Areas) from the source (Telephone, RM-1, AUX A or AUX B). The Special Paging Function map programming at the DVC will receive the page function.	The Point Active LED is lit if a corresponding mapped point is active. The Status (trouble) LED is on when a point or zone is in trouble.

Table 5.4 ACS Point Mapping: Explanation of Point Modes (2 of 3)

ACS Point Mode	Function:	Explanation
FFT-NFN	....will, when pressed: • Notify a DVC in the map formal Nxxx,Nxxx,NxxxLyyMzzz or Nxxx,Nxxx,NxxxAyyT to open the FFT-NFN link and turn on the mapped FFT point or riser. A second press will notify the DVC to turn off that FFT point or riser and determine whether the FFT-NFN link should be closed or remain open. • Notify the DVC in the map format Nxxx,Nxxx to close or open the FFT-NFN link between two DVCs.	The Point Active LED is lit if a corresponding mapped point is active. The Status (trouble) LED is on when a point or zone is in trouble.
Page Evac	...will, when pressed after an “Enable Paging” button, allow PAGE EVAC paging from that source (Telephone, RM-1, AUX A or AUX B). The Special Paging Function map programming at the DVC will receive the page function.	The Point Active LED is lit if a corresponding mapped point is active. The Status (trouble) LED is on when a point or zone is in trouble.
Page Alert	...will, when pressed after an “Enable Paging” button, allow PAGE ALERT paging from that source (Telephone, RM-1, AUX A or AUX B). The Special Paging Function map programming at the DVC will receive the page function.	The Point Active LED is lit if a corresponding mapped point is active. The Status (trouble) LED is on when a point or zone is in trouble.
Shadow	Supports direct shadowing of ACS points when the NCA-2 communicates with an AM2020/AFP-1010 or AFP-300/400. Complete annunciator programming at the FACP local to the point to be shadowed must be complete before NCA-2 shadow programming is performed. The lights on the ACS points will shadow the lights on the mapped ACS point, except any flashing sequence may be different.	The lights on the ACS points will shadow the lights on the mapped ACS point, except any flashing sequence may be different.
Page	Use this mode only when ACS point A32 is programmed as AMG. This function allows the user to define a group of standard or high-speed NOTI•FIRE•NET™ control panels to function as one “system” for the purpose of Fire Fighter's Telephone and ALL CALL paging. An ACS point in the range of A32P1 - A32P64 may be programmed as PAGE. The source for this point is a single node address. If either an ALL CALL or Fire Fighter's Telephone's remote ALL CALL PAGE is active, the NCA-2 will only command the programmed list of nodes to participate. **NOTE:** If none of the points A32P01 - A32P64 are defined as the page function, the NCA-2 will command the entire list of mapped nodes to participate.	The Point Active LED is lit if a corresponding mapped node is active. The Status (trouble) LED is on when a point or zone is in trouble.

Table 5.4 ACS Point Mapping: Explanation of Point Modes (3 of 3)

SAVE will save the current point programming without exiting the menu. Press NEXT to advance to the next ACS address for configuring.

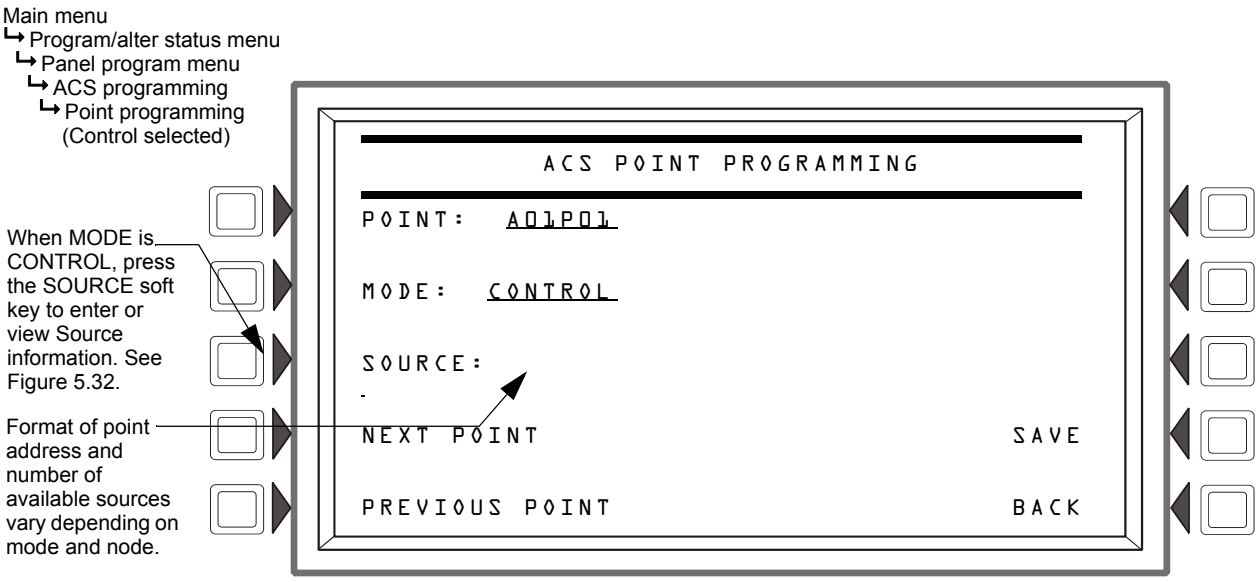


Figure 5.31 ACS Point Programming Screen

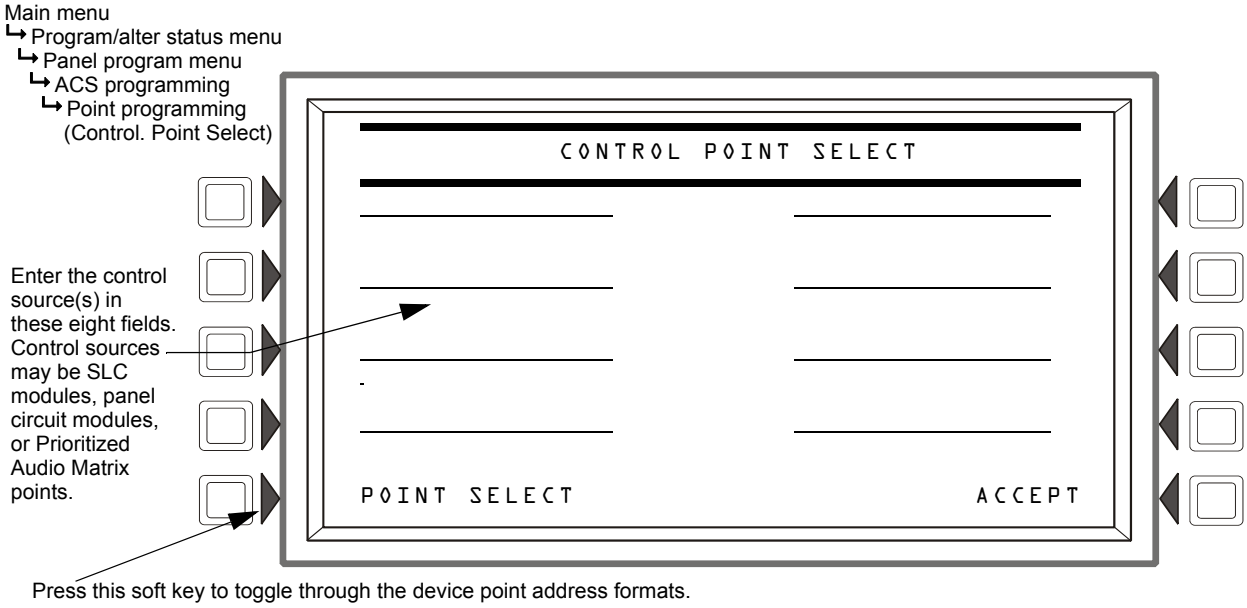


Figure 5.32 ACS Source Programming Screen

Control mode source field entries may be:

- SLC modules in the format NxxxLyyMzzz. xxx = FACP node number, yy = the SLC loop number, zzz = module SLC address.
- Panel Circuit modules in the format NxxxPyy.z. xxx = FACP node number, yy = panel circuit module number, z = panel circuit pushbutton number.
- Prioritized Audio Matrix (PAM) speaker points, in the format NxxxIyyyyAzzSn. xxx = the DVC node number, yyyy = the input number in the PAM, zz = the DAA address on the Digital Audio Loop (01 through 32), and n = the speaker circuit (1 through 4).

- General zones in the format NxxxZyyy.xxx = FACP node number, yyy=General zone number (Z001-Z999), not Z000. Zone 0 is not valid.

CAUTION:
Do not mix general zones with other source types for an ACS control Point. Program up to eight general zones OR up to eight other control point types.

For ALL CALL, PAGE INACTIVE, PAGE EVAC, and PAGE ALERT modes, enter the node number of the DVC where the source is connected. These modes are used in conjunction with ENABLE PAGING FOR ____ mode.

`FFT-NFN` mode sources:

- format Nxxx,Nxxx,NxxxLyyMzzz: Telephone control module (NxxxLyyMzzz) preceded by the node numbers of the two DVCs (Nxxx,Nxxx) that will communicate over FFT-NFN link.
- format Nxxx, Nxxx: Numbers of the two DVCs that will communicate over the FFT-NFN link.
- format NxxxAyyT: Use this address (N = the DVC node number and A = the DAL device address on the digital audio loop) when no telephone control modules are installed on a DAL device's FFT riser.

Refer to the FFT-NFN section of the *DVC Manual,* the *DS-DB Digital Amplifier Manual,* and the *DAA2 and DAX Amplifiers Manual* for programming and application examples.

ACS LED Designations

The LEDs on an ACM-16AT or ACM-24AT each have a user defined meaning, depending on how the NCA-2 is programmed. For each point programmed in NCA-2, the annunciator has two lights. The colors of these lights may vary depending on the model of the annunciator. On the ACM-24AT, the colors of the lights may be dynamically reprogrammed. We will use the designation 'state' for the top light, and 'status' for the bottom light.

NOTE: For Canadian Applications (Regional Setting set to Canada):
ACS points programmed as Acknowledge, Signal Silence, System Reset and Drill will not function.

Program each point in one of the following ways:

1. **ACKNOWLEDGE**
   - The state light is on if there are any fire alarms in the system.
   - The status light is on if there are any troubles in the system.
   - Other types of events are not annunciated at the ACS board level.
   - Pressing the button is analogous to pressing the 'ACKNOWLEDGE' soft key of the NCA-2, i.e. either one fire alarm will be acknowledged, or troubles and so forth will be block acknowledged. The lights will continue to blink until all corresponding events are acknowledged.
2. **SIGNAL SILENCE -** There are two cases: the node number may be 0 (all mapped nodes) or the node number may be a specific node.

a. All Mapped Nodes - This reflects the silence status as shown on the NCA-2 silence light.

- Neither light is ever on.
- Pressing the button attempts to silence all mapped nodes.

b. Specific Node - This reflects the silence status of a single node.

- Neither light is ever on.
- Pressing the button attempts to silence the single node.

3. **SYSTEM RESET -** There are two cases: the node number may be 0 (all mapped nodes) or the node number may be a specific node.

a. All Mapped Nodes

- Neither light is ever on.
- Pressing the button attempts to reset all mapped nodes.

b. Specific Node

- Neither light is ever on.
- Pressing the button attempts to reset the single node.

4. **DRILL -** There are two cases: the node number may be 0 (all mapped nodes) or the node number may be a specific node.

a. All Mapped Nodes

- The state light is on if any mapped node has entered the drill state.
- The status light is never on.
- Pressing the button attempts to drill all mapped nodes.

b. Specific Node

- The state light is on if the node has entered the drill state.
- The status light is never on.
- Pressing the button attempts to drill the single node.

5. DISABLE

- The State light is on if the corresponding point or zone is active.
- The status light is on if the corresponding point or zone is disabled. Note that for most panels, the state light will not be on when the point is disabled (however, this can vary in different panels).
- Pressing the button will modify the state of the point or zone as follows:
  -If the point is enabled, pressing the button will disable it.
  -If the point is disabled, pressing the button will enable it.

6. MONITOR

- The State light is on if the corresponding point or zone is active.
- The status light is on if the corresponding point or zone is in trouble.
- Pressing the button has no effect.

7. CONTROL

- The State light is on if any of the corresponding points or zones are active.
- The status light is on if any of the corresponding points or zones are in trouble. The light will also be on if any of the points in the group fail to activate.
- Pressing the button will modify the state of the point or zone as follows:
  -If the point or zone is currently active, pressing the button will deactivate it
  -If the point or zone is currently inactive, pressing the button will activate it

NOTE: Attempts to change the state of a point or zone in this manner may be overridden by some system settings, such as a panel auto-silencing an output after a certain amount of time, or CBE equations based on events at another network node.

8. **ALL CALL -** The node number is a specific node:

- The state light is on if the node has entered the all call state.
- If Node 0 is selected, the state light is on if any of the nodes are active.

9. PAGE INACTIVE, PAGE EVAC, PAGE ALERT

- The state light is on when the program function is active.
- The status light is on if the point is in trouble.

10. **TELEPHONE**
    - Both lights will flash if a telephone has just been placed in the jack. Otherwise, the State light is on if the corresponding point or zone is active.
    - The status light is on if the corresponding point or zone is in trouble.
    - Pressing the button will activate or deactivate the telephone circuit.
11. **SHADOW**
    - Lights on the ACS points will shadow (mimic) the lights on the mapped ACS point, except any flashing sequence may be different.
12. **PAGE**
    - Intended for DVC, not LED annunciators; the state and status light are not applicable.

5.5.7 Supervision

The Supervision screen allows you to make supervision settings for various ancillary devices. The EIA-232 and EIA-485 ports are unsupervised, but a programmed NCA-2 will detect loss of communication with the device(s) on these circuits.

- **MAIN PS NODE:** - To enable supervision of the NCA-2's main power supply, enter the node number where the power supply is located. If the NCA-2. is powered by its own power supply, the node number will be the same as the NCA-2's. node number. If power supply supervision is not desired, enter 000. Default = 000.
- **PRINTER: -** Press to scroll through the types of printer supervision: NONE, 40 COLUMN, 40 COLUMN SUPERVISED, 80 COLUMN, 80 COLUMN SUPERVISED, 40 GRAPHIC, 80 GRAPHIC, 80 GRAPHIC SUPERVISED. The printer will not be active if NONE is selected. If a SUPERVISED selection is made, the printer will be supervised. Default = NONE.
- **CRT BAUD RATE:** Press to scroll through CRT baud rates. "SUP" after the rate indicates supervised. Select from: 4800, 4800 SUP, 9600, 9600 SUP, 19200, 19200 SUP, 38400, 38400 SUP, 57600, 57600 SUP. Default: NONE
- **AUXILIARY TROUBLE REPORTING: -** Press to toggle between YES and NO. Choose YES if a trouble bus cable has been attached at J5. Default: NO
- **TAMPER INPUT: -** Selections are YES, NO, and AKS-1. Default = NO.

  YES/NO reports (YES) or does not report (NO) a tamper situation at the panel cabinet door (as determined by an STS-1 tamper switch. Section 3.17, "Security Tamper Switch" provides installation information.

  AKS-1 should be selected when using an AKS-1 key switch connected to the panel cabinet door (which allows the operator to use Signal Silence, Reset, Drill (Alarm Signal for Canadian applications) and Acknowledge functions when a key turns the lock to "Enable). Section 3.16 provides installation instructions.
- **MORE** - Select MORE to bring up the second supervision screen.

Main menu
↳ Program/alter status menu
↳ Panel program menu
↳ Supervision

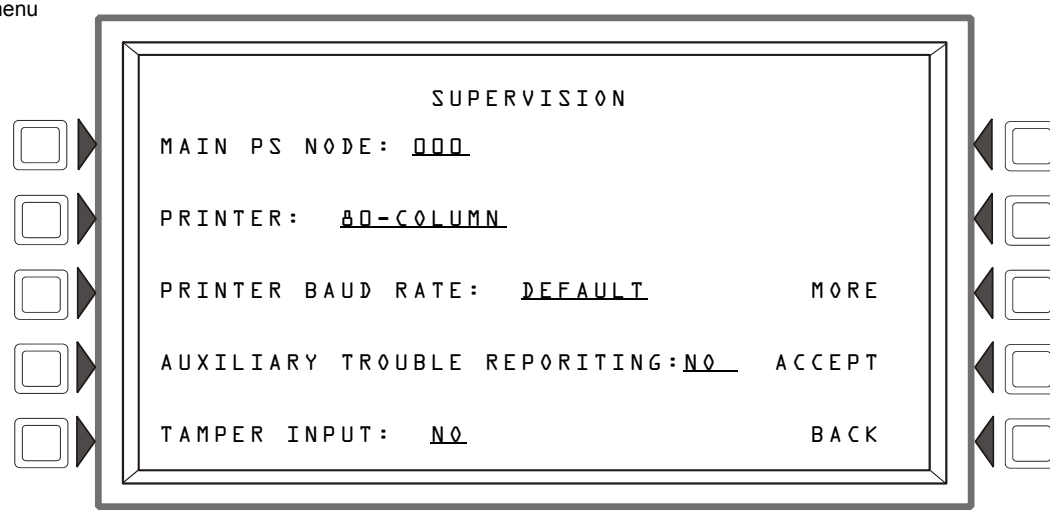


Figure 5.33 Panel Program Menu: Supervision

TERMINAL: Select NONE or LCD-80. (Default: NONE.) When LCD-80 is selected, LCD-160 programming is not allowed.

Main menu
↳ Program/alter status menu
↳ Panel program menu
↳ Supervision menu
↳ More menu

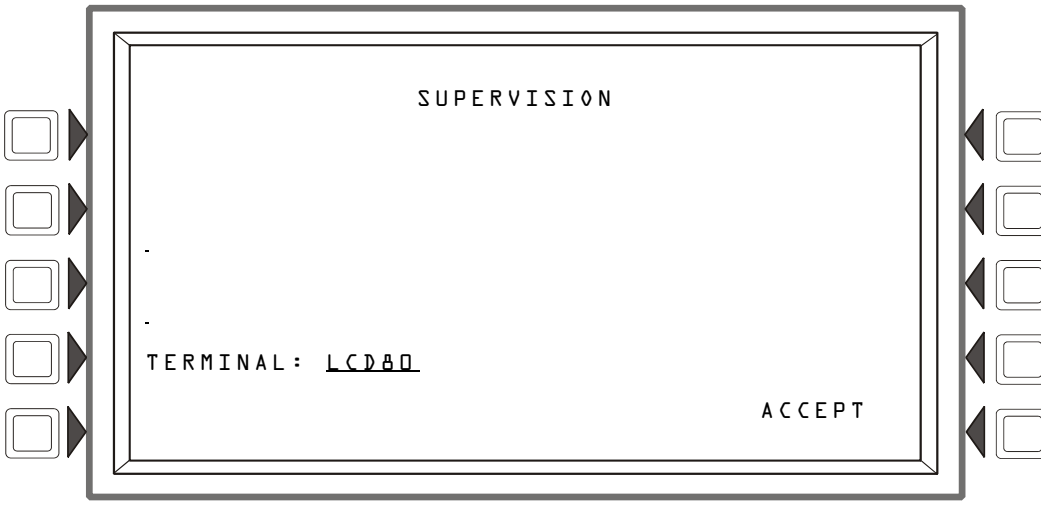


Figure 5.34 Supervision Screen: More

5.5.8 MORE Menu

Pressing “MORE” at the Panel Program Menu will bring up the Event Logging screen.

Main menu
↳ Program/alter status menu
↳ Panel Program menu
↳ More

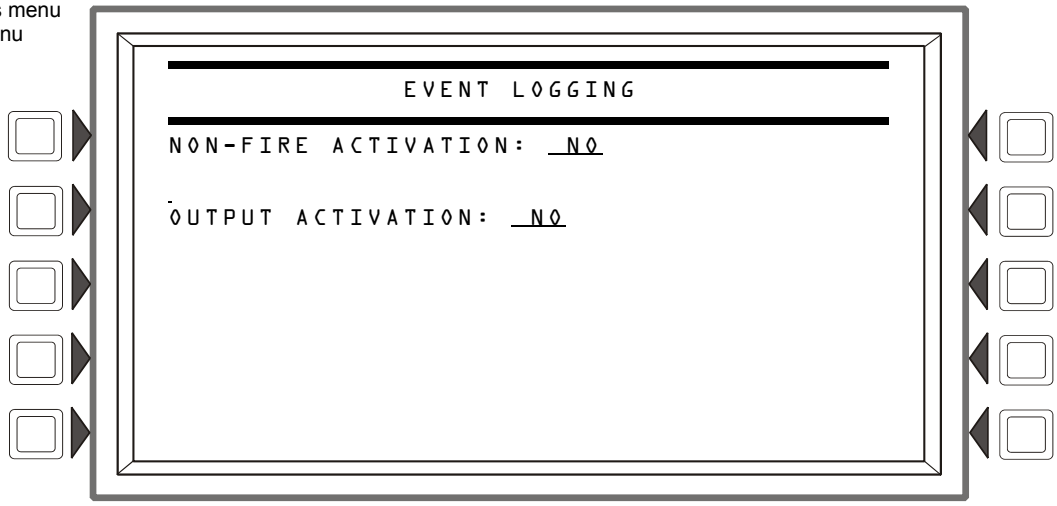


Figure 5.35 Panel Program Menu: More

Press the appropriate soft key to toggle between YES (log the event activation) and NO (do not log the event activation.

5.6 Point Program Menu

The point program menu allows the programmer to change the volume setting on any networked DVC or DAA or program Logic Equations.

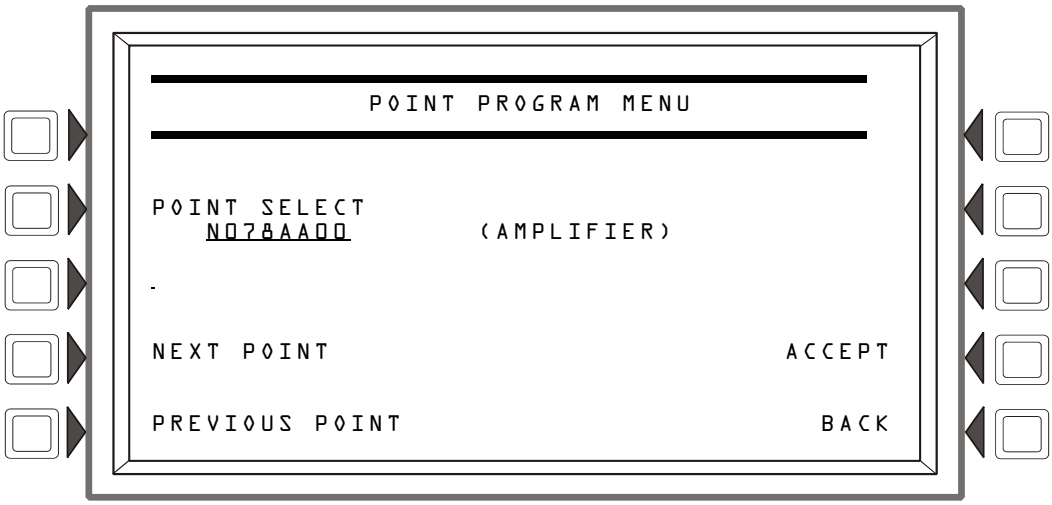


Figure 5.36 Point Programming Menu

Type	Address Format	
LOGIC ZONE	ZLyyyy	ZL=Logic Zone, yyyy=Logic Zone number(1-1000)
DVC/DAA	NxxxAAyy	N = Node, xxx=DVC or DVC-EM Node number, AA = DAA Audio Amplifier, yy=DAA address (01 through 32). Note: When yy=00, the address format is the DVC or DVC-EM address.

Table 5.5 Address Formats (1 of 2)

Type	Address Format	
ACS	Ayy+Custom Label	A=Annunciator, yy=Annunciator address
GENERAL ZONE	Zyyy	Z=General Zone, yyy=General Zone number

Table 5.5 Address Formats (2 of 2)

5.6.1 DVC/DAA

Setting the DVC/DAA Volume

Volume setting on any networked DVC or DAA can be changed via Point Programming. The setting will affect the analog output circuits on the DVC, the speaker output circuits on the DAA, as well as auxiliary inputs A and B on the DVC.

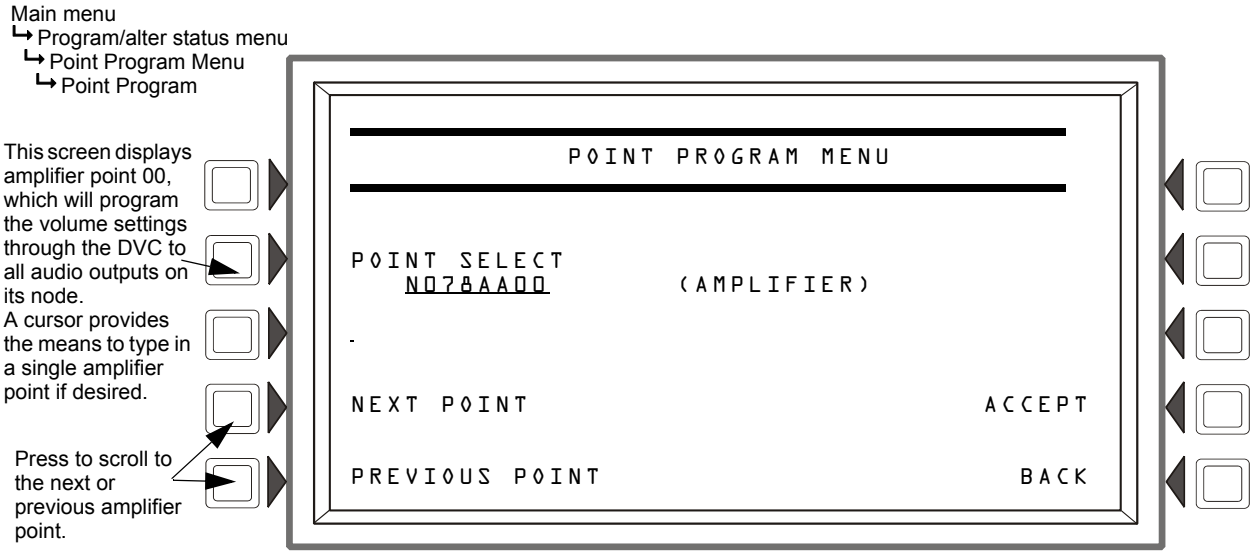


Figure 5.37 Point Selection

Press ACCEPT when the desired point is displayed. The Audio Volume Control screen will appear.

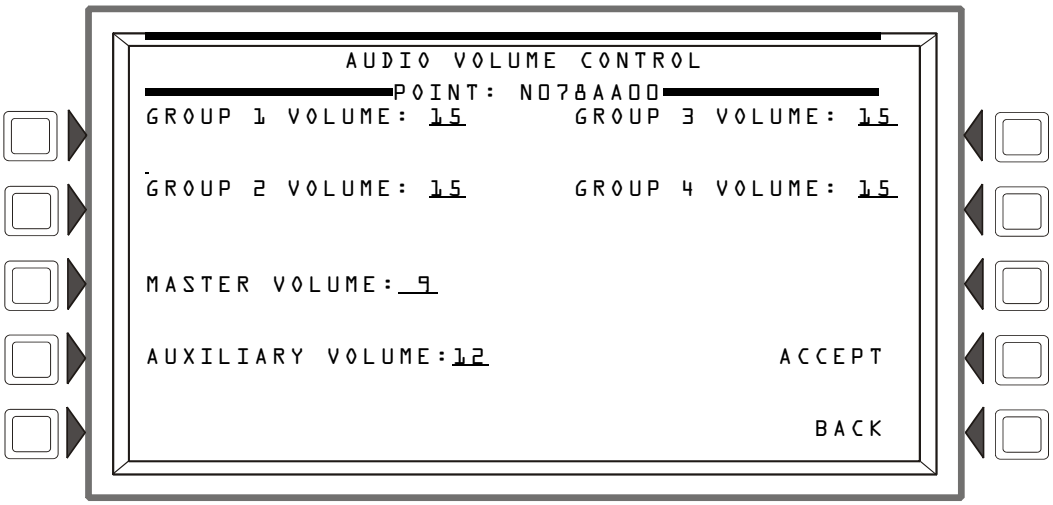


Figure 5.38 Audio Volume Control

GROUP x VOLUME: This field can set the volume for all audio outputs in Group x on the DS-DB or DAA2. Set this field to any volume setting from 0 (off) to 15 (high). Default: 15. For more information, refer to the *DVC Digital Voice Command Manual,* the *DS-DB Digital Amplifier Manual,* and the *DAA2 and DAX Manual*.

MASTER VOLUME: - This field can set the volume for all audio outputs at the DVC node. When the audio amplifier point is set to 00, as it is in Figures 5.37 and 5.38, the setting affects all audio outputs on the DVC node (this includes all outputs on the DVC and all its DAAs). When a specific DAA point is entered at the point program menu (for example, N078AA01) the MASTER VOLUME setting will apply to the audio outputs at that DAA (the DAA with its address set to 01). Set this field to any volume setting from 0 (off) to 15 (high). Default: 15

AUXILIARY VOLUME: - This field sets the volume for DVC inputs AUXA (background music from various sources or a telephone paging source) and AUXB (AMG-1 input). The field does not appear if a specific DAA address has been entered. The DAAs have onboard volume control for AUXA and AUXB inputs. Set this field to any volume setting from 0 (off) to 15 (high). Default: 15.

ACCEPT - Press to program the displayed volume.

5.6.2 Logic Zone

Logic Zone Programming

This screen displays when a logic zone is entered at the Point Programming Menu (see Figure 5.36 on page 96).

The logic equation for that zone will display in line 6. Line 4 indicates the current state of the logic zone (ON or OFF). If there is no equation at the logic zone number entered, nothing will display in lines 4 and 6, and the user must press the EDIT EQUATION soft key to proceed to the next screen and enter an equation.

Refer to Appendix G, "Logic Equations" for information on how to create a logic equation, and how logic equations operate.

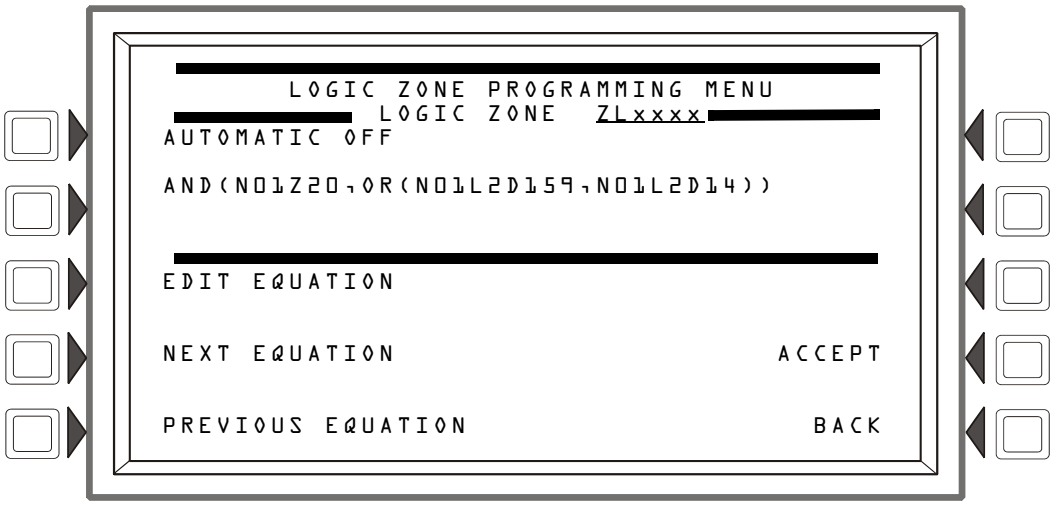


Figure 5.39 Logic Zone Programming Menu Screen

Soft Keys

EDIT EQUATION: Press to proceed to the edit screen to add or edit a logic equation.

NEXT/PREVIOUS EQUATION: Press to view the next or previous logic equation.

Edit Logic Equation

This screen displays when the EDIT EQUATION soft key is pressed on the Logic Zone Programming Menu

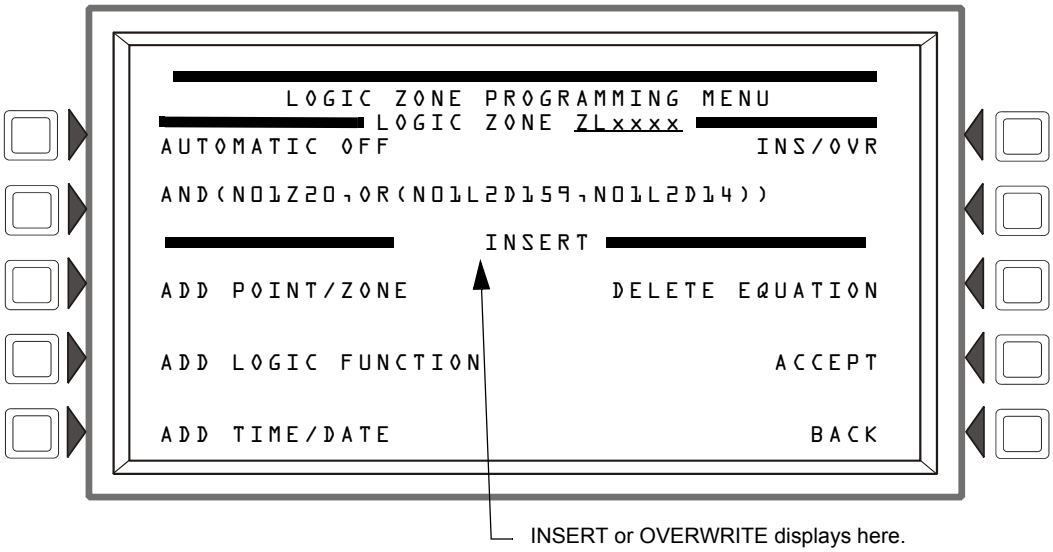


Figure 5.40 Edit Logic Equation Screen

The cursor will be present in the equation, and can be moved by pressing the left/right arrow keys on the keyboard. To add or delete information, use the INS/OVR soft key function described below. Use the keypad to type in an equation. The ADD POINT/ZONE and ADD LOGIC FUNCTION soft keys may be used to facilitate creating a logic equation; however, commas must be added by using the keypad.

Soft Keys

INS/OVR: Press to toggle between insert and overwrite. Stop at the appropriate mode, which displays in line 8 of the screen. Insert will add information to the equation, overwrite will write over information already in the equation.

ADD POINT/ZONE: Press to proceed to the Add Point/Zone screen. This screen is an alternative to typing in the information at this screen; it provides point and zone formats that make it less likely for typographical errors to occur.

ADD LOGIC FUNCTION: Press to proceed to the Add Logic Function screen. This screen is an alternative to typing in the information at this screen; it provides logic function formats that make it less likely for typographical errors to occur.

ADD TIME/DATE: Press to proceed to the Add Time/Date screen.

DELETE EQUATION: Press to delete the entire equation.

ACCEPT: Press to save changes made on this screen and return to the previous screen.

NOTE: When the ACCEPT soft key is pressed to save an equation, the panel checks the equation for errors. If there is an error in the equation, the previous screen will not appear, and the cursor will appear at the error point. Correct the equation, and re-press the ACCEPT soft key.

Add Point/Zone

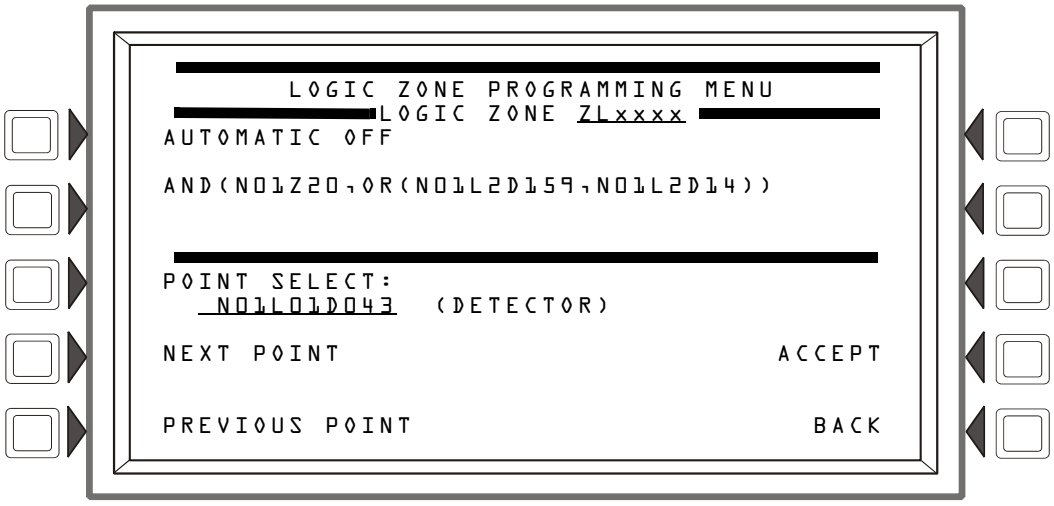


Figure 5.41 Add Logic Point/Zone Screen

The cursor will be present in the logic equation. Place it, using the arrow keys on the keyboard, at the place where the additional point should be inserted.

Soft Keys

POINT SELECT: Press to scroll through the list of possible formats (detector, module, etc.). Stop at the desired format. Type in the address for the additional point.

ACCEPT: Press to insert the point into the equation where the cursor is blinking, and to return to the previous screen.

NEXT/PREVIOUS POINT: Press these soft keys to scroll forward or backward from the displayed point to the next installed point.

Add Logic Function

This screen appears when the ADD LOGIC FUNCTION soft key is pressed at the Logic Zone Programming Menu screen.

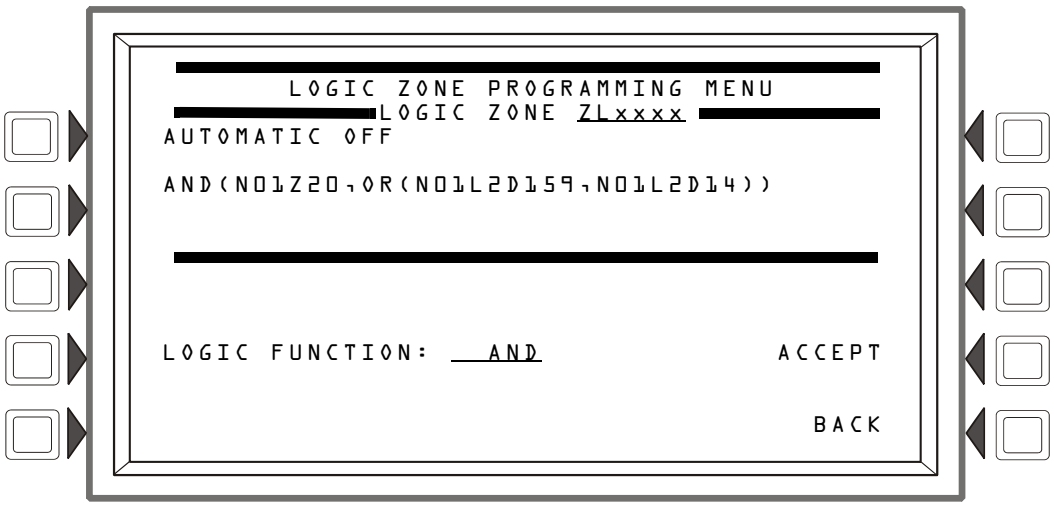


Figure 5.42 Add Logic Function Screen

The cursor will be present in the logic equation. Place it, using the arrow keys on the keyboard, at the place where the logic function should be inserted.

Soft Keys

LOGIC FUNCTION: Press to scroll through the list of possible logic functions.

ACCEPT: Press to insert the logic function into the equation where the cursor is blinking, and to return to the previous screen.

Add Time/Date

This screen appears when the ADD TIME/DATE soft key is pressed at the Logic Zone Programming Menu screen

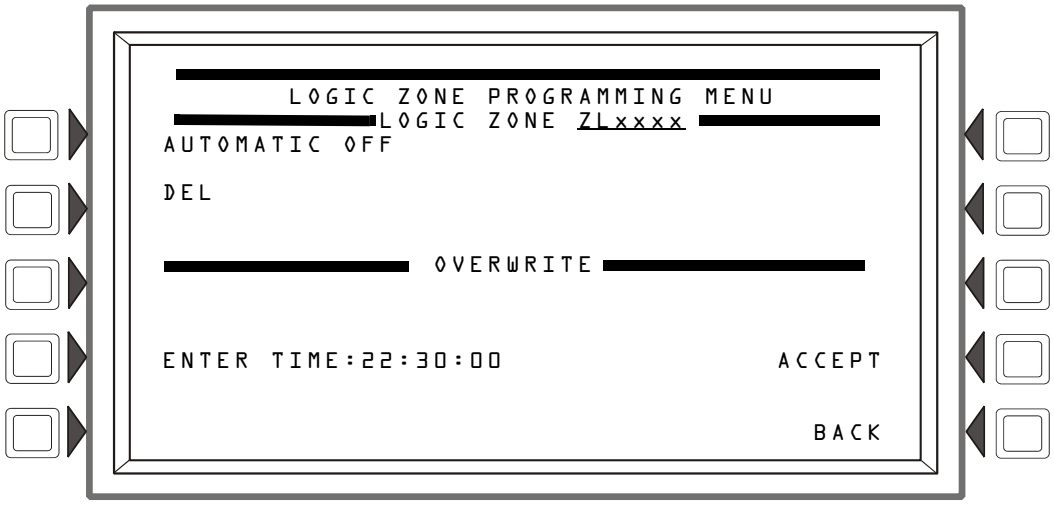


Figure 5.43 Add Time/Date to Logic Zone Screen

Soft Keys

ENTER TIME: _ _:_ _:_ _ Press this soft key to toggle between the time/date formats. Choose one based on the type of time-based function used.

Time-based function	Screen Field	Time/date format
DEL, SDEL, TIM	ENTER TIME:_ _:_ _:_ _	HH:MM:SS, entered as military time (22:30:00 = 10:30 P.M.)
TIM	ENTER DATE:_ _-_ _-_ _	(MM-DD-YY)
TIM	ENTER DAY: MO	(Use the TOGGLE DAY soft key that appears to scroll through and choose a day of the week.

5.6.3 Annunciator Board Label

When ACS BOARD is selected from the Point Program Menu, the ACS Label Menu appears.

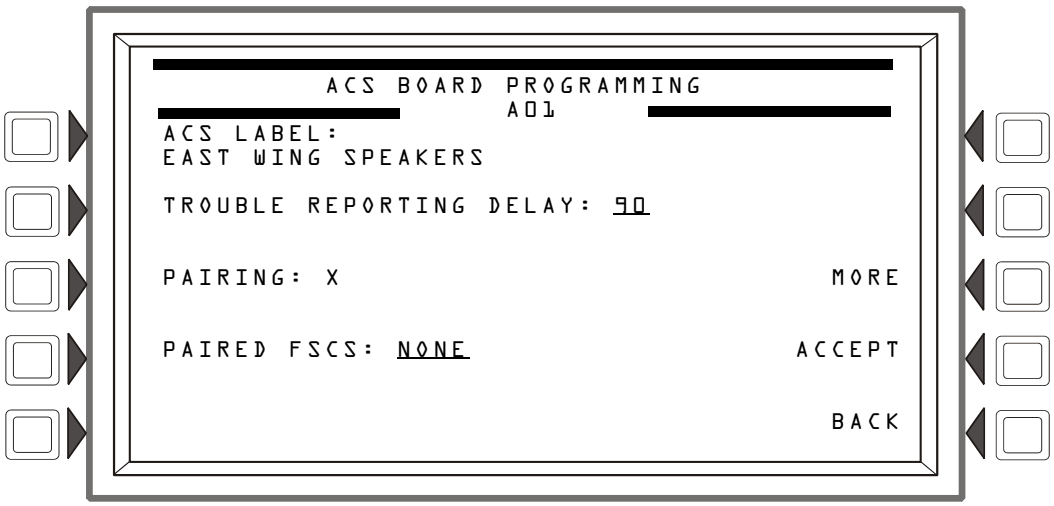


Figure 5.44 ACS Label Menu Screen (1)

Soft Keys

ACS LABEL: Type a label for the selected annunciator. The label can have up to 40 characters.

TROUBLE REPORTING DELAY: Smoke Control Systems only: Adjustable trouble timer for FSCS. Programmable range is 0 to 180 seconds. Default: 90

NOTE: This value may not exceed 90 seconds for ULC installations.

PAIRING: Smoke Control Systems only: Select group 1, 2 or 3 to pair up to eight (8) FSCS boards so that multiple smoke control modules can act as a single unit. If enabled, each FSCS address can only be assigned to one group and each group can be assigned up to eight (8) FSCS addresses, Default: X

PAIRED FSCS: Smoke Control Systems only: Displays any FSCS boards that have been paired to this annunciator.

ACCEPT: Press to insert the logic function into the equation where the cursor is blinking, and to return to the previous screen.

Press the MORE softkey to display the second ACS label screen.

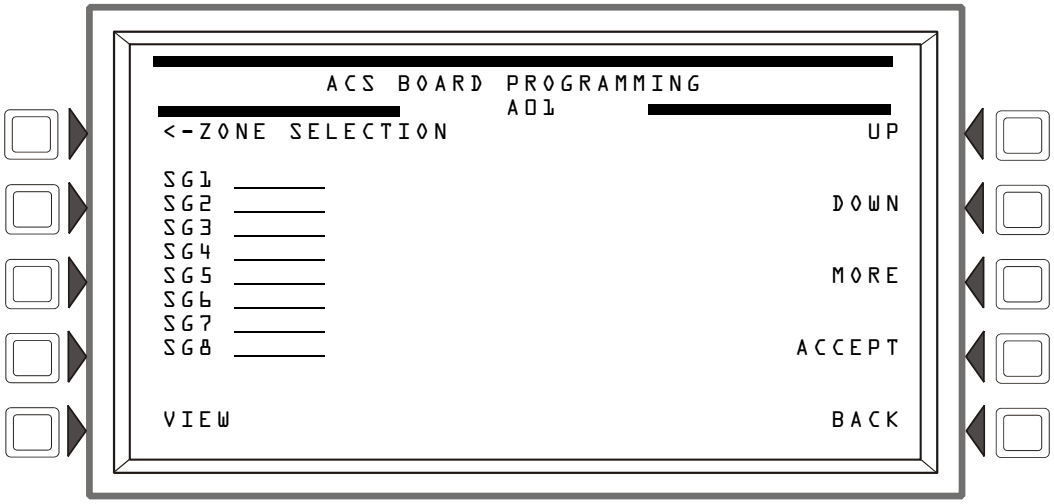


Figure 5.45 ACS Label Menu Screen (2)

Soft Keys

ZONE SELECTION: Press to assign the zone label that is to be displayed for the switch group selected.

VIEW: Press to view the associated zone label for the switch group selected.

UP/DOWN: Press to move between switch group selections.

Press the MORE softkey to display the third ACS label screen.

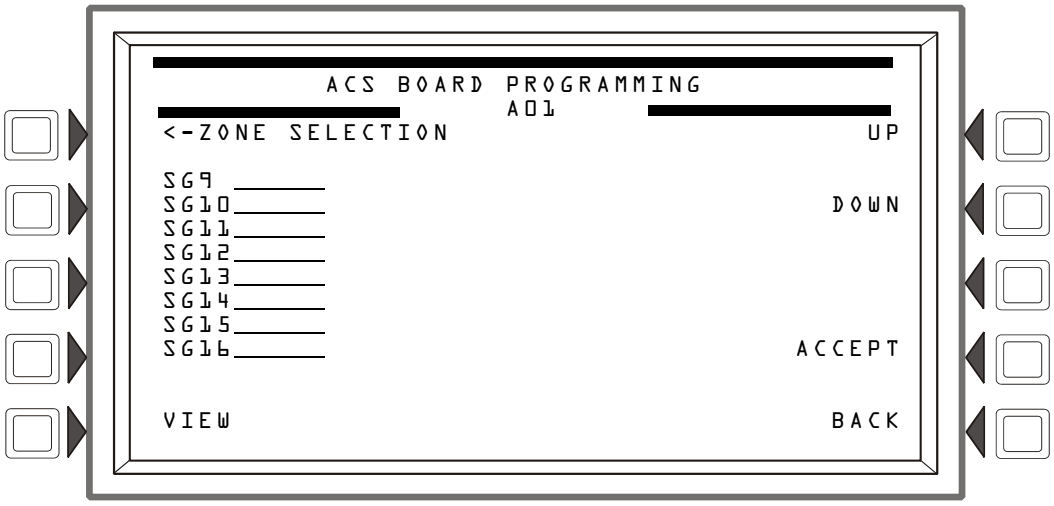


Figure 5.46 ACS Label Menu Screen (3)

Soft Keys

ZONE SELECTION: Press to assign the zone label that is to be displayed for the switch group selected.

VIEW: Press to view the associated zone label for the switch group selected.

UP/DOWN: Press to move between switch group selections.

5.6.4 General Zone

This screen displays when a general zone is chosen at the Point Program menu.

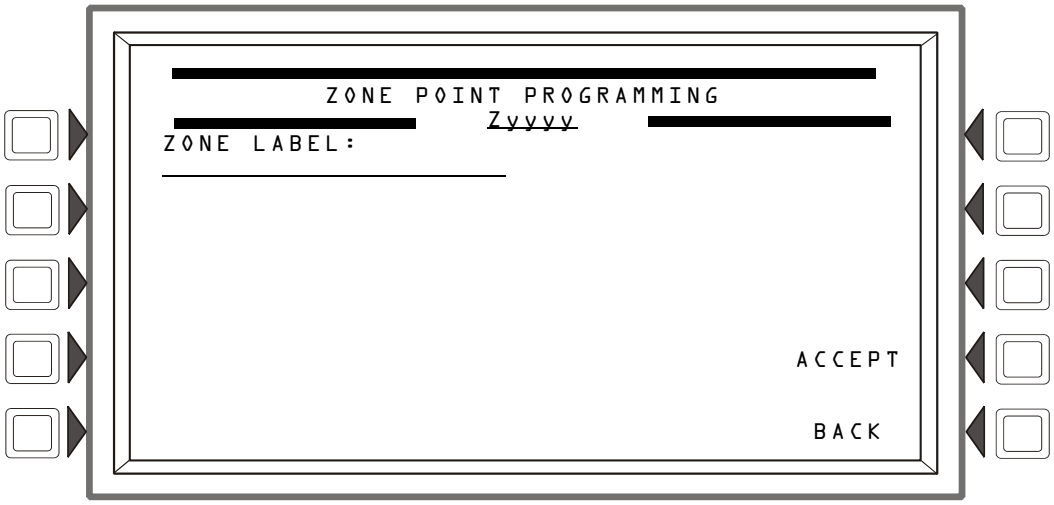


Figure 5.47 Zone Point Programming Screen

Soft Keys

ZONE LABEL: Press to type in a 20-character maximum zone description that will appear in the zone's display messages. The zone label can referenced in ACS Board programming to assign a label to a switch group.

ACCEPT: Press to save the message and return to the previous screen.

5.7 Delete Programming

The following menu allows complete or partial clearing of programming.

Main menu
↳ Program/alter status menu
↳ Delete Programming

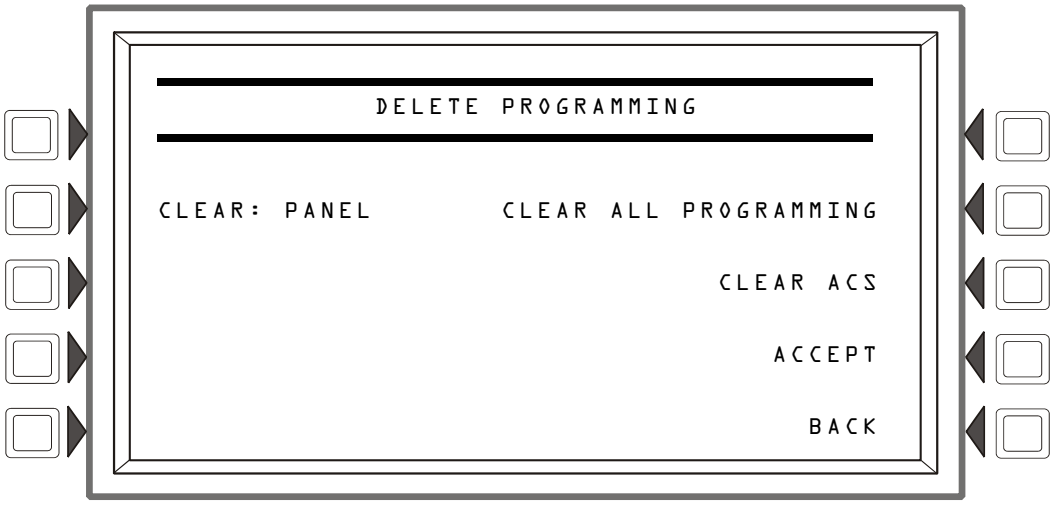


Figure 5.48 Delete Programming

CLEAR ALL PROGRAMMING - Press to remove all panel and ACS programming information. Pressing this key removes everything except passwords. A confirmation screen will display asking the user to confirm the deletion command. Pressing this key causes a reboot.

CLEAR: PANEL - Press to remove all programmed panel setting information from control panel memory. This does not remove ACS programming. A confirmation screen will display asking the user to confirm the deletion command. Pressing this key causes a reboot.

CLEAR ACS - Press to remove all ACS programming from panel memory. A confirmation screen will display asking the user to confirm the deletion command. Pressing this key causes a reboot.

Appendix A: Power Supply Calculations

Category	Primary, Non-Fire Alarm Current (Amps)			Primary, Fire Alarm Current (Amps)			Secondary, Fire Alarm Current (Amps)		
	Qty	x [current draw]=	Total	Qty	x [current draw]=	Total	Qty	x [current draw]=	Total
NCA-2 - backlight ON NCA-2 - backlight OFF	[ ] [ ]	x [0.400]= x [0.200]=		[ ] [ ]	x [0.400]= x [0.200]=		[ ] [ ]	x [0.400]= x [0.200]=	
NCM-W/F HS-NCM-W/MF/SF/WSF/WMF/MFSF RPT-W, RPT-WF, RPT-F RPT-485W RPT-485WF	[ ] [ ] [ ] [ ] [ ]	x [0.110] = x [0.400] = x [0.017] = x [0.047] = x [0.049] =		[ ] [ ] [ ] [ ] [ ]	x [0.110] = x [0.400] = x [0.017] = x [0.047] = x [0.049] =		[ ] [ ] [ ] [ ] [ ]	x [0.110] = x [0.400] = x [0.017] = x [0.047] = x [0.049] =	
ACM-24AT, ACM-48A AEM-24AT, AEM-48A ACM-16AT, ACM-32A AEM-16AT, AEM-32A ACM-8R (refer to Doc. 15342) LDM Series (refer to Doc. 15885) SCS-8 (refer to Doc. 15712)	[ ] [ ] [ ] [ ] [ ] [ ] [ ]	x [0.016]= x [0.002]= x [0.040]= x [0.002]= x [ ]= x [ ]= x [ ]=		[ ] [ ] [ ] [ ] [ ] [ ] [ ]	x [0.070]= x [0.056]= x [0.056]= x [0.018]= x [ ]= x [ ]= x [ ]=		[ ] [ ] [ ] [ ] [ ] [ ] [ ]	x [0.016]= x [0.002]= x [0.040]= x [0.002]= x [ ]= x [ ]= x [ ]=	
Number of Annunciator LEDs illuminated during non-fire alarm conditions ACM-16AT, ACM-32A AEM-16AT, AEM-32A	[ ] [ ]	x [0.016]= x [0.016]=		[ ] [ ]	INCLUDED ABOVE		[ ] [ ]	x [0.016]= x [0.016]=	
UDACT UDACT-2	[ ] [ ]	x [0.100]= x [0.052]=		[ ] [ ]	x [0.100]= x [0.087]=		[ ] [ ]	x [0.100]= x [0.087]=	
Sum each column for totals	Primary, non-alarm total:			Primary, alarm total:			Secondary, non-alarm total:		

Appendix B: Menu Hierarchy

<table>
<tr><td rowspan="11">Main Menu
(see page 45)</td><td colspan="2">Read Status (see page 51)</td></tr>
<tr><td rowspan="3">Program/Alter Status
(see page 45)</td><td>Alter Status (see page 57)
• Disable/Enable
• Detector Sensitivity
• Clear Verify Counts
• Clear History
• Walk Test
• Change Time/Date
• Control On/Off
• Back</td></tr>
<tr><td>Node Program
...for specified remote node (see page 76)
• Edit point labels
• Edit node labels
• Back
...for specified ACS point on local NCA-2 (see page 88)
• ACS label
• Back</td></tr>
<tr><td>NCA-2 Program (see page 77)
• Network Parameters
• Network Mapping
• NCA-2 Settings
• Reminder Menu
• NCA-2 Timers
• Event Monitoring
• LCD Display
• ACS Programming
• Supervision
• Password Change
• Point Program
• Back</td></tr>
<tr><td>Event Counts Display
(see page 44)</td><td>More Information
Program/Alter Status
Signal Silence
System Reset
Main Menu</td></tr>
<tr><td>Multiple Event List
(see page 46)</td><td>First Event
Main Menu</td></tr>
<tr><td rowspan="2">History Display
(see page 47)</td><td>Local History (see page 47)
• All Events
• Alarms Only
• Troubles Only
• Supervisory Only
• Security/Other
• Time/Date Interval
• Point Range
• Back</td></tr>
<tr><td>Node History (see page 50)
• All events
• Alarms only</td></tr>
<tr><td rowspan="3">Printer Functions
(Print reports)
(see page 57)</td><td>NCA-2 Programming Reports (see page 57)
• Network Parameters
• Network Mapping
• NCA-2 Settings
• NCA-2 Timers
• Event Monitoring
• LCD Display
• ACS Programming
• ACS Point Programming
• Supervision
• Back</td></tr>
<tr><td>Active Points (see page 59)</td></tr>
<tr><td>Walk Test (see page 71)</td></tr>
</table>

Appendix C: Wire Requirements

Circuit Type	Circuit Function	Wire Requirements	Distance (ft/m)	Typical Wire Type
EIA-485 (power limited)	Connects to ACS modules, or TM-4 Transmitter	Twisted-shielded pair with a characteristic impedance of 120 ohms 18 AWG (0.75 mm^2) minimum	6,000/1,829 (max)*	16 AWG (1.30 mm^2) (e.g. Belden 9860)
EIA-232 (power limited)	Connects to Printers, or PC	Twisted-shielded pair. 18 AWG (0.75 mm^2) minimum	50/15.24 (without modem)	16 AWG (1.30 mm^2) (e.g. Belden 9860)

Table C.1 Wire Requirements

*In ACS mode, the distance is the total length of the EIA-485 cable from the NCA-2 to the last device on the circuit.

Appendix D: Display and Control Center (DCC)

A Display and Control Center (DCC) is a display location which can respond to events occurring at other participating locations. While there may be multiple Display and Control Centers on a network, an individual location can only accept the commands of one DCC at a time. The user's actions at any participating station, panel, or remote display determine which location will be the DCC.

For Fire Applications: When the NCA-2 is not the Display and Control Center, pressing Signal Silence, System Reset, Acknowledge or Drill (Alarm Signal for Canadian applications) will automatically send a permission request to the current DCC. The DCC must release control of the node to the requesting NCA-2 before the key will be processed. If no DCC already exists, the key is processed and the acknowledging panel or station assumes control. Unless specifically denied authorization, the NCA-2 will assert control over any NCA-2, NFS-320, NFS2-640, NFS2-3030, NFS-3030 and NCS node that is mapped to it. When it assumes control, the CONTROLS ACTIVE LED on the keypad will illuminate.

Pressing an ALL CALL, PAGE ACTIVE EVAC AREAS, PAGE ACTIVE ALERT AREAS, PAGE INACTIVE AREAS or ENABLE TELEPHONE PAGE button on a DVC-KD that has been programmed to participate in DCC with the NCA-2, will cause permission to be requested

ACS points programmed on an annunciator with a type of 96DCC will also cause permission to be requested.

Partial control is also possible, where one or more of the nodes denies authorization and one or more nodes allows it to assert control.

DCC participation is set on the NCA-2 Settings screen under the NCA-2 Programming menu (see "Panel Settings" on page 81).

CAUTION:
On systems utilizing the DCC function, all locations that can participate must be enabled.

CAUTION:
When re-booting a NCA-2 that is participating in DCC, wait until system is completely initialized before sending DCC commands to a remote node.

For Mass Notification Applications: DCC must be turned off for mass notification applications. When the NCA-2 is used as part of an ACU, LOC or CCS configuration, the DVC must have Mass Notification Control Settings selected and the NCA-2 node number selected. The CONTROLS ACTIVE LED will remain lit unless control is taken from another node, indicating that Acknowledge, System Reset, Signal Silence and Drill functions are available for the NCA-2. If a mass notification page is initiated from a DVC, the node associated with that DVC will assume control of the network and its CONTROL ACTIVE LED will remain lit. Control functions for that node will remain available.

Other nodes on the network: For all other nodes, the CONTROLS ACTIVE LED will turn off and control functions will be blocked for the duration of the MN page. Once the page is complete, control will be returned to all nodes and their CONTROLS ACTIVE LEDs will turn back on.

LCD-160: Any LCD-160s connected to the NCA-2 will turn off their CONTROLS ACTIVE LED during an MN page from the DVC. If the MN page is performed from the DVC-RPU, the NCA-2 will not have control, so the CONTROLS ACTIVE LED will turn off and control functions will not be available. The LCD-160 that shares the same address as the DVC-RPU will have control and its CONTROLS ACTIVE LED will remain lit.

Annunciators (ACM, LCD2-80, etc.): Any annunciators connected will follow the control status of the NCA-2 and will have the same control functions, if available.

For additional information, refer to the Mass Notification Systems Configuration, Programming and Operations Manual.

Appendix E: Regional Settings

The panel programming REGIONAL SETTINGS choices, available through the Panel Settings (2) screen (refer to page 83) are described below. The REGIONAL SETTINGS screen (Refer to Figure E.1) allows scrolling through the available choices by pressing the soft key. Choices are CHICAGO, SINGAPORE, AUSTRALIA, CHINA, CANADA or DEFAULT (no special regional settings).

Main menu
↳ Program/alter status menu
↳ Panel Program menu
↳ Panel settings
↳ More

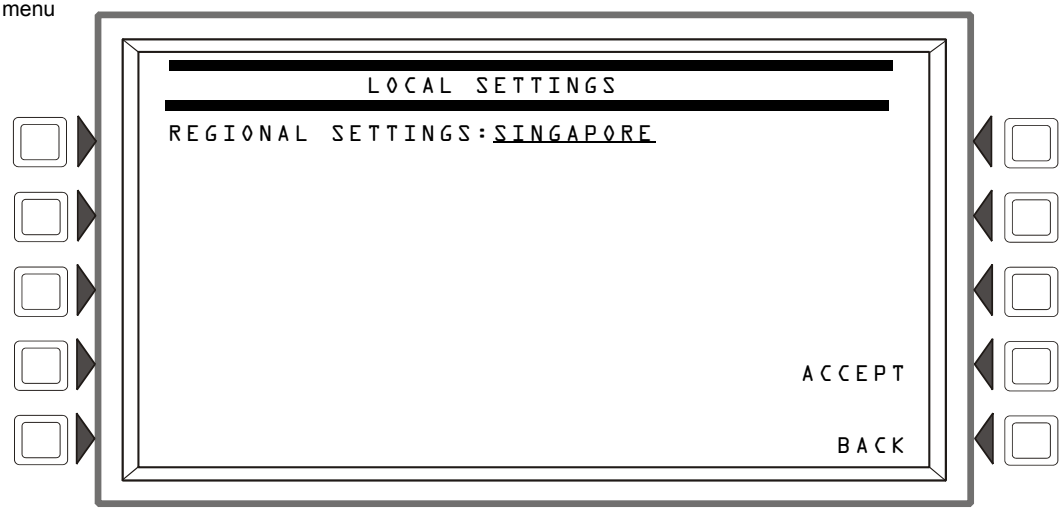


Figure E.1 Regional Settings Screen

E.1 Singapore

The REGIONAL SETTING choice of SINGAPORE:

- Does not turn ON the System Trouble LED or the System Trouble relay for disabled points.
- Does not turn ON the System Trouble LED, the System Trouble relay, or the piezo when Drill is initiated.
- Turns ON keypad LEDs, PCB LEDs, and all ACM-24/48 LEDs during Lamp Test.
- Requires the user to initiate the start of the application when the panel boots/reboots. The CPU Failure LED will be ON until the user initiates startup. (Refer to Figure E.2.)
- Will sound the piezo when local control is set to OFF.

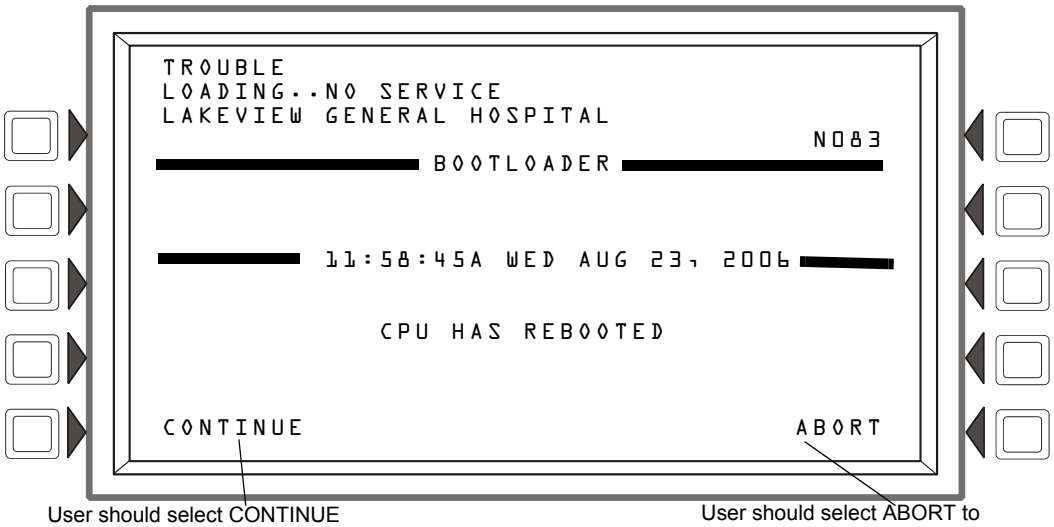


Figure E.2 Singapore Application Initiation

E.2 Chicago

The REGIONAL SETTING choice of CHICAGO disallows local drill or signal silence.

- The DRILL and SIGNAL SILENCE keys at the panel will not function.
- Annunciator Control Modules and SLC modules given a drill or signal silence Mode or Type Code will not allow local drill or signal silence initiation.
- Events must be acknowledged prior to system reset.

E.3 Australia

The REGIONAL SETTING choice of AUSTRALIA activates the following features:

- allows use of the Australian smoke control module SCS-8AU.
- "Brigade Act" LED is controlled by ZL1000.
- Test LED is lit during walktest.
- Special passwords for testing memory corruption detection.
  "Corrupta" will temporarily corrupt a location in the application.
  "Corruptb" will temporarily corrupt a location in the boot.
  "Corruptd" will temporarily corrupt a location in the database.
  "Remove corruption" will uncorrupt the panel and reboot.
- Plant Isolate button will disable/enable ZL999.
- No softkeys on the panel will function while there is an unacknowledged alarm *EXCEPT* scroll, silence, reset and disable.
- Silence key acknowledges everything before silencing.
- Disable key disables the current event on the screen.
- Fan control function per AS/NZS 1668:1:1998, section 4.13.2.
- First zone in alarm displayed at top of display. Additional zones in alarm also displayed, until panel reset. Alarm zones not currently on display may be viewed using the scroll button.
- Security events will light the supervisory LED. The supervisory scroll key will scroll through security events.
- Pre-alarm events will be displayed after alarms.
- The Main Menu includes an "Other events" menu key to scroll through other events.
- Password Bypass Timer enabled. After entering a valid password, the user does not need to enter a password again until no key is pressed for ten minutes.
- Active Output events are displayed if Output Activations are enabled in the Event Logging menu.
- Disable/Enable button will disable or enable the currently-displayed event.
- AMPS-24 supervision disabled.
- When the primary supply is not an AMPS-24, selecting AUX trouble supervisory setting will generate a general power supply fault.

E.4 China

The REGIONAL SETTING choice of CHINA activates the following features:

- POM-8a support
- Active output events displayed. A counter is displayed for active outputs.

- Municipal Communication panel settings
- New special function zone for alarm verification
- Prealarm automatically cleared after five minutes
- Co-op detectors alarm functions
- Dual alarm window
- Points in trouble will not activate
- Ten minute limit for DEL and SDEL delay functions
- Disable events do not light LED or trip the trouble relay
- No system trouble generated upon entering program mode
- Low AC operation of FACP
- Power supply troubles.

E.5 Canada

The `REGIONAL SETTING` choice of `CANADA`:

- Two-Stage coded systems (3/5 minute timer) - An ACM-24AT control point mapped to Special Function zone ZF39 is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage timer
- Multiple Display and Control Centers (DCC) - An ACM-24AT programmed as 96DCC is required to provide ACS monitor points to indicate which DCC is in control.
  If the Display and Control Center (DCC) feature is enabled:
  -An ACS control point mapped to the local Special Function zone ZF36 is required
  -An ACS monitor point mapped to ZF36 for each DCC and node that has DCC enabled on the network is required
- If an LCD-160 is connected to the NCA-2 and DCC is enabled, Local Control should be disabled
- A Signal Silence or System Reset is required to clear an Alarm Signal
- Annunciator Applications:
  -ACS points programmed as Acknowledge, Signal Silence, System Reset, and Drill do not function
  -ACM points programmed for Alarm Signal Cancel should be labeled as “Automatic Alarm Signal Cancel” or “Auto Alm Signal Cancel”
  -The following LED colors must be employed:

  Red must be used to indicate fire alarms
  Yellow must be used to indicate supervisory, burglary, trouble signals, and Automatic Alarm Signal Cancel
  Green must be used to indicate the presence of power or an activated output
- Ancillary Devices:
  -Panel control functions (Acknowledge, Signal Silence, Reset, and Drill) will not function on ancillary devices such as the LCD2-80 or ACM-24AT. (Local acknowledge will function on the ancillary device to silence the piezo and steady the LEDs)
- Auto Silence:
  -If the NCA-2 or any node on the network has the Auto Silence feature enabled, an annunciator point monitoring Special Function Zone ZF40 of that node is required on the NCA-2
  -Activation of Auto Silence will activate the Signal Silence LED on the panel display and any ACM LED point programmed for Auto Silence.

Appendix F: UL 8th Edition Panel Applications

The NCA-2 is compatible with the FACPs in this appendix that have software as described in Table F.1. Display differences and programming requirements are noted in each section.

FACP	Compatible with NCA-2 at Software Level:
AFP-200	Rev. 3.02 or greater
AFP-300, AFP-400	Rev. 3.65 or greater
AM2020, AFP-1010	SIB, DIA, CPU Rev. 4.0 or greater

Table F.1 Software Compatibility

Use of the NCA-2 with these FACPs is subject to AHJ approval. Refer to “UL 864 Ninth Edition Compliance” on page 8.

F.1 Conversions Common to UL 8th Edition Panels

Device Trouble Types

Device trouble types for the AFP-200, AFP-300/400,and AM2020/AFP-1010 FACPs will be displayed on the NCA-2 as follows:

FACP Device Trouble	NCA-2 Displays:
Invalid Reply	No Response
Low Chamber Value < 20% of alarm level	Low Threshold
Maintenance required > 80% of alarm level	Maintenance Alert
Sensitivity High	Maintenance Alert
Sensitivity Low	Maintenance Alert
Open Circuit	Open Circuit
Short Circuit	Short Circuit
Point Trouble	General Trouble
Detector Failed Chamber Test	Detector Failed Test
Drift Compensation Error	Maintenance Alert
Verification Count Overflow	Verify Count Over 20
Security Tamper	Security Tamper
Security Invalid Reply	No Response

Table F.2 NCA-2 Device Trouble Display

Detector Sensitivity

NCA-2 screens that display detector sensitivity translate the AFP-200, AFP-300/400, and AM2020/AFP-1010FACP levels as follows:

FACP Sensitivity Level	NCA-2 Displays Sensitivity Level:
Low Sensitivity	9
Medium Sensitivity	5
High Sensitivity	1

Table F.3 NCA-2 Detector Sensitivity Display

F.2 AM2020/AFP-1010

Device Point Types

The device types for this panel will display according to the NCA-2 in Table F.4.

AFP-1010/AM2020 Device Point Type	NCA-2 Displays:
HEAT(ANALOG)	HEAT
FIXED THER D	HEAT(FIXED)
MON NORM CLD	NC MONITOR
SPRNKLR MNTR	SPRINKLER SYS
FORM C RELAY	RELAY
POWER(CONV)	CONTROL
TRBLES PEND	TROUBLE PEND
TRBL MONITOR	TROUBLE MON
CMX CONTROL	CONTROL
CMX FORM C	FORM C RESET
NON ALM MON	NON FIRE
GN ALARM EVC	GEN ALARM
GN ALARM	GEN ALARM
GN ALARM FORC	GEN ALARM
GN WATER FLW	GEN ALARM
GN TRBL FORC	GEN TROUBLE
GN WAT FORC	GEN ALARM
GN SUPR FORC	GEN SUPERVIS

AFP-1010/AM2020 Device Point Type	NCA-2 Displays:
TROUBLE	GEN TROUBLE
TROUBLE FORC	GEN TROUBLE
FIXED PHOT D	SMOKE(PHOTO)
PAGE	TELE PAGE
MON PULL STA	PULL STATION
MONITOR PAGE	TELE PAGE
ION DUCT DET	SMOKE(DUCT I)
NON ALARM	NON FIRE
FORMC MANUAL	RELAY
SYSTEM MONTR	SYS MONITOR
DACT CONNECT	GEN TROUBLE
SPRVSRY MNTR	TRACK SUPERV
SMOKE ION HP	SMOKE(DUCT I)
SMOKE ION LP	SMOKE(DUCT I)
SMOKE(COMBO)	SMOKE(MULTI)
SMOKE(PHOTV)	SMOKE(PHOTO)
SMOKE(IONV)	SMOKE(ION)

Table F.4 NCA-2 Display for AM2020/AFP-1010 Device Point Types

Annunciator Point Types

The annunciator types for this panel will display according to the NCA-2 Column in Table F.5.

CAUTION:
When using the NCA-2 to annunciate points on the AM2020/AFP-1010 over the network, enable state reporting in the AM2020/AFP-1010 panel for control module points and “NONA”NOA” module points. Otherwise, any changes in the state of these points on the FACP will not be annunciated over the network to annunciator points mapped to the NCA-2.

1. Choose option “I=PSYS” from the FACP programming menu for partial system programming.
2. Choose option “6=EXTEQ”.
3. Answer YES to the following questions:
   - *DO YOU WANT TO CHANGE THE CONTROL MODULE STATE REPORTING?*
   - *DO YOU WANT TO REPORT CONTROL MODULE STATE CHANGES?*
   - *DO YOU WANT TO CHANGE THE “NONA”/”NOA” MDULE STATE REPORTING?*
   - *DO YOU WANT TO REPORT “NONA”/”NOA” MODULE STATE CHANGES?*

OR, if completely programming the panel:

1. Choose option “2-FSYS”.
2. Answer YES to the following questions:
   - *DO YOU WANT TO REPORT CONTROL MODULE STATE CHANGES?*
   - *DO YOU WANT TO REPORT “NONA”/”NOA” MODULE STATE CHANGES?*

.

AFP-1010/AM2020 Annunciator Point Type	NCA-2 Displays:
AMAN	MANUAL
AAST	ACKNOWLEDGE
ASGS	SILENCE

AFP-1010/AM2020 Annunciator Point Type	NCA-2 Displays:
AMON	MONITOR
AINP	MONITOR
ACON	CONTROL

Table F.5 NCA-2 Display for AM2020/AFP-1010 Annunciator Point Types

AFP-1010/AM2020 Annunciator Point Type	NCA-2 Displays:
ARES	RESET
ALMP	NONE
AZON	MONITOR
ADET	MONITOR

AFP-1010/AM2020 Annunciator Point Type	NCA-2 Displays:
ATEL	TELEPHONE
ASUP	MONITOR
AFCM	CONTROL

Table F.5 NCA-2 Display for AM2020/AFP-1010 Annunciator Point Types

F.3 AFP-300/AFP-400

Device Point Types

The device types for this panel will display on the NCA-2 as follows:

AFP-300/AFP-400 Device Point Type	NCA-2 Displays:
HEAT(ANALOG)	HEAT
MULTISENSOR	SMOKE(MULTI)
SUPERVISORY	TRACK SUPERV
SILENCE	SIL SWITCH
SYSTEM RESET	RESET SWITCH
EVACUATE	EVACUATE SW
BURGLAR ALA	SECURITY L
COMB.MONITOR	SMOKE(MULTI)

Table F.6 NCA-2 Display for AFP-300/AFP-400 Device Point Types

System Troubles

There is one FACP System Trouble that displays differently at the NCA-2.

AFP-300/AFP-400 System Trouble	NCA-2 Displays:
PROG. MODE ENTERED	PROG MODE ACTIVATED

Table F.7 NCA-2 Display for AFP-300/AFP-400 System Trouble

Read Status

Read Status of Special Function Zone 7 on the AFP-300/AFP-400 is not supported.

Disable/Enable

Disable/Enable of zones on an AFP-300/AFP-400 is not supported.

Control ON/OFF

Control ON/OFF on the AFP-300/AFP-400 is not supported.

Shadow Points

Shadow points are not supported on an AFP-300/AFP-400.

MONITOR and CONTROL ACS points can not look at output modules, bell circuits or panel circuits on an AFP-300/AFP-400.

Auto-Acknowledge

A Network Adaptor Module (NAM) connected to an AFP-300/AFP-400 will auto-acknowledge an event on the panel. The panel then shows the event as acknowledged, and this event can not be acknowledged again at the panel since it has already been acknowledged locally. The NCA-2 or another display node must be used for acknowledgement.

F.4 AFP-200

The device types for this panel will display on the NCA-2 as follows:

AFP-200 Device Point Type	Displayed at NCA-2 as Device Point Type:
HEAT(ANALOG)	HEAT
BURGLAR ALA	SECURITY L
SUPERVISORY	TRACK SUPERV
SILENCE	SIL SWITCH
SYSTEM RESET	RESET SWITCH
EVACUATE	EVACUATE SW

Table F.8 NCA-2 Display for AFP-200 Device Point Types

System Troubles

There are two FACP System Troubles that display differently at the NCA-2.

AFP-200 System Troubles	Displayed at NCA-2 as:
NO DEVICES INSTALLED	NO DEV.INST ON L1
PROG. MODE ENTERED	PROG MODE ACTIVATED

Table F.9 NCA-2 Display for AFP-200 System Troubles

Read Status

Read Status is not supported on the AFP-200.

Disable/Enable

Disable/Enable on an AFP-200 is not supported.

Control ON/OFF

Control ON/OFF on the AFP-200 is not supported.

Shadow Points

Shadow points are not supported on an AFP-200.

MONITOR ACS points can not look at output modules, bell circuits or panel circuits on an AFP-200.

Auto-Acknowledge

A Network Adaptor Module (NAM) connected to an AFP-200 will auto-acknowledge an event on the panel. The panel then shows the event as acknowledged, and this event can not be acknowledged again at the panel since it has already been acknowledged locally. The NCA-2 or another display node must be used for acknowledgement.

Appendix G: Logic Equations

G.1 Equations

Logic Equations can define complex relationships between input and output devices.

The NCA-2 supports up to 1000 Logic Equations, each designated with a Logic Zone number of ZL1 through ZL1000.

1. Equations will always begin with a logic function. The function set is listed below.
2. Equations will be a maximum of 80 characters long, including parentheses and commas.
3. Logic Equations can have a maximum of 10 logic functions unless a time delay function is used: a time delay function must be the only function in its equation.
4. Equations are evaluated after all other devices have been evaluated.
5. One logic equation can be used as an argument in another logic equation, only if the equation used has previously been evaluated; that is, only zones with a lower number than the zone currently being edited can be used as arguments.
6. A logic function can have a maximum of 20 arguments (inclusive start and stop address).
7. Maximum for the delay timer is 23 hours, 59 minutes, 59 seconds (23:59:59).
8. Mass Notification enabled systems: Logic zones must be written conditionally to ensure proper event suppression. Refer to the Mass Notification manual for additional information.

Equations are entered using Point Programming for logic zones. Refer to these sections in this manual for instruction. The panel will check for errors after the user has entered the complete equation. Possible errors are too many or two few parentheses, too many or two few arguments inside the parentheses, unknown function and unknown device type.

Equations are made up of two basic components: functions (either logic or time delay) and arguments.

G.1.1 Arguments

Arguments are discrete parts of a logic or time delay function used in a logic or trouble equation. They can consist of another function, another equation, or any of the devices listed below.

(Nxxx)LxxD1 - (Nxxx)LxxD159	detectors loop xx	(159 per loop)
(Nxxx)LxxM1 - (Nxxx)LxxM159	modules loop xx	(159 per loop)
(Nxxx)Z0 - (Nxxx)Z999*	general zones	(1000)
(Nxxx)ZF0 - ZF7, ZF9 - ZF22, ZF36 - ZF40	special zones	(27)
(Nxxx)ZL1 - (Nxxx)ZL1000	logic zones	(1000)
(Nxxx)A1 - A32	SCS device address	32
(Nxxx)A1G1 - A32G16	SCS switch group	(16 per annunciator)
xx = loop number (01 through 10) (Nxxx) = Node number, necessary for CCBE programming. The node number identifies what node the panel will watch for a particular zone activation.		

Table G.1 Table of Arguments

G.1.2 Logic Equations

Logic Functions

- **The "AND" Operator**

  Requires that each argument be active.

  Example: AND(N01Z02,N01Z05,N01L2D12)

  All three arguments in the equation must be active for the logic zone to be activated.

- **The “OR” Operator**

  Requires that any argument be active

  Example: OR(N01Z02,N02Z05,N01L2D12)

  If any one of the three arguments in the equation is active the logic zone will be activated.

- **The “NOT” Operator**

  Inverts the state of the argument (activated to deactivated OR deactivated to activated).

  Example: NOT(N01Z02)

  The logic zone will remain activated until the argument activates.
  If the argument activates the logic zone will deactivate.

- **The “ONLY1” Operator**

  Requires that only one argument be active.

  Example: ONLY1(N01Z02,N02Z05,N01Z09)

  If only one of the arguments activates the logic zone will be activated.

- **The “ANYX” Operator**

  Requires that the amount of arguments specified by the number preceding the arguments be active.

  Example: ANYX(2,N01Z02,N01Z05,N02Z09)

  If any two or more of the arguments are in alarm the output point will be activated.

  The X amount may be a value from 1 through 9.

- **The “RANGE” Operator**

  Each argument within the range must conform to the requirements of the governing function. The range limit is 20 consecutive arguments.

  Example: AND(RANGE(N01Z1,N02Z20))

  Zone 1 through Zone 20 must all be active to activate the logic zone.

- **The “DIS(point argument)” Operator**

  Requires that the point argument be disabled for the operator to go active.

- **The “PRE(point argument)” Operator**

  Requires that the point argument be in prealarm for the operator to go active.

  Example: AND(N01L1D1,PRE(N01L1D2))

  The detector at address N01L1D1 must be active and the detector at N01L1D2 must be in prealarm for this equation to go active.

- **The “SUP(point argument)” Operator**

  Requires that the point argument be in an active supervisory state for the operator to go active.

  Example: OR(N01L1D1,SUP(N02L1M1))

  The detector at address L1D1 must be active, or the module at N01L1M1 must be in an active supervisory state, for the equation to go active.

- **The “FIRE(point argument)” Operator**

  Requires that the point argument be in an active fire alarm state for the operator to go active.

  Example: AND(N01L1D1,FIRE(N01L1M1),FIRE(N02L1M2))

  The detector at address N01L1D1 must be active, and the modules at N01L1M1 and N02L1M2 must be in an active fire alarm state, for the equation to go active.

- **The “NON(point argument)” Operator**

  Requires that the point argument be in an active non-alarm state for the operator to go active.

  Example: AND(N01L1D1,NON(N02L1M1))

  The detector at address N01L1D1 must be active, and the module at address N02L1M1 must be in an active non-fire alarm state, for the equation to go active.

- **The "SEC(point argument)" Operator**

  Requires that the point argument be in an active security alarm state for the operator to go active.

  Example: AND(N01L1M1,SEC(N01L1M2))

  The module at address N01L1M1 must be active, and the module at address N01L1M2 must be in an active security alarm state, for the equation to go active.

- **The "AUTO(point argument)" Operator[1]**

  This operator will evaluate as "Active" if all of the SCS switches or specified switch group are in the "Auto" position.

  Examples:
  OR(AUTO(A1G16))
  The switch associated with switch group 16 on Annunciator 1 must be set as "Auto" for the equation to go active.

  OR(AUTO(A1))
  All the switches of Annunciator 1 must be set to "Auto" for the equation to go active.

- **The "NORM(point argument)" Operator[1]**

  This operator will evaluate as "Active" if the entire SCS device or specified switch group is in a "normal" state.

  Examples:
  OR(NORM(A1G16))
  The switch associated with switch group 16 on Annunciator 1 must be in the "normal" state for the equation to go active.
  OR(NORM(A1)
  All switches on Annunciator 1 must be in the "normal" state for the equation to go active.

- **The "SCSDIS(point argument)" Operator[1]**

  For use with the SCS-8L only. This operator will evaluate as "Active" if the keyswitch on the specified SCS device is in the disabled position.

  Example: OR(SCSDIS(A25))

  If the keyswitch on annunciator 25 is disabled, this equation will go active.

[1]For use with Smoke Control applications only.

Time-based Functions

The panel supports three time-based functions: DEL, SDEL, and TIM. Special rules apply to an equation containing a time-based function:

- Only one time-based function may be used in an equation.
- The time-based function must appear only once, as the first entry of the equation.
- It may not be nested within parentheses in the equation.
- Logic functions may be used in an equation that begins with a DEL or SDEL time-based function: however, they must appear within parentheses following the time-based function.

Delay and duration times are in 24-hour format (HHMMSS); the allowable range is 00:00:00 to 23:59:59.

The "DEL" Function

Used for delayed operation.

Example: DEL(HH.MM.SS, HH.MM.SS,AND(L1M1,L1M140))

- The first HH.MM.SS is the delay time, the second HH.MM.SS is the duration time. If the argument - AND(N01L1M1,N01L1M140) - in the example above activates, the function becomes true after the argument has been active for the delay time, and continues to be true for the duration time as long as the argument stays active. If the argument goes inactive during the delay time or the duration time, the function reverts to false and the timing would begin all over again if reactivated.

- If duration time of zero is entered (00.00.00), the equation will evaluate true when the delay time expires if the argument remains active throughout the delay time period.
- If no duration or delay is specified, then the function will follow the input argument, indicating true while it is active and false when it is inactive. DEL assumes a value of false on reset.

The "SDEL" Function

A latched version of the DEL function.

Example: SDEL(HH.MM.SS, HH.MM.SS,N01L1M140)

- The first HH.MM.SS is the delay time, the second HH.MM.SS is the duration time. If the argument (N01L1M140 in the example above) activates, the function becomes true after the delay time, and will remain active for the duration even if the argument becomes inactive during either the delay or duration time.
- If delay time of zero is entered (00.00.00), the equation will evaluate true as soon as the argument (N01L1M140) activates and will remain that way for the specified duration, even if the argument becomes inactive during that time.
- If no duration or delay time is specified, then the argument will not deactivate until reset, even if the argument becomes inactive.

The "TIM" Operator

The TIM function is used to specify activation on specific days of the week or year.

Examples:

TIM(7-11-06) will evaluate as true for 24 hours starting at midnight (00:00:00) on July 11, 2006.

TIM(MO,TU,WE,TH,FR,08:00:00,23:00:00) will evaluate as true at 8:00 AM and remain true until 11:00 PM (23:00) for the list of days supplied.

TIM(MO,TU,WE,TH,FR,08:00:00) will evaluate as true at 8:00 AM and remain true until 23:59:59 of the current day for the list of days supplied.

TIM(TU,07:45:00,18:30:00) will evaluate as true every Tuesday between 7:45 AM until 6:30 PM.

TIM(MO,TU,WE,TH,FR) will evaluate as true from Monday morning at 12:01 AM until Friday evening at 11:59:00 PM.

Logic Equation Syntax Example

OR(AND(L1D1,L1D4),AND(L2D6,L2M3,NOT(L2M4)),ANYX(2,L1M13,L1M14,L1M15))

Equation begins with a logic function - OR

67 *Characters* (maximum of 80) - includes parentheses and commas.

5 *Logic Functions* (maximum of 10) - OR, AND, AND, NOT and ANYX.

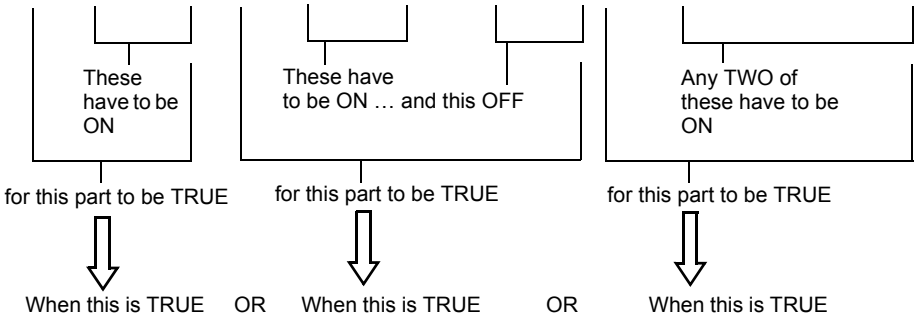
8 *Arguments* (maximum of 20 per logic function) - L1D1,L1D4,L2D6,L2M3,L2M4…

The equation contains no spaces.

Evaluating an Equation

To evaluate an equation, start from the innermost part of the equation and work outwards. For this equation to evaluate TRUE and thus turn on any output mapped to it, the following conditions must be met:

OR(AND(L1D1,L1D4),AND(L2D6,L2M3,NOT(L2M4)),ANYX(2,L1M13,L1M14,L1M15))



Then all outputs programmed with this equation will be turned ON.

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NCA-2 OPERATING INSTRUCTIONS

Section 1 Operating Information

Normal Standby Operation.

1. Green POWER indicator lit steadily.
2. Red FIRE ALARM indicator off.
3. Yellow TROUBLE indicators off.
4. Yellow OTHER indicator off.

Alarm Condition.

1. Red FIRE ALARM and/or Yellow OTHER (for MNS alarms) indicator(s) lit.
2. Alarm signaling devices activated.
3. Option module (remote station or supplementary alarm relay) activated.
4. Alarm information visible on LCD (liquid crystal display).

Alarm Reset. After locating and correcting the alarm condition, reset the control panel by pressing the SYSTEM RESET switch. If both Fire and MNS conditions are present on the panel, SYSTEM RESET must be pressed twice.

Trouble Condition. Activation of trouble signal under normal operation indicates a condition that requires **immediate** attention. Contact your local service representative. Silence the audible signal by pressing the ACKNOWLEDGE switch. The trouble indicator will remain illuminated.

Section 2 NCA-2 Key Functions

Acknowledge. This silences the piezo sounder and changes all flashing conditions to steady. It sends an acknowledge message to the printer and history file. ACKNOWLEDGE also automatically sends a special command to silence piezo sounders on ACS Annunciators. If more than one event exists, it advances the display to the next item and displays it until the ACKNOWLEDGE switch is pressed again. Only one press is necessary for non-fire, trouble, or supervisory signals.

Signal Silence. SIGNAL SILENCE turns off all silenceable circuits and illuminates the SIGNALS SILENCED indicator. It also sends a SIGNALS SILENCED message to the LCD, printer, and history file. A subsequent alarm will then resound the system.

Notes:

1. This system is programmed to inhibit signal silence for ____seconds.
2. This system is programmed to automatically silence alarm signal after _____ minutes.

Drill/Alarm Signal (Canada). The NCA-2 waits for the DRILL/ALARM SIGNAL (Canada) switch to be pressed for 2 seconds (to prevent accidental activations), then turns on all silenceable circuits (all control modules/panel circuits that are programmed silenceable), and turns off the SIGNALS SILENCED LED. This event shows on the LCD, printer, and History file.

System Reset. Resets the control panel in standalone applications. Resets panel when enabled in network applications.

Lamp Test. Press and hold the switch to lamp-test the LEDs.

Section 3 LED Indicators

Controls Active. Green LED which illuminates when the NCA-2 assumes control of the network primary display**.**

Power . Green LED which illuminates when primary power is applied to the control panel.

Fire Alarm. Red LED that flashes when one or more alarms occur. Illuminates steadily after alarms are acknowledged, and turns off when SYSTEM RESET is pressed after alarm clears.

Pre-Alarm. Red LED that flashes when a pre-alarm threshold is reached.

Security. Blue LED that illuminates for a security alarm. LED turns off after the alarm clears and SYSTEM RESET is pressed.

Supervisory. Yellow LED that flashes when a Supervisory or Tamper condition occurs, such as a sprinkler valve tamper condition. The LED illuminates steady after conditions are acknowledged, and turns off when the conditions are cleared. The Tamper indication will latch until SYSTEM RESET is pushed.

System Trouble. Yellow LED that flashes when one or more troubles occur. Goes on steadily when ACKNOWLEDGE is pressed, and turns off when all trouble conditions are cleared.

Other Event. Yellow LED flashes when an MNS alarm, process monitor, CO alarm, CO Pre-alarm, hazard alert or weather alert occurs. Goes on steady when Acknowledge is pressed, and turns off when the condition is cleared. System reset required for MNS alarms.

Signals Silenced. Yellow LED that illuminates after SIGNALS SILENCED has been pressed. Turns off when DRILL or SYSTEM RESET is pressed.

Point Disabled. Yellow LED that illumina tes when one or more points are disabled. The LCD will indicate which points have been disabled. Turns off when points are re-enabled.

CPU Failure. Yellow LED that illuminates if the microprocessor fails.

Section 4 NCA-2 Audible Sounder

Alarm. A continuous sounding tone.

Trouble, Disable, Pre-alarm. Two beeps per second.

Supervisory. Four beeps per second.

Security. Eight beeps per second.

Section 5 Periodic Testing and Maintenance

To ensure proper and reliable operation, system inspection and testing should be scheduled as required by the Authority Having Jurisdiction, or as required by NFPA 72 or local fire codes. A qualified Service Representative should perform testing.

Before Testing: Notify fire department and/or central alarm receiving station if alarm condition is transmitted. Notify facility personnel of the test so alarm sounding devices are ignored during the test period. *Physically disconnect all releasing devices*.

Remote Connection Feature: ULC requires that devices such as UDACT and TM-4 be disconnected during annual testing to prevent transmission of false alarms.

TM-4: Slide SW4 Disable All Output switch from “Enable” to “Disable.”

After Testing: Notify all fire, central station, and/or building personnel when testing is complete. *Re-connect releasing devices.*

Section 6 Local Service Representative:

NAME: _____

ADDRESS: _____

TELEPHONE NUMBER: _____

This sheet must be framed and mounted adjacent to the control panel.
Document 52553 Rev B3 ECN 16-0219 05/23/2016

This sheet must be framed and mounted adjacent to the control panel.
Document 52553 Rev B3 ECN 16-0219 05/23/2016

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Network Communications Module NCM-W/F Product Installation Document

PN 51533:D4 10/21/2020 ECN: 151329

1 UL 864 Compliance

1.1 Products Subject to AHJ Approval

This product has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864 10th Edition.

The following products have not received UL 864 9th or 10th Edition certification and may only be used in retrofit applications. Operation of the NCM-W, NCM-F with products not tested for UL 864 9th or 10th Edition has not been evaluated and may not comply with NFPA 72 and/or the latest edition of UL 864. These applications will require the approval of the local Authority Having Jurisdiction (AHJ).

- AM2020/AFP1010
- MIB
- NAM-232

2 Product Overview

The Network Communications Module (NCM) provides a means for connecting specific Notifier fire alarm control products to **NOTI•FIRE•NET™**. There are two types of NCMs available: NCM-W for connecting nodes with twisted-pair wire, and NCM-F for connecting nodes with fiber-optic cable.

In most applications, one NCM is required per **NOTI•FIRE•NET™** node (including fire alarm control panels and network annunciators) . Even though the NCM has two NUP ports, only one may be connected to a **NOTI•FIRE•NET™**. node. Except in some DVC applications, do not connect two NCMs via NUP ports (aka “NUP to NUP”).

For instructions on the additional capabilities available with the DVC, refer to the *DVC Manual*.

- Input power requirements: 24 VDC, 0.11 amps, regulated, power-limited compatible power supply UL/ULC listed for fire protective signalling use.
- Communications circuit requirements: Refer to the **NOTI•FIRE•NET™** *Manual (Network Version 4.0 and Higher)* for wiring length and threshold information.

2.1 The Network Communications Module for Wire (NCM-W)

- Supports twisted-pair wire medium.
- NFPA Class B operation or NFPA Class X operation.
- Two programmable data thresholds.
- Transformer coupling provides electrical isolation between nodes.
- Pluggable terminal wiring with strain relief.
- Pluggable service connector (feeds signal directly through) in the event that power must be removed from a node.
- 312.5 Kbaud transmission rate.
- Data is regenerated at each node.
- Two network ports to allow simultaneous connection to fire alarm control panel and to programming computer
- Enables software and database upload/download over **NOTI•FIRE•NET™**.
- Refer to the **NOTI•FIRE•NET™** *Manual (Network Version 4.0 and Higher)* for wiring length and threshold information.

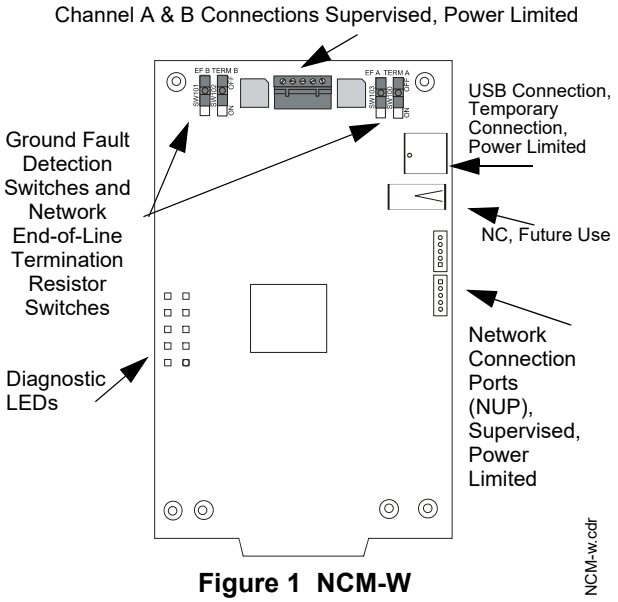


Figure 1 NCM-W

2.2 The Network Communications Module for Fiber (NCM-F)

- Supports fiber-optic medium.
- NFPA Class B or Class X operation.
- Data is immune to all environmental noise.
- Optical isolation prevents ground loops.
- **NOTI•FIRE•NET™** fiber optic medium.
- Fiber type:
  - 62.5/125 micrometers (multimode, 8 dB limit)
  - 50/125 micrometers (multimode, 4.2 dB limit)
- Wavelength (1): 820 nanometers. (Use standard 850 nm fiber.)
- Connectors: ST® Style (ST® is a registered trademark of AT&T).
- 312.5 Kbaud transmission rate.
- Data is regenerated at each node.
- Two network ports to allow simultaneous connection to fire alarm control panel and to programming computer.
- Enables software and database upload/download over **NOTI•FIRE•NET™**.

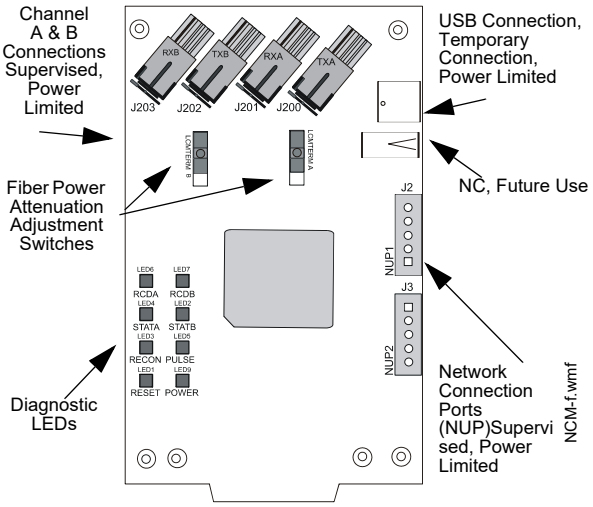


Figure 2 NCM-F

3 Installation

3.1 Mounting Options

The NCM-W/NCM-F is designed to mount in a variety of CAB-3/CAB-4 -compatible chassis, in the NFS-320 enclosure, on a BMP-1 blank plate for dress panel mounting, or behind the DVC in the CA-1 or CA-2 audio chassis. NCM-W can be door-mounted; NCM-F must be installed in a stationary location. Recommended location is in the top row under the backbox's knockout, so as to avoid over-bending fiber-optic cable. Avoid mounting other option boards in front of NCM so that its LEDs are visible. Attach the NCM-W/F to its mounting hardware using the four screws that ship with it.

Cabinet-mounting NCM-W/NCM-F:

- CHS-4/4L/4N, CHS2-M2, CHS2-M3, CHS-M3, or NFS-320 enclosure: Mount the NCM in standard option module positions as described in your control panel installation manual. Figure 3 shows CHS-4L as an example.

- CA-1, CA-2: Mount the NCM-W/F behind a DVC in either the CA-1 or CA-2 audio chassis. Figure 4 illustrates how to install it in a CA-1. Mounting is the same behind a DVC in the lower half-chassis of a CA-2.

Door-mounting NCM-W:

- Door-mount on the ADP-4B Dress Panel on a single-space blank plate (BMP-1) for mounting in a CAB-4 series backbox, as described in Figure 5.

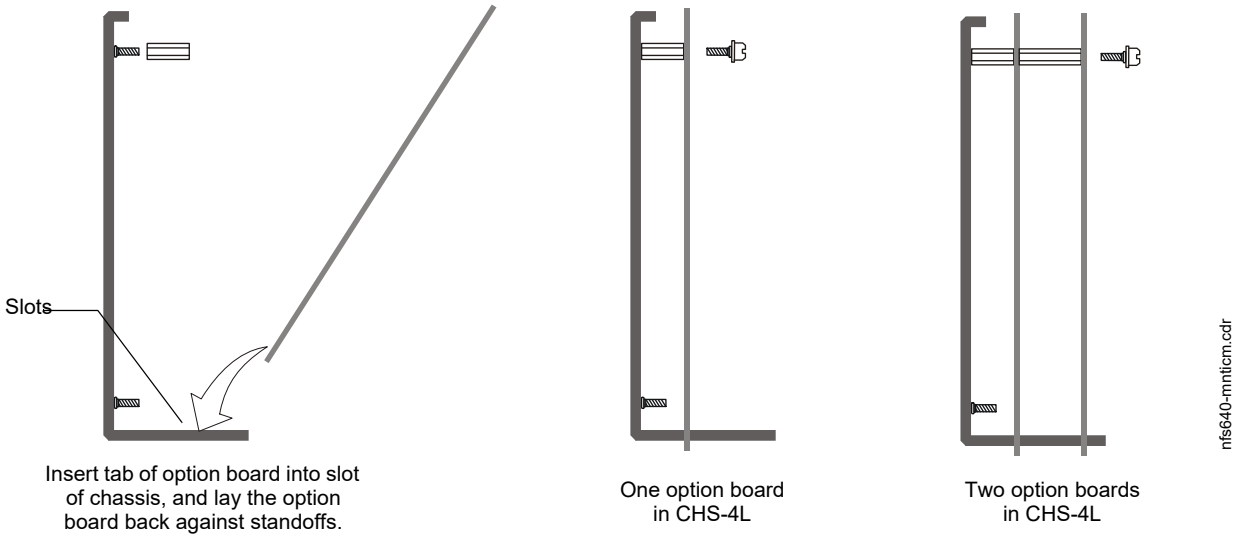


Figure 3 Mounting NCM in a Chassis (CHS-4L Shown)

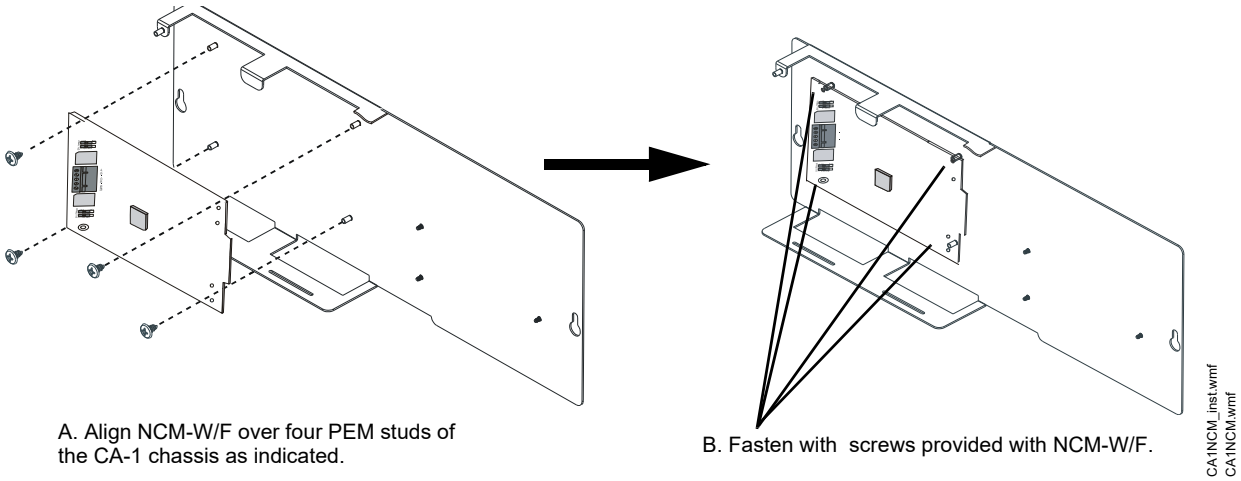
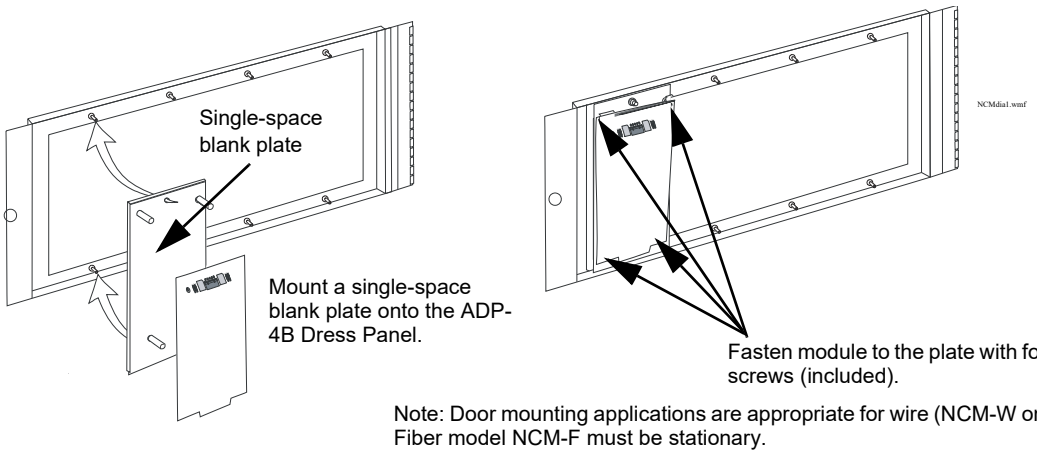


Figure 4 Installing an NCM-W/F onto the CA-1 or CA-2 Audio Chassis Assembly



NOTE: The module cannot be mounted in the ADP-4B Dress Panel when a front slot of the CHS-4 or CHS-4N is occupied, or when either of the two front right positions of the CHS-M2 is occupied. Always be certain there is enough clearance to close the cabinet door when this installation is used.

Figure 5 Door-Mounting the NCM-W

3.2 Interconnecting the NCM-W

When wiring consecutive NCM-W boards, note that wiring may enter or exit at Port A or Port B as shown in Figure 6. NCM-W port-to-port wiring is not polarity sensitive. The use of Port A or Port B is arbitrary. An NCM-W may be connected to any of the following devices:

- NCM-W (in another panel)
- NCS-W network connection
- RPT-W
- RPT-WF
- NFN-GW-PC-W (included with ONYXWORKS-NW)

For information regarding these devices, refer to the documentation listed in Table 4 “Supplemental Documentation”.

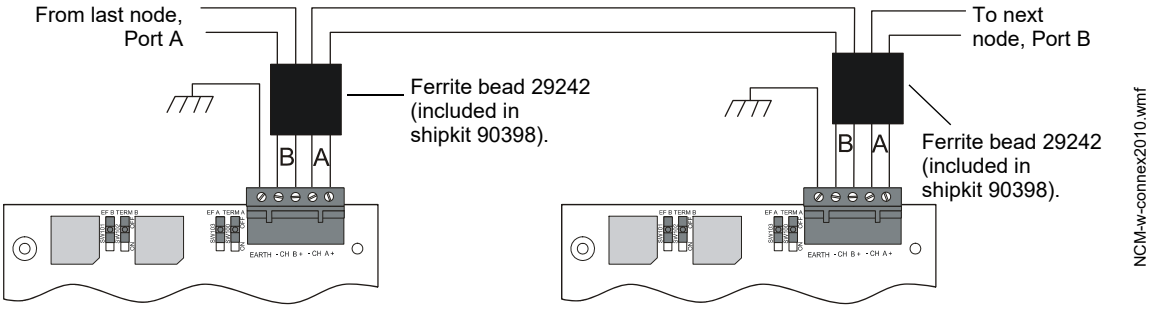


Figure 6 The NCM-W

- Please note that for FCC compliance, the specified ferrite bead must be installed on the network wiring entering/ leaving the NCM-W. Snap the ferrite bead around the two wires (Class B) or four wires (Class X) approximately 0.5” - 0.75” from the connector. Secure using tie wraps.
- Please note that wiring from the NCM-W that is installed outside the building:
  - Cannot exceed 1000m (3280 ft.).
  - Must be in conduit and is to be buried in a trench separate from any power lines.
  - Cannot cross any power lines.

TB100-1	CH-A (+)	Channel-A Driver/Receiver
TB100-2	CH-A (-)	Channel-A Driver/Receiver
TB100-3	CH-B (+)	Channel-B Driver/Receiver
TB100-4	CH-B (-)	Channel-B Driver/Receiver
TB100-5	Earth Ground	

Table 1 NOTI•FIRE•NET™ Connections: NCM-W

■ Switch Functions: Ground Fault Detection and Line Termination

The NCM-W provides two sets of switches to simplify network setup; in Figure 7 all are in the "off" position.

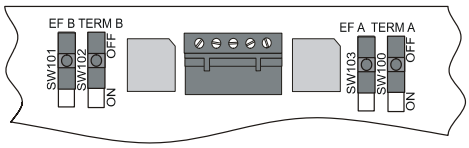


Figure 7 NCM-W Switches

- For UL 864 applications, enable ground fault detection by setting EF switches "on":
  SW103 for Channel A, and SW101 for Channel B.
- Activate on-board end-of-line resistors by setting TERM switches "on": SW100 for Channel A; SW102 for Channel B.
- Zero Ohms to ground will cause a ground fault.

Correct configuration depends on your network design; for an explanation of design concepts, refer to the ***NOTI•FIRE•NET™*** *Manual (Network Version 4.0 and* Higher).

NOTE: The NCM-W does not indicate ground faults; it enables its +24V power supply to detect and indicate ground faults.

NOTE: Ground fault detection **must** be enabled for UL 864 applications and for ULC applications.

3.3 Interconnecting the NCM-F

When connecting consecutive nodes/repeaters, note that fiber cable must exit one board on transmit (TX) and enter the next node/repeater on receive (RX). Also, note that the fiber-optic pair (RX, TX) from port A of one Node/Repeater may be connected to either Port A or Port B of another node/repeater (refer to Figure 8). An NCM-F may be connected to any of the following devices:

- Another NCM-F
- Network connection for NCS-F
- RPT-F
- RPT-WF
- NFN-GW-PC-F (included with ONYXWORKS-NF)

For information regarding these devices, refer to the documentation listed in Table 4 "Supplemental Documentation".

NOTE: See the **NOTI•FIRE•NET™** *Manual (Network Version 4.0 and Higher)* for maximum fiber-optic cable attenuation.

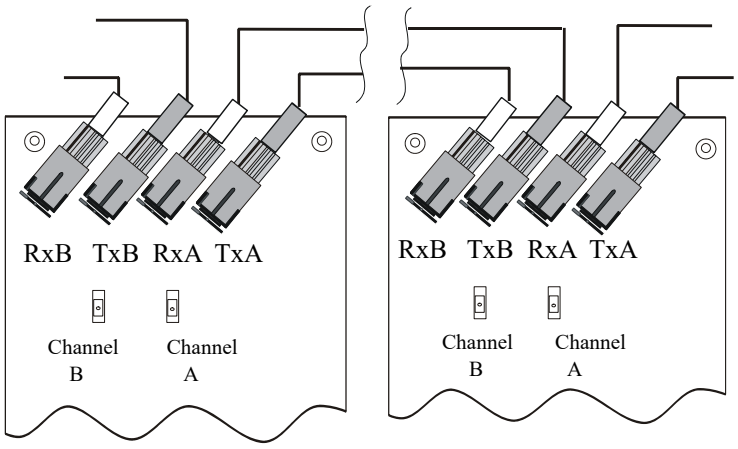


Figure 8 NCM-F Connection

3.4 Switch Functions: Fiber Power

The NCM-F provides a set of switches to attempt to resolve any issues that might arise with back reflections or signal overdriving.

- For default configuration, leave the switches set to "full" for normal signal power.
- If an issue arises with a short distance of fiber or low dB loss, set the switch to "low."

J200	CH A	Transmit
J201	CH A	Receive
J202	CH B	Transmit
J203	CH B	Receive

Table 2 NOTI•FIRE•NET™ Connections: NCM-F

3.5 Mixing Wire & Fiber on One Network

In some networks, it may be necessary to mix twisted-pair wire and fiber-optic cable—use an RPT-WF as an interface between wire and fire. Under UL 8th edition, networks using AM2020/AFP1010 used a MIB-WF as the interface between wire and fiber.

See Section 2.2, "The Network Communications Module for Fiber (NCM-F)" for requirements and restrictions on the use of fiber optic cable. See the ***NOTI•FIRE•NET™*** *Manual (Network Version 4.0 and Higher)* for a discussion of all compatible configurations.

4 Diagnostic Indicators

The NCM has LEDs that serve as diagnostic indicators to help in troubleshooting and system connection. Refer to Table 3 for a list of diagnostic indicators and their descriptions. Refer to Figure 9 for location of the diagnostic indicators.

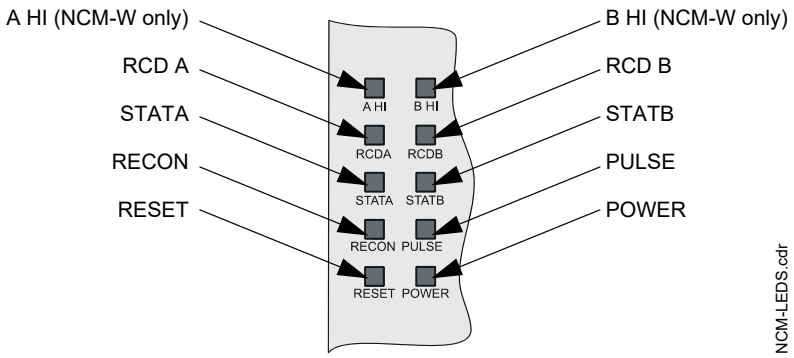


Figure 9 Diagnostic Indicator Locations

LED Indicator	LED Color	LED Description
A HI (NCM-W only)	Green	Illuminates to indicate the NCM-W Port A is set for high threshold.
B HI (NCM-W only)	Green	Illuminates to indicate the NCM-W Port B is set for high threshold.
RCD A	Green	Illuminates when the NCM is receiving data from **NOTI•FIRE•NET™** on Port A.
RCD B	Green	Illuminates when the NCM is receiving data from **NOTI•FIRE•NET™** on Port B.
STATA	Yellow	Illuminates when the NCM has not received valid data from **NOTI•FIRE•NET™** on Port A for at least 16 seconds.
STATB	Yellow	Illuminates when the NCM has not received valid data from **NOTI•FIRE•NET™** on Port B for at least 16 seconds.
RECON	Yellow	Illuminates when a reconfiguration on **NOTI•FIRE•NET™** is in progress.
PULSE	Green	Illuminates when the NCM is transmitting data to **NOTI•FIRE•NET™**.
RESET	Yellow	Illuminates when the microcontroller fails.
POWER	Green	Illuminates when +5 VDC is available

Table 3 Diagnostic Indicator Functions and Colors

5 Supplemental Documentation

The table below provides a list of document sources (manuals) containing additional information regarding the NCM-W/F and the **NOTI•FIRE•NET™** products that it can connect to.

For information on…	Refer to…		Part No.
Fire Alarm Control Panels (FACPs) and Networking	**NOTI•FIRE•NET™** Manual (for Network Version 4.0 and Higher)		51584
	Onyx NCS Network Control Station (for Network Version 4.0 and Higher)		51658
	NCS Network Control Station (for Network Version 4.0)		51585
	NCA Network Control Annunciator		51482
	NCA-2 Network Control Annunciator		52482
	NCD- Network Control Display		LS10210-051NF-E
	ONYXWorks		50255
	Media Interface Board (MIB) Manual		50038
	NAM-232 Network Adaptor Module		50256
	RPT - W/WF/F Repeaters for **NOTI•FIRE•NET™**		
	NFS2-640	Installation	52741
		Operations	52743
		Programming	52742
	NFS-320	Installation	52745
		Operations	52747
		Programming	52746
	NFS-640	Installation	51332
		Operations	51333
		Programming	51334
	NFS-3030	Installation	51330
		Operations	51345
		Programming	51344
	NFS2-3030	Installation	52544
		Operations	52545
		Programming	52546
	N16	Listing Document	LS10239-051NF-E
	ONYXWorks™ Workstation Hardware & Software Application: Installation and Operation Manual		52342
	ONYXWorks™ NFN Gateway (PC Platform) Installation & Operation Manual		52307
	ONYXWorks™ NFN Gateway (Embedded Platform) Installation & Operation Manual		52306
	CLSS Gateway Manual		LS10248-000HW-E
Off-line Programming Utility	VeriFire™ Tools CD on-line help file		VeriFire-TCD
Compatible Devices	Device Compatibility Document		15378
Cabinets & Chassis	CAB-3/CAB-4 Series Installation Document		15330
	CA-2 Audio Chassis Installation Document		52455
	BMP-1 Product Installation Document		51119
	Also see your panel's Installation Manual		

Table 4 Supplemental Documentation

NOTE: For module mounting instructions, refer to the documentation for your control panel.

NOTIFIER®
by Honeywell

NBG-12LX Addressable Pull Station

Document 52131 I56-3511-002

Description

The NBG-12LX Addressable pull station is a non-coded, dual-action manual pull station with a key-lock reset feature. It provides NOTIFIER intelligent fire alarm control panels (FACP) with one addressable alarm initiating input. The addressable module is housed inside the pull station. The NBG-12LX is compatible with all Notifier intelligent panels and will automatically operate in either FlashScan™ or CLIP (Classic Loop Interface Protocol) mode. FlashScan™ is a patented High Speed Communications Protocol. Refer to the FACP Installation Manual to determine if FlashScan™ protocol is supported. FlashScan™ or CLIP operating mode must be selected in the FACP. (This selection is not available or required in FACPs that do not support FlashScan™, therefore CLIP mode is enabled by default.) No selection is required in the Pull Station. The NBG-12LX meets the ADAAG controls and operating mechanisms guidelines (section 4.1.3[13]), and the ADA requirement for a 5 lb. maximum pull force to activate the pull station. Operating instructions are molded into the pull station handle along with Braille text. Molded Terminal numbers are also present. Conforms to ANSI/UL Standard 38 and ULC Standard S528.

Ratings

Normal Operating Voltage: 24 VDC.
Average Operating Current (LED Flash): 375 μA.
Maximum Operating Current (LED On): 5 mA.
Temperature Range: 32° F – 120° F (0° C – 49° C).
Relative Humidity Range: 10% - 93% non-condensing.

Installation

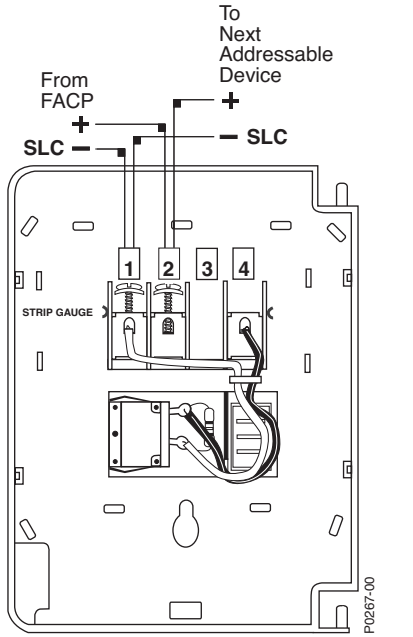
The NBG-12LX Addressable pull station can be surface mounted to an SB-10 or SB-I/O surface backbox or semi-flush mounted on a standard single-gang, double-gang or 4″ (10.16 cm) square electrical box. The optional BG-TR trim ring can be used if the NBG-12LX is to be semi-flush mounted.

Operation

To activate the dual-action pull station, push in and pull down on the handle. The word 'ACTIVATED' appears after the handle is pulled down. This will remain until the pull station is reset.

The pull station includes one Single Pole, Single Throw (SPST) Normally Open (N/O) switch which closes upon activation of the pull station.

Wiring



NBG-12LX
Addressable Pull Station

Document 52131 I56-3511-002

Resetting the Pull Station

1. Insert the key into the lock and rotate 1/4 turn counterclockwise.
2. Open the door until the handle returns to normal.
3. Close and lock the door.

NOTE: Closing the door automatically resets the switch to the 'Normal' position. Opening the door will not activate or deactivate the alarm switch.

CAUTION! Do not detach the door of the pull station during installation. The door of the pull station cannot be reattached to the backplate after the backplate has already been installed onto an electrical box.

CAUTION!

Install the Notifier NBG-12LX addressable pull station in accordance with these instructions, applicable NFPA standards, national and local Fire and Electrical codes and the requirements of the AHJ (Authority Having Jurisdiction). Regular testing of the devices should be conducted in accordance with the appropriate NFPA standards. Failure to follow these directions may result in failure of the device to report an alarm condition. Notifier is not responsible for devices that have been improperly installed, tested or maintained.

ADA Compliance

For ADA compliance, if the clear floor space only allows forward approach to an object, the maximum forward reach height allowed is 48 inches (121.92 cm). If the clear floor space allows parallel approach by a person in a wheelchair, the maximum side reach allowed is 54 inches (137.16 cm).

(over for Programming information)

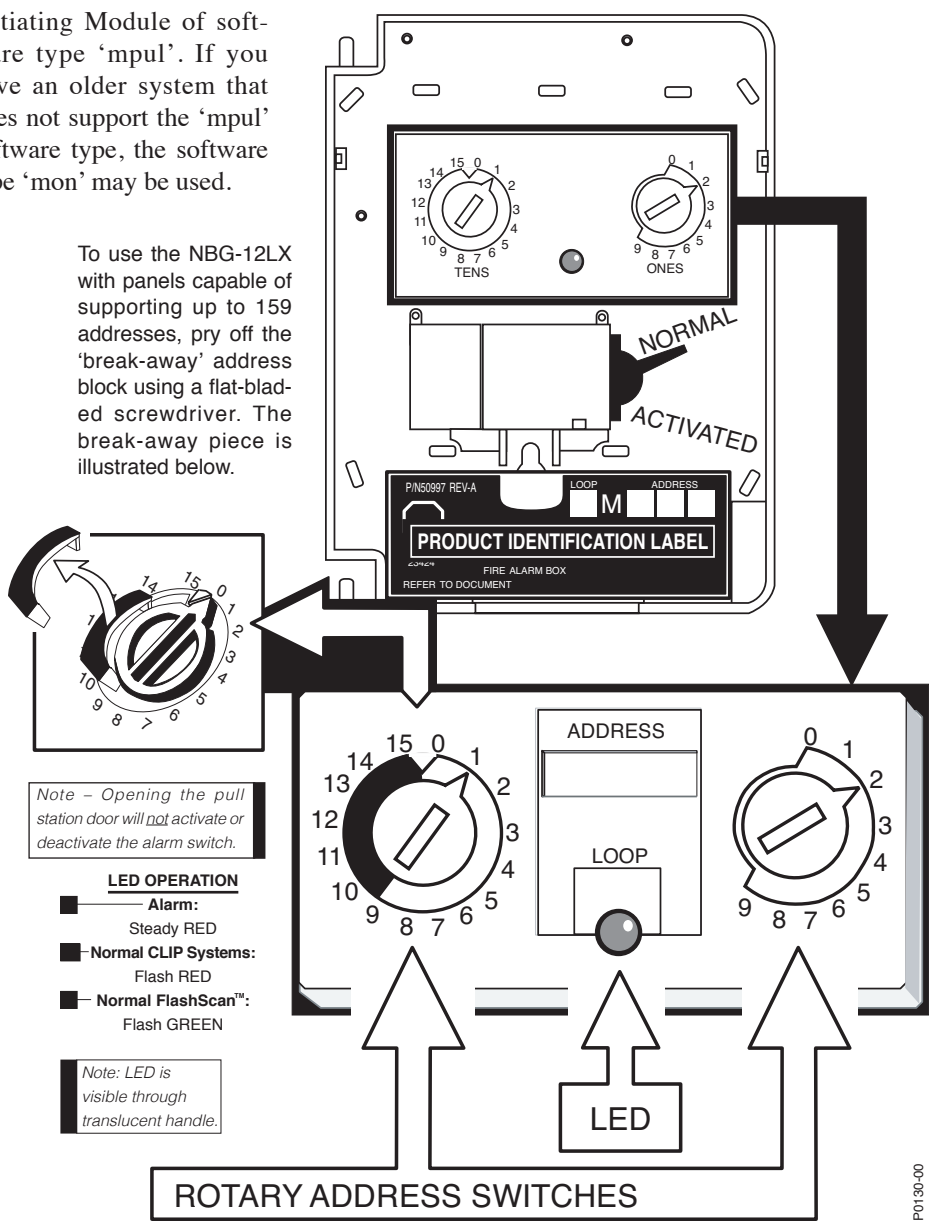
Setting the NBG-12LX Address

The NBG-12LX Addressable pull station is factory preset with address '00.' Set the address for the pull station by turning the rotary address switches on the addressable module mounted inside the pull station. Only one device per address is allowed. Multiple modules may not be set to the same address on the Signaling Line Circuit. Once the address is set, record it in the space provided on the product ID label located inside the pull station.

Software Note for AM2020/AFP1010 Programming

The NBG-12LX is an Alarm Initiating Module of software type 'mpul'. If you have an older system that does not support the 'mpul' software type, the software type 'mon' may be used.

To use the NBG-12LX with panels capable of supporting up to 159 addresses, pry off the 'break-away' address block using a flat-bladed screwdriver. The break-away piece is illustrated below.



Note – Opening the pull station door will not activate or deactivate the alarm switch.

LED OPERATION

Alarm:
Steady RED

Normal CLIP Systems:
Flash RED

Normal FlashScan™:
Flash GREEN

Note: LED is visible through translucent handle.

NOTIFIER
by Honeywell

NBG-12LO/-12LOB Manual Pull Station
(Listed for Outdoor Applications)

Patented, U.S. Patent No. Des. 428,351; 6,380,846; Other Patents Pending

Document 51303 I56-2274-004

Description

The NBG-12LO and NBG-12LOB pull stations are non-coded, dual-action manual pull stations with a key-lock reset feature, an approved outdoor gasket, and an accompanying outdoor backbox (NBG-12LOB only). They provide Notifier control panels with one normally open (N/O) alarm initiating input. The NBG-12LO/-12LOB meet the ADAAG controls and operating mechanisms guidelines (section 4.1.3[13]), and the ADA requirement for a 5 lb. maximum pull force to activate the pull station. Operating instructions are molded into the pull station handle along with Braille text. Molded terminal numbers are also present.

NOTE: To meet UL requirements for outdoor use, the NBG-12LO pull station must be mounted to the SB-I/O backbox to create the NBG-12LOB model. The NBG-12LO, with the WP-10 backbox, is UL approved in retrofit applications.

Ratings

The gold plated switch contact (N/O) is sealed for reliability and rated at 0.25 A at 30 volts (AC or DC).

Installation

The supplied Outdoor Backbox (SB-I/O) is surface mounted using the incorporated mounting bosses. The backbox can be positioned to allow conduit from any side and the pull station will mount in any position. Use the (4) screws provided to mount the pull station to the backbox.

Operation

To activate the dual-action pull station, push in and pull down on the handle. The word 'ACTIVATED' appears after the handle is pulled down. This will remain until the pull station is reset.

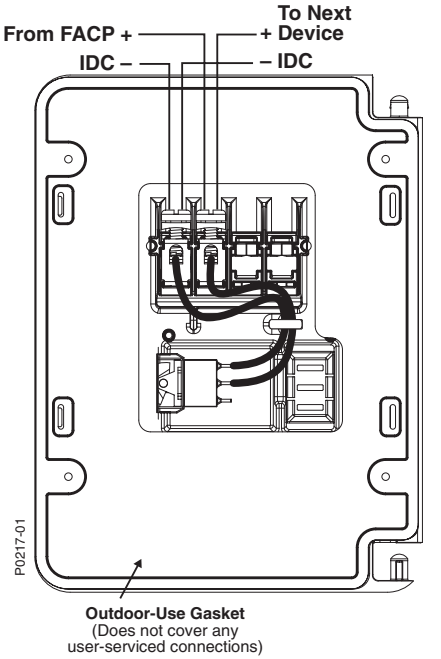
The pull station includes one Single Pole, Single Throw (SPST) Normally Open (N/O) switch which closes upon activation of the pull station.

Resetting the Pull Station

1. Insert the key into the lock and rotate 1/4 turn counterclockwise.
2. Open the door until the handle returns to normal.
3. Close and lock the door.

NOTE: Closing the door automatically resets the switch to the 'Normal' position. Opening the door will not activate or deactivate the alarm switch.

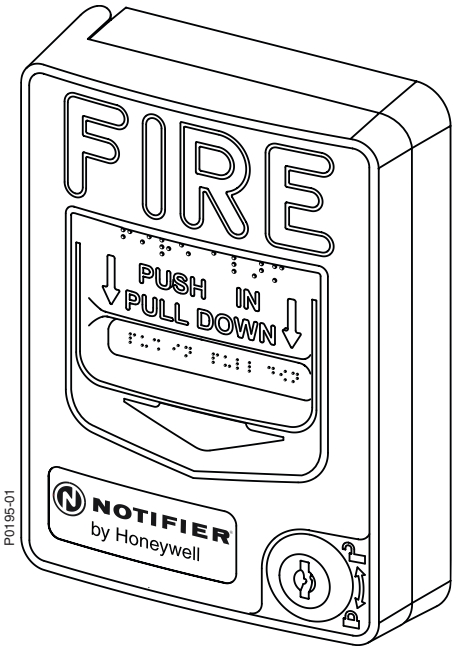
Wiring



WARNING! Do not loop wiring under any terminals. Break wire run to maintain IDC supervision.

NBG-12LO/-12LOB
Manual Pull Station

Document 51303 I56-2274-004



CAUTION! Do not detach the door of the pull station during installation. The door of the pull station cannot be reattached to the backplate after the backplate has already been installed onto an electrical box.

CAUTION!

Install the Notifier NBG-12LO/-12LOB pull stations in accordance with these instructions, applicable NFPA standards, national and local Fire and Electrical codes and the requirements of the AHJ (Authority Having Jurisdiction). Regular testing of the devices should be conducted in accordance with the appropriate NFPA standards. Failure to follow these directions may result in failure of the device to report an alarm condition. Notifier is not responsible for devices that have been improperly installed, tested or maintained.

ADA Compliance

For ADA compliance, if the clear floor space only allows forward approach to an object, the maximum forward reach height allowed is 48 inches (121.92 cm). If the clear floor space allows parallel approach by a person in a wheelchair, the maximum side reach allowed is 54 inches (137.16 cm).

NOTIFIER® by Honeywell

FSP-951 and FSP-951-IV
Intelligent Photoelectric Smoke Sensors

12 Clintonville Road
Northford, CT 06472-1653
Phone: 203.484.7161

SPECIFICATIONS

Operating Voltage Range:	15 to 32 VDC
Operating Current @ 24 VDC:	200 uA (one communication every 5 seconds with green LED blink on communication)
Maximum Alarm Current:	2 mA @ 24 VDC (one communication every 5 seconds with red LED solid on)
Maximum Current:	4.5 mA @ 24 VDC (one communication every 5 seconds with amber LED solid on)
Operating Humidity Range:	10% to 93% Relative Humidity, Non-condensing
Operating Temperature Range:	32°F to 122°F (0°C to 50°C)
Air Velocity:	0 to 4000 ft./min. (0 to 1219.2 m/min.)
Height:	2.0″ (51 mm) installed in B300-6 Base
Diameter:	6.2″ (156 mm) installed in B300-6 Base; 4.1″ (104 mm) installed in B501 Base
Weight:	3.4 oz. (95 g)
Isolator Load Rating:	0.0063*

*Please refer to your isolator base/module manual for isolator calculation instructions.

UL 268 listed for Open Air Protection.

UL268A listed for Duct Applications.

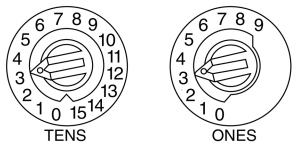
This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed in compliance with the National Fire Protection Association (NFPA); see NFPA 72.

GENERAL DESCRIPTION

Models FSP-951 and FSP-951-IV are plug-in type smoke sensors that combine a photoelectronic sensing chamber with addressable-analog communications.

The sensors transmit an analog representation of smoke density over a communication line to a control panel. Rotary dial switches are provided for setting the sensor's address. (See Figure 1.)

FIGURE 1. ROTARY ADDRESS SWITCHES:



C0162-00

Two LEDs on the sensor are controlled by the panel to indicate sensor status. An output is provided for connection to an optional remote LED annunciator (P/N RA100Z).

Notifier panels offer different features sets across different models. As a result, certain features of the photoelectric sensors may be available on some control panels, but not on others. FSP-951 will support only FlashScan® protocol mode. FSP-951-IV will support either FlashScan or CLIP (Classic Loop Interface Protocol) mode. The possible features available in the photoelectric sensors, if supported by the control panel are:

1. The sensor's LEDs can operate in three ways—on, off, and blinking–and they can be set to red, green, or amber. This is controlled by the panel.
2. The remote output may be synchronized to the LED operation or controlled independent of the LEDs.
3. Devices are point addressable up to 159 addresses.

Please refer to the operation manual for the UL listed control panel for specific operation. The photoelectric sensors require compatible addressable communications to function properly. Connect these sensors to listed-compatible control panels only.

SPACING

Notifier recommends spacing sensors in compliance with NFPA 72. In low air flow applications with smooth ceilings, space sensors 30 feet apart (9.1 m). For specific information regarding sensor spacing, placement, and special applications, refer to NFPA 72 or the System Smoke Detector Application Guide, available from Notifier.

Duct Applications: FSP-951 and FSP-951-IV are listed for use in ducts. See Duct Smoke Detectors Applications Guide HVAG53 for details on pendant mount applications. **NOTE:** Intelligent photoelectric smoke sensors are also listed for use inside DNR(W) duct smoke detectors.

WIRING GUIDE

All wiring must be installed in compliance with the National Electrical Code, applicable local codes, and any special requirements of the Authority Having Jurisdiction. Proper wire gauges should be used. The installation wires should be color-coded to limit wiring mistakes and ease system troubleshooting. Improper connections will prevent a system from responding properly in the event of a fire.

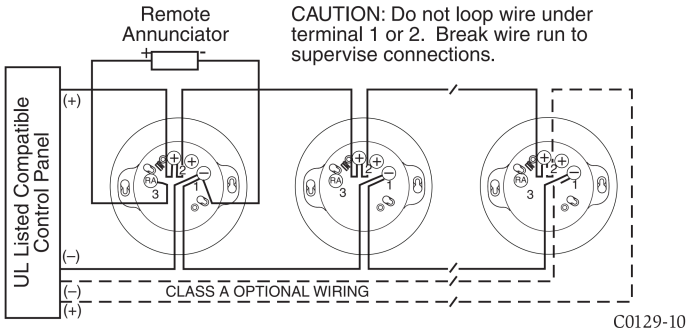
Remove power from the communication line before installing sensors.

1. Wire the sensor base (supplied separately) as shown in the wiring diagram. (See Figure 2.)
2. Set the desired address on the sensor address switches. (See Figure 1.)
3. Install the sensor into the sensor base. Push the sensor into the base while turning it clockwise to secure it in place.
4. After all sensors have been installed, apply power to the control panel and activate the communication line.
5. Test the sensor(s) as described in the TESTING section of this manual.

⚠CAUTION

Dust covers provide limited protection against airborne dust particles during shipping. Dust covers must be removed before the sensors can sense smoke. Remove sensors prior to heavy remodeling or construction.

FIGURE 2. WIRING DIAGRAM:



C0129-10

TAMPER-RESISTANCE

Intelligent photoelectric smoke sensors include a tamper-resistant capability that prevents their removal from the base without the use of a tool. Refer to the base manual for details on making use of this capability.

TESTING

Before testing, notify the proper authorities that the system is undergoing maintenance, and will temporarily be out of service. Disable the system to prevent unwanted alarms.

All sensors must be tested after installation and periodically thereafter. Testing methods must satisfy the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when tested and maintained in compliance with NFPA 72.

The sensor can be tested in the following ways:

A. Functional: Magnet Test (P/N M02-04-01 or M02-09-00)

This sensor can be functionally tested with a test magnet. The test magnet electronically simulates smoke in the sensing chamber, testing the sensor electronics and connections to the control panel.

1. Hold the test magnet in the magnet test area as shown in Figure 3.
2. The sensor should alarm the panel.

Two LEDs on the sensor are controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, can cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.

B. Smoke Entry

Sensitivity readings are available through the FACP. Refer to the manufacturer's published instructions for proper use.

Additionally, canned aerosol simulated smoke (canned smoke agent) may be used for smoke entry testing of the smoke detector. Tested and approved aerosol smoke products include:

Manufacturer	Model
HSI Fire and Safety	25S, 30S (PURCHECK)
SDi	SMOKE CENTURIAN, SOLOA4, SMOKESABRE, TRUTEST
No Climb	TESTIFIRE 2000

When used properly, the canned smoke agent will cause the smoke detector to go into alarm. Refer to the manufacturer's published instructions for proper use of the canned smoke agent.

⚠CAUTION

Canned aerosol simulated smoke (canned smoke agent) formulas will vary by manufacturer. Misuse or overuse of these products may have long term adverse effects on the smoke detector. Consult the canned smoke agent manufacturer's published instructions for any further warnings or caution statements.

A sensor that fails any of these tests may need to be cleaned as described under CLEANING, and retested.

When testing is complete, restore the system to normal operation and notify the proper authorities that the system is back in operation.

CLEANING

Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover by pressing firmly on each of the four removal tabs that hold the cover in place. (See Figure 4.)
3. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 4, otherwise skip to Step 7.
4. Remove the chamber cover/screen assembly by pulling it straight out.
5. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
7. Replace the cover using the LEDs to align the cover and then gently pushing it until it locks into place.
8. Reinstall the detector.
9. Test the detector as described in TESTING.
10. Reconnect disabled circuits.
11. Notify the proper authorities that the system is back on line.

SPECIAL NOTE REGARDING SMOKE DETECTOR GUARDS

Smoke detectors are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose.

FIGURE 3: FEATURES OF THE PHOTO DETECTOR

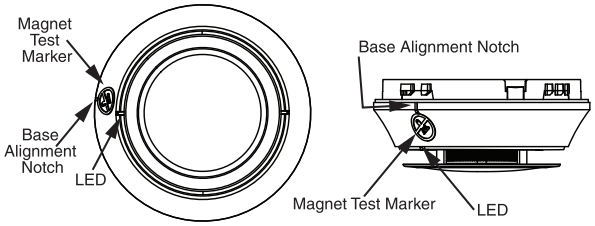


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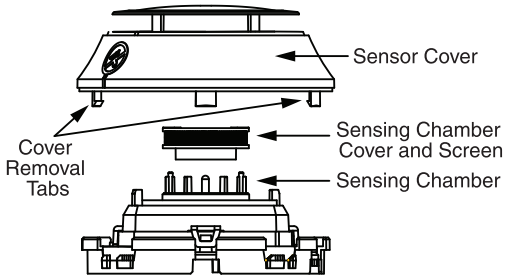
FIGURE 4: CLEANING THE PHOTO DETECTOR



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Please refer to insert for the Limitations of Fire Alarm Systems

FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

I56-6566-001

B300-6 and B300-6-IV
6" Plug-in Detector Bases

3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6495
www.systemsensor.com

SPECIFICATIONS

Base Diameter:	6.1 inches (155 mm)
Base Height:	0.76 inches (19 mm)
Operating Temperature:	Refer to applicable sensor Operating Temperature Range using the Base/Sensor Cross Reference Chart at systemsensor.com.
Electrical Ratings:	
Operating Voltage:	15 to 32 VDC
Standby Current:	170 µA
Listings: UL268	

BEFORE INSTALLING

Please read the *System Smoke Detectors Application Guide*, which provides detailed information on detector spacing, placement, zoning, wiring, and special applications. Copies of this application guide are available from System Sensor. NFPA 72 guidelines should be observed.

NOTICE: This manual should be left with the owner/user of this equipment.

IMPORTANT: The detector used with this base must be tested and maintained regularly following NFPA 72 requirements. The detector should be cleaned at least once a year.

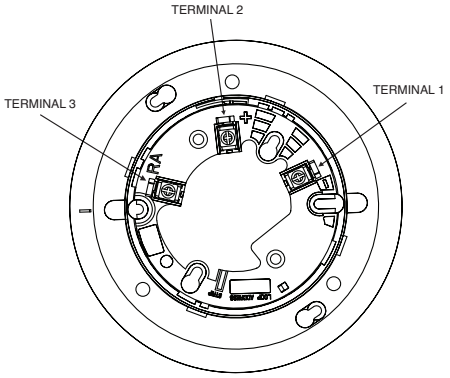
GENERAL DESCRIPTION

The B300-6 and B300-6-IV are plug-in detector bases intended for use in an intelligent system, with screw terminals provided for power (+ and –), and remote annunciator connections. Communication takes place over the power lines (+ and –).

BASE TERMINALS

NO.	FUNCTION
1	Power (–), Remote Annunciator (–)
2	Power (+)
3	Remote Annunciator (+)

FIGURE 1. TERMINAL LAYOUT



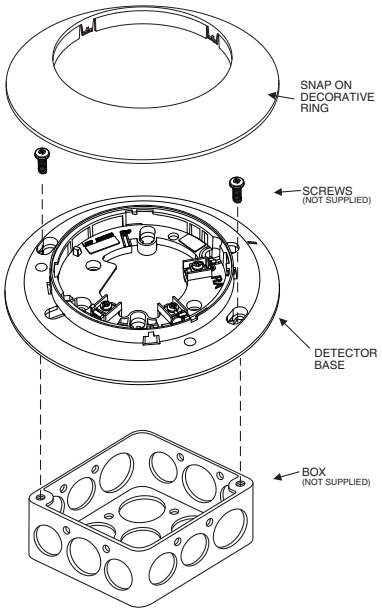
C0127-07

MOUNTING

This detector base mounts directly to 4-inch square (with and without plaster rings), 4-inch octagon, 3 1/2-inch octagon, and single gang junction boxes. To mount, remove the decorative ring by turning it in either direction to unhook the snaps, then separate the ring from the base. Install the base on the box using the screws supplied with the junction box and the appropriate mounting slots in the base.

Place the decorative trim ring on the base and rotate it in either direction until it snaps into place. (See Figure 2.)

FIGURE 2. MOUNTING DETECTOR TO BOX



C2036-01

INSTALLATION AND WIRING GUIDELINES (SEE FIGURE 3)

All wiring must be installed in compliance with all applicable local codes and any special requirements of the authority having jurisdiction. Proper wire gauges should be used. The conductors used to connect smoke detectors to control panels and accessory devices should be color-coded to reduce the likelihood of wiring errors. Improper connections can prevent a system from responding properly in the event of a fire.

For signal wiring (the wiring between interconnected detectors), it is recommended that the wire be no smaller than 18 AWG (0.823 mm²). Wire sizes up to 12 AWG (3.31 mm²) may be used with the base.

Make electrical connections by stripping about 3/8 inch (10 mm) of insulation from the end of the wire (use strip gauge molded in base). Then slide the wire under the clamping plate and tighten the clamping plate screw. Do not loop the wire under the clamping plate. (See Figure 4.)

Check the zone wiring of all bases in the system before installing the detectors. This includes checking the wiring for continuity, correct polarity, ground fault testing and performing a dielectric test.

The base includes an area for recording the zone, address, and type of detector being installed. This information is useful for setting the detector head address and for verification of the detector type required for that location.

Once all detector bases have been wired and mounted, and the loop wiring has been checked, the detector heads may be installed in the bases.

TAMPER-RESIST FEATURE

NOTE: Do not use the tamper-resist feature if a removal tool will be used.

The detector base includes a tamper-resist feature that prevents removal of the detector without using a small screwdriver or similar tool.

To activate this feature, use needle-nose pliers to break the tab on the detector base as shown in Figure 5A. Then, install the detector.

To remove the detector from the base once the tamper-resist feature has been activated, remove the decorative ring by rotating it in either direction and pulling it away from the base. Then, insert a small screwdriver into the notch, as indicated in Figure 5B, and press the plastic lever toward the mounting surface before rotating the detector counterclockwise for removal.

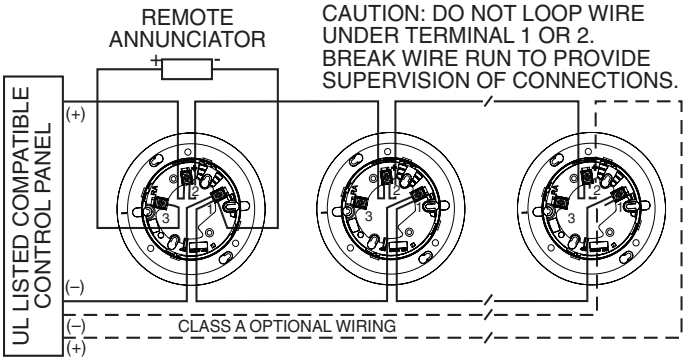
The tamper-resist feature can be defeated by breaking and removing the plastic lever from the base. However, this prevents the feature from being used again.

REMOTE ANNUNCIATOR (RA100Z)

Connect the remote annunciator between terminals 1 and 3 using the spade lug terminal included. The spade lug terminal is connected to the base terminal as shown in Figure 6.

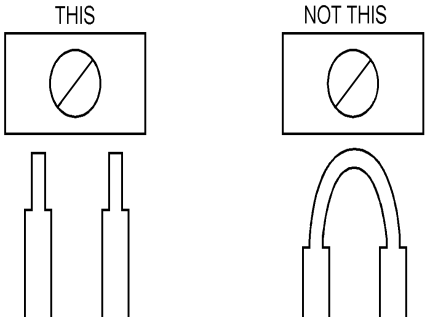
It is not acceptable to have three stripped wires under the same wiring terminal unless they are separated by a washer or equivalent means. The spade lug supplied with the model RA100Z is considered an equivalent means. See Figure 3 for proper installation.

FIGURE 3. TYPICAL WIRING DIAGRAM FOR 2-WIRE LOOP



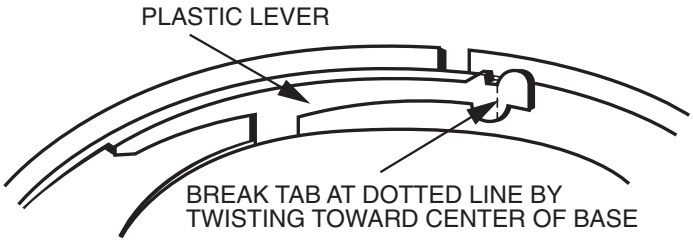
C0129-02

FIGURE 4. TERMINAL WIRE INSTALLATION



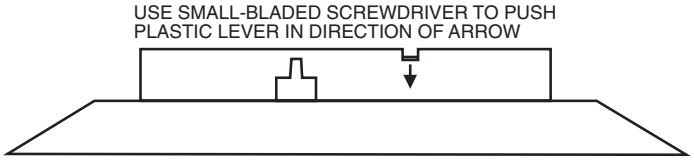
C0473-00

FIGURE 5A. ACTIVATE TAMPER-RESIST FEATURE



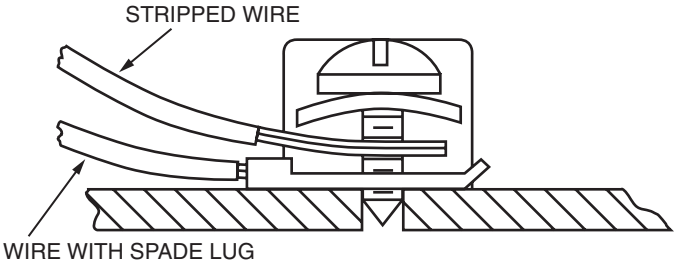
C0130-00

FIGURE 5B. DETECTOR REMOVAL



C0130-00

FIGURE 6. CONNECTION TO REMOTE ANNUNCIATOR TERMINAL



C0116-00

Please refer to insert for the Limitations of Fire Alarm Systems

THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed smoke detector base to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this smoke detector base. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the repair or replacement of any part of the smoke detector base which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: Honeywell, 12220 Rojas Drive, Suite 700, El Paso TX 79936 USA. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to repair or replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

156-6522-000

NOTIFIER® by Honeywell

FST-951, FST-951-IV, FST-951R, FST-951R-IV, FST-951H, and FST-951H-IV Intelligent Programmable Temperature Sensors

12 Clintonville Road
Northford, CT 06472-1653
Phone: 203.484.7161

SPECIFICATIONS

Operating Voltage Range:	15 to 32 Volts DC Peak
Operating Current @ 24 VDC:	200 uA (one communication every 5 seconds with green LED blink on communication)
Maximum Alarm Current:	2 mA @ 24 VDC (one communication every 5 seconds with red LED solid on)
Maximum Current:	4.5 mA @ 24 VDC (one communication every 5 seconds with amber LED solid on)
Operating Humidity Range:	10% to 93% Relative Humidity, Non-condensing
Installation Temperature:	Set for fixed-temperature or rate-of-rise (ROR): –4°F to 100°F (–20°C to 38°C) Set for high-heat: –4°F to 150°F (–20°C to 66°C)
Fixed Temperature Rating:	135°F (57°C)
High Heat Temperature Rating:	190°F (88°C)
Rate-of Rise Detection:	Responds to greater than 15°F/minute or 135°F (8.3°C/minute or 57°C)
Height:	2.0" (51 mm) installed in B300-6 Base
Diameter:	6.2" (156 mm) installed in B300-6 Base
Weight:	3.4 oz. (95 g)

UL 521 listed for Heat Detectors

This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed in compliance with the National Fire Protection Association (NFPA); see NFPA 72.

Before installing sensors, please read the system wiring and installation manual thoroughly. This manual provides detailed information on sensor spacing, placement, zoning, and special applications. Copies of these manuals are available from Notifier.

GENERAL DESCRIPTION

Models FST-951, FST-951-IV, FST-951R, FST-951R-IV, FST-951H, and FST-951H-IV are field programmable intelligent sensors that utilize a state-of-the-art thermistor sensing circuit for fast response. These sensors are designed to provide open area protection with 50-foot spacing capability as approved by UL 521. The intelligent temperature sensor can be programmed as either a 135°F fixed temperature sensor, a rate of rise and 135°F fixed temperature sensor or a 190°F high temperature sensor through the Fire Alarm Control Panel (FACP).

Two LEDs on each sensor light to provide a local, visible sensor indication. Remote LED annunciator capability is available as an optional accessory (Part No. RA100Z). Rotary dial switches are provided for setting the sensor's address. (See Figure 1.)

FIGURE 1: ROTARY ADDRESS SWITCHES

C0162-00

Notifier panels offer different feature sets across different models. As a result, certain features of the Intelligent Programmable Temperature Sensors may be available on some control panels, but not on others. FST-951, FST-951R, and FST-951H will support only FlashScan® protocol mode. FST-951-IV, FST-951R-IV, and FST-951H-IV will support either FlashScan or CLIP (Classic Loop Interface Protocol) mode.

The possible features available if supported by the control panel include:

1. The sensor's LEDs can operate in three ways—on, off, and blinking–and they can be set to red, green, or amber. This is controlled by the panel.
2. The remote output may be synchronized to the LED operation or controlled independent of the LEDs. Please refer to the operation manual for the UL listed control unit for specific operation of these models
3. Devices are point addressable up to 159 addresses.
4. The heat sensor operates as a programmable heat detector.
   NOTE: In panels where this feature is not available, the FST-951 and FST-951-IV will default to a 135°F fixed heat detector. FST-951R and FST-951R-IV will default to a 135°F fixed heat detector and rate-of-rise. FST-951H and FST-951H-IV will default to a 190°F high temperature heat detector.

Intelligent programmable temperature sensors require compatible addressable communications to function properly. Connect these sensors to listed-compatible control panels only.

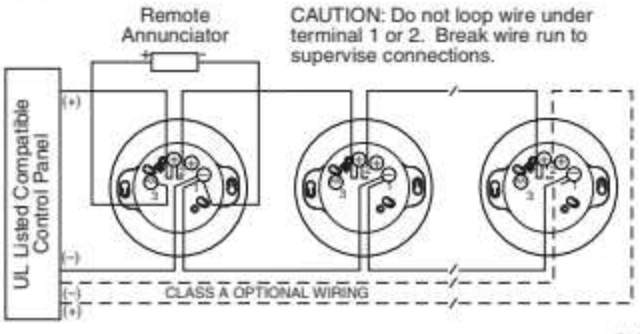
WIRING GUIDE

All wiring must be installed in compliance with the National Electrical Code, applicable local codes and the Authority Having Jurisdiction. Proper wire gauges should be used. The installation wires should be color coded to limit wiring mistakes and ease system troubleshooting. Improper connections will prevent a system from responding properly in the event of a fire.

Remove power from the communication line before installing sensors.

1. Wire the sensor base (supplied separately) as shown in the wiring diagram. (See Figure 2.)
2. Set the desired address on the rotary dial switches. (See Figure 1.).
3. Install the sensor into the sensor base. Push the sensor into the base while turning it clockwise to secure it in place.
4. After all sensors have been installed, apply power to the control unit and activate the communication line.
5. Test the sensor(s) as described in the TESTING section of this manual.

FIGURE 2. WIRING DIAGRAM:



C0129-10

TAMPER RESISTANCE

Intelligent programmable temperature sensors include a tamper-resistant capability that prevents their removal from the base without the use of a tool. Refer to the base manual for details on making use of this capability.

TESTING

Before testing, notify the proper authorities that the system is undergoing maintenance, and will temporarily be out of service. Disable the system to prevent unwanted alarms.

All sensors must be tested after installation and periodically thereafter. Testing methods must satisfy the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when tested and maintained in compliance with NFPA 72.

A. Test Magnet (Model No. M02-04 - optional)

1. Place the optional test magnet against the cover in the magnet test area, as shown in Figure 3, to activate the test feature.
2. The LEDs should latch on within 10 seconds, indicating alarm and annunciating the panel.
3. Reset the detector at the system control panel.

B. Direct Heat Method (Hair dryer of 1000 – 1500 watts)

1. From the side of the detector, direct the heat toward the sensor. Hold the heat source about 6 inches (15 cm) away to prevent damage to the cover during testing.
2. The LEDs on the detector should light when the temperature at the detector reaches the alarm setpoint. If the LEDs fail to light, check the power to the detector and the wiring in the detector base.
3. Reset the detector at the system control panel.

Detectors that fail these tests may need to be cleaned as described under CLEANING and retested.

CLEANING

Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of service.

Disable the zone or system undergoing maintenance to prevent unwanted alarms.

1. Remove the sensor to be cleaned from the system.
2. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing area.
3. Reinstall the detector.
4. Test the detector as described in TESTING.
5. Reconnect disabled circuits.
6. Notify the proper authorities that the system is back on line.

FM CLASSIFICATION

RTI ratings are for installations which must comply with FM 3210.

135°F Fixed RTI:	FAST
Rate of Rise/135°F Fixed RTI:	V2-FAST
190°F Fixed RTI:	QUICK

FIGURE 3: FEATURES OF THE HEAT DETECTOR

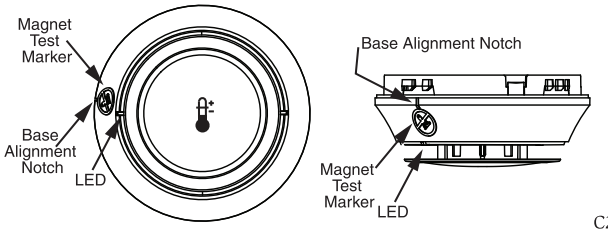


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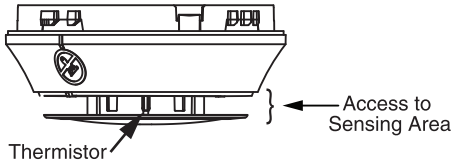
FIGURE 4: CLEANING THE HEAT DETECTOR



C2026-00

Please refer to insert for the Limitations of Fire Alarm Systems

FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

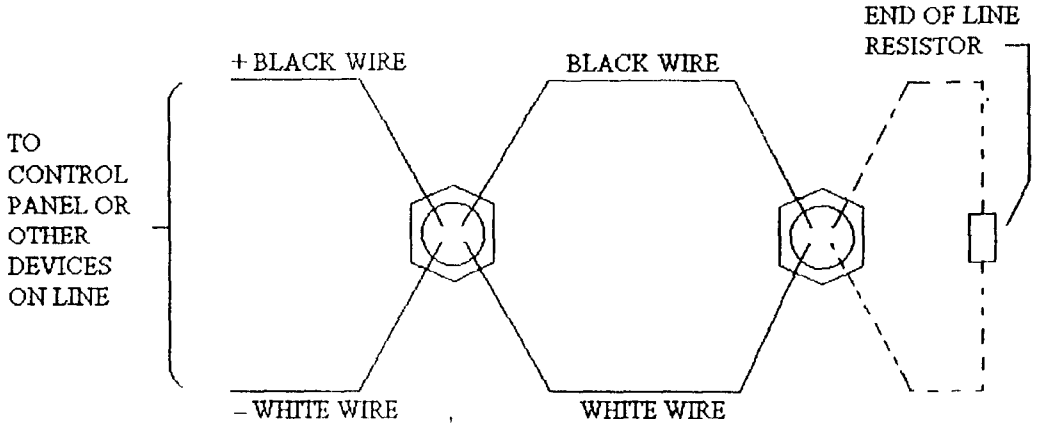
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Thermotech
AUTOMATIC HEAT DETECTORS

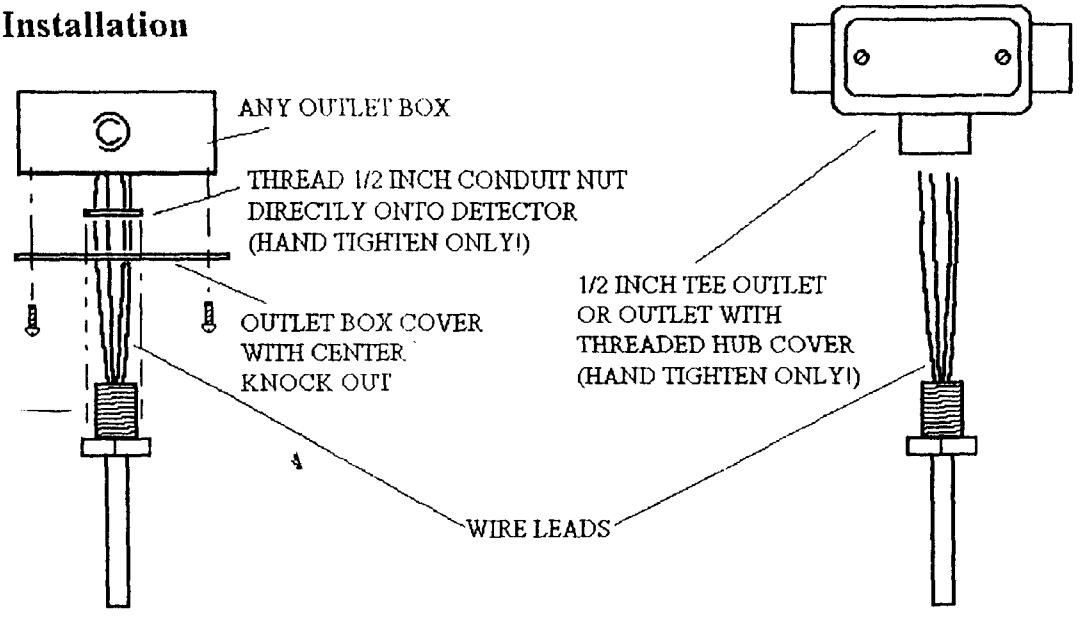
2900 NORTH 1000 W.
OGDEN, UTAH 84414
(801) 782-2233
FAX (801) 782-1746

INSTALLATION INSTRUCTIONS – MODEL 302-ET

Wiring Information



Installation



INSTALLATION AND MAINTENANCE INSTRUCTIONS

Selectable Output Horn Strobes, Chime Strobes and Strobes – Wall Mount

SYSTEM SENSOR®
3825 Ohio Avenue, St. Charles, Illinois 60174
800/736-7672, FAX: 630/377-6495
www.systemsensor.com

For use with the following models:
Standard Wall Mount Horn Strobes: P2RL, P2WL, P2RL-P, P2WL-P, P2RL-SP, P2WL-SP
Compact Wall Mount Horn Strobes: P2GRL, P2GWL
Standard Wall Mount Chime Strobes: CHSRL, CHSWL
Standard Wall Mount Strobes: SRL, SWL, SRL-P, SWL-P, SRL-SP, SWL-CLR-ALERT
Compact Wall Mount Strobes: SGRL, SGWL

PRODUCT SPECIFICATIONS

Standard Operating Temperature:	32°F to 120°F (0°C to 49°C)
Humidity Range:	10 to 93% Non-condensing
Strobe Flash Rate	1 flash per second
Nominal Voltage:	Regulated 12VDC or regulated 24DC/FWR
Operating Voltage Range:	8 to 17.5V (12V nominal) or 16 to 33V (24V nominal)
Operating Voltage with MDL3 Sync Module:	8.5 to 17.5V (12V nominal) or 16.5 to 33V (24V nominal)
Input terminal wire gauge:	12 to 18 AWG

DIMENSIONS FOR PRODUCTS AND ACCESSORIES

WALL PRODUCTS	Length	Width	Depth
Standard Strobe, Chime Strobe and Horn Strobe	5.6" (143mm)	4.7" (119mm)	1.25" (32mm)
Compact Strobe and Horn Strobe	5.26" (133 mm)	3.46" (88 mm)	1.93 (49 mm)
Standard device with SBBRL/WL Surface Mount Back Box	5.9" (149 mm)	4.9" (125 mm)	1.85" (47 mm)
Compact device with SBBGRL/WL Surface Mount Back Box	5.5" (140 mm)	3.7" (94 mm)	1.6" (39 mm)
NOTE: SBBRL/WL Surface Mount Back Box intended only for standard horn strobes, chime strobes and strobes. SBBGRL/WL Surface Mount Back Box intended for compact horn strobes and strobes.			

MOUNTING BOX OPTIONS

Standard 2-Wire Indoor Products:	4" x 4" x 1½", Single Gang, Double Gang, 4" Octagon, SBBRL/WL (wall), SBBGRL/WL (wall)
Compact 2-Wire Indoor Products:	Single Gang, SBBGRL/WL (wall)

NOTICE: This manual shall be left with the owner/user of this equipment.

BEFORE INSTALLING

Please read the System Sensor Audible Visible Application Reference Guide, which provides detailed information on notification devices, wiring and special applications. Copies of this manual are available from System Sensor. NFPA 72 and NEMA guidelines should be observed.

Important: The notification appliance used must be tested and maintained following NFPA 72 requirements.

GENERAL DESCRIPTION

System Sensor series of notification appliances offer a wide range of audible and visible devices for life safety notification. Our 2-wire horn strobes, chime strobes and strobes come with 8 field selectable tone and volume combinations and 7 field selectable candela settings. Intended for indoor applications and approved for wall mount installations only. Available in two attractive mounting designs, standard and compact (horn strobe and strobe only).

2-wire horn strobes and strobes are public mode notification appliances intended to alert occupants of a life safety event. The 2-wire chime strobe is a private mode notification appliance. The horn is listed to ANSI/UL 464 requirements (public mode) and the strobe is listed to ANSI/UL 1638 (public mode). 2-wire chime strobe is a private mode notification appliances intended to alert trained personnel to investigate a life safety event and take appropriate actions. The chime portion of the chime strobe is listed to ANSI/UL 464 (private mode) and the strobe portion is listed to ANSI/UL 1638 (private mode).

System Sensor notification appliances are designed to be used in either 12 VDC, 24VDC, or 24V FWR (full wave rectified) systems. System Sensor AV devices can be activated by a compatible fire alarm control panel or power supply. Refer to the appropriate fire alarm control panel manufacturer or power supply for more information.

System Sensor wall 2-wire horn strobes, 2-wire chime strobes, and strobes are electrically backward compatible with the previous generation, since 1996, of notification appliances. They come enabled with System Sensor synchronization protocol which requires connections to a power supply capable of generating the System Sensor synchronization pulses, a FACP NAC output configured to System Sensor synchronization protocol, or the use of MDL3 module to generate the synchronization protocol.

FIRE ALARM SYSTEM CONSIDERATIONS

The National Fire Alarm and Signaling Code, NFPA 72, requires that all notification appliances, used for building evacuation installed after July 1, 1996, produce temporal coded signals. Signals other than those used for evacuation purposes do not have to produce the temporal coded signal. System Sensor recommends spacing notification appliances in compliance with NFPA 72.

SYSTEM DESIGN

The system designer must make sure that the total current draw by the devices on the loop does not exceed the current capability of the panel supply, and that the last device on the circuit is operated within its rated voltage. The current draw information for making these calculations can be found in the tables within the manual. For convenience and accuracy, use the voltage drop calculator on the System Sensor website (www.systemsensor.com).

When calculating the voltage available to the last device, it is necessary to consider the voltage due to the resistance of the wire. The thicker the wire, the smaller the voltage drop. Wire resistance tables can be obtained from electrical handbooks. Note that if Class A wiring is installed, the wire length may be up to twice as long as it would be for circuits that are not fault tolerant. The total number of strobes on a single NAC must not exceed 69 for 24 volt applications.

AVAILABLE TONES

System Sensor offers a wide variety of tones for your life safety needs, including temporal 3 pattern (½ second on, ½ second off, ½ second on, ½ second off, ½ second on, 1½ off and repeat) which is specified by ANSI and NFPA 72 for standard emergency evacuation signaling.

To select the tone, turn the rotary switch on the back of the product to the desired setting. (See Figure 1.)

Available horn settings can be found in Table 1. Available chime settings can be found in Table 2.

TABLE 1. HORN TONES

Pos	Tone	Volume Setting
1	Temporal	High
2	Temporal	Low
3	Non-Temporal	High
4	Non-Temporal	Low
5	3.1 KHz Temporal	High
6	3.1 KHz Temporal	Low
7	3.1 KHz Non-Temporal	High
8	3.1 KHz Non-Temporal	Low

TABLE 2. CHIME TONES

Pos	Tone	Volume Setting
1	1 Second Chime	High
2	1 Second Chime	Low
3	1/4 Second Chime	High
4	1/4 Second Chime	Low
5	Temporal Chime	High
6	Temporal Chime	Low
7	5 Second Whoop	High
8	5 Second Whoop	Low

AVAILABLE CANDELA SETTINGS

System Sensor offers a wide range of candela settings for your life safety needs. In order to select your candela output, adjust the slide switch on the rear of the product to the desired candela setting on the selector switch. (See Figure 2.)

The candela setting can also be verified by looking into the small window on the front of the unit. See Table 3 for candela settings for wall products. All products meet the light output profiles specified in the appropriate UL Standards. (See Figures 3 and 4.)

CURRENT DRAW AND AUDIBILITY RATINGS

For the strobe, the current draw for each setting is listed in Table 3. For the horn strobe, the current draw and audibility settings are listed in Table 4. For the chime strobe, the current draw and audibility settings are listed in Table 5.

FIGURE 1. AUDIO SELECTOR

A0517-00

FIGURE 2. CANDELA SELECTOR

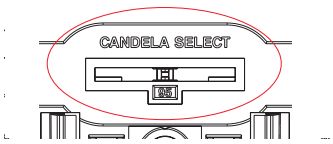


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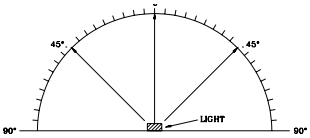
TABLE 3. WALL-MOUNT STROBE CURRENT DRAW (mA)

Candela	8-17.5 Volts	16-33 Volts	
	DC	DC	FWR
15	88	43	60
30	143	63	83
75	-	107	136
95	-	121	155
110	-	148	179
135	-	172	209
185	-	222	257

NOTE: Products set at 15 and 30 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12V DC operation when set to any other candela settings.

FIGURE 3. LIGHT OUTPUT – HORIZONTAL DISPERSION

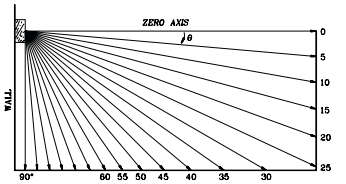
Degrees*	Percent of Rating
0	100
5-25	90
30-45	75
50	55
55	45
60	40
65	35
70	35
75	30
80	30
85	25
90	25
Compound 45 to the left	24
Compound 45 to the right	24



A0467-00

FIGURE 4. VERTICAL DISPERSION– WALL TO FLOOR

Degrees*	Percent of Rating
0	100
5-30	90
35	65
40	46
45	34
50	27
55	22
60	18
65	16
70	15
75	13
80	12
85	12
90	12



A0469-00

*Tolerance of ±1 degree is permitted.

WIRING AND MOUNTING

All wiring must be installed in compliance with the National Electric Code and the local codes as well as the authority having jurisdiction. Wiring must not be of such length or wire size which would cause the notification appliance to operate outside of its published specifications. Improper connections can prevent the system from alerting occupants in the event of an emergency.

Wire sizes up to 12 AWG (2.5 mm°) may be used with the mounting plate. The mounting plate ships with the terminals set for 12 AWG wiring.

Make wire connections by stripping about 3/8" of insulation from the end of the wire. Then slide the bare end of the wire under the appropriate clamping plate and tighten the clamping plate screw.

We provide a wire strip guide. See Figure 5 for wiring terminals and strip guide reference.

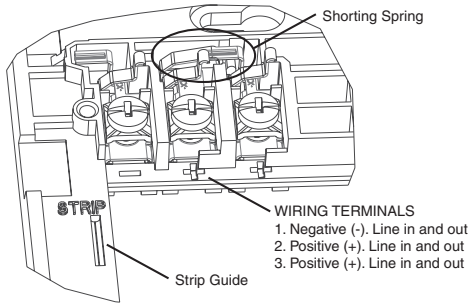
⚠CAUTION

Factory finish should not be altered: Do not paint!

⚠CAUTION

Do not over tighten mounting plate screws; this may cause mounting plate to flex.

FIGURE 5. WIRING TERMINALS, SHORTING SPRING, AND STRIP GUIDE

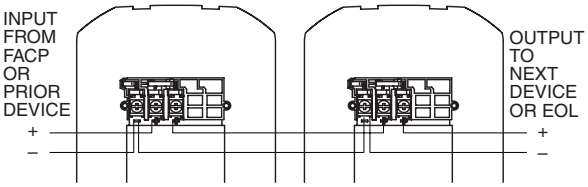


A0475-01

SYSTEM WIRING

The 2-wire horn strobe, chime strobe and strobe only require two wires for power and supervision. (See Figure 6.) Please consult your FACP manufacturer or power supply manufacturer for specific wiring configurations and special cases.

FIGURE 6. 2-WIRE CIRCUIT



A0367-02

SHORTING SPRING FEATURE

System Sensor notification appliances come with a shorting spring that is provided between terminals 2 and 3 of the mounting plate to enable system continuity checks after the system has been wired, but prior to installation of the final product. (See Figure 5.) This spring will automatically disengage when the product is installed, to enable supervision of the final system.

MOUNTING

1. Attach mounting plate to junction box. The standard mounting plate is compatible with 4" square, single gang, double gang, and 4" octagon junction boxes. The compact mounting plate is compatible with single gang junction boxes. (See Figures 7 and 8, respectively.)

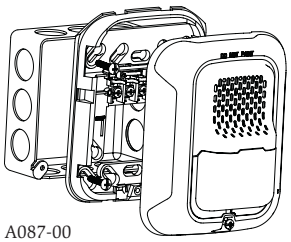
2. Connect field wiring according to terminal designations. (See Figures 5 and 6.)

3. If the product is not to be installed at this point, use the protective dust cover to prevent contamination of the wiring terminals on the mounting plate.

4. To attach product to mounting plate, hook tabs on the top of the product housing into the grooves on mounting plate. Then, hinge the product into

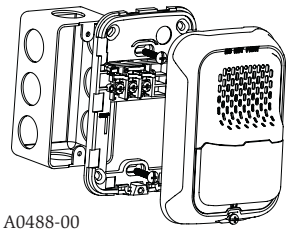
FIGURES 7 AND 8. MOUNTING

Standard Device



A087-00

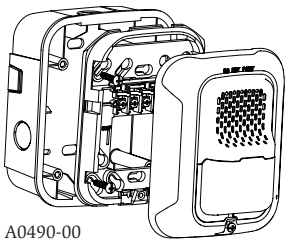
Compact Device



A0488-00

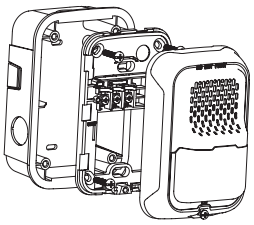
FIGURES 9 AND 10. SURFACE MOUNT BACK BOX MOUNTING:

Standard SBBRL/SBBWL



A0490-00

Compact SBBGRL/SBBGWL



A0491-00

TABLE 4. WALL-MOUNT HORN STROBE CURRENT DRAW (mA) AND SOUND OUTPUT (dBA)

			Current draw (mA)																	Sound Output (dBA)		
Pos	Tone	Volume Setting	8-17.5 VDC		16-33 VDC							16-33 FWR								8-17.5 V	16-33 V	
			15	30	15	30	75	95	110	135	185	15	30	75	95	110	135	185	DC	DC	FWR
1	Temporal	High	98	158	54	74	121	142	162	196	245	83	107	156	177	198	234	287	84	89	89
2	Temporal	Low	93	154	44	65	111	133	157	184	235	68	91	145	165	185	223	271	75	83	83
3	Non-Temporal	High	106	166	73	94	139	160	182	211	262	111	135	185	207	230	264	316	85	90	90
4	Non-Temporal	Low	93	156	51	71	119	139	162	190	239	79	104	157	175	197	235	283	76	84	84
5	3.1 KHz Temporal	High	93	156	53	73	119	140	164	190	242	81	105	155	177	196	234	284	83	88	88
6	3.1 KHz Temporal	Low	91	154	45	66	112	133	160	185	235	68	90	145	166	186	222	276	76	82	82
7	3.1 KHz Non-Temporal	High	99	162	69	90	135	157	175	208	261	104	131	177	204	230	264	326	84	89	89
8	3.1 KHz Non-Temporal	Low	93	156	52	72	119	138	162	192	242	77	102	156	177	199	234	291	77	83	83

NOTE: Products set at 15 and 30 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12VDC operation when set to any other candela settings.

TABLE 5. WALL MOUNT CHIME STROBE CURRENT DRAW (mA) AND SOUND OUTPUT (dBA)

			Current draw (mA)																	Sound Output (dBA)		
Pos	Chime Tone	Volume Setting	8-17.5 VDC		16-33 VDC							16-33 FWR								8-17.5 V	16-33 V	
			15	30	15	30	75	95	110	135	185	15	30	75	95	110	135	185	DC	DC	FWR
1	1 Second	High	90	154	51	71	116	136	161	202	242	70	90	160	176	197	233	275	61	62	62
2	1 Second	Low	89	154	50	70	115	136	154	199	238	67	88	158	175	191	232	271	56	55	55
3	1/4 Second	High	90	154	52	72	117	137	168	201	242	69	93	159	175	198	233	272	67	70	70
4	1/4 Second	Low	89	153	49	70	115	136	165	199	241	68	93	154	169	196	232	270	61	61	61
5	Temporal	High	88	153	49	69	112	137	168	201	246	65	90	145	170	189	228	283	64	66	66
6	Temporal	Low	88	152	47	68	111	136	167	196	241	64	89	142	170	188	219	282	59	60	60
7	5 Second Whoop	High	91	154	52	70	113	132	176	206	243	70	93	145	168	187	223	278	76	78	78
8	5 Second Whoop	Low	87	149	46	66	108	130	170	202	240	62	84	137	159	180	216	272	62	64	64

NOTE: Products set at 15 and 30 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12VDC operation when set to any other candela settings.

position to engage the pins on the product with the terminals on the mounting plate. Make sure that the tabs on the back of the product housing fully engage with the mounting plate.

5. Secure product by tightening the single mounting screw in the front of the product housing.

SURFACE MOUNT BACK BOX MOUNTING

1. The surface mount back box may be secured directly to the wall or ceiling. A grounding bracket with ground screw capability is provided if needed. For standard size devices see Figure 9, and for compact devices see Figure 10.

2. The wall mount back box must be mounted with the up arrow pointing up. (See Figure 12.)

3. Threaded knockout holes are provided for the sides of the box for ½ inch conduit adapter. Knockout holes in the back of the box can be used for ½ inch rear entry.

4. To remove the ½ inch knockout, we recommend you use a flat head screwdriver, place the blade of the flat head screwdriver in the inner edge of the knockout. Strike the screwdriver as you work your way around as shown in Figure 13.

NOTE: For ½ in. installation, use caution not to strike the knockout near the top edge of the surface mount back box.

5. V500 and V700 raceway knockouts are also provided. Use V500 for low profile applications and V700 for high profile applications.

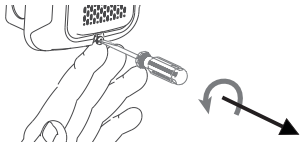
6. To remove the knockout turn pliers up, as shown in Figure 13.

TAMPER SCREW

For tamper resistance, the standard captive screw may be replaced with the enclosed Torx screw.

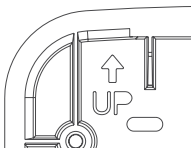
1. To remove the captive screw, back out the screw and apply pressure to the back of the screw until it disengages from the housing. Replace with the supplied Torx screw. (See Figure 11.)

FIGURE 11. TAMPER SCREW



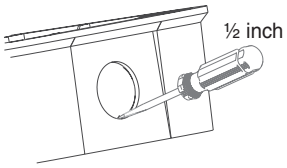
A0478-00

FIGURE 12. SMBB UP ARROW



A0481-00

FIGURE 13. KNOCKOUT AND V500/V700 REMOVAL FOR SURFACE MOUNT BACK BOX



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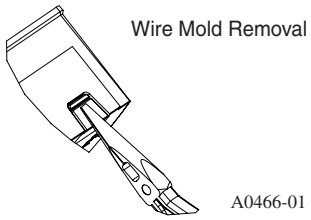


A0466-01

Please refer to insert for the Limitations of Fire Alarm Systems

⚠WARNING

THE LIMITATIONS OF HORN/STROBES

The horn and/or strobe will not work without power. The horn/strobe gets its power from the fire/security panel monitoring the alarm system. If power is cut off for any reason, the horn/strobe will not provide the desired audio or visual warning.

The horn may not be heard. The loudness of the horn meets (or exceeds) current Underwriters Laboratories' standards. However, the horn may not alert a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. The horn may not be heard if it is placed on a different floor from the person in hazard or if placed too far away to be heard over the ambient noise such as traffic, air conditioners, machinery or music appliances that may prevent alert persons from hearing the alarm. The horn may not be heard by persons who are hearing impaired.

NOTE: Strobes must be powered continuously for horn operation.

The signal strobe may not be seen. The electronic visual warning signal uses an extremely reliable xenon flash tube. It flashes at least once every second. The strobe must not be installed in direct sunlight or areas of high light intensity (over 60 foot candles) where the visual flash might be disregarded or not seen. The strobe may not be seen by the visually impaired.

The signal strobe may cause seizures. Individuals who have positive photoic response to visual stimuli with seizures, such as persons with epilepsy, should avoid prolonged exposure to environments in which strobe signals, including this strobe, are activated.

The signal strobe cannot operate from coded power supplies. Coded power supplies produce interrupted power. The strobe must have an uninterrupted source of power in order to operate correctly. System Sensor recommends that the horn and signal strobe always be used in combination so that the risks from any of the above limitations are minimized.

THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: Honeywell, 12220 Rojas Drive, Suite 700, El Paso TX 79936. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

FCC STATEMENT

System Sensor Strobes and Horn/Strobes have been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INSTALLATION AND MAINTENANCE INSTRUCTIONS

SPECTRAlert ADVANCE from System Sensor

SYSTEM SENSOR®

3825 Ohio Avenue, St. Charles, Illinois 60174
800/736-7672, FAX: 630/377-6495
www.systemsensor.com

Selectable Output Strobes, Horns, and Horn/Strobes

For use with the following models: P2R, P2RH, P2RK, P2RHK, P2W, P2WK, P2WH, P2WHK, P4R, P4RH, P4RK, P4W, P4WK, SR, SRH, SRK, SRHK, SW, SWK, SWH, SWHK, SW-CLR-ALERT, PC2R, PC2RH,PC2RK, PC2RHK, PC2W, PC2WK, PC2WH, PC2WHK, PC4R, PC4RH, PC4W, PC4WK, PC4WHK, SCR, SCRH, SCRK, SCRHK, SCW, SCWK, SCWH, SCWHK, SCW-CLR-ALERT, HR, HRK, HW, SR-P, SW-P, SRH-P, SWH-P,P2R-P, P2W-P, P2WH-P, P4R-P, P4W-P, SCW-P, PC2R-P, PC2W-P, PC2WH-P, SRK-P, SRHK-P, P2RK-P, P2RHK-P, SWK-P, SWHK-P, P2WK-P, P2WHK-P, SR-SP, P2R-SP, PC2W-SP, SRK-R, SWK-R, SRHK-R, SWHK-R, P2RK-R, P2WK-R, P2RHK-R, P2WHK-R, SBHK, SBK-R

SIGNALING UL LISTED UL LISTED

NOTE: All -R models are specifically designed for use with the WTP Series of Weatherproof plates

NOTE: When replacing outdoor units; device and back box must be replaced

NOTE: Models SBHK, SBK-R are UL listed for General Signaling

PRODUCT SPECIFICATIONS

Operating Temperature:	Standard Products	32°F to 120°F (0°C to 49°C)
	K Series	–40°F to 151°F
Humidity Range:	Standard Products	10 to 93% Non-condensing
	K Series	Meets NEMA 4X requirements
Strobe Flash Rate:		1 flash per second
Nominal Voltage:		Regulated 12VDC/FWR or regulated 24DC/FWR
Operating Voltage Range (includes fire alarm panels with built in sync):		8 to 17.5V (12V nominal) or 16 to 33V (24V nominal)
Operating Voltage with MDL3 Sync Module:		8.5 to 17.5V (12V nominal) or 16.5 to 33V (24V nominal)
Input terminal wire gauge:		12 to 18 AWG

NOTE : Strobes will operate at 12 V nominal for 15 & 15/75 candela settings only. Switching between ranges is automatic.

DIMENSIONS FOR PRODUCTS AND ACCESSORIES

WALL PRODUCTS	Length	Width	Depth	CEILING PRODUCTS	DIAMETER	DEPTH
Strobe and Horn/Strobes (including lens)	5.6"	4.7"	2.5"	Strobes and Horn/Strobes (including lens)	6.8"	2.5"
	142 mm	119 mm	64 mm		173 mm	64 mm
Horns	5.6"	4.7"	1.3"	SA-WBBC Red Weatherproof Back Box	7.1"	2.2"
	142 mm	119 mm	33 mm	SA-WBBCW White Weatherproof Back Box	180 mm	51 mm
SA-WBB Red Weatherproof Back Box	5.7"	5.1"	2.0"	SBBCR Red Surface Mount Box	6.9"	5.3"
SA-WBBW White Weatherproof Back Box	145 mm	130 mm	51 mm	SBBCW White Surface Mount Box	175 mm	135 mm
SBBR Red Surface Mount Box	5.6"	4.7"	4.3"	NOTE: SA-WBB, SA-WBBW, SA-WBBC and SA-WBBCW dimensions do not include the two mounting tabs		
SBBW White Surface Mount Box	142 mm	119 mm	109 mm			

MOUNTING BOX OPTIONS

2-Wire Indoor Products	4-Wire Indoor Products	K Series Products
4 × 4 × 1½, Single Gang, Double Gang, 4˝ Octagon SBBR/W (wall), SBBCR/W (ceiling)	4 × 4 × 1½, Double Gang, 4˝ Octagon	SA-WBB/W (wall), SA-WBBC/CW (ceiling)

NOTICE: This manual shall be left with the owner/user of this equipment.

GENERAL DESCRIPTION

The SpectrAlert Advance series of notification appliances offers a wide range of horns, strobes, and horn/strobes, for wall and ceiling applications, indoors and outdoors. They are designed to be used on 12 or 24 volt, DC or FWR (full wave rectified) systems. These products are electrically backward compatible with the previous generation of SpectrAlert notification appliances. Horn/strobe products are available in two versions. The 2-wire products fit systems where a single NAC controls both horn and strobe. The 4-wire products are intended for systems which have separate wiring circuits for the horn and strobe. All SpectrAlert Advance products are suitable for use in synchronized systems. The System Sensor MDL3 module may be used to provide synchronization.

K Series products are designed to be used over a wider range of temperatures and are suitable for use in wet environments with outdoor backbox supplied with product.

Wall and ceiling products may be used interchangeably (wall products may be used on the ceiling and ceiling products may be used on the wall.)

FIRE ALARM SYSTEM CONSIDERATIONS

The National Fire Alarm Code, NFPA 72, requires that all horns, used for building evacuation produce temporal coded signals. Signals other than those used for evacuation purposes do not have to produce the temporal coded signal. System Sensor recommends spacing notification appliances in compliance with NFPA 72.

LOOP DESIGN AND WIRING

The system designer must make sure that the total current drawn by the devices on the loop does not exceed the current capability of the panel supply, and that the last device on the circuit is operated within its rated voltage. The current draw information for making these calculations can be found in the tables within this manual. For convenience and accuracy, use the voltage drop calculator on the System Sensor website (www.systemsensor.com).

When calculating the voltage available to the last device, it is necessary to consider the voltage drop due to the resistance of the wire. The thicker the wire, the smaller the voltage drop. Wire resistance tables can be obtained from electrical handbooks. Note that if Class A wiring is installed, the wire length may be up to twice as long as it would be for circuits that are not fault tolerant.

NOTE: The total number of strobes on a single NAC must not exceed 40 for 24 volt applications or 12 for 12 volt applications. Loop resistance on a single NAC should not exceed 120 ohms for 24 volt and 30 ohms for 12 volt systems.

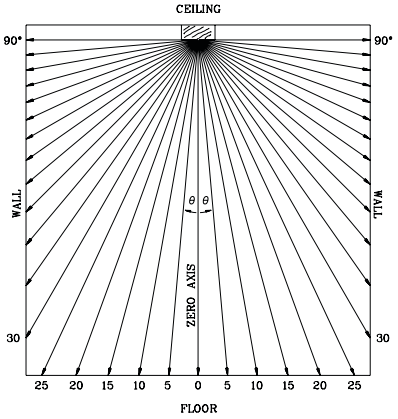
CANDELA SELECTION

Adjust the slide switch on the rear of the product to the desired candela setting in the small window on the front of the unit. All products meet the light output profiles specified in the appropriate UL Standards. **See Figures 1-3**. Use **Table 1** to determine the current draw for each candela setting. For K series products used outdoors at low temperatures, listed candela ratings must be reduced in accordance with **Table 2**.

NOTE: SpectrAlert products set at 15 and 15/75 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12V operating voltages when set to any other candela settings. For 4-Wire products, total current draw may be determined by adding current draw for the specific candela selection and the current draw for the specific horn selection use **Table 1 and Table 3**.

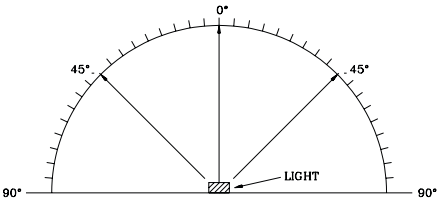
FIGURE 1. LIGHT OUTPUT - VERTICAL DISPERSION, CEILING TO WALLS TO FLOOR

Degrees*	Percent of Rating
0	100
5-25	90
30-45	75
50	55
60	45
65	35
70	35
75	30
80	30
85	25
90	25



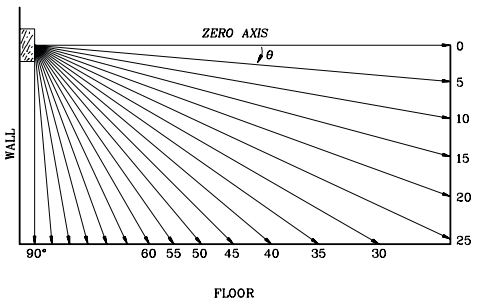
Figures 1-3 list the minimum light output requirements per UL1971.

FIGURE 2. LIGHT OUTPUT - HORIZONTAL DISPERSION



Degrees*	Percent of Rating
0	100
5-25	90
30-45	75
50	55
55	45
60	40
65	35
70	35
75	30
80	30
85	25
90	25
Compound 45 to the right	24
Compound 45 to the right	24

FIGURE 3. LIGHT OUTPUT - VERTICAL DISPERSION, WALL TO FLOOR



*Tolerance of ± 1 degree is permitted.

Degrees*	Percent of Rating
0	100
5-30	90
35	65
40	46
45	34
50	27
55	22
60	18
65	16
70	15
75	13
80	12
85	12
90	12

TABLE 1. STROBE CURRENT DRAW (mA) FOR S, SC, P4 & PC4 SERIES:

	Candela	8–17.5 Volts		16–33 Volts	
		DC	FWR	DC	FWR
Standard Candela Range	15	123	128	66	71
	15/75	142	148	77	81
	30	NA	NA	94	96
	75	NA	NA	158	153
	95	NA	NA	181	176
	110	NA	NA	202	195
	115	NA	NA	210	205
High Candela Range	135	NA	NA	228	207
	150	NA	NA	246	220
	177	NA	NA	281	251
	185	NA	NA	286	258

TABLE 2. CANDELA DERATING:

Listed Candela	Candela rating at –40°F (K Series Outdoor Applications Only)
15	Do not use below 32°F
15/75	
30	
75	44
95	70
110	110
115	115
135	135
150	150
177	177
185	185

HORN SELECTION

Turn the rotary switch on the back of the product to the desired setting. For horn and 4-wire horn/strobe products, the current draw for each setting is listed in **Table 3**. For 2-wire horn/strobe products (P2 series), current draws are listed in **Tables 4** and **5**. The sound output measurement for each horn setting is shown in **Table 6**.

TABLE 3. HORN CURRENT DRAW (mA) FOR H, P4 & PC4 SERIES:

Pos	Sound Pattern	dA Out	8–17.5 Volts		16–33 Volts	
			DC	FWR	DC	FWR
1	Temporal	High	57	55	69	75
2	Temporal	Medium	44	49	58	69
3	Temporal	Low	38	44	44	48
4	Non-temporal	High	57	56	69	75
5	Non-temporal	Medium	42	50	60	69
6	Non-temporal	Low	41	44	50	50
7	Coded	High	57	55	69	75
8	Coded	Medium	44	51	56	69
9	Coded	Low	40	46	52	50

NOTE: In positions 7, 8, and 9, temporal coding must be provided by the NAC. If the NAC voltage is held constant, the horn output will remain constantly on. Positions 7, 8, and 9 are not available on 2-wire horn/strobe products.

TABLE 4. 2-WIRE HORN/STROBE CURRENT DRAW (mA) FOR P2 AND PC2 STANDARD CANDELA SERIES:

DC Input	8–17.5 Volts		16–33 Volts						
	15 cd	15/75 cd	15 cd	15/75 cd	30 cd	75 cd	95 cd	110 cd	115 cd
Temporal High	137	147	79	90	107	176	194	212	218
Temporal Medium	132	144	69	80	97	157	182	201	210
Temporal Low	132	143	66	77	93	154	179	198	207
Non-temporal High	141	152	91	100	116	176	201	221	229
Non-temporal Medium	133	145	75	85	102	163	187	207	216
Non-temporal Low	131	144	68	79	96	156	182	201	210
FWR Input									
Temporal High	136	155	88	97	112	168	190	210	218
Temporal Medium	129	152	78	88	103	160	184	202	206
Temporal Low	129	151	76	86	101	160	184	194	201
Non-temporal High	142	161	103	112	126	181	203	221	229
Non-temporal Medium	134	155	85	95	110	166	189	208	216
Non-temporal Low	132	154	80	90	105	161	184	202	211

TABLE 5. 2-WIRE HORN/STROBE CURRENT DRAW (mA) FOR P2 AND PC2 HIGH CANDELA RANGE SERIES:

Sound Pattern	16–33 Volts Volts DC				16–33 Volts Volts FWR			
	135 cd	150 cd	177 cd	185 cd	135 cd	150 cd	177 cd	185 cd
Temporal High	245	259	290	297	215	231	258	265
Temporal Medium	235	253	288	297	209	224	250	258
Temporal Low	232	251	282	292	207	221	248	256
Non-temporal High	255	270	303	309	233	248	275	281
Non-temporal Medium	242	259	293	299	219	232	262	267
Non-temporal Low	238	254	291	295	214	229	256	262

TABLE 6. HORN OUTPUT (dBA) IN UL REVERBERANT ROOM:

Switch Position	Sound Pattern	dA	8–17.5 Volts**		16–33 Volts**		24 V Nominal Measurements			
							Reverberant		Anechoic	
			DC	FWR	DC	FWR	DC	FWR	DC	FWR
1	Temporal	High	78	78	84	84	88	88	99	98
2	Temporal	Medium	75	75	80	80	86	85	96	96
3	Temporal	Low	71	71	76	76	81	79	94	89
4	Non-temporal	High	82	82	88	88	93	92	100	100
5	Non-temporal	Medium	78	78	85	85	90	89	98	98
6	Non-temporal	Low	73	74	81	81	86	84	96	92
7*	Coded	High	82	82	88	88	93	92	101	101
8*	Coded	Medium	78	78	85	85	90	89	97	98
9*	Coded	Low	74	75	81	81	85	83	96	92

*Horn & 4-wire Horn/Strobe only. ** Minimum dB rating for Operational Voltage Range as per UL 464.

FIGURE 4. WIRING 2-WIRE PRODUCTS:

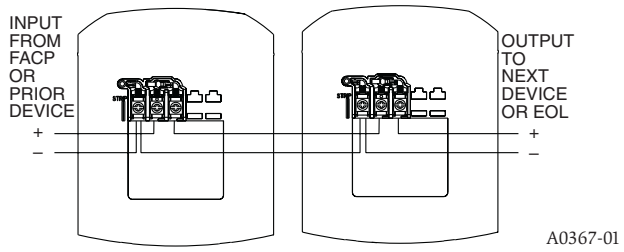


FIGURE 5. WIRING 4-WIRE PRODUCTS:

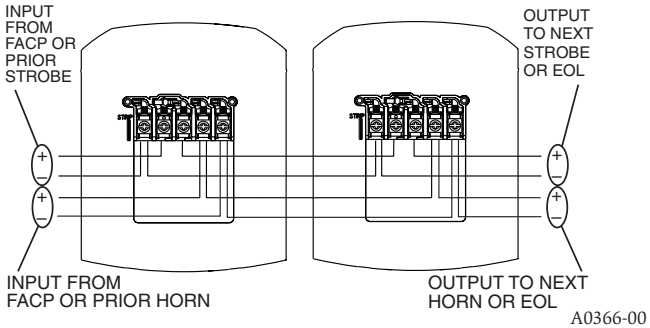
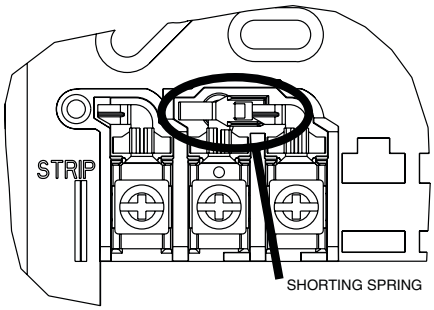


FIGURE 6. SHORTING SPRING:



For 4-Wire installations, terminals 1, 2, and 3 connect to the strobe; terminals 4 and 5 connect to the horn. The horn and strobe circuits must be wired independently, and each circuit must be terminated with the appropriate EOL device. Removal of a notification device will result in an open circuit indication on the strobe loop.

NOTE: A shorting spring is provided between terminals 2 and 3 of the mounting plate to enable wiring checks after the system has been wired, but prior to installation of the final product. This spring will automatically disengage when the product is installed, to enable supervision of the final system. Only available on indoor products(non K-series).

MOUNTING INDOOR WALL OR CEILING PRODUCTS

1. Attach mounting plate to junction box as shown in Figure 7. The mounting plate is compatible with 4-inch square, double gang, and 4-inch octagon junction boxes (2-wire products may be used with a single gang box).
2. Connect field wiring to terminals, as shown in Figures 4 or 5.
3. If the product is not to be installed at this point, use the paint cover to prevent contamination of the mounting plate. (For indoor models only)
4. To attach product to mounting plate, remove the paint cover, then hook tabs on the product housing into the grooves on mounting plate.
5. Swing product into position to engage the pins on the product with the terminals on the mounting plate. Make sure that the tabs on the back of the product housing fully engage with the mounting plate.
6. Secure product by tightening the single mounting screw in the front of the product housing. For tamper resistance, the standard captivated mounting screw may be replaced with the enclosed Torx screw.

SURFACE MOUNT BACK BOX MOUNTING

1. The surface mount back box may be secured directly to the wall or ceiling. Grounding bracket provided if needed.
2. The wall mount box must be mounted with the up arrow pointing up.
3. Threaded knockout holes are provided for the sides of the box for ¾ inch and ½ inch conduit adapter. Knockout holes in the back of the box can be used for ¾ inch and ½ inch rear entry.
4. To remove the ½ inch knockout, we recommend you use a flat head screwdriver ,place the blade of the flat head screwdriver in the inner edge of the knockout. Strike the screwdriver as you work you way around as shown in Figure 9.

   To remove the ¾ inch knockout place the blade of the screwdriver along the outer edge and work your way around the knockout as you strike the screwdriver, as shown in Figure 9.

   NOTE: For both ½ in. and ¾ in. installation, use caution not to strike the knockout near the top edge of the wall version of the surface mount back box.
5. V500 and V700 raceway knockouts are also provided. Use V500 for low profile applications and V700 for high profile applications.
6. To remove the knockout turn pliers up, as shown in Figure 9.
7. Attach the mounting plate to the surface mount back box using the four unpainted screws, as shown in Figure 8.
8. Follow steps 2-6 of the mounting indoor wall or ceiling products to wire and attach the product.

   NOTE: For Outdoor Mounting Installation see included Outdoor Mounting Installation Document (I56-3222).

FIGURE 7. MOUNTING:

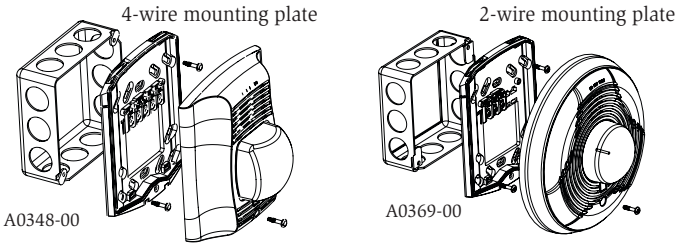


FIGURE 8. SURFACE MOUNT BACK BOX MOUNTING:

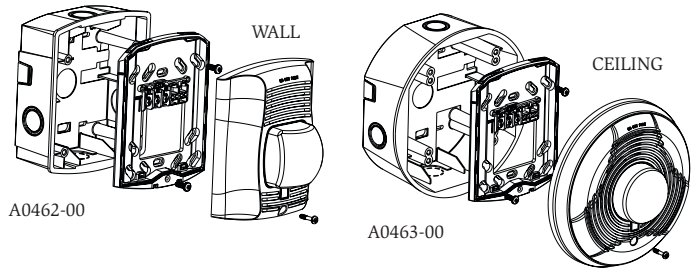
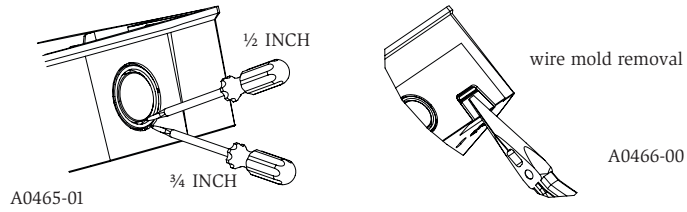


FIGURE 9. KNOCKOUT REMOVAL FOR SURFACE MOUNT BACK BOX:



Please refer to insert for the Limitations of Fire Alarm Systems

⚠WARNING

THE LIMITATIONS OF HORN/STROBES

The horn and/or strobe will not work without power. The horn/strobe gets its power from the fire/security panel monitoring the alarm system. If power is cut off for any reason, the horn/strobe will not provide the desired audio or visual warning.

The horn may not be heard. The loudness of the horn meets (or exceeds) current Underwriters Laboratories' standards. However, the horn may not alert a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. The horn may not be heard if it is placed on a different floor from the person in hazard or if placed too far away to be heard over the ambient noise such as traffic, air conditioners, machinery or music appliances that may prevent alert persons from hearing the alarm. The horn may not be heard by persons who are hearing impaired.

NOTE: Strobes must be powered continuously for horn operation.

The signal strobe may not be seen. The electronic visual warning signal uses an extremely reliable xenon flash tube. It flashes at least once every second. The strobe must not be installed in direct sunlight or areas of high light intensity (over 60 foot candles) where the visual flash might be disregarded or not seen. The strobe may not be seen by the visually impaired.

The signal strobe may cause seizures. Individuals who have positive photoic response to visual stimuli with seizures, such as persons with epilepsy, should avoid prolonged exposure to environments in which strobe signals, including this strobe, are activated.

The signal strobe cannot operate from coded power supplies. Coded power supplies produce interrupted power. The strobe must have an uninterrupted source of power in order to operate correctly. System Sensor recommends that the horn and signal strobe always be used in combination so that the risks from any of the above limitations are minimized.

THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: Honeywell, 12220 Rojas Drive, Suite 700, El Paso TX 79936, USA. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

FCC STATEMENT

SpectrAlert Strobes and Horn/Strobes have been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

MICRO IV BEACON
12-80VDC MODELS

470SSGP, 470S, 470SMB, 490S, 492S, 495S
TYPE 4X ENCLOSURE

INSTALLATION, OPERATION AND MAINTENANCE DATA SHEET

SAFETY NOTICE WARNING

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.

SAFETY MESSAGE TO INSTALLERS, USERS, AND MAINTENANCE PERSONNEL

It is important to follow all instructions shipped with this product. This device is to be installed by a trained installer who is thoroughly familiar with the national electrical code and local codes as well.

The selection of the mounting location for the device, its controls and the routing of the wiring is to be accomplished under the direction of the facilities engineer. In addition, listed below are some other important safety instructions and precautions you should follow:

- Read and understand all instructions before installing or operating this equipment.
- Do not connect this device to the system when the power is turned on.
- After installation, ensure that all screws and thread joints are properly tightened.
- After installation, test the system regularly to ensure that it is operating properly.
- After installation and testing is complete, provide a copy of this instruction sheet to all operating personnel.

INSTALLATION

Important-Before installing, check the fixture nameplate to be sure you have the correct fixture.

MAKE SURE THAT THE CIRCUIT IS DEACTIVATED BEFORE STARTING INSTALLATION.

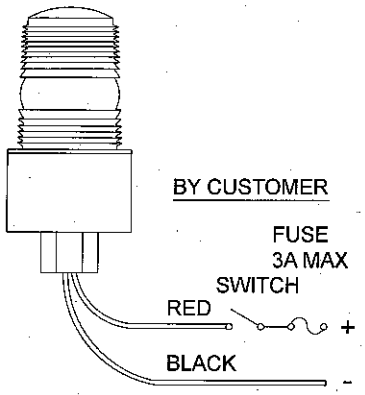
Wiring shall be installed in accordance with national and local codes. Refer to NFPA 70 ART 501-4 (b).

The unit may be mounted in any orientation that provides the desired illumination.

Mounting hardware and installation details are left to the installer to provide.

WIRING

The 12-80VDC Model is rated for operation at 12-80VDC or 16-24VAC power.



OPERATION

To operate the unit, just apply power. There are no adjustments to make for flash rate or intensity.

SERVICE AND REPAIR
DANGER HIGH VOLTAGE

Should the light fail to operate, check to see that the proper voltage is reaching the unit. If the unit still fails to operate, replace the lamp. To replace a lens or lamp, switch power off and wait 5 minutes before removing lens.

The unit's base contains electronic components that are not accessible. Therefore, no field repairs other than lens or lamp replacement are possible.

When replacing the lens, hand tighten only-do not over tighten. The water tight O-ring seal will seal the unit as soon as the lens seats on the base. The O-ring seal does not depend on how tight the lens is screwed in.

Cleaning-The unit is made of GE Lexan polycarbonate plastic. Use mild soap and water to wash.

TOMAR ELECTRONICS, INC.
2100 WEST OBISPO GILBERT, ARIZONA 85233 USA
(800) 338-3133 * (480) 497-4400 * FAX (480) 497-4416
www.tomar.com * sales@tomar.com

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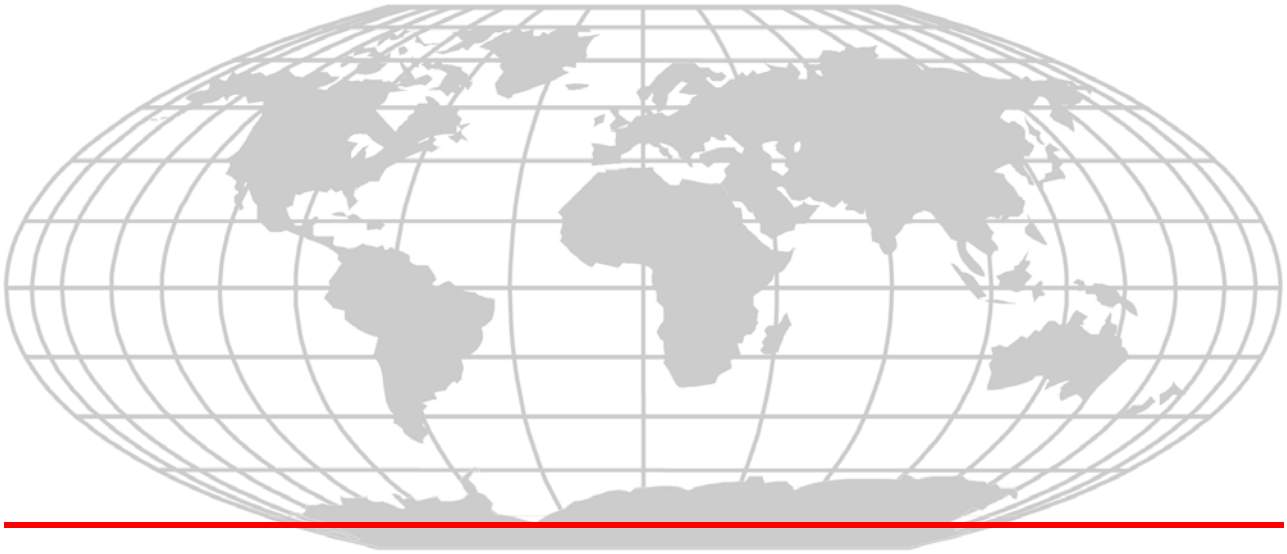
by Honeywell



Fire Alarm Control Panel
NFS-320/E/C, NFS-320SYS/E
Operations Manual

Document 52747
11/7/16 Rev: J3
P/N 52747:J3 ECN 16-579

Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premises to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

Limit-D-1-2013

Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Overtightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

Precau-D1-9-2005

FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are 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 his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

Documentation Feedback

Your feedback helps us keep our documentation up-to-date and accurate. If you have any comments or suggestions about our online Help or printed manuals, you can email us.

Please include the following information:

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- Your suggestion for how to correct/improve documentation

Send email messages to:

FireSystems.TechPubs@honeywell.com

Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.

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Section 1: General Information

1.1 UL 864 Compliance

This product has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864 9th Edition and ULC-S527 11th edition.

1.2 About This Manual

1.2.1 Cautions and Warnings

This manual contains cautions and warnings to alert the reader as follows:

CAUTION:
Information about procedures that could cause programming errors, runtime errors, or equipment damage.

WARNING:
Indicates information about procedures that could cause irreversible damage to the control panel, irreversible loss of programming data or personal injury.

1.2.2 Typographic Conventions

This manual uses the following typographic conventions as listed in below:

When you see	Specifies	Example
text in small caps	the text as it appears in the LCD display or on the control panel	MARCH TIME is a selection that appears in the LCD display; or Press the ENTER key
text in quotes	a reference to a section or a LCD menu screen	"Read Status"; specifies the Read Status section or menu screen
bold text	In body text, a number or character that you enter	Press **1**; means to press the number "1" on the keypad
italic text	a specific document	*NFS-320* Installation Manual
a graphic of the key	In a graphic, a key as it appears on the control panel	Press Esc means to press the Escape key

Table 1.1 Typographic Conventions in this Manual

NOTE: In this manual, the term NFS-320 is used to refer to the NFS-320, NFS-320E, NFS-320C, NFS-320SYS and NFS-320SYS/E unless otherwise noted.

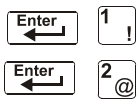
1.2.3 Supplemental Information

The table below provides a list of documents referenced in this manual, as well as documents for selected other compatible devices. The document series chart (DOC-NOT) provides the current document revision. A copy of this document is included in every shipment.

Compatible Conventional Devices (Non-addressable)	**Document Number**
Device Compatibility Document	15378
Fire Alarm Control Panel (FACP) and Main Power Supply Installation	**Document Number**
NFS2-640/E Installation, Operations, and Programming Manuals	52741, 52742, 52743
DVC Digital Voice Command Manual	52411
DVC-RPU Manual	50107425-001
DVC-RPU UL Listing Document	50107424-001
DAL Devices Reference Document	52410
DS-DB Digital Series Distribution Board and Amplifier Manual	53622
DAA2 and DAX Amplifiers Manual	53265
SLC Wiring Manual	51253
Note: For individual SLC Devices, refer to the *SLC Wiring Manual*	
Off-line Programming Utility	**Document Number**
VeriFire® Tools CD help file	VERIFIRE-TCD
Cabinets & Chassis	**Document Number**
CAB-3/CAB-4 Series Cabinet Installation Document	15330
Heat Dissipation for Cabinets with Audio Products	53645
Battery/Peripherals Enclosure Installation Document	50295
Power Supplies, Auxiliary Power Supplies & Battery Chargers	**Document Number**
ACPS-2406 Installation Manual	51304
ACPS-610 Installation Manual	53018
APS-6R Instruction Manual	50702
APS2-6R Instruction Manual	53232
CHG-120 Battery Charger Manual	50641
FCPS-24 Field Charger/Power Supply Manual	50059
FCPS-24S6/FCPS-24S8 Field Charger/Power Supply Manual	51977
Networking	**Document Number**
High-Speed NCM Installation Document	54014
Noti•Fire•Net Manual, Network Version 5.0 & Higher	51584
NCM-W/F Installation Document	51533
HS-NFN Installation Document	54013
ONYXWorks™ Workstation Hardware & Software Application: Installation and Operation Manual	52342

ONYXWorks™ NFN Gateway (PC Platform) Installation & Operation Manual	52307
ONYXWorks™ NFN Gateway (Embedded Platform) Installation & Operation Manual	52306
NCS ONYX® Network Control Station Manual, Network Version 4.0 & Higher	51658
NCA-2 Network Control Annunciator Manual	52482
NCA Network Control Annunciator Manual	51482
System Components	**Document Number**
Annunciator Control System Manual	15842
FDU-80Remote Annunciator Manual	51264
LCD-80 Liquid Crystal Display Remote Annunciator	15037
LCD2-80 Liquid Crystal Display Remote Annunciator	53242
LDM Series Lamp Driver Annunciator Manual	15885
SCS Smoke Control Manual (Smoke and HVAC Control Station)	15712
DPI-232 Direct Panel Interface Manual	51499
TM-4 Installation Document (Reverse Polarity Transmitter)	51490
UDACT Manual (Universal Digital Alarm Communicator/Transmitter)	50050
UDACT-2 Manual (Universal Digital Alarm Communicator/Transmitter)	54089
UDACT-2 Listing Document (Universal Digital Alarm Communicator/Transmitter)	54089LD
AA-Series Audio Amplifiers Manual	52526
ACT-1 Installation Document	52527
ACT-2 Installation Document	51118
FireVoice-25/50, FireVoice-25/50ZS & FireVoice-25/50ZST Manual	52290
FirstCommand Emergency Communication System	LS1001-001NF-E
RM-1 Series Remote Microphone Installation Document	51138
RA100Z Remote LED Annunciator Installation Document	I56-0508
XP Transponder Manual	15888
XP10-M Installation Document	I56-1803
XP5 Series Manual	50786
XP6-C Installation Document	I56-1805
XP6-MA Installation Document	I56-1806
XP6-R Installation Document	I56-1804
FSA-5000(A) FAAST XS Intelligent Aspiration Sensing Technology Document	I56-6008
FSA-8000(A) FAAST XM Intelligent Aspiration Sensing Technology Document	I56-3903
FSA-20000(A) FAAST XT Intelligent Aspiration Sensing Technology Document	I56-3903
FWSG Wireless Manual	LS10036-000NF-E

1.2.4 Shortcuts to Operating Functions



To the left of each program function, you'll find a keypad shortcut, which contains a series of keypad entries required to access the program function. All shortcuts start with the control panel in normal operation.

For example, the keypad shortcut to the left, shows how to enter the Read Status function with the control panel in normal operation, as well as how to exit the function.

1.3 Introduction to the Control Panel

The NFS-320 is a modular, intelligent Fire Alarm Control Panel (FACP) with features suitable for most applications. Following is a list of operating features available.

- Alarm Verification selection, to reduce unwanted alarms, for intelligent detector points
- Positive Alarm Sequence (PAS) and Presignal per NFPA 72
- Silence Inhibit timer and Auto Silence timer for Notification Appliance Circuits (NACs)
- March time/temporal code for Notification Appliance Circuits (NACs)
- Programmable Signal Silence, System Reset, and Alarm Activate functions through monitor modules
- Automatic time-of-day and day-of-week control functions, with holiday option
- Intelligent Sensing with nine field-adjustable Pre-Alarm levels with programmable Control-By-Event (CBE)
- Operate automatic smoke or heat detector sounder base on action Pre-Alarm level, with general evacuation on alarm level
- Security alarm point option with separate audible signal code
- Audible alarm signaling options
- Programmable Control-By-Event control of outputs from individual alarm or supervisory addressable devices
- Networks with other FACPs and equipment for large applications.

Section 2: Use of the Controls

2.1 Introduction

Listing of the controls and indicators and where to find information on their use:

Operating Components	Covered in
Twelve System Status Indicator LEDs	“System Status Indicator LEDs” on page 12
Five Control Keys	“Control Keys” on page 13
Programming Keypad	“Programming Keypad” on page 15

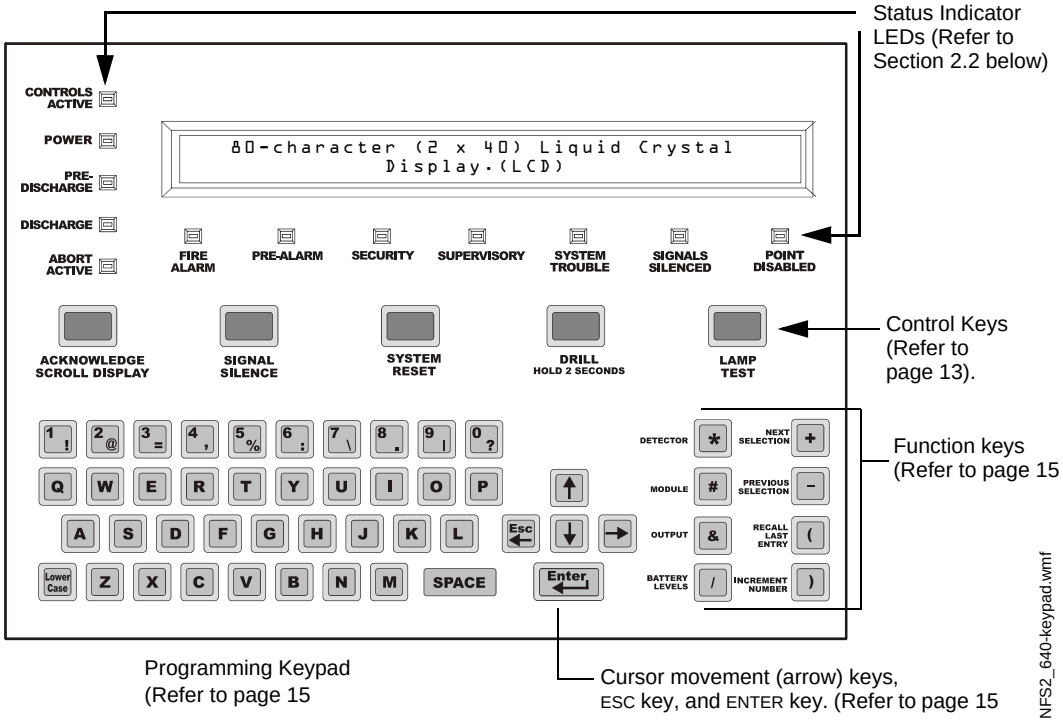


Figure 2.1 NFS-320 Control Panel Keys and Indicators

2.2 System Status Indicator LEDs

The control panel contains 12 labeled LEDs described in Table 2.1.

Indicator	Color	When Active	To Turn Off
CONTROLS ACTIVE	Green	LIghts when the panel assumes control of local operation as primary display.	Turns off automatically when another panel assumes control of local operation.
POWER	Green	Lights when the proper primary AC power is applied. Remains lit while power is applied.	Always lit with AC power applied.

Table 2.1 Descriptions of System Status Indicator LEDs (1 of 2)

Indicator	Color	When Active	To Turn Off
PRE-DISCHARGE	Red	Lights when any of the releasing zones have been activated, but have not yet discharged a releasing agent.	Turns off automatically when no releasing zones are in the pre-discharge state.
DISCHARGE	Red	Lights when any of the releasing zones are active and in the process of discharging a releasing agent.	Turns off automatically when no releasing zones are discharging a releasing agent.
ABORT ACTIVE	Yellow	Lights when an abort switch has been activated.*	Turns off automatically when an abort switch has been pressed and its timer is still counting down.
FIRE ALARM	Red	Flashes when a non-acknowledged fire alarm exists. Lights steadily after you acknowledge the fire alarm.	Clear the alarm condition and reset the system.
PRE-ALARM	Red	Flashes when a non-acknowledged fire Pre-Alarm exists. Lights steadily after you acknowledge the Pre-Alarm.	Clear the pre-alarm condition. (An Action Pre-Alarm requires a system reset.)
SECURITY	Blue	Flashes when a non-acknowledged Security alarm exists. Lights steadily after you acknowledge the alarm.	Clear the Security alarm condition and reset the system.
SUPERVISORY	Yellow	Flashes when a non-acknowledged Supervisory condition exists. Lights steadily after you acknowledge the event.	Clear the condition (Supervisory inputs require a system reset if they are latching. Refer to Table 3.4 page 31 for latching information.).
SYSTEM TROUBLE	Yellow	Flashes when a non-acknowledged system trouble exists. Lights steadily after you acknowledge the trouble.	Clear the trouble condition.
SIGNALS SILENCED	Yellow	Lights steadily after a fire alarm condition occurs and after you press SIGNAL SILENCE to silence all outputs. Flashes to indicate that some silenceable outputs are on and some are off.	Press SYSTEM RESET. DRILL will also turn off the LED.
POINT DISABLED	Yellow	Lights when one or more system devices are disabled.	Enable the device or remove the disabled device from the system program.

Table 2.1 Descriptions of System Status Indicator LEDs (2 of 2)

* Activation of a Manual Release Switch will override Predischarge Delay and override an active Abort Release Switch, resulting in an immediate agent release.

2.3 Control Keys

The control panel provides five Control Keys as described below:

2.3.1 Acknowledge/Scroll Display

Use the ACKNOWLEDGE/SCROLL DISPLAY key to respond to new alarm or trouble signals. When pressed, the control panel does the following:

- Silences the panel sounder
- Changes all active LED indicators from flashing to steady
- Sends an Acknowledge message to the History buffer and installed printers, CRT-2 terminals, and FDU-80 annunciators
- Sends a signal to silence the sounders on the FDU-80 and ACS annunciators

You can also press this key to display multiple alarms or troubles. If more than one alarm or trouble exists, the control panel displays the next alarm or trouble for 3 seconds (or until you press the ACKNOWLEDGE/SCROLL DISPLAY key), then displays the next alarm or trouble.

NOTE: If Local Control is set to "0" (NO), the FACP will not respond to ACKNOWLEDGE, and the piezo will not sound.

2.3.2 Signal Silence

Use the SIGNAL SILENCE key to silence the panel sounder and turn off all audio and visual devices connected to Notification Appliance Circuits. When pressed, the control panel does the following:

- Turns off the panel sounder
- Turns off all silenceable output circuits
- Lights the SIGNALS SILENCED LED
- Sends a SIGNALS SILENCED message to the History buffer and installed printers, CRT-2 terminals, and FDU-80 annunciators

Partial Signal Silence

When some active outputs are silenced and others remain constant, the SIGNALS SILENCED LED will flash

NOTE: If Local Control is set to "0" (NO) or "2" (Partial Control), the FACP will not respond to SIGNAL SILENCE.

2.3.3 System Reset

Use the SYSTEM RESET key to reset the control panel. When pressed, the control panel does the following:

- Clears ALL active inputs
- Interrupts resettable power
- Sends a "System Reset" message to the History buffer, and installed printers, CRT-2 terminals, and FDU-80 annunciators
- Decouples from Noti•Fire•Net, if connected, for 60 seconds to allow Cooperative Control By Event (CCBE) to clear.

If any alarm or trouble exists after you press the SYSTEM RESET key, all NACs, control outputs, and panel audio and visual indicators will reactivate.

NOTE: Trouble conditions will not clear and re-report upon reset.

NOTE: If Local Control is set to "0" (NO), the FACP will not respond to SYSTEM RESET.

2.3.4 Drill

Use the DRILL key (Alarm Signal for Canadian applications) to manually activate all silenceable outputs and Notification Appliance Circuits. To prevent accidental activation, you must press the DRILL key for 2 seconds. When pressed, the control panel does the following:

- Turns on all silenceable NACs
- Turns off the SIGNALS SILENCED LED
- Sends a Manual Evacuate message to the History buffer and installed printers, CRT-2 terminals, and FDU-80 annunciators

NOTE: If Local Control is set to "0" (NO) or "2" (Partial Control), the FACP will not respond to DRILL.

2.3.5 Lamp Test

Use the LAMP TEST key to test the control panel LEDs and the panel sounder. When pressed and held, the control panel does the following:

- Lights all control panel LEDs
- Turns on the panel sounder
- Lights all segments of the LCD display. When the LAMP TEST key is held for longer than five seconds, the LCD will display the Software Revisions.

2.4 Programming Keypad

The programming keypad includes:

- Function keys: DETECTOR, MODULE, OUTPUT, BATTERY LEVELS, NEXT SELECTION, PREVIOUS SELECTION, RECALL LAST ENTRY, and INCREMENT NUMBER
- ENTER key
- Cursor movement keys: ESC/LEFT ARROW key, UP key, RIGHT key, DOWN key
- Alphabetic and numeric keys, with LOWER CASE selection key

Shown below is the Programming Keypad, with descriptions for the keys.

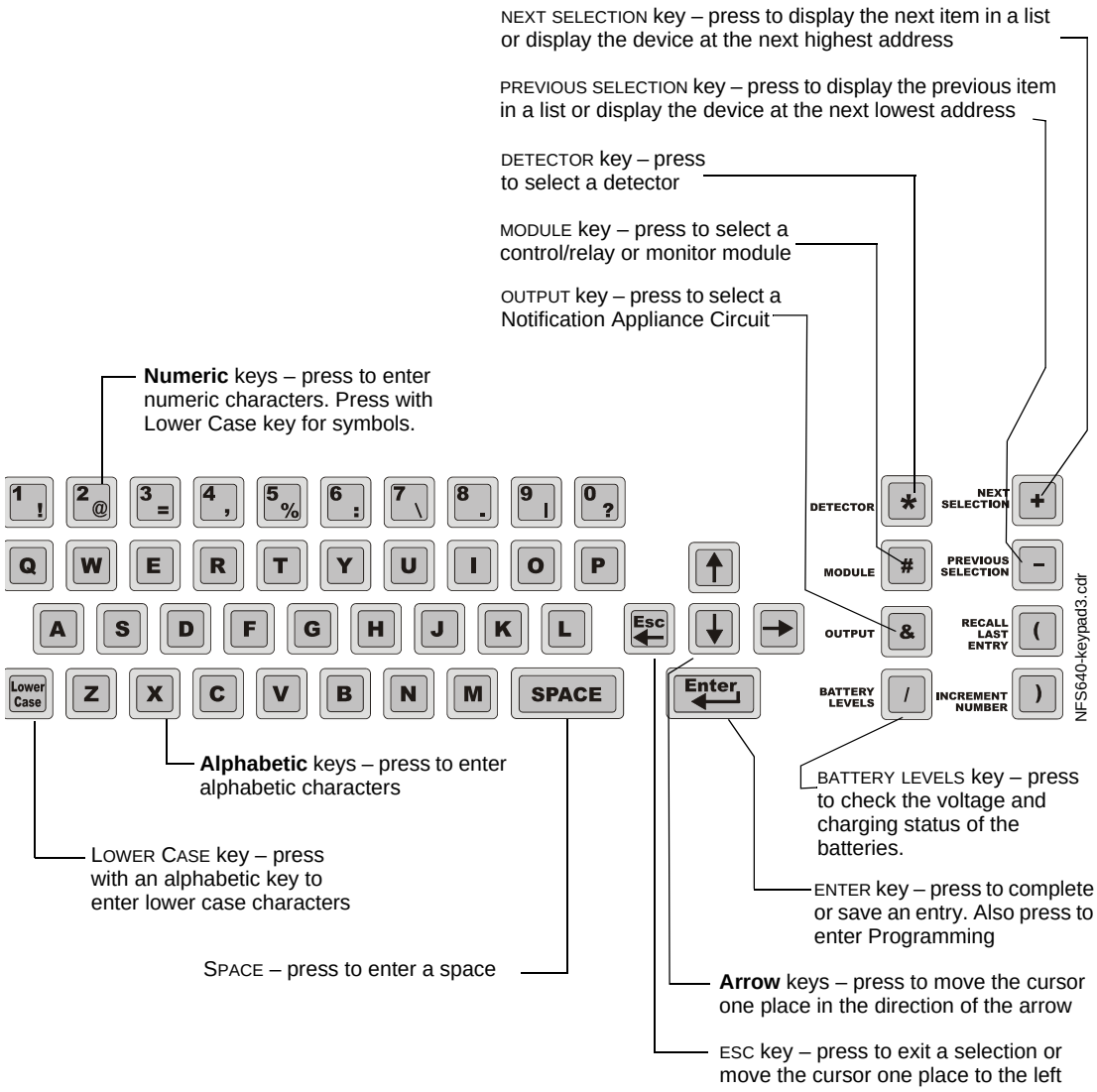


Figure 2.2 Programming Keypad

Section 3: Operation of the Control Panel

3.1 Overview

This section contains instructions for operating the control panel. Listed below are the topics detailed in this section:

Section	Refer to Page
3.2, "Normal Mode of Operation"	page 18
3.3, "Fire Alarm Mode of Operation"	page 18
3.4, "Mass Notification Mode of Operation"	page 21
3.5, "Carbon Monoxide (CO) Alarm Mode of Operation"	page 22
3.6, "System Trouble Mode of Operation"	page 23
3.6, "System Trouble Mode of Operation"	page 26
3.7, "Security Alarm Mode of Operation"	page 28
3.8, "Active Supervisory Signal Mode of Operation"	page 29
3.9, "Pre-Alarm Warning Mode of Operation"	page 32
3.10, "Disabled Points Mode of Operation"	page 33
3.11, "Non-Alarm Mode of Operation"	page 33
3.12, "Active Trouble Monitor Mode of Operation"	page 34
3.13, "Output Circuit Trouble Mode of Operation"	page 35
3.14, "Operation of Special System Timers"	page 37
3.15, "Waterflow Circuit Operation"	page 39
3.16, "Style 6 and Style 7 Operation"	page 39

This manual also contains information on operating the control panel in the appendixes, listed as follows:

- Appendix A, “Special Zone Operation”, on page 54
- Appendix B, “Intelligent Detector Functions”, on page 64
- Appendix C.3, “Remote Terminal Mode Functions”, on page 67
- Appendix D, “Point and System Troubles Lists”, on page 73

WARNING:
When used for CO_2 releasing applications, observe proper precautions as stated in NFPA 12. Do not enter the protected space unless physical lockout and other safety procedures are fully completed. Do not use software disable functions in the panel as lockout.

3.2 Normal Mode of Operation

The system operates in Normal mode when no alarms or troubles exist. In Normal mode, the control panel displays a System Normal message as follows

```
SYSTEM NORMAL          01:56P 041515 Tue
```

Figure 3.1 Sample System Normal Message

In Normal mode, the control panel does the following functions at regular intervals:

- Polls all SLC devices and the four NACs to check for valid replies, alarms, troubles, circuit integrity, supervisory signals, etc.
- Checks power supply troubles and batteries at 10-second intervals
- Sends a supervisory query on the optional FDU-80 and verifies proper response
- Refreshes the LCD display and the optional FDU-80 display and updates time
- Scans for any keypad or Control Key entries
- Performs a detector automatic test operation
- Tests system memory
- Monitors for microcontroller failure

3.3 Fire Alarm Mode of Operation

3.3.1 How the Control Panel Indicates a Fire Alarm

When an initiating device (detector or monitor module) activates, the control panel does the following:

- Produces a steady audible tone
- Activates the System Alarm relay (TB4)
- Flashes the FIRE ALARM LED
- Displays a Type Code that indicates the type of device that activated the fire alarm
- Displays ALARM in the status banner on the LCD display, along with information specific to the device, as shown below:

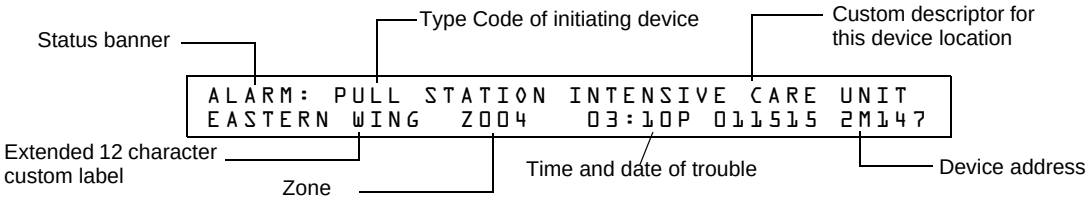


Figure 3.2 Sample Fire Alarm Display

- Sends an Alarm message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.
- Latches the control panel in alarm. (You can not return the control panel to normal operation until you correct the alarm condition and reset the control panel)
- Initiates any Control-By-Event actions
- Starts timers (such as Silence Inhibit, Auto Silence)
- Activates the general alarm zone (Z00)

3.3.2 How to Respond to a Fire Alarm

If the control panel indicates a fire alarm, you can do the following:

- To silence only the panel sounder:

  Press the ACKNOWLEDGE/SCROLL DISPLAY key. The local sounder will silence and the FIRE ALARM LED will change from flashing to steady.

  The control panel will send an acknowledge message to the LCD display, history buffer, and installed printers, FDU-80 annunciators, and CRT-2s.

- To silence the panel sounder and any activated outputs that are programmed as silenceable:

  Press the SIGNAL SILENCE key. The FIRE ALARM LED and SIGNALS SILENCED LED light steady.

  The control panel sends an Signal Silenced message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s. The figure below shows a sample Alarm Silenced message.

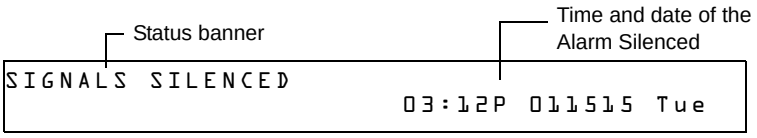


Figure 3.3 Sample Alarm Silenced Message

1. Check the Alarm message for the location and type of trouble.
2. Correct the condition causing the alarm.
3. When you finish correcting the alarm condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.3.3 Interpreting Fire Alarm Type Codes

The Type Code that displays in the Alarm message indicates the function of the point that initiates the fire alarm. For example, a monitor module with a PULL STATION Type Code means that the monitor module connects to a manual pull station. The table below lists the Type Codes that can appear in an alarm message:

Type Code	Latching (Y/N)	Purpose	What it does
Monitor Modules			
Blank	Y	Indicates activation of a device with no description	Lights FIRE ALARM LED and activates CBE
HEAT DETECT	Y	Indicates activation of a conventional heat detector	Lights FIRE ALARM LED and activates CBE
MONITOR	Y	Indicates activation of an alarm-monitoring device	Lights FIRE ALARM LED and activates CBE
PULL STATION	Y	Indicates activation of a manual fire-alarm-activating device, such as a pull station.	Lights FIRE ALARM LED and activates CBE
RF MON MODUL	Y	Indicates activation of a wireless alarm-monitoring device	Lights FIRE ALARM LED and activates CBE
RF PULL STA	Y	Indicates activation of a wireless manual fire-alarm-activating device, such as a pull station	Lights FIRE ALARM LED and activates CBE
SMOKE CONVEN	Y	Indicates activation of a conventional smoke detector attached to an FZM-1	Lights FIRE ALARM LED and activates CBE
SMOKE DETECT	Y	Indicates activation of a conventional smoke detector attached to an FZM-1	Lights FIRE ALARM LED and activates CBE
WATERFLOW	Y	Indicates activation a waterflow alarm switch	Lights FIRE ALARM LED and activates CBE
EVACUATE SW	N	Performs Drill function	Activates all silenceable outputs
MAN. RELEASE	Y	Indicates activation of a monitor module programmed to a releasing zone to perform a releasing function.	Lights FIRE ALARM LED and activates CBE

Table 3.1 Fire Alarm Type Codes (1 of 3)

Type Code	Latching (Y/N)	Purpose	What it does
MANREL DELAY	Y	Indicates activation of a monitor module programmed for a release output	Lights FIRE ALARM LED and activates CBE
SECOND SHOT	N	Provides second activation of releasing zone after soak timer has expired.	Indicates ACTIVE and activates CBE
CO MONITOR*	Y	Indicates activation of a CO conventional detector	Activates CBE, does not light an indicator at the control panel.
Detectors			
SMOKE(ION)	Y	Indicates activation of an ion smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(DUCT I)	Y	Indicates activation of a duct ion smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(PHOTO)	Y	Indicates activation of a photo smoke detector	Lights FIRE ALARM LED and activates CBE
RF_PHOTO	Y	Indicates activation of a wireless photoelectric smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(DUCTL)	Y	Indicates activation of a duct laser detector	Lights FIRE ALARM LED and activates CBE
SMOKE(DUCTP)	Y	Indicates activation of a duct photo smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(HARSH)*	Y	Indicates activation of a HARSH smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(LASER)	Y	Indicates activation of a laser smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(BEAM)	Y	Indicates activation of a beam smoke detector	Lights FIRE ALARM LED and activates CBE
SMOKE(DUCTL)	Y	Indicates activation of a duct laser smoke detector	Lights FIRE ALARM LED and activates CBE
AIR REF	Y	Indicates activation of a laser air reference detector.	Lights FIRE ALARM LED and activates CBE
HEAT	Y	Indicates activation of a 190^{o}F intelligent thermal detector	Lights FIRE ALARM LED and activates CBE
HEAT+	Y	Indicates activation of a 190^{o}F adjustable threshold intelligent thermal detector	Lights FIRE ALARM LED and activates CBE
HEAT(ANALOG)	Y	135^{o}F intelligent thermal sensor	Lights FIRE ALARM LED and activates CBE
HEAT (ROR)	Y	15^{o}F per minute rate-of-rise detector	Lights FIRE ALARM LED and activates CBE
Acclimate			
SMOKE ACCLIM	Y	Indicates activation of detector without freeze warning	Lights FIRE ALARM LED and activates CBE
SMOKE (ACCL+)	Y	Indicates activation of a detector with freeze warning	Lights FIRE ALARM LED and activates CBE
SMOKE MULTI*	Y	Multi sensor smoke detector	Lights FIRE ALARM LED and activates CBE
ACCL (P SUP)	Y (see note below)	Combination Photoelectric/Heat detector. Photo element activation generates a supervisory condition. FlashScan only. No Pre-alarm.	Lights FIRE ALARM LED and activates CBE
ACCL+ (P SUP)	Y (see note below)	Combination Photoelectric/Heat detector with low temperature warning. Photo element activation generates a supervisory condition. FlashScan only. No Pre-alarm.	Lights FIRE ALARM LED and activates CBE
NOTE: For ACCL/ACCL+ detectors: Detectors programmed as ACCL (P SUP) or ACCL+ (P SUP), the heat element will latch and require a system reset to clear. The Photo element will latch or track, depending on the ACCL (P SUP) latching setting.			
PHOTO/CO*	Y	Indicates activation of the Photo, Heat, or CO element of a detector	Lights FIRE ALARM LED for photo and heat, no LED will light for a CO alarm. Photo and heat will activate CBE, CO alarm activates special function zone FC and sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools)
PHOTO/CO (P SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector. FlashScan only. No Pre-alarm.	Lights FIRE ALARM LED for heat, no LED will light for a CO alarm, supervisory LED will light for photo alarm, heat and photo will activate CBE, CO alarm activates special function zone FC and sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools)
PHOTO/CO (C SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector. FlashScan only. No Pre-alarm.	Lights FIRE ALARM LED for heat and photo alarms, will light supervisory LED for CO alarm, photo and heat alarms will activate CBE, CO alarm will activate sixth CBE zone only (sixth CBE zone programmable via VeriFire Tools)

Table 3.1 Fire Alarm Type Codes (2 of 3)

Type Code	Latching (Y/N)	Purpose	What it does
NOTE: For Photo/CO detectors: Detectors programmed as P/CO (P SUP), the heat and CO elements will latch and require a system reset to clear. The Photo element will latch or track, depending on the Photo/CO (Photo SUP) setting. Detectors programmed as P/CO (C SUP), the heat and Photo elements will latch and require a system reset to clear. The CO element will latch or track depending on the Photo/CO (CO SUP) setting.			
*FlashScan mode only			

Table 3.1 Fire Alarm Type Codes (3 of 3)

3.4 Mass Notification Mode of Operation

3.4.1 How the Control Panel Indicates a Mass Notification Alarm

When an initiating device activates, the control panel does the following:

- Produces a steady audible tone
- Does not activate any alarm relays or devices programmed as Alarm Pending or General Pending
- Does not flash any panel LEDs
- Displays a Type Code that indicates the type of device that activated the MN alarm
- Displays MN ALM in the status banner on the LCD display, along with information specific to the device, as shown below:

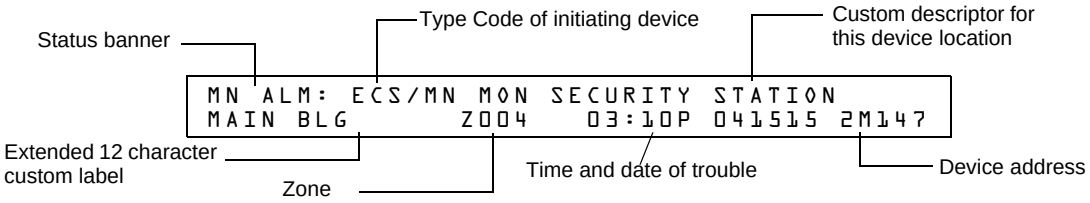


Figure 3.4 Sample MN Alarm Display

- Sends an Alarm message to the LCD display, remote annunciators, History buffer and installed printers, and CRT-2s.
- Latches the control panel in MN alarm. (You can not return the control panel to normal operation until you correct the alarm condition and reset the control panel)
- Initiates any Control-By-Event actions
- Activates special zone ZFD (Not applicable for FirstCommand applications)
- Sends an Alarm message to the central station receiver via the network, if applicable

3.4.2 How to Respond to an MN Alarm

If the control panel indicates a mass notification alarm, you can do the following:

- To silence only the panel sounder:

  Press the ACKNOWLEDGE/SCROLL DISPLAY key. The local sounder will silence. The control panel will send an acknowledge message to the LCD display, remote annunciators, history buffer, and installed printers, and CRT-2s.
- To silence the panel sounder and any activated outputs that are programmed as silenceable:

  Press the SIGNAL SILENCE key. The SIGNALS SILENCED LED will light steady.

The control panel sends a Signal Silenced message to the remote annunciators, History buffer and installed printers, and CRT-2s. The figure below shows a sample Alarm Silenced message.

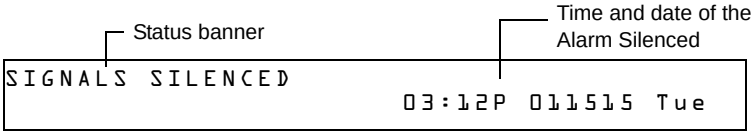


Figure 3.5 Sample Alarm Silenced Message

1. Check the alarm message for the location and type of trouble.
2. Correct the condition causing the alarm.
3. When you finish correcting the alarm condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, remote annunciators, and CRT-2s.

3.4.3 How the Control Panel Indicates a Mass Notification Supervisory

When an initiating device activates, the control panel does the following:

- Produces a warbling audible tone
- Activates any alarm relays or devices programmed as Supervisory Pending, General Supervisory, or General Pending
- Flashes the panel's Supervisory LEDs
- Displays a Type Code that indicates the type of device that activated the MN supervisory
- Displays MN SUP in the status banner on the LCD display, along with information specific to the device, as shown below:

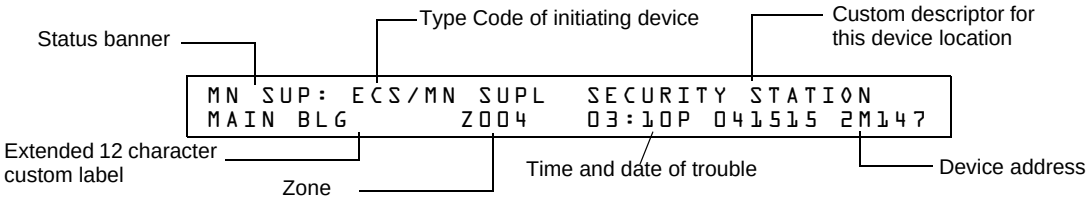


Figure 3.6 Sample MN Supervisory Display

- Sends an MN Supervisory message to the LCD display, remote annunciators, History buffer and installed printers, and CRT-2s.
- Initiates any Control-By-Event actions
- Activates special zone ZFE
- Sends an MN Supervisory message to the central station receiver via the network, if applicable

3.4.4 How to Respond to an MN Supervisory

If the control panel indicates an MN supervisory alarm, you can do the following:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the supervisory LED from flashing to steady. An Acknowledge message is sent to the remote annunciators, history buffer, installed printers, and CRTs. Pressing the ACKNOWLEDGE/SCROLL DISPLAY key will acknowledge all MN supervisory events on the fire panel.
2. Correct the condition that activated the MN supervisory point.

3. For a Latching event, press the system reset key to return the panel to normal operation. For a non-latching event, the panel will return to normal operation once the supervisory condition is corrected.
   The control panel sends a "System Normal" message to the LCD display, History buffer, installed printers, remote annunciators, and CRT-2s

3.4.5 How the Control Panel Indicates a Mass Notification Trouble

When an initiating device activates, the control panel does the following:

- Produces a pulsed audible tone
- Activates any alarm relays or devices programmed as Trouble Pending, General Trouble, or General Pending
- Flashes the panel's Trouble LEDs
- Displays a Type Code that indicates the type of device that activated the MN supervisory
- Displays MN TBL in the status banner on the LCD display, along with information specific to the device, as shown below:

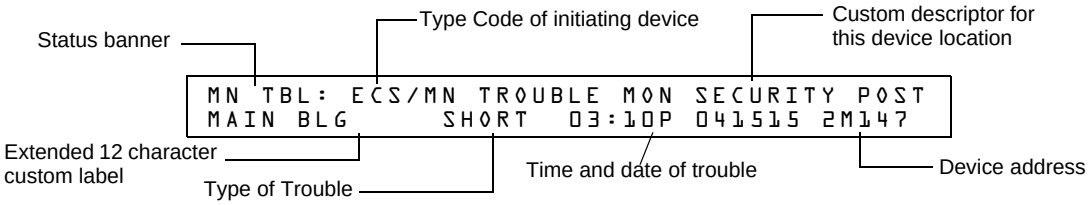


Figure 3.7 Sample MN Trouble Display

- Sends an MN Trouble message to the LCD display, remote annunciators, History buffer and installed printers, and CRT-2s.
- Initiates any Control-By-Event actions
- Activates special zone ZFF
- Sends an MN Trouble message to the central station receiver via the network, if applicable

3.4.6 How to Respond to an MN Trouble

If the control panel indicates an MN trouble, you can do the following:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the Trouble LED from flashing to steady. An Acknowledge message is sent to the remote annunciators, history buffer, installed printers, and CRTs. Pressing the ACKNOWLEDGE/SCROLL DISPLAY key will acknowledge all MN trouble events on the fire panel.
2. Check the trouble message for location and type of trouble.
3. Correct the condition that the trouble condition. If the trouble clears, the panel sends a Clear trouble message to the History Buffer, installed printers, remote annunciators and CRT-2s (troubles will clear from the fire panel even if they are not acknowledged.).
4. If no other events are present in the fire panel, a "System Normal" message is sent to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s. The fire panel returns to normal operation.

3.4.7 Interpreting MN Type Codes

The Type Code that displays in the fire panel message indicates the function of the point that initiates the activation. The table below lists the Type Codes that can appear in an alarm message:

Type Code	Latching (Y/N)	Purpose	What it does
Monitor Modules			
ECS/MN MONITOR[1]	Y	Indicates activation of a mass notification device	Activates CBE, does not light and LEDs, overrides existing fire events[2], shuts off silenceable outputs and all fire activated strobes
ECS/MN SUPL[1]	Y	Indicates activation of a mass notification device	Lights SUPERVISORY LED and activates CBE
ECS/MN SUPT[1]	N	Indicates activation of a mass notification device	Lights SUPERVISORY LED and activates CBE
ECS/MN TROUBLE MON[1]	N	Indicates trouble on a mass notification device	Monitors mass notification devices. Will generate a trouble condition for both open and short conditions

[1] This type code is not compatible with FirstCommand applications.
[2] If ECS/MN OVERRIDE is not selected in VeriFire Tools, fire events will take precedence over ECS/MN audio events.

3.5 Carbon Monoxide (CO) Alarm Mode of Operation

3.5.1 How the Control Panel Indicates a CO Alarm

When a CO alarm from a FCO-851 or monitor module with a CO monitor activates due to a CO alarm event, the control panel does the following:

- Produces a pulsed audible tone (if the piezo is enabled)
- Displays a CO alarm event that indicates the type of device that activated the CO alarm
- Displays ALARM in the status banner on the LCD display, along with information specific to the device, as shown below:

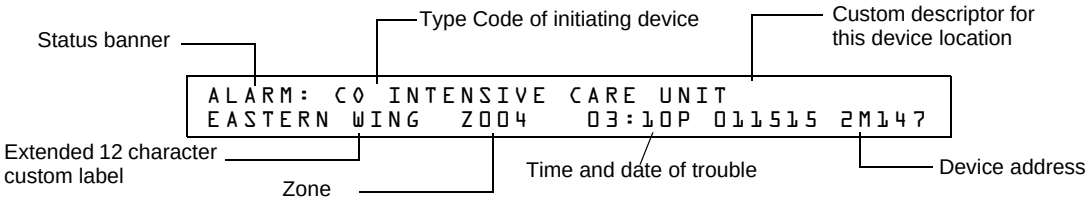


Figure 3.8 Sample CO Alarm Display

- Sends a CO alarm message to the LCD display, remote annunciators, History buffer, installed printers, and CRT-2s.
- Latches the control panel in CO alarm. (You can not return the control panel to normal operation until you correct the CO alarm condition and reset the control panel.)
- Initiates any Control-By-Event actions and activates special function zone FC.

3.5.2 How to Respond to a CO alarm

If the control panel indicates a CO alarm, you can do the following:

- To silence only the panel sounder:

Press the ACKNOWLEDGE/SCROLL DISPLAY key. The local sounder will silence.

The control panel will send an acknowledge message to the LCD display, remote annunciators, history buffer, installed printers, and CRT-2s

- To silence the panel sounder and any activated outputs that are programmed as silenceable:

Press the SIGNAL SILENCE key. The SIGNAL SILENCE LED will light steady.

The control panel sends an Signal Silenced message to the History buffer, installed printers, remote annunciators, and CRT-2s. The figure below shows a sample Alarm silenced message.

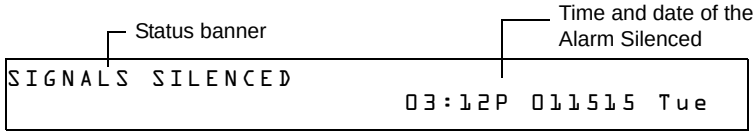


Figure 3.9 Sample Alarm Silenced Message

1. Check the Alarm message for the location and type of trouble.
2. Correct the condition causing the CO alarm.
3. When you finish correcting the CO alarm condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, History buffer, installed printers, FDU-80 annunciators, and CRT-2s.

3.5.3 Interpreting CO Alarm/Supervisory Type ID Codes

The Type Code that displays in the CO alarm message indicates the function of the point that initiates the CO alarm. For example, a monitor module with a CO MONITOR Type Code means that the monitor module monitors a conventional CO Detector. The table below lists the Type Codes that can appear in an alarm message:

Type Code	Latching (Y/N)	Purpose	What it does
Monitor Modules			
CO Monitor*	Y	Indicates activation of a CO conventional detector	Activates CBE, CO alarm does not light an indicator at the control panel.
Detectors			
Photo/CO*	Y	Indicates activation of the Photo, Heat, or CO element of a detector	Activates CBE, CO alarm does not light an indicator at the control panel.
Photo/CO (C Sup)*	Y	Indicates activation of the Photo, Heat or CO element of a detector.	Activation of the Heat or Photo elements will light an indicator at the control panel. Activation of the CO element will light the SUPERVISORY LED. Activates the CBE
Photo/CO (P Sup)*	Y	Indicates activation of the Photo, Heat or CO element of a detector.	Activation of the Heat element will light an indicator at the control panel. Activation of a CO alarm will not light an indicator at the control panel. Activation of the Photo element will light the SUPERVISORY LED. Activates the CBE
NOTE: For Photo/CO detectors: Detectors programmed as P/CO (P SUP), the heat and CO elements will latch and require a system reset to clear. The Photo element will latch or track, depending on the Photo/CO (Photo SUP) setting. Detectors programmed as P/CO (C SUP), the heat and Photo elements will latch and require a system reset to clear. The CO element will latch or track depending on the Photo/CO (CO SUP) setting.			
*FlashScan mode only			

Table 3.2 CO Alarm Type Codes

3.6 System Trouble Mode of Operation

3.6.1 How the Control Panel Indicates a System Trouble

The system goes into system trouble when the control panel detects an electrical fault. If no fire alarms exist, the control panel does the following:

- Produces a pulsed audible tone
- Activates the Trouble relay (TB4)
- Flashes the SYSTEM TROUBLE LED
- Displays a Type Code that indicates the type of device with a trouble.
- Displays TROUBLE in the status banner on the LCD display as well as the type of trouble and information specific to the device, as shown in Figure 3.10 below.
- Sends a Trouble message to the LCD display, history buffer and installed printers, FDU-80 annunciators, and CRT-2s.

NOTE: If a fire alarm exists when a trouble exists, the SYSTEM TROUBLE LED lights, but the Alarm message appears in the LCD display.

Typical Trouble message that appears on the LCD display:

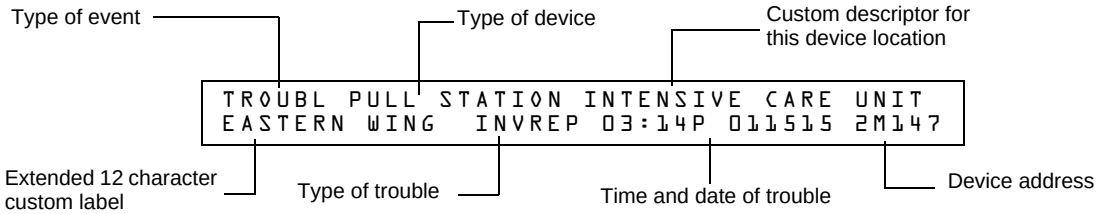


Figure 3.10 Sample Trouble Message

3.6.2 How to Respond to a System Trouble

If the control panel indicates a trouble, you can do the following:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SYSTEM TROUBLE LED from flashing to steady—regardless of the number of troubles, alarms, security and supervisory signals.

NOTE: Pressing the SIGNAL SILENCE key when only troubles exist, gives the same result as pressing the ACKNOWLEDGE/SCROLL DISPLAY key.

2. The control panel sends an Acknowledge message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

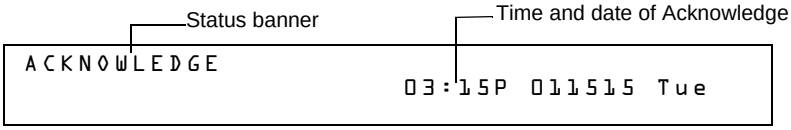


Figure 3.11 Sample Acknowledge Message

3. Check the trouble message for the location and type of trouble.

```
TROUBL MONITOR        MODULE ADDRESS  M021 Z00 OPEN CIRCUIT  08:10A 041515 2M021
TROUBL MONITOR        MODULE ADDRESS  M022 Z00 OPEN CIRCUIT  08:12A 041515 2M022
```

Figure 3.12 Sample Trouble Messages on CRT-2 or Printer

4. Correct the condition causing the trouble. If the trouble clears, the control panel sends a Clear Trouble message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

If all troubles clear and no supervisory signals or fire alarms exist, the control panel does the following:

- Returns to Normal operation (indicated by the “System Normal” message)
- Sends a “System Normal” message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Restores troubles automatically - even if troubles are not acknowledged

If multiple trouble conditions exist in the system, the LCD and optional CRT-2 and FDU-80 annunciators display automatically step through each trouble every 3 seconds in the following order:

1. Alarms, in order of address
2. Supervisory, in order of address
3. Troubles, in order of address

Press the ACKNOWLEDGE/SCROLL DISPLAY key and the display stops on the current trouble event for 1 minute, then begins to automatically step through remaining troubles. To manually step through remaining troubles, press the ACKNOWLEDGE/SCROLL DISPLAY key.

Refer to Appendix D, “Point and System Troubles Lists”, on page 73 for explanations of troubles that appear on the display.

3.7 Security Alarm Mode of Operation

3.7.1 How the Control Panel Indicates a Security Alarm

The system goes into Security mode when a monitor module point programmed with a Security Type Code activates. If no fire alarm exists, the control panel does the following:

- Produces a warbling audible tone
- Turns on the Security relay (TB5)
- Flashes the SECURITY LED (blue)
- Displays a Type Code that indicates the type of security alarm being generated
- Displays ACTIVE in the status banner on the control panel, along with information specific to the device
- Sends a Security message to the LCD display, History buffer, and installed printers, FDU-80 annunciators, and CRT-2s
- Sends a Security message to the proprietary receiver via the network, if applicable.

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Security alarm will resound the panel sounder.

A Typical security message that appears on LCD display:

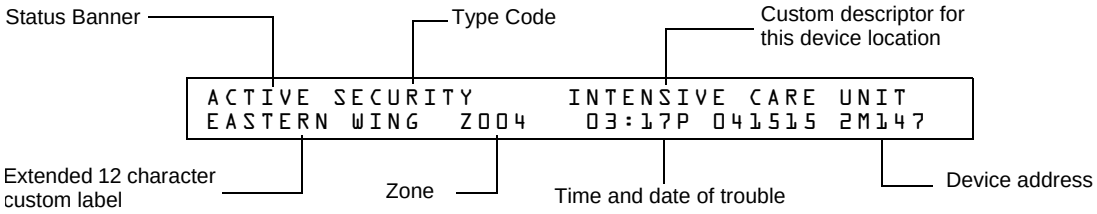


Figure 3.13 Sample Security Alarm Message

3.7.2 How to Respond to a Security Alarm

A Security Type Code latches the control panel. To return the control panel to normal operation, you must correct the condition causing the security condition, then reset the control panel. If the control panel indicates a security alarm, take the following action:

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Security alarm will resound the panel sounder.

1. Press the ACKNOWLEDGE/SCROLL display key to silence the panel sounder and switch the SECURITY LED from flashing to steady—regardless of the number of troubles, alarms, supervisory, and security signals. The control panel sends a Security message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s.
2. Correct the condition that activated the Security point.

3. When you finish correcting the Security condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.7.3 Interpreting Security Type Codes

The Type Code that displays in the security alarm message indicates the type of security alarm being generated by the monitor module that initiates the alarm. For example, a monitor module with a Type Code of AREA MONITOR indicates an intruder in a protected premises area. The table below lists the Type Codes that can appear in a security alarm message.

Monitor Modules			
Type Code	**Latching (Y/N)**	**Purpose**	**What it does**
AREA MONITOR	Y	Monitors area surveillance equipment, such as motion detectors	Lights SECURITY LED, activates CBE
SECURITY	Y	Monitors security switches for tampering	Lights SECURITY LED, activates CBE
SYS MONITOR	Y	Monitors critical equipment for security	Lights SECURITY LED, activates CBE

Table 3.3 Security Type Codes

3.8 Active Supervisory Signal Mode of Operation

3.8.1 How the Control Panel Indicates an Active Supervisory

The system goes into Supervisory mode when a monitor module point programmed with a Supervisory type code activates. When a Supervisory point activates, the control panel does the following:

- Produces a warbling audible tone
- Turns on the Supervisory relay (TB5)
- Flashes the SUPERVISORY LED (yellow)
- Displays one of the Type Codes listed in Table 3.4.
- Displays ACTIVE in the status banner on the control panel, along with information specific to the device
- Sends a Supervisory message to the LCD display, History buffer, and installed printers, FDU-80 annunciators, and CRT-2s

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Supervisory alarm will resound the panel sounder.

A Typical Supervisory message that appears on LCD display:

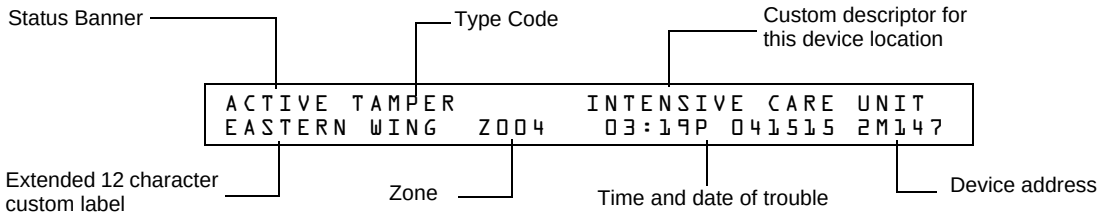


Figure 3.14 Sample Supervisory Signal Message

3.8.2 How to Respond to an Active Supervisory

If a Latching Supervisory Type Code Displays

Some Supervisory Type Codes latch the control panel (Refer to Table 3.4 for a list of these type codes). To return the control panel to normal operation, you must correct the condition causing the supervisory condition, then reset the control panel. Take the following action:

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Supervisory alarm will resound the panel sounder.

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SUPERVISORY LED from flashing to steady—regardless of the number of troubles, alarms, and supervisory signals. The control panel sends a Supervisory message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s.
2. Correct the condition that activated the supervisory point.
3. When you finish correcting the latching supervisory condition, press the SYSTEM RESET key to return the control panel to normal operation (indicated by the "System Normal" message). The control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

If Non-latching Type Code Displays

Some Supervisory Type Codes do not latch the control panel. (Refer to Table 3.4 for a list of these type codes). The control panel automatically returns to normal operation, when you correct the condition that activates the supervisory point. If the control panel indicates a non-latching supervisory point, take the following action:

NOTE: If a fire alarm exists, and there are silenced alarms (the SIGNALS SILENCED LED is lighted), a Supervisory alarm will resound the panel sounder.

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SUPERVISORY LED from flashing to steady—regardless of the number of troubles, alarms, and supervisory signals. The control panel sends a Supervisory message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s.
2. Correct the condition that activated the supervisory point.
3. The control panel automatically returns to normal operation (indicated by the "System Normal" message) and the control panel sends a "System Normal" message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.8.3 How to Interpret Supervisory Type Codes

The Type Code that displays in the Supervisory message indicates the function of the point that initiates the Supervisory. For example, a monitor module with a TAMPER Type Code means that the monitor module connects to a tamper switch.

Type Codes that can appear in an Supervisory message:

Type Code	Latching (Y/N)	Purpose	What it does
Monitor Modules			
WATERFLOW S	Y	Indicates supervisory condition for activated water flow switch	Lights SUPERVISORY LED and activates CBE
RF SUPERVSRY	N	Monitors a radio frequency device	Lights SUPERVISORY LED and activates CBE
LATCH SUPERV	Y	Indicates latching supervisory condition	Lights SUPERVISORY LED and activates CBE
TRACK SUPERV	N	Indicates tracking supervisory condition	Lights SUPERVISORY LED and activates CBE
SPRINKLR SYS	Y	Indicates activation of sprinkler system	Lights SUPERVISORY LED and activates CBE
TAMPER	Y	Indicates activation of tamper switch	Lights SUPERVISORY LED and activates CBE
Detectors			
SUP.T(DUCTI)	N	Ion detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(DUCTI)	Y	Ion detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUPT(DUCTL)	N	Laser detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUPL(DUCTL)	Y	Laser detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.T(DUCTP)	N	Photo detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(DUCTP)	Y	Photo detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUPT(PHOTO)	N	Photo detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(PHOTO)	Y	Photo detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.T(ION)	N	Ion detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(ION)	Y	Ion detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.L(LASER)	Y	Laser detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
SUP.T(LASER)	N	Laser detector that indicates supervisory (non-alarm) condition	Lights SUPERVISORY LED and activates CBE
PHOTO/CO (C SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector. FlashScan only. No Pre-alarm.	Activation of a Heat or Photo elements will light an indicator at the control panel. Activation of the CO element will light the SUPERVISORY LED. Activates the CBE
PHOTO/CO (P SUP)*	Y	Indicates activation of the Photo, Heat or CO element of a detector. FlashScan only. No Pre-alarm.	Activation of a Heat element will light an indicator at the control panel. Activation of a CO alarm will not light an indicator at the control panel. Activation of the Photo element will light the SUPERVISORY LED. Activates the CBE
NOTE: For Photo/CO detectors: Detectors programmed as P/CO (P SUP), the heat and CO elements will latch and require a system reset to clear. The Photo element will latch or track, depending on the Photo/CO (Photo SUP) setting. Detectors programmed as P/CO (C SUP), the heat and Photo elements will latch and require a system reset to clear. The CO element will latch or track depending on the Photo/CO (CO SUP) setting.			
ACCL (P SUP)	Y (see note below)	Combination Photoelectric/Heat detector. Photo element activation generates a supervisory condition FlashScan only. No Pre-alarm.	Lights SUPERVISORY LED and activates CBE
ACCL+ (P SUP)	Y (see note below)	Combination Photoelectric/Heat detector with low temperature warning. Photo element activation generates a supervisory condition. FlashScan only. No Pre-alarm.	Lights SUPERVISORY LED and activates CBE
NOTE: For ACCL/ACCL+ detectors: Detectors programmed as ACCL (P SUP) or ACCL+ (P SUP), the heat element will latch and require a system reset to clear. The Photo element will latch or track, depending on the ACCL (P SUP) latching setting.			
*FlashScan mode only			

Table 3.4 Supervisory Type Codes

3.9 Pre-Alarm Warning Mode of Operation

3.9.1 How the Control Panel Indicates a Pre-Alarm Warning

The control panel activates a Pre-Alarm Warning if a detector exceeds the programmed Pre-Alarm Alert or Action level. When a detector activates a Pre-Alarm, the control panel does the following:

- Pulses the panel sounder
- Flashes the PRE-ALARM LED
- Activates the Pre-Alarm zone (F9)
- Sends a Pre-Alarm message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Displays a pre alarm status banner, the Type Code of the detector, and the Pre-Alarm level (Alert or Action) on the LCD display, along with information specific to the device as shown in Figure 3.15.

3.9.2 How to Respond to a Pre-Alarm Warning

Pre-Alarm Alert and Action Levels

The Pre-Alarm function is a programmable option which determines the system's response to real-time detector sensing values above the programmed setting. Use the Pre-Alarm function if you want to get an early warning of incipient or potential fire conditions. The Pre-Alarm function provides one of two levels of Pre-Alarm as follows:

NOTE: For detailed information on Pre-Alarm applications, refer to the *NFS-320 Programming Manual*.

- Alert – a non-latching condition that causes a Pre-Alarm when a detector reaches the programmed Pre-Alarm level.
- Action – a latching condition that causes a Pre-Alarm when a detector reaches the programmed Pre-Alarm level.

Responding to a Pre-Alarm Warning

The Pre-Alarm screen display is the same for both alert and action conditions. Following is a sample screen for a Pre-Alarm message.

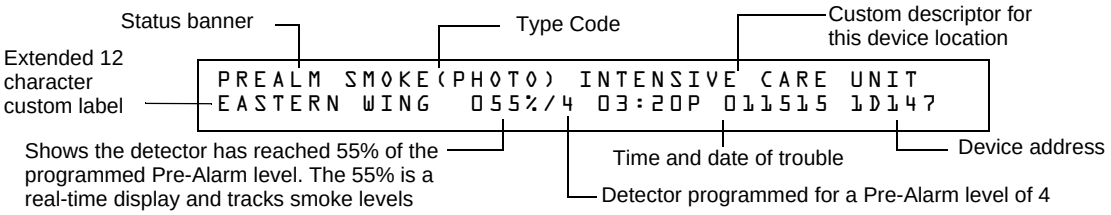


Figure 3.15 Sample of an Alert Pre-Alarm Message

An Alert Pre-Alarm automatically restores to normal when the detector sensitivity, programmable to one of nine settings, drops below the programmed Alert level. Zone F09 automatically clears when no Pre-Alarm conditions exist.

An Action Pre-Alarm latches until you reset the system - even if the detector sensitivity drops below the Action level. Zone F09 activates - but Zone Z00 (general alarm) and the trouble and alarm relays do not activate. The fifth zone programmed, not the first four, in the detector's CBE activates. A subsequent alarm condition for this detector clears the Action indication from the LCD display.

Interpreting Pre-Alarm Type Codes

The Type Code that displays in the Pre-Alarm warning indicates the function of the point that initiates the Pre-Alarm warning. Refer to the Detectors section of Table 3.1 for the Type Codes that can appear in a Pre-Alarm warning, and for descriptions of those Type Codes.

3.10 Disabled Points Mode of Operation

The control panel indicates disabled points by displaying a screen for each disabled detector, monitor module, and control/relay module. Disabled points do not cause an alarm or any Control-by-Event activity. If more than one point is disabled, the control panel automatically displays by priority, mimicking the alarms.

CAUTION:
Disabling a zone disables all input and output devices associated with the zone if the zone is in first zone "primary" mapped location.

When one or more points are disabled, the control panel does the following:

- Holds all disabled output points in the off-state
- Flashes the SYSTEM TROUBLE LED
- Lights the POINT DISABLED LED
- Sends a Disabled Point message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Displays a message for each disabled point

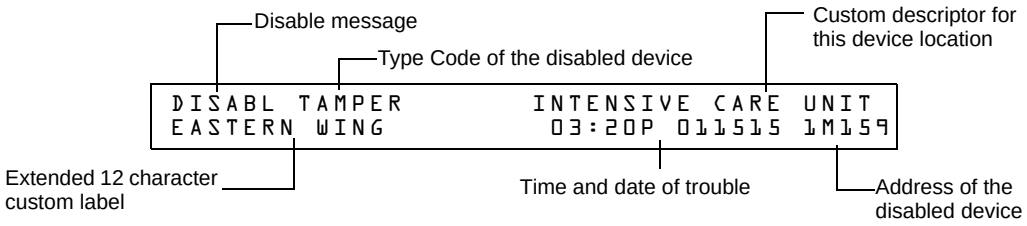


Figure 3.16 Sample Disabled Point Message

3.11 Non-Alarm Mode of Operation

3.11.1 Purpose of Non-Alarm Points

Non-Alarm points are addressable monitor modules programmed with one of the Non-Alarm Type Codes listed in Table 3.5. Non-Alarm points, except Non-Fire, operate like monitored system functions that can produce troubles—but with the differences shown in the following sections.

Monitor Modules			
Type Code	**Latching (Y/N)**	**Purpose**	**What it does**

Table 3.5 Non-Alarm Type Codes (1 of 2)

ACCESS MONTR	N	Used for monitoring building access	Activates CBE
ACK SWITCH	N	Performs Acknowledge function	Silences panel sounder, gives an Acknowledge message on the panel LCD
DRILL SWITCH	N	Performs Drill function (Not for use in Canadian applications.)	Activates silenceable outputs
FIRE CONTROL	N	Used for air handler shutdown, intended to override normal operating automatic functions	Activates CBE, does NOT light an indicator at the control panel
NON-FIRE	N	Used for energy management or other non-fire situations. Does not affect operation of the control panel	Activates CBE, does NOT light an indicator at the control panel
PAS INHIBIT	N	Inhibits Positive Alarm Sequence	Inhibits Positive Alarm Sequence
RESET SWITCH	N	Performs Reset function	Resets control panel
SIL SWITCH	N	Performs Signal Silence function	Turns off all activated silenceable outputs
ABORT SWITCH	N	Indicates Active at the panel	Aborts activation of a releasing zone

Table 3.5 Non-Alarm Type Codes (2 of 2)

3.11.2 How the Control Panel Indicates an Active Fire Control

Activation of a FIRE CONTROL point causes the control panel to do the following:

- Initiate the monitor module Control-by-Event
- Send a message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Display an ACTIVE status banner and FIRE CONTROL Type Code on the LCD display, along with information specific to the device

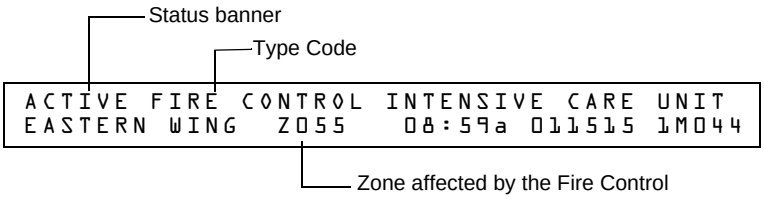


Figure 3.17 Sample Fire Control Point Display

3.11.3 How the Control Panel Indicates an Active Non-Fire Point

Non-Fire point operation does not affect control panel operation, nor does it display a message at the panel LCD. Activation of a Non-Fire point activates CBE—but does not cause any indication on the control panel. For example, you can program a Non-Fire point to turn lights in a zone to a lower setting when activated. In this case, when the point activates the control panel activates the point's CBE to turn the lights down without any audio or visual indication on the control panel.

3.12 Active Trouble Monitor Mode of Operation

3.12.1 How the Control Panel Indicates an Active Trouble Monitor

Trouble Monitor Points are monitor modules programmed with the following Type Codes:

Type Code	Latching (Y/N)	Device Function	Point Function
EQUIP MONITR	N	Used for recording access to monitored equipment	Activates CBE
POWER MONITR	N	Used to monitor remote power supplies or other external equipment	Indicates trouble
TROUBLE MON	N	Used to monitor remote power supplies or other external equipment	Indicates trouble

Table 3.6 Trouble Monitor Type Codes

These types of monitor modules operate like monitored system functions that can produce troubles—but with the following differences:

- The LCD display status banner displays ACTIVE as shown:

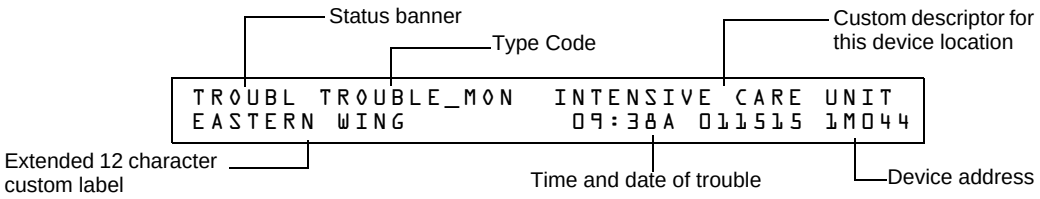


Figure 4 Sample Trouble Monitor Point Message

- The monitor module is non-latching: the module will return to normal when the trouble condition no longer exists.
- The monitor modules activate Control-by-Event
- The panel trouble relay transfers (TB4)

3.12.2 How to Respond to an Active Trouble Monitor

If the control panel indicates an active Trouble Monitor Point, take the following action:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SYSTEM TROUBLE LED from flashing to steady—regardless of the number of troubles, alarms, and supervisory signals.
2. The control panel sends an Acknowledge message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s. Check the trouble message for the location and type of trouble.
3. Correct the condition causing the trouble.
4. When the trouble condition is corrected, the panel will return to normal operation (indicated by the “System Normal” message).
5. The control panel sends a “System Normal” message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.13 Output Circuit Trouble Mode of Operation

3.13.1 Overview

Output circuits include NACs, Control/Relay Modules, and Transponder Points. This section contains a description of control panel operation for each type of output circuit.

- Four NACs are included on the control panel
- Control/Relay Modules connected to the control panel on an SLC
- Transponder Points: XPC-8 (CLIP only), or XP6-C (CLIP or FlashScan)

Trouble Type Codes for Control Modules and NAC Circuits

Type Code	Silenceable (Y/N)	Configuration	Device Function
CONTROL	N	NAC	Supervised NAC
RELAY	N	FORM-C relay	Relay Output
BELL CIRCUIT	N	NAC	Supervised NAC for notification appliance
STROBE CKT	N	NAC	Supervised NAC for notification appliance
HORN CIRCUIT	N	NAC	Supervised NAC for notification appliance
AUDIBLE CKT	N	NAC	Supervised NAC for notification appliance
REL END BELL	N	NAC	Supervised NAC for notification appliance
blank	N	NAC	Supervised NAC for undefined device
RELEASE CKT	N	NAC	Directs outputs to perform a releasing function.

Table 3.7 Control Module and NAC Circuit Trouble Type Codes (1 of 2)

REL CKT ULC	N	NAC	Directs outputs to perform a release function as required by ULC.
REL AUDIBLE	N	NAC	NAC, activated upon release
NONRESET CTL*	N	NAC	Relay output, unaffected by “System Reset” command
TELEPHONE	N	NAC	Standard Telephone circuit
REL CODE BELL**	N	NAC	Supervised NAC (NFS-320 NAC only)
INSTANT RELE	N	NAC	NAC, short = normal; supervised for open circuits and ground faults. Always non-silenceable and switch-inhibited.
ALARMS PEND	N	NAC	Output that will activate upon receipt of an alarm condition, and remain in the alarm state until all alarms have been acknowledged.
CONTROL NAC**	N	NAC	Supervised NAC
GEN ALARM	Y		Control Module, an XPC-8 circuit, or an XP6-C configured as a Municipal Box Transmitter for NFPA 72 Auxiliary Fire Alarm Systems application. This Type ID can also be used for general alarm activation.
GEN SUPERVIS	Y		Control Module, an XPR-8 relay, or an XP6-R activated under any Supervisory condition (includes sprinkler type).
GEN TROUBLE	Y		Control Module, an XPR-8 relay, or an XP6-R activated under any System Trouble condition.
GENERAL PEND	Y		Control Module, an XPC-8 circuit, or an XP6-C that will activate upon receipt of an alarm and/or trouble condition, and remain in the ON state until all events have been ACKNOWLEDGED.
TROUBLE PEND	N		Control Module, an XPC-8 circuit, or an XP6-C that will activate upon receipt of a trouble condition, and remain in the ON state until all troubles have been ACKNOWLEDGED.
MNS GENERAL[1]	N	NAC	Mass Notification supervised output
MNS CONTROL[1]	N	NAC	Mass Notification supervised output
MNS STROBE[1]	N	NAC	Mass Notification supervised output
MNS SPEAKER[1]	N	NAC	Mass Notification supervised output for speaker circuits
MNS RELAY[1]	N	NAC	Mass Notification supervised output

* Type Code is Control Module type code only.
** Type Code is NAC Circuit type code only.
[1] This type code is not compatible for FirstCommand applications.

Table 3.7 Control Module and NAC Circuit Trouble Type Codes (2 of 2)

3.13.2 How the Control Panel Indicates a NAC Trouble

A Trouble occurring on a NAC causes the control panel to do the following:

- Produce a pulsed audible tone
- Flash the SYSTEM TROUBLE LED
- Turn on the Trouble relay (TB4)
- Send a message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Display a trouble status banner and a CONTROL Type Code on the LCD display, along with information specific to the device

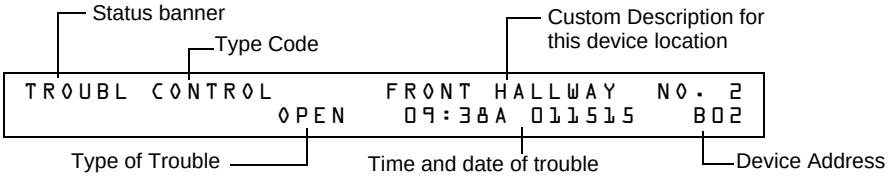


Figure 3.1 Sample of a NAC in Trouble Message

3.13.3 How the Control Panel Indicates a Control/Relay Trouble

A trouble occurring on a control/relay module or control/relay transponder causes the control panel to do the following:

- Produce a pulsed audible tone
- Flash the SYSTEM TROUBLE LED
- Turn on the Trouble relay (TB4)
- Send a message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s
- Display a trouble status banner and CONTROL Type Code on the LCD display, along with information specific to the device

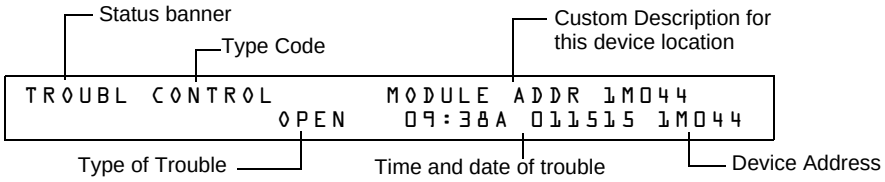


Figure 3.2 Sample of a Control/Relay Module in Trouble Message

3.13.4 How to Respond to a NAC or Control/Relay Trouble

If the control panel indicates an active NAC or Control/Relay Trouble, take the following action:

1. Press the ACKNOWLEDGE/SCROLL DISPLAY key to silence the panel sounder and switch the SYSTEM TROUBLE LED from flashing to steady—regardless of the number of troubles, alarms, and supervisory signals.
2. The control panel sends an Acknowledge message to the History buffer and installed printers, FDU-80 annunciators, and CRT-2s. Check the trouble message for the location and type of trouble.
3. Correct the condition causing the trouble.
4. When the trouble condition is corrected, the panel will return to normal operation (indicated by the “System Normal” message).
5. The control panel sends a “System Normal” message to the LCD display, History buffer and installed printers, FDU-80 annunciators, and CRT-2s.

3.14 Operation of Special System Timers

3.14.1 What are System Timers?

There are user-programmable time delays for three specific functions: the Auto Silence Timer, the Alarm Verification Timer, and the Silence Inhibit Timer. Figure 3.3 shows a sample System Function Selection screen with system timer settings. For instructions on changing system functions, refer to the *NFS-320 Programming Manual.*

3.14.2 How to View System Timer Selections

You can use the Read Status Entry option (explained in Chapter 4) to view the current selection for the System Timers. To do so, press the keys shown below in sequence:

The LCD display shows the current selections for System Functions, which includes the three system timers.
Sample LCD display of a System Function screen with system timer selections:

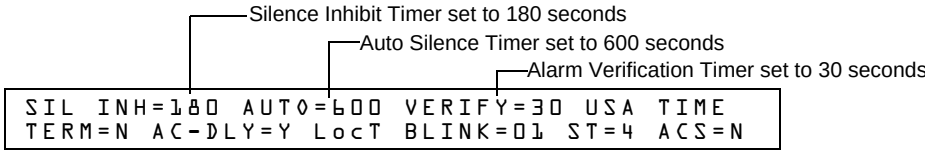


Figure 3.3 Sample System Function Selection Screen

3.14.3 How System Timers Work

The control panel can operate with special system timers: Auto Silence Timer, Alarm Verification Timer and Silence Inhibit Timer.

Auto Silence Timer

A timer that functions like pressing the SIGNAL SILENCE key. When the Auto Silence Timer reaches its programmed value (600-1200 seconds), the control panel automatically shuts off all active outputs programmed as silenceable.

When Auto Silence activates, special function zone ZF40 will activate and remain active until a system reset alarm resound or drill (alarm signal for Canadian applications) is initiated.

Activation of Auto Silence will activate the Signal Silence LED on the fire panel display and any ACM LED point programmed for Auto Silence.

NOTE: In Canadian applications, if auto silence is enabled, the value must be set to 20 minutes. An ACS point is required to monitor special function zone ZF40.

Alarm Verification Timer

A timer that directs the control panel to ignore a fire alarm for a smoke detector, programmed for Alarm Verification, while the Alarm Verification Timer is counting. Table 3.8 contains a summary of how the Alarm Verification Timer works.

If	The control panel does this
A second fire alarm occurs while the Alarm Verification Timer is counting	Ignores the Alarm Verification Timer
The Alarm Verification Timer elapses and a fire alarm still exists	Activates the fire alarm
The Alarm Verification Timer expires and a fire alarm no longer exists	Increments the Alarm Verification counter (up to 99) for the device and returns to normal operation

Table 3.8 Alarm Verification Timer Operation

Silence Inhibit Timer

A timer that disables the SIGNAL SILENCE key function and inhibits reset during countdown for the programmed time (0-300 seconds) when a fire alarm occurs. A Silence Inhibit Timer starts at the first fire alarm. Subsequent alarms will not restart the timer until the alarm condition is completely resolved and a panel reset is performed.

3.15 Waterflow Circuit Operation

If a monitor module programmed with a WATERFLOW Type Code initiates a fire alarm, the control panel disables the SIGNAL SILENCE key and the Auto Silence Timer. Refer to the *NFS-320 Installation Manual* for information on Waterflow circuits.

NOTE: In firmware version 18.x (or higher), silenceable outputs activated from a WATERFLOW type code activation can be silenced if the silenceable waterflow option is enabled via VeriFire Tools.

3.16 Style 6 and Style 7 Operation

Style 6 and Style 7 are supervised methods of communicating with addressable devices. If the control panel detects a trouble (open or short), it will attempt to drive both ends of the loop, maintaining communication in an unsupervised method. The trouble will display on the panel as a Style 6 trouble until you correct the condition. Style 7 configuration of the SLC requires the use of ISO-X isolator modules.

Section 4: Read Status Operation

4.1 Introduction

This section contains instructions and sample screens to show how to access all Read Status functions and menus. For information on Read Status using a CRT-2 refer to Appendix C.3, “Remote Terminal Mode Functions”, on page 67.

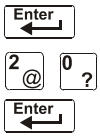
4.2 What is Read Status?

Read Status is a control panel function that lets you view system program information—but not change any programmed settings. The Read Status function lets you do the following:

- View Read Status information without entering a password.
- Enter and operate Read Status functions while the control panel provides full fire protection.
- View Read Status information while a fire alarm or trouble condition exists.

NOTE: If a fire alarm or trouble occurs while you are in Read Status, the control panel automatically exits Read Status operation and displays the new fire alarm or trouble.

4.2.1 Quick Reference Key Sequences



For quick reference, in the left margin next to each Read Status option is a block that shows the key sequence needed to view that option.

For example, the block to the left shows how to display the “Read Point” screen:

4.3 Entering Read Status

To enter Read Status, follow these steps:

1. From the “System Normal” screen, press the ENTER key. The control panel displays the “Entry” screen as shown below;

```
1=PROGRAMMING        2=READ STATUS ENTRY
 (ESCAPE TO ABORT)
```

2. From the “Entry” screen, press the **2** key. The control panel displays the “Read Status Options” screen as shown below:.

```
READ POINT=0 HIST=2 ALARM HIST=4 <ENTER>
PRNT POINT=1 HIST=3 ALARM HIST=5 <ENTER>
```

4.4 Viewing and Printing a Read Status

To view or print Read Status information follow the instructions below:

Option	Press	Lets you
Read Point	**0** key, ENTER key	View information for a detector, module, NAC or zone
Print Points	**1** key, ENTER key	Print information for all installed points in the system
Read History	**2** key, ENTER key	Display the total number of events in the History buffer and step through each event in sequence
Print History	**3** key, ENTER key	Print the contents of the History buffer (up to 800 events)
Read Alarm History	**4** key, ENTER key	View a display of the number of alarms in the Alarm History buffer, then scroll through each alarm event
Print Alarm History	**5** key, ENTER key	Print the contents of the Alarm History buffer (up to 200 events)

NOTE: If attempting to read a point that is not installed, the control panel displays “Not Installed”.

During all Read Status operations (except print operations) the control panel starts a 2-minute timer each time you press a key. If the control panel does not detect a key press for 2 minutes, the control panel exits Read Status and returns to the “System Normal” display.

In Read Status, you can also do the following:

- Press the ESC key to delete the previous entry.
- Press the SYSTEM RESET key to abort Read Status.

4.4.1 How to View Read Status of Devices, Zones, & System Settings

Overview

Read Point options 0, 2, and 4 in the Read Status Screen let you display and view information for devices and zones programmed into the control panel, as well as view system and annunciator settings. This section provides instructions and sample displays so you can view Read Status.

Topics covered in this section:

To view Read Status for	Refer to
Intelligent Detectors	“How to View Read Status for a Detector” on page 42
Control/relay and Monitor modules	“How to View Read Status for a Control/Relay or Monitor Module” on page 43
NAC	“How to View Read Status for a NAC” on page 44
Software Zones (Z01-Z99)	“How to View Read Status for a Software Zone (Z01-Z99)” on page 45
Special Zones (F0-F9)	“How to View Read Status for a Special Zone (F0-F9)” on page 45
Releasing Zones (R0-R9)	“How to View Read Status for a Releasing Zone (R0-R9)” on page 46
System Functions	“How to Read Status for System Functions” on page 46
Annunciator Selections	“How to Read Status for Annunciator Selections” on page 47

How to Display the Total of Installed Devices

Enter 2 @ A

To view the total number of installed devices, enter the "Read Status" screen by pressing the ENTER key, then **2**, then **A**. A screen similar to the following will appear:

```
L1:159Dets, 159Mods
SB L1:000: 64   Bells: 04
```

How to Display a Point or Zone for Read Status

Enter 2 @ 0 ? Enter

From the "Read Status" screen, press 0**,** then press the ENTER key to display the "Read Point Entry" screen as shown below:

```
ZONE=Z,AA,E              DETECTOR=*,LDAAA,E
MODULE=#,LMAA,E           OUTPUT CKT=&,AA,E
```

- To view a detector, press DETECTOR *, detector SLC address, ENTER.
- To view a zone, press Z, zone number, ENTER.
- To view a monitor or control/relay module, press MODULE #, module SLC address, ENTER.
- To view a NAC, press OUTPUT &, two-digit address, (for example 01 for B01, etc.), ENTER.

When you select a device or a zone, the control panel displays information for the device or zone, but does not send this information to the serial ports or the History buffer.

How to View Read Status for a Detector

Enter 2 @ 0 ? Enter *

Three digit address

\+ next device

\- previous device

From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a detector as follows: press DETECTOR, enter the three digit address, then press the ENTER key. For example, to read the status of detector 1D002: press DETECTOR, enter address 002, then press the ENTER key. The control panel now displays information about the detector, as shown in Figure 4.1.

The display and descriptions of the fields are shown below:

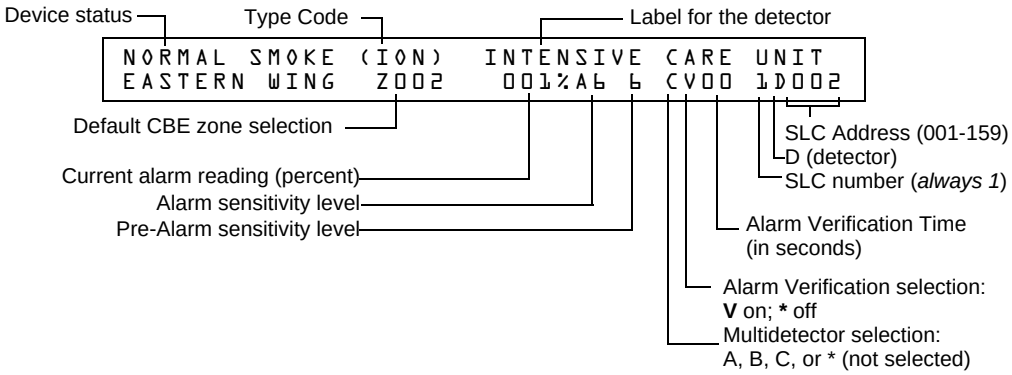


Figure 4.1 Sample Detector Read Status Display

- **Device Status** The status of the detector: Normal, Alarm, or Test.
- **Type Code** The software Type Code that identifies the type of detector. (Refer to "Point Programming" in the *NFS-320* Programming Manual.)
- **Default CBE Zone Selection** This is the first zone in the 5 zone CBE list. Defaults are Zone 001 (Heat detectors) Zone 002 (Ion detectors) Zone 003 (Photo detectors) Zone 004 (Laser detectors) Zone 005 (Multisensor). Values may differ depending on point programming.
- **Current alarm reading** (xxx%) The current alarm reading of the detector, as a percentage of the alarm sensitivity setting.
- **Alarm sensitivity level** (Ax) The alarm sensitivity (x=1-9) entered in the Detector Sensitivity Screen.
- **Pre-Alarm sensitivity level** The Pre-Alarm Sensitivity (1-9; 0 = Pre-Alarm not used) entered in the Detector Settings Screen.

NOTE: Refer to "Detector Sensitivity Settings" in the *NFS-320 Programming Manual* for more information on the Pre-Alarm and Alarm Sensitivity settings

- **Cooperative Multi-Detector selection** A smoke detector programmed to evaluate readings from nearby detectors in making Alarm or Pre-Alarm decisions. Cooperative Multi-Detector sensing also allows the combination of ionization with photoelectric technology in reaching an alarm decision.
  ***** – Multi-not used.
  A – combines the detector's alarm decision with the next SLC address above.
  B – combines the detector's alarm decision with the next SLC address below.
  C – combines the detector's alarm decision with the next SLC address above and the next SLC address below.
- **Alarm Verification** (***** or **V**)
  ***** – Alarm Verification not programmed for this detector.
  V – Alarm Verification enabled.
  Alarm Verification is a user-defined global time function that can reduce the number of nuisance alarms. Refer to page page 38 for more information.
- **Device SLC Address** The SLC address of the detector.

How to View Read Status for a Control/Relay or Monitor Module

Enter 2 @ 0 ? Enter #

SLC address Enter

\+ next device

– previous device

From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a monitor or a control/relay module as follows: press MODULE, enter the SLC address, then press the ENTER key. For example, to read the status of an FCM-1 module 1M147: press MODULE, enter 147, then press the ENTER key. The control panel now displays information about the module as shown in Figure 4.2.

The display and descriptions of the fields are shown below:

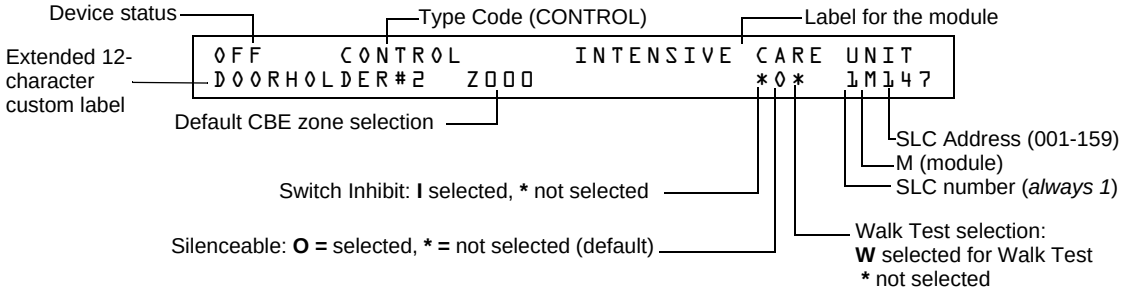


Figure 4.2 Sample Control/Relay or Monitor Module Read Status Display

- **Device Status** The status of the module: control/relay module [On (device active) OFF (device not active] or monitor module (Normal, Alarm, or Test).
- **Type Code** The software Type Code that identifies the type of module. (Refer to "Point Programming" in the *NFS-320 Programming Manual*.)
- **CBE list** Only the first zone in the device's CBE list will be displayed.
- **Device SLC Address** The SLC address of the module.
- **Switch Inhibit (control/relay module only)** Displays whether the remote ON/OFF capability of the device is inhibited. (I=on; *=off).
- **Silenceable (control/relay module only)** A selection that specifies if the device can be silenced during an alarm by pressing the signal silence key. Possible values are:
  ***** = output nonsilenceable
  F = silenceable, resound by fire alarm
  U = silenceable, resound by supervisory alarm
  B = silenceable, resound by security alarm
  T = silenceable, resound by trouble
  O = silenceable, does not resound

NOTE: If the "Strobe" Type ID is used with System Sensor Strobe synchronization, F, U, B, T, or O will silence the entire circuit, "*" will silence the horn portion only.

Walk Test (control/relay module only) A selection that specifies if the device will activate during a Walk Test.

How to View Read Status for a NAC

Enter 2 @ 0 ? Enter &

Device address Enter

\+ next device

\- previous device

From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a NAC as follows: press OUTPUT, enter the device address, then press the ENTER key. For example, to read the status of NAC 0-2: press OUTPUT, enter 02, then press the ENTER key. The control panel now displays information for a NAC as shown in Figure 4.3.

The display and descriptions of the fields are shown below:

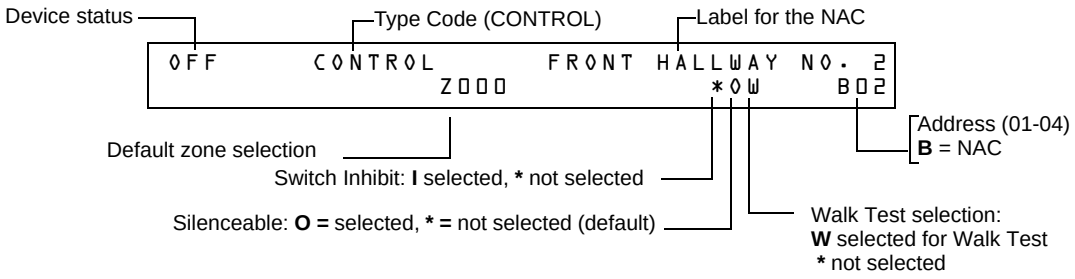


Figure 4.3 Sample NAC Read Status Display

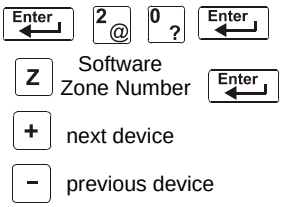
- **Device Status** The status of the device: ON (device active) OFF (device not active).
- **Type Code** The software Type Code that identifies the type of NAC. Refer to "Appendix F - Type Codes" in the *NFS-320 Programming Manual*.
- **CBE List** Only the first zone in the NAC's CBE list will be displayed here.
- **Device Address** The address of the NAC (01-04)
- **Switch Inhibit** A selection for disabling the switch function for the control/relay or transponder output circuit. (**I**=on; *****=off).

- **Silenceable** A selection that specifies if the device can be silenced during an alarm by pressing the SIGNAL SILENCE key. Possible values are:
  ***** = output nonsilenceable
  F = silenceable, resound by fire alarm
  U = silenceable, resound by supervisory alarm
  B = silenceable, resound by security alarm
  T = silenceable, resound by troubl
  O = silenceable, does not resound

NOTE: If the "Strobe" Type ID is used with System Sensor Strobe synchronization, F, U, B, T, or O will silence the entire circuit, "*****" will silence the horn portion only.

- **Walk Test** A selection that specifies if the device will activate during a Walk Test.

How to View Read Status for a Software Zone (Z01-Z99)



From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a Software Zone as follows: press **Z**, enter the zone number (01-99), then press the ENTER key. For example, to read the status of Software Zone 07: press **Z**, enter **07**, then press the ENTER key. The control panel now displays information for a Software Zone as shown below.

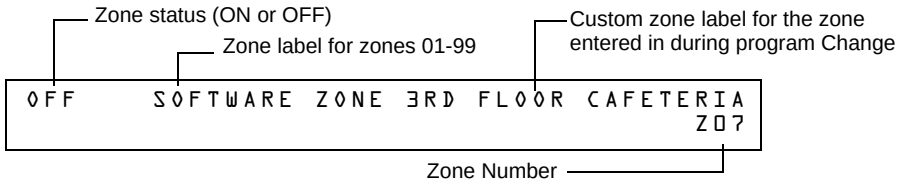
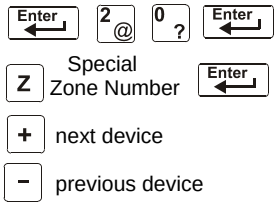


Figure 4.4 Sample Software Zone Read Status Display

How to View Read Status for a Special Zone (F0-F9)



From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for a Special Zone as follows: press **Z**, enter the zone number (F0-F9), then press the ENTER key. For example, to read the status of Special Zone F8: press **Z**, enter **F8**, then press the ENTER key. The control panel now displays information for a Special Zone as shown below.

NOTE: The zone label depends on the type of Special Zone. For example, CODING FUNCTION CODE TYPE for F8.

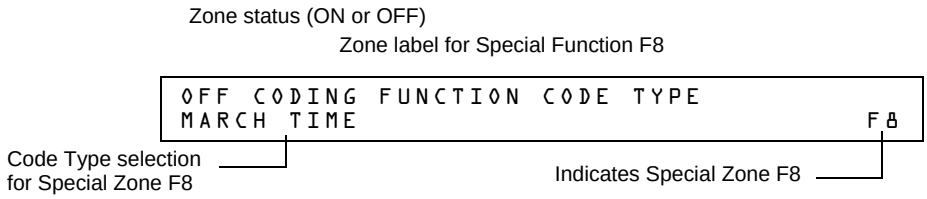


Figure 4.5 Sample Special Zone Read Status Display

How to View Read Status for a Releasing Zone (R0-R9)

Enter 2 @ 0 ? Enter

Z Releasing Zone Number Enter

\+ next device

– previous device

From the "Read Status" screen, press **0**, then press the ENTER key. You can now view the Read Status of a Releasing Zone as follows: press **Z**, enter the zone number (R0-R9), then press the ENTER key. For example, to read the status of Releasing Zone R0, enter **Z**, enter R0, then press the ENTER key. The control panel now displays information for a Releasing Zone as shown below.

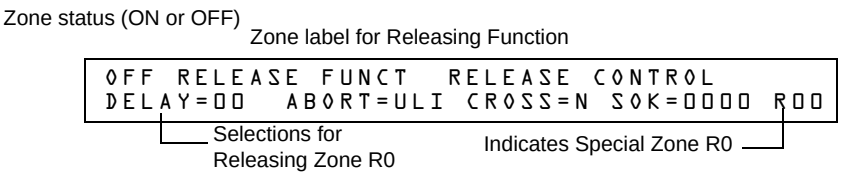


Figure 4.6 Sample Releasing Zone Read Status Display

How to Read Status for System Functions

Enter 2 @ 0 ?

Enter Z S 0 ?

Enter

The "System Functions" screen specifies global settings for the control panel. From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for System Functions as follows: press Z, enter **S0**, press the ENTER key. Shown below is a sample display and description of items for the Read Status of System Functions:

```
SIL INH=000 AUTO=000 VERIFY=30 USA TIME
TERM=N AC_DLY=Y LocT BLINK=01 ST=4 ACS=N
```

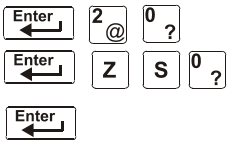
Parameter	Description	Settings
SIL INH=000	Silence Inhibit timer in seconds.	000 = no timer; or the timer duration in seconds up to 300.
AUTO=000	Auto Silence Timer in seconds.	000 = no timer; 600-1200 seconds.
VERIFY=30	Alarm Verification Timer	00 = no timer; 00-30 seconds.
USA TIME	Time and date display format	USA TIME or EUR TIME
TERM=N	Terminal supervision	YES – To supervise the wiring of an FDU-80. NO – No FDU-80 supervision.
AC_DLY=N	Delays AC loss reporting	YES - AC loss reporting is delayed for approximately 3 hours. NO - No AC loss delay.
LocT	One of three operating modes of a PC or terminal connected to the control panel (through TB12 PC Terminal)	LocT – terminal connected to control panel and located in the same room as the control panel. LocM – terminal connected to control panel but requires password for operation. RemT – terminal connected through a modem for Read Status operations only.

Table 4.1 System Function Parameters (1 of 2)

Parameter	Description	Settings
BLINK=01	The rate at which all intelligent control or all monitor modules blink during polling	BLINK=00: No blink BLINK=01: Devices blink on every poll. BLINK=16: Devices blink every 16th poll.
ST=4	NFPA wiring style operation for the SLC	4 – Style 4 SLC or 6 – both Style 6 and Style 7 SLC
ACS=N	Use ACS Selection Groups	N – No annunciator selected or Y – Select and display ACS Selection Groups

Table 4.1 System Function Parameters (2 of 2)

How to Read Status for Annunciator Selections



Annunciator Selection screens specify the information that displays on ACS annunciators. From the "Read Status" screen, press **0**, then press the ENTER key. You can now view Read Status for System Functions as follows: press **Z**, enter **S**, enter annunciation selection number (1-4), press the ENTER key. Sample LCD displays for the Read Status of Annunciator Selection are shown below:

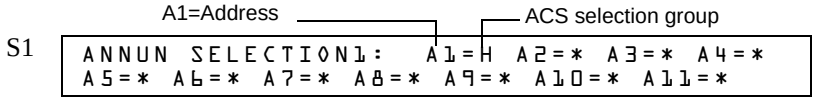


Figure 4.7 Annunciator Selection 1 Screen

To view the next three annunciator selection screens, press the + (NEXT SELECTION) key.

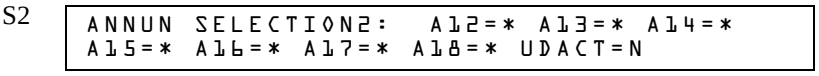


Figure 4.8 Annunciator Selection 2 Screen

If UDACT=N, the control panel displays the Annunciator Selections 3 and 4 screen, addresses A20-A32, as shown below:

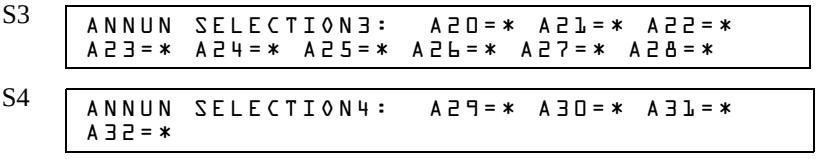


Figure 4.9 Annunciator Selections 3 and 4 Screens

Figure 4.10 System Function Selection 5 Screen

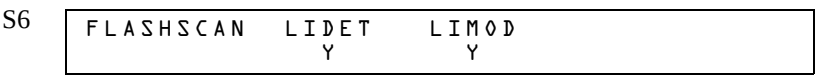


Figure 4.11 System Function Selection 6 Screen

S7

```
NODE: 000.XXX, STYLE7:N
THRESHOLD CHANNEL A:H, CHANNEL B:H
```

Figure 4.12 System Function Selection 7 Screen

- SEC_RLY and SUP_RLY (0= turn on by Fire Alarm, 1= turn on by Security, 2= turn on by Supervisory).
- BAT_SIZE (1= battery size is greater than 26 Ahr, 0= less t han 26 Ahr).
- C_DRILL (custom drill N= No custom drill, Y= Yes).
- TERM_DATA (0= LCD80 Terminal using 7 bit data, 1= LCD80 Terminal using 8 bit data).
- PRT_BAND (0= 2400, 1= 4800, 2= 9600).

S8

```
SEC_RLY:1 SUP_RLY:2 BAT_SIZE:0 C_DRILL:N
TERM_DATA:0   PRT_BAUD:2   CHARGER:Y
```

Figure 4.13 System Function Selection 8 Screen

An Annunciator Selection screen shows the information that will display on the ACS annunciators. The table below contains the ACS display selections.

1 through 9	Programmable Annunciator #1 through #9
0	Programmable Annunciator #10

A	8 Systems points + Zones 1-56
B	Zones 57-99, 9 F zones, 8 R zones, 4 NAC
C	Loop 1, Modules 1-64
D	Not Used
E	Loop 1, Modules 65-128
F	Not Used
G	Loop 1, Modules 129-159
H	Loop 1, Detectors 1-64
I	Not Used
J	Loop 1, Detectors 65-128
K	Not Used
L	Loop 1, Detectors 129-159
M	Not Used
N	8 Systems points + Zones 1-56, used for remote station communicator (TM-4)
O	8 Systems points + Zones 1-56, used for municipal box trip output (TM-4)

Annunciator addresses 1 to 19 can be programmed to any one of the above selections. If there is a UDACT or UDACT-2, selections A-M will be sent to Annunciator addresses 20 to 32 respectively.

Table 4.2 ACS Selection Groups

An example of ACS selections in Annunciator Selection Screen 1:

```
ANNUN SELECTION1:   A1=H  A2=C  AC=*  A4=*
A5=*  A6=*  A7=*  A8=*  A9=*  A10=*  A11=*
```

Figure 4.14 Annunciator Selection Screen 1 Example

NOTE: An ACS selection marked with an asterisk (*) indicates no annunciator selection.

The figure above shows annunciator selections for addresses A1-A3 (addresses A4-A10, marked with asterisks, are not selected)

- Annunciators set to annunciator address 1 (A1) display the status of detectors 1-64 on SLC 1 (ACS Selection Group H)
- Annunciators set to annunciator address 2 (A2) display the status of intelligent modules 1-64 on SLC-1 (ACS Selection Group C)

How to Read Status for Battery Levels

Pressing the BATTERY LEVEL key on the NFS-320 keyboard displays information concerning the state of the battery.

A sample LCD display is shown below.

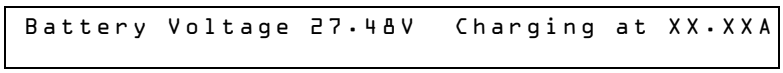


Figure 4.15 Battery Levels

4.4.2 How to View Read Status for Event and Alarm History

Overview

The control panel maintains a History buffer of the last 800 events, each with a time and date stamp. History events include the following:

- All alarms, troubles and operator actions, such as: Acknowledge, System Reset, Signal Silence, Drill, and Walk Test.
- Programming entries (Program Change and Status Change, but not Read Status), along with a number (0-9) indicating the programming submenu (for example, 0=Clear). For an example, see Figure 4.18.

You can view events from the History buffer in two forms: by displaying all events (option 2, HIST=2) or by displaying alarm events only (option 4, ALARM HIST=4).

NOTE: The History buffer contains 800 events total, including the alarm events that display for Alarm history. The control panel generates Alarm history from the alarm events that exist in the 800-event History buffer.

How to View Read Status for Event History

Enter, 2 @

2 @, Enter

\+ next event

\- previous event

Option 2 (HIST=**2**) lets you view the total number of events in the History buffer (up to 800 events), then view each event in chronological sequence. From the "Read Status" screen, press **2**, then press the ENTER key to display the "Event History" screen. A sample of the Event History screen is shown below:

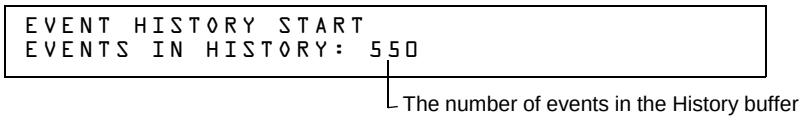


Figure 4.16 Sample Event History Display

To display events in the History buffer, do the following:

- Press the NEXT SELECTION key to step through each event from the first entry (oldest event first) in the History buffer, or
- Press the PREVIOUS SELECTION key to step through each event from the most recent entry in the History buffer.

NOTE: The NEXT SELECTION key will show the most recent event first, and then move to its normal function of displaying the oldest events first.

A sample LCD display for a trouble event:

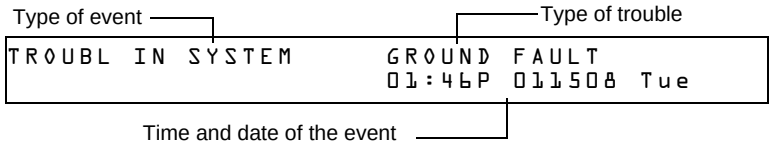


Figure 4.17 Sample Trouble Event Display

A sample LCD display for a Program Change event:

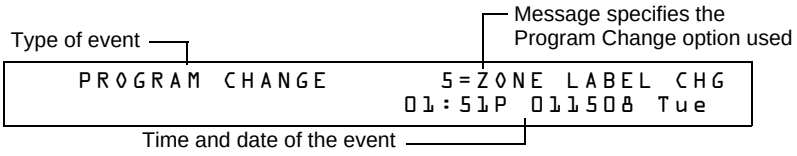


Figure 4.18 Sample Program Change Event Display

How to View Read Status for Alarm History

Enter 2 @

4 , Enter

\+ next event

\- previous event

Option 4 (ALARM HIST=4) lets you view the total number of alarms in the History buffer (up to 200), then view each alarm in chronological sequence. From the "Read Status" screen, press **4**, then press the ENTER key to display the "Event History" screen. A sample Alarm History screen is shown below:

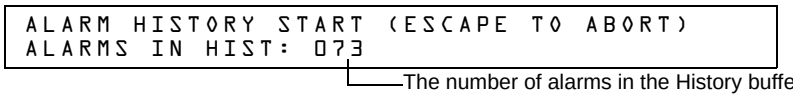


Figure 4.19 Sample Alarm History Display

To display alarms in the buffer, do the following:

- Press the NEXT SELECTION key to step through each alarm from the first entry (oldest alarm first) in the buffer, or
- Press the PREVIOUS SELECTION key to step through each alarm from the most recent entry in the buffer

NOTE: The NEXT SELECTION key will show the most recent event first, and then move to its normal function of displaying the oldest events first.

A sample display for an alarm event:

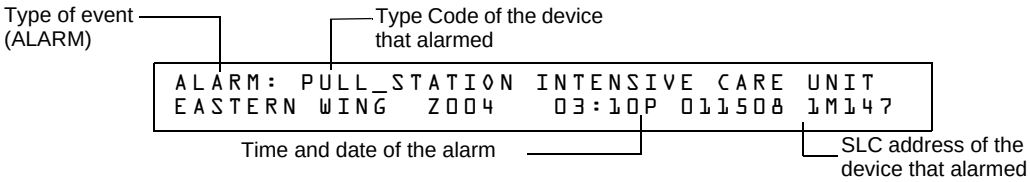


Figure 4.20 Sample Alarm Event Display

4.4.3 How to Print Points, Event and Alarm History

Overview

Read Point options 1, 3, and 5 in the "Read Status" screen let you print points, event history, and alarm history. This section contains instructions for printing, as well as sample point, event history, and alarm history printouts.

NOTE: Before printing, make sure your control panel is connected to a compatible printer and the printer is configured according to the manufacturer's specifications, and that the correct baud rate is selected at the panel.

How to Print Points

Enter 2 @ 1 !
Enter

Option 1 (PRNT POINT=1) lets you print a list of all points programmed into the system. From the "Read Status" screen, press **1**, then press the ENTER key to print a list of installed points. A sample Print Point screen is shown below:

```
                                STATUS PRINT
```

Figure 4.21 Sample Print Point Display

A sample printout of three points using the Print Point option:

```
NORMAL SMOKE(PHOTO) DETECTOR ADDR 1D043              Z003  000%AB 8 **   1D043
NORMAL SMOKE(PHOTO) DETECTOR ADDR 1D044              Z003  000%AB 8 **   1D044
NORMAL SMOKE(PHOTO) DETECTOR ADDR 1D045              Z003  000%AB 8 **   1D045
```

How to Print Event History

Enter 2 @ 3 =
Enter

Option 3 (HIST=3) lets you print a list of all events in the History buffer (up to 800). From the "Read Status" screen, press **3**, then press the ENTER key to print a list of events. A sample History Print screen is shown below:

```
                                HISTORY PRINT
```

Figure 4.22 Sample History Print Screen

A sample printout of three events in history using the History Print option:

```
******************** EVENT HISTORY START*****************************************
 SYSTEM RESET                                                 02:28P 011508 Tue
ALARM: SMOKE (ION)  DETECTOR ADDR 1D075              Z002    02:28P 011508 1D075
ALARM: SMOKE (ION)  DETECTOR ADDR 1D076              Z002    02:28P 011508 1D076
 ACKNOWLEDGE                                                 02:28P 011508 Tue
```

How to Print Alarm History

Enter 2 @ 5 %
Enter

Option 5 (ALARM HIST=5) lets you print a list of alarm events in the History buffer (up to 200). From the "Read Status" screen, press **5**, then press the ENTER key to print a list of alarm events. A sample Print Alarm History screen is shown below:

```
                          ALARM HISTORY PRINT
```

Figure 4.23 Sample Print Alarm History Display

A sample printout of two alarm events in the History buffer using the Print Alarm History option.

```
********************ALARM HISTORY START ***************************************
ALARM: SMOKE (ION)  DETECTOR ADDR 1D075              Z002    02:28P 011508 1D075
ALARM: SMOKE (ION)  DETECTOR ADDR 1D076              Z002    02:28P 011508 1D076
********************       PRINT END      ***************************************
```

4.4.4 How to View and Print Hidden Event and Alarm History

The control panel maintains a copy of the History buffer. For instance, if someone clears the History buffer using Status Change programming option 4, the control panel retains a copy of the History buffer. The copy of the preceding History buffer is called a Hidden History buffer and a copy of the preceding Alarm History is called a Hidden Alarm History buffer.

If you attempt to view or print history and the control panel displays one of the screens shown below you can use the options listed in the table below to view the contents of a Hidden History buffer.

```
HISTORY EMPTY      (ESCAPE TO ABORT)
**************************************
```

Figure 4.24 History Empty Display

```
ALARM HISTORY EMPTY  (ESCAPE TO ABORT)
**************************************
```

Figure 4.25 Alarm History Empty Display

Options for viewing and printing Hidden History and Hidden Alarm History do not appear in the LCD display when in Read Status. You can view and print the contents of these Hidden History buffers using the options listed in the table below. You read and print Hidden History and Hidden Alarm History the same way you read and print history using the options that appear on the "Read Status" screen. The table also contains references to the sections that contain instructions for reading and printing history.

To	Press	Refer to
Read Hidden Alarm History	Enter, 2 @, 6 :, Enter	"How to View Read Status for Alarm History" on page 51
Print Hidden Alarm History	Enter, 2 @, 7 \, Enter	"How to Print Alarm History" on page 52
Read Hidden History	Enter, 2 @, 8 ., Enter	"How to View Read Status for Event History" on page 50
Print Hidden History	Enter, 2 @, 9 |, Enter	"How to Print Event History" on page 52

Table 4.3 Hidden History Selections

Appendix A: Special Zone Operation

A.1 Overview

This section contains information for operating the control panel as detailed in the topics listed below:

Section	Special Zone	Refer to Page
A.2, "Releasing Zones (R0-R9)"	R0-R9	page 54
A.3, "Time, Date, and Holiday Functions"	F5, F6, F7	page 57
A.4, "NAC Coding"	F8	page 59
A.5, "Presignal and Positive Alarm Sequence (PAS) Operation"	F0	page 60

A.2 Releasing Zones (R0-R9)

A.2.1 Purpose of Releasing Zones

WARNING: When used for CO_2 releasing applications, observe proper precautions as stated in NFPA 12. Do not enter the protected space unless physical lockout and other safety procedures are fully completed.
Do not use software disable functions in the panel as lockout.

The control panel provides ten Releasing Zones (R0-R9). These are special zones that you can use for up to ten independent releasing operations. This section contains descriptions of each Releasing Function option and an example of how Releasing Zone options work.

For instructions on programming Releasing Functions, refer to the *NFS-320 Programming Manual.*

Each Releasing Zone includes the following releasing options:

Option	Description
Cross Zone	Cross Zones let you program the control panel to activate a Releasing Zone when two or more initiating devices are alarmed. Cross Zone selections are: **Y** Two or more detectors are alarmed that are mapped to one of the ten Releasing Zones (R0-R9) **Z** Two or more detectors are alarmed that are mapped to two different Software Zones and mapped to one of the ten Releasing Zones (R0-R9). **H** At least one smoke detector mapped to one of the ten Releasing Zones (R0-R9) is alarmed *and* at least one heat detector mapped to the same Releasing Zone as the smoke detector is alarmed. **N** Cross Zones not used
Delay Timer	Select a 0–60 second delay before activating a zone.
Abort	An Abort Switch Type Code used to abort activation of a zone.
Manual Release	Allows immediate zone activation by overriding the abort function, cross-zone function, and delay timer.
Soak Timer	Automatically shuts off the releasing device after a preprogrammed period of time. Select 0001-9999 seconds for a Soak Timer or 0000 seconds for no Soak Timer.

Table A.1 Releasing Options

A.2.2 How to View Releasing Zone Selections

You can use the Read Status Entry option to view the current selections for a Releasing Zone. For example, to view selections for Releasing Zone R1, press the keys in sequence:

A sample LCD display of a Releasing Function selected for Releasing Zone R1:

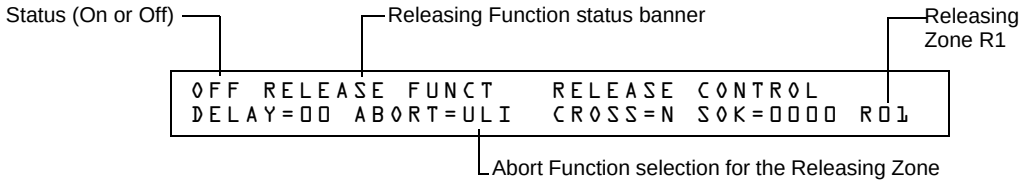
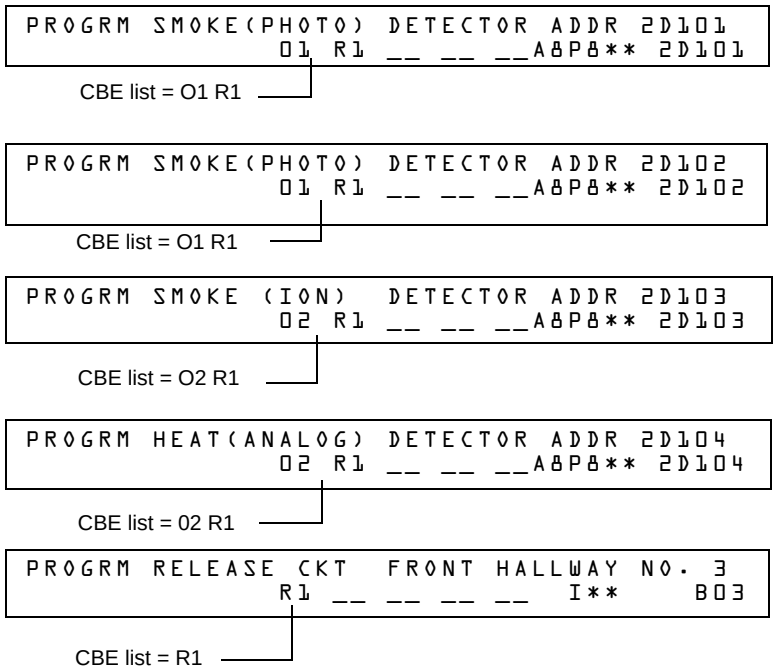


Figure A.1 Sample Read Status for a Releasing Zone

A.2.3 How Releasing Zones Operate

The figure below contains an illustrated example of how Releasing Zones work, using cross zone selections with four detectors and a NAC mapped to Releasing Zone 1 (listed as ZR1 in the CBE list). Table A.2 lists the cross zone selections and the conditions that activate the Releasing Zone:



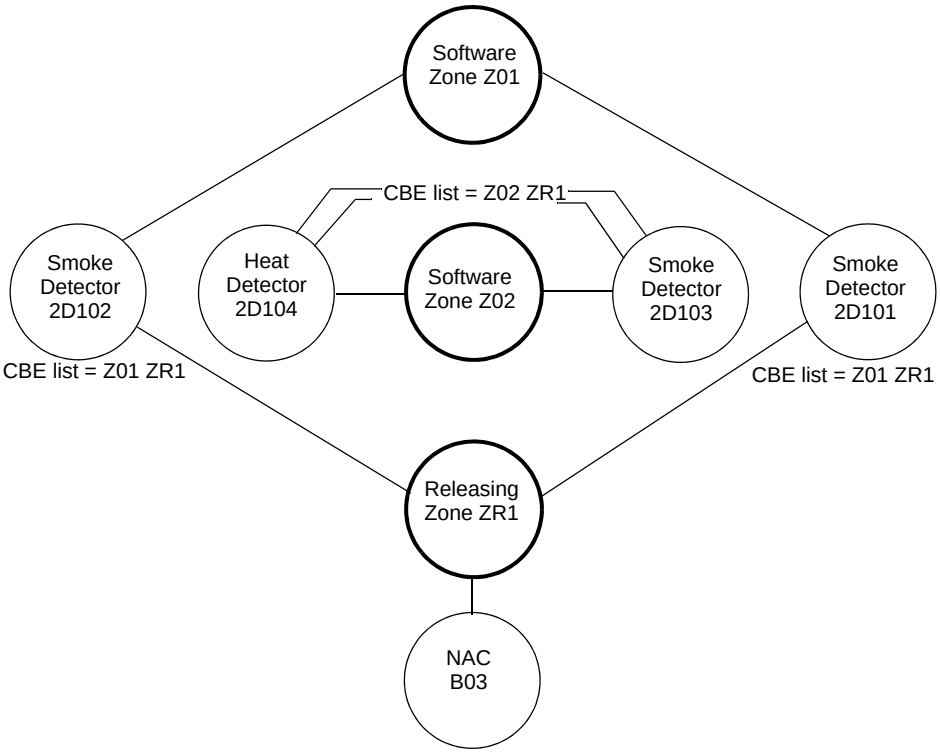


Figure A.2 Illustrated Example of Cross Zone Programming

Listing of each Cross Zone option and the conditions required to activate the Releasing Zone, according to the example shown in Figure A.2.

Cross Zone Selection (Cross=)	**Condition(s) Required to Activate the Releasing zone**
Cross=**N**	An alarm from any initiating devices activates the releasing circuit.
Cross=**Y**	An alarm from any two initiating devices activates the releasing circuit.
Cross=**Z**	An alarm from two initiating devices mapped to different Software Zones, but mapped to the same Releasing Zone. • An alarm from 2D101 and 2D103 – detectors mapped to different zones, but both list ZR1 in their CBE. • An alarm from 2D102 and 2D104 – detectors mapped to different zones, but both list ZR1 in their CBE. • An alarm from 2D101 and 2D104 – detectors mapped to different zones, but both list ZR1 in their CBE. • An alarm from 2D102 and 2D103 – detectors mapped to different zones, but both list ZR1 in their CBE.
Cross=**H**	Activation of heat detector 2D104 and one smoke detector (2D101, 2D102, or 2D103).

Table A.2 Example of Cross Zone Selections

A.3 Time, Date, and Holiday Functions

A.3.1 Overview

The control panel includes a real-time clock that displays the time-of-day, the date, and the day-of-week. The clock includes a lithium battery backup. Time displays in a USA format (12-hour time format with month/day/year) or a EUR (European) format as shown below:

```
TROUBL CONTROL        MODULE ADDR 1M159
                 OPEN   03:48P 011515 1M159
```

USA Time and Date format (default)

```
TROUBL CONTROL        MODULE ADDR 1M159
                 OPEN   15:48  150115 1M159
```

EUR Time and date format

Figure A.3 Sample USA and EUR Time/Date Formats

The control panel also provides Time Control zones F5 and F6 for time and date control functions and zone F7 for holiday functions.

A.3.2 How to View Time Control Selections

You can use the Read Status Entry option to view the current selection for the Time function. To do so, press the following keys in sequence:

Enter, 2 @, 0 ?, Enter, Z, F, 5 %, Enter

or

Enter, 2 @, 0 ?, Enter, Z, F, 6 :, Enter

NOTE: For instructions on programming the Time function, refer to the *NFS-320 Programming Manual.*

The LCD display shows the current selections for the Time Control function. The figure below shows a sample LCD display of a Time Control function:

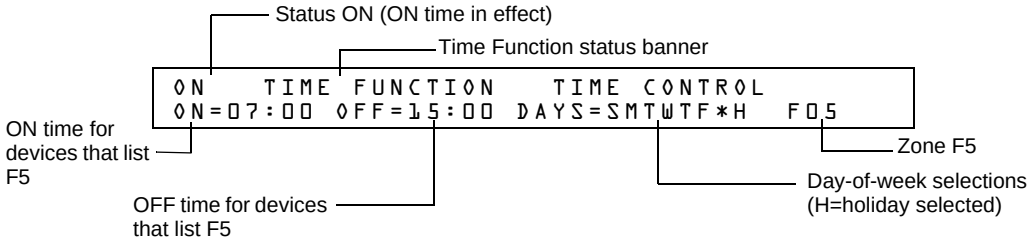


Figure A.4 Sample Read Status for Time Function

A.3.3 How to View Holiday Function Selections

You can use the Read Status Entry option to view the current selection for the Holiday function. To do so, press the following keys in sequence:

Enter 2 @ 0 ? Enter Z F 7 \ Enter

NOTE: For instructions on programming the Holiday function, refer to the *NFS-320 Programming Manual.*

The LCD display in Figure A.5 gives an example of an LCD display of a Holiday function:

Status ON (holiday function not in effect)
Holiday Function status banner

```
ON HOLIDAY FUNCTION 12/15 **/** **/**
**/** **/** **/** **/** **/** **/**
```

Holiday selections (for zone F7)

Figure A.5 Sample Read Status for Holiday Function

A.3.4 How Time Control and Holiday Functions Work

Time and Holiday activation occurs automatically and does not require operator intervention. All outputs with a CBE list containing F5 or F6 activate within the times specified for the days of the week listed in F5 or F6. All smoke detectors with a CBE list containing F5 or F6 switch to their lowest sensitivity (AL:9) within the times specified for the days of the week listed in ZF5 or ZF6. Refer to "Intelligent Sensing Applications" in the *NFS-320 Programming Manual* for details on setting detector sensitivity.

Time Control is active for all days of the week listed in F5 or F6. Holidays listed in F7 are excluded unless you list Holidays (H) in the day-of-week selection of F5 and F6 (shown in Figure A.4). Enter the time functions in a 24-hour format with the OFF time later than the ON time. After changing programming using Time Control, always reset the control panel.

NOTE: You can turn a NON FIRE control point on and off, by listing zone F5 or F6 in the CBE list of a control/relay module.

You can use Time Control zones F5 and F6 to program non-fire applications such as turning lights on and off, setting a thermostat, and so on. For example, you can program zones F5 and F6 to activate outputs at one time of day and deactivate outputs at later time, on specified days of a week. Table A.3 contains descriptions of additional Time Control applications:

Application	Requirement
Control day and night sensitivity of intelligent, addressable detectors	List zone F5 or F6 in the detector CBE. This automatically sets the detector sensitivity to the minimum setting (AL:9) during the day and automatically returns detector sensitivity to programmed sensitivity during the evening.
Control a specific date of year	Input up to nine date in the Holiday selection screen for Special Zone F7, then list zone F7 (Holiday) in the CBE of a device.

Table A.3 Time Control Applications

A.4 NAC Coding

A.4.1 Overview of Coding

A Coding selection is the Code Type that pulses when the control panel activates a NAC mapped to Special Zone F8. Special Zone F8 provides coding selections (see Table A.4) that you can list in the CBE of a NAC. To use a Code Type, program a NAC to list Zone F8 (reserved for a Code Type) in the NAC CBE list.

NOTE: Control modules (FCM-1, FRM-1) cannot be coded.

The table below contains descriptions of the signals that correspond to each NAC Code Type:

Coding Selection	Signal	Notes
March Time (default)	120 PPM (pulses Per minute)	Default selection for NACs mapped to F8.
Two-Stage	Alert signal (20 PPM) or General Alarm signal (Temporal pattern)	Alert signal – When an alarm occurs and not activated by another zone, the output pulses at 20 PPM. General Alarm signal – If not acknowledged within 5 minutes, the control panel switches from 20 PPM to Temporal pattern.
California	10 sec. On, 5 sec. Off, repeats	n/a
Temporal	0.5 on, 0.5 off, 0.5 on, 0.5 off, 0.5 on, 1.5 off, repeats	Used as a standard general EVAC signal.
Two-Stage Canada (3 minutes)	Alert signal (20 PPM) Drill Switch (Alarm Signal Mode for Canadian Applications) activation switches to Temporal pattern	Operates the same as Two-Stage except it wil only switch to second stage: • by activation of Drill Switch, or • the three minute timer expires, or • through a CBE event (General Alarm Z00 plus Zones 1-99 or Logic Zones 1-20) NOTE: In Canadian applications ACM-24AT control point is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage Timer. NOTE: For Canadian applications using Two-Stage with the ACPS-610, see the ACPS-610 manual for additional programming instructions.
Two-Stage Canada (5 minutes)	Alert signal (20 PPM) Drill Switch (Alarm Signal Mode for Canadian Applications) activation switches to Temporal pattern	Operates the same as Two-Stage except it wil only switch to second stage: • by activation of Drill Switch, or • the five minute timer expires, or • through a CBE event (General Alarm Z00 plus Zones 1-99 or Logic Zones 1-20) NOTE: In Canadian applications ACM-24AT control point is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage Timer. NOTE: For Canadian applications using Two-Stage with the ACPS-610, see the ACPS-610 manual for additional programming instructions.
Two-Stage Canada Manual	Alert signal (20 PPM) Drill Switch (Alarm Signal Mode for Canadian Applications) activation or CBE activation switches to Temporal pattern	Operates the same as Two-Stage except it wil only switch to second stage: • by activation of Drill Switch, or • through a CBE event (General Alarm Z00 plus Zones 1-99 or Logic Zones 1-20)
System Sensor Strobe		Synchronizes System Sensor ADA horn/strobes.
Gentex Strobe		Synchronizes Gentex horns/strobes.

Table A.4 F8 Code Types and Audio Signals

A.4.2 How to View Coding (F8) Selections

You can use the Read Status Entry option to view the current selection for the Coding function. To do so, press the following keys in sequence:

Enter, 2 @, 0 ?, Enter, Z, F, 8 ., Enter

NOTE: For instructions on programming the Coding function, refer to the *NFS-320 Programming Manual.*

The LCD display shows the current selections for the Code Type. Figure A.6 shows a sample LCD display of a Code Type selection of March Time:

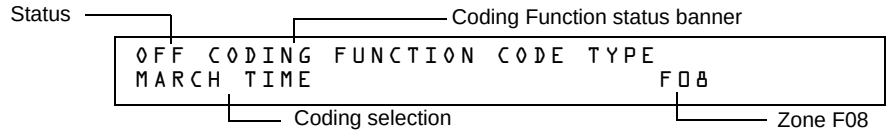


Figure A.6 Sample Read Status for Coding Function

A.4.3 How to Respond to an Alarm with Coding

If an alarm occurs with a Coding selection, the control panel latches the control panel in alarm and pulses outputs mapped to F8 at the pulse specified by the Coding selection (see Table A.4). To silence the outputs, press the SIGNAL SILENCE key.

A.5 Presignal and Positive Alarm Sequence (PAS) Operation

A.5.1 Overview

This section describes the Presignal and PAS selection, and provides instructions on how to do the following:

- View Presignal and PAS selections
- Respond to an alarm with Presignal
- Operate the control panel with a Presignal Delay Timer only
- Operate the control panel with a Presignal Delay Timer and PAS

A.5.2 What is Presignal and PAS?

Presignal is a feature that initially causes alarm signals to only sound in specific areas, monitored by qualified persons. This allows delay of the alarm from 60 to180 seconds after the start of alarm processing. The control panel Presignal feature provides two selections:

NOTE: Presignal differs from the Alarm Verification Timer which does not require human intervention.

- A Presignal Delay Timer (60-180 seconds) that delays activation of all outputs with a CBE that includes Special Zone F0.
- A PAS selection, in addition to the Presignal Delay Timer, that allows a 15-second time period for acknowledging an alarm signal from a fire detection/initiating device. If the alarm is not acknowledged within 15 seconds, all local and remote outputs activate immediately and automatically.

An illustration of Presignal and PAS timing.

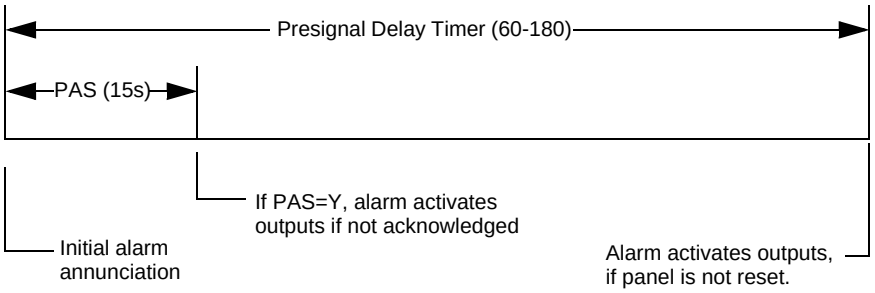


Figure A.7 Presignal and PAS Time

A.5.3 How to View Presignal and PAS Selections

You can use the Read Status Entry option to view the current selection for the Presignal function. To do so, press the keys in sequence:

Enter, 2 @, 0 ?, Enter, Z, F, 0 ?, Enter

NOTE: For instructions on programming the Presignal function, refer to the *NFS-320 Programming Manual.*

The LCD display shows the current selections for the Presignal function. The figure below shows a sample LCD display of a Presignal function selected for PAS and a Presignal Delay Timer of 60 seconds:

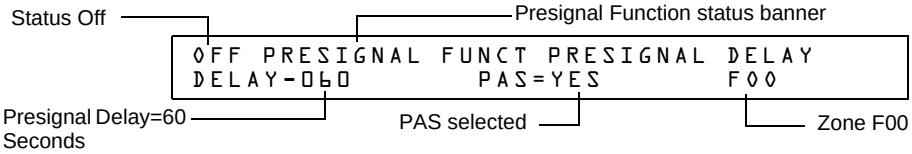


Figure A.8 Sample Read Status for Presignal Function

NOTE: If any monitor modules are programmed with a PAS INHIBIT Type Code and a fire alarm occurs, zone F0 goes false and aborts the Presignal Delay Timer.

A.5.4 How to Respond to an Alarm with Presignal Delay Timer (no PAS)

If an alarm occurs with a Presignal Delay Timer (60-180 seconds), the control panel displays the type of device and the SLC address of the device causing the alarm. If a second alarm occurs during the Presignal Delay Timer, the control panel aborts the Presignal Delay Timer and activates all programmed outputs. A sample Alarm screen for a monitor module is shown below:

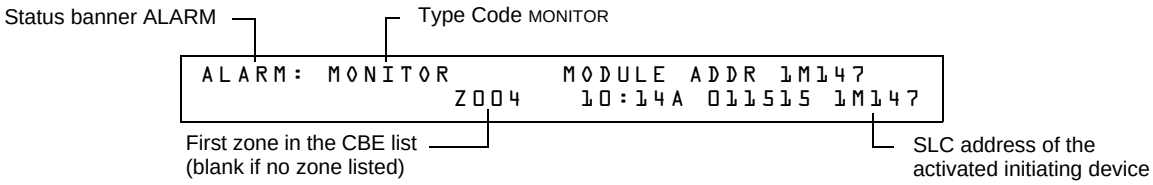


Figure A.9 Sample Alarm Display Screen

The FIRE ALARM LED flashes and the panel sounder pulses a steady tone. The control panel latches until the alarm is corrected and you press the SYSTEM RESET key to reset the control panel. You have the duration of the Presignal Delay Timer (60-180 seconds) to respond to the alarm before the control panel automatically activates all outputs programmed to F0. You can take the following actions:

- To silence the panel sounder and change the FIRE ALARM LED from flashing to steady, press the ACKNOWLEDGE/SCROLL DISPLAY key.
- To abort the Presignal Delay Timer, press the SYSTEM RESET key.
- To manually activate all outputs programmed to F0, press the DRILL key. The Manual Evacuate screen appears, the panel sounder pulses and the FIRE ALARM LED changes from flashing to steady. The Manual Evacuate screen and Alarm screen display alternately at 3-second intervals.

If the Presignal Delay Timer reaches its programmed value, without operator intervention, the control panel activates all outputs programmed to F0.

A.5.5 How to Respond to an Alarm with Presignal Delay Timer (PAS selected)

If an alarm occurs with a Presignal Delay Timer (60-180 seconds) and PAS selected, the control panel displays an Alarm screen that shows the type of device and the SLC address of the device causing the alarm. When an alarm comes from an initiating device with a CBE list that includes F0 (with PAS selected), the control panel delays the following outputs:

- System Alarm relay
- TM-4 Polarity Reversal Alarm output
- TM-4 Municipal Box output

NOTE: These outputs do not delay for Presignal operations without PAS selected.

If a second alarm occurs during the Presignal Delay Timer, the control panel aborts the Presignal Delay Timer and activates all programmed outputs.

A sample Alarm screen for a monitor module:

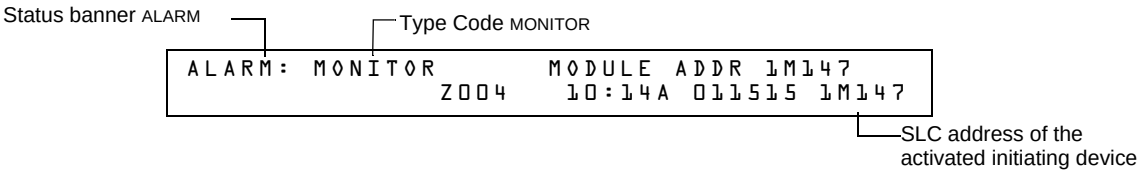


Figure A.10 Sample Alarm Display Screen

The FIRE ALARM LED flashes and the panel sounder pulses a steady tone. The control panel latches until the alarm is corrected and you press the SYSTEM RESET key to reset the control panel. You have 15 seconds to acknowledge the alarm or the control panel automatically activates all outputs programmed to F0. If you acknowledge the alarm within 15 seconds, the control panel increases the delay time to the full Presignal Delay Timer (60-180 seconds). You have the duration of the Presignal Delay Timer to respond to the alarm before the control panel activates all outputs programmed to F0. You can take the following actions:

- To increase the delay to the full programmed Presignal Delay Timer, press the ACKNOWLEDGE/SCROLL DISPLAY key. The panel sounder goes silent and the FIRE ALARM LED changes from flashing to steady.
- To abort the Presignal Delay Timer, press the SYSTEM RESET key.
- To manually activate all outputs programmed to F0, press the DRILL key. The Manual Evacuate screen appears, the panel sounder pulses and the FIRE ALARM LED changes from flashing to steady. The Manual Evacuate screen and Alarm screen display alternately at 3-second intervals.

If the Presignal Delay Timer reaches its programmed value, without operator intervention, the control panel activates all outputs programmed to F0.

Appendix B: Intelligent Detector Functions

NOTE: For instructions on selecting Intelligent Detector Functions, refer to the *NFS-320 Programming Manual*.

Descriptions for Intelligent Detector Functions

Function	Description
Analog Display	The control panel reads and displays analog information from the 318 analog detectors (159 per SLC). The display shows the sensed air at the detector as a percentage of the alarm threshold for each detector.
Sensitivity Adjust	Nine selections for manually setting intelligent detector alarm levels within the UL range. *If using ionization detectors in duct applications, set Sensitivity Adjust to Level 1.* Refer to the *NFS-320 Programming Manual* for detector sensitivity information.
Day/Night Sensitivity Operation	You can program the system to automatically force smoke detectors to minimum sensitivity during the day. Refer to “Time, Date, and Holiday Functions” on page 57.
Maintenance Alert	When compensation reaches the limit of the amount of drift compensation that can be safely applied, the control panel reports a trouble condition, according to National Fire Alarm Code standards. This condition also activates if the detector remains at very high or very low measured air levels for an extended time.
Automatic Test Operation	The control panel performs an automatic test of each detector every 256 minutes. Failure to meet the test limits causes an Auto Test Fail trouble.
Type Code Supervision	The control panel monitors hardware device Type Codes for each installed device at regular intervals (an interval can take up to 40 minutes for a full capacity system). If a mismatch of type compared to the program occurs, the control panel generates a point trouble labeled Invalid Type.
LED Control Operation	A global program selection to prevent detector LEDs from blinking as a result of polling during normal operation. A typical application is a sleeping area where a blinking light can distract people. As a standard function, independent of this programming selection, the control panel allows all LEDs to turn on in alarm.
Alarm Verification Timer and Verification Counter Operation	The control panel performs alarm verification on programmed intelligent smoke detectors. The Alarm Verification Timer is a global program selection of 0–240 seconds (ULC installations can not exceed 30 seconds/ Can not exceed 60 seconds for UL 864). Each detector includes a Verification Counter, which displays the number of times that a detector entered verification but did not time-out to alarm. The Verification Counter increments to 99 and holds.

Table B.1 Intelligent Detector Functions

Appendix C: Remote Terminal Access

C.1 General Description

The control panel can communicate with a remote terminal or computer connected to the EIA-232 PC/Terminal port. Refer to the *NFS-320 Installation Manual* for installation information.

NOTE: See the *NFS-320 Programming Manual* for instructions on enabling the CRT.

This port may be set up for interactive operation or for monitoring only. Interactive operation requires that all equipment be UL-listed under UL Standard for Safety UL 864 and be installed and set up as directed under Local Terminal Mode (LocT) or Local Monitor Mode (LocM).

ITE (Information Technology Equipment) equipment listed under UL 1950 is allowed for ancillary system monitoring when the system is installed and set up as directed under Remote Terminal Mode (RemT).

C.2 Operating Modes

The control panel provides three operating modes for the CPU EIA-232 PC/Terminal port:

- Local Terminal - LocT
- Local Monitor - LocM
- Remote Monitor - RemM

You select the operating mode during control panel programming (Global System Functions). For more information, refer to the *NFS-320 Programming Manual*.

The following subsections outline the functions, password requirements, and additional information for each operating mode.

C.2.1 Local Terminal Mode (LocT)

Functions, passwords, and special requirements of Local Terminal Mode (LocT) are:

Functions:	Read Status, Alter Status, and Control Functions (Table C.1).
Passwords:	User-defined password for Alter Status functions.
Requirements:	The terminal must be mounted in a UL 864 listed enclosure or positioned to provide equivalent protection against unauthorized use.

Functions available with the Local Terminal Mode:

Function	Lets you...
Read Status	• Display the status of an individual point (Detector, Module, or Zone). • Display a list of all the points in Alarm or trouble. • Display a list of all programmed points in the system. • Step through the History buffer event by event. • Display the entire History buffer.
Alter Status	• Disable/Enable an individual point. • Change the sensitivity of a detector. • Clear the verification counter of all detectors. • Clear the entire History buffer. • Set the Intelligent Sensing alert and action levels.

Table C.1 Local Terminal Mode Functions (1 of 2)

Function	Lets you...
Control Functions	• Acknowledge. • Signal Silence. • System Reset. • Drill.

Table C.1 Local Terminal Mode Functions (2 of 2)

C.2.2 Local Monitor Mode (LocM)

Functions, passwords, and special requirements of Local Monitor Mode (LocM) are:

Functions: Read Status, Alter Status, and Control Functions (Table C.2).

Passwords: User-defined password for Alter Status and Control functions.

Requirements: Password security feature for Control Functions eliminates the need for mounting the CRT-2 in an enclosure.

Functions available with the Local Monitor Mode:

Function	Lets you...
Read Status	• Display the status of an individual point (Detector, Module, or Zone). • Display a list of all the points in Alarm or trouble. • Display a list of all programmed points in the system. • Step through the History buffer event by event. • Display the entire History buffer.
Alter Status	• Disable/Enable an individual point. • Change the sensitivity of a detector. • Clear the verification counter of all detectors. • Clear the entire History buffer. • Set the Intelligent Sensing alert and action levels.
Control Functions	• Acknowledge • Signal Silence • System Reset • Drill

Table C.2 Local Monitor Mode Functions

C.2.3 Remote Terminal Mode (RemT)

Functions, passwords, and special requirements of Remote Terminal Mode (RemT) are:

Functions: Read Status only. See Table C.3.

Passwords: None

Requirements: Use with UL ITE-listed terminals, including personal computers with the VeriFire™ Tools or terminal emulation software. Intended for terminals connected through modems, including FSK modems connected through a public switched telephone network.

Functions available with the Remote Terminal Mode:

Functions	Lets you...
Read Status	• Display the status of an individual point (Detector, Module, or Zone). • Display a list of all the points in Alarm or trouble. • Display a list of all programmed points in the system. • Step through the History buffer event by event. • Display the entire History buffer.
Alter Status	• N/A
Control Functions	• N/A

Table C.3 Remote Terminal Mode Functions

C.3 Using the CRT-2 for Read Status

C.3.1 Overview

This section shows how to perform Read Status functions from a CRT-2.

NOTE: See the *NFS-320* Programming Manual for instructions on enabling the CRT port.

For more information see the “Read Status” section of this manual.

Function	Lets you...
Read Point	Read the status of any point in the system (detectors, modules, software zones, and system parameters).
Alm/Tbl Status	Display a list of all devices in the system that are in Alarm or trouble.
Read All Points	Display a list of all points programmed in the system. This list will display the status of all addressable detectors, modules, system parameters and software zones.
History Step	Step through the History buffer one event at a time.
History-All	Send the entire History buffer to the CRT, from the most recent event to the oldest event.

Table C.4 Read Status Functions

C.3.2 Accessing Read Status Options

Access the Read Status function from the CRT-2 by following these steps.

1. Turn on the CRT-2, which is connected to the control panel.
2. Press the Read Status function key. The control panel displays the “Read Status” menu options:

```
Rd Point=1, Rd Alm/Tbl=2, All Points=3, Hist:Step=4/All=5, Ala-Hist:Step=6/All=7
```

From the Read Status menu, you can select options 1-7.

C.3.3 Read Point

From the Read Status menu, select option **1** - Read Point. The CRT-2 displays the following:

Press <**1**> <**ENTER**>

```
Type D(nnn), (n)M(nnn), Z(nn), F(n),, R(n), Ex, Lx or S(n) then hit Enter
```

Address)01-159)

Number

Enter the following:.

NOTE: Press **F5** to scroll forward through a list of devices. Press **F6** to scroll back through a list of devices.

1. Enter the first letter of the device, using upper case letters.
   - Detector = “D”
   - Module = “M”
   - Zone = “Z”
   - Special Function = “F”
   - Releasing Zone = “R”
   - E Zone = “E”
   - L Zone = “L”
   - System Parameter = “S”
2. Enter the address or number of the device.
3. Press “ENTER”.

Example Read points for detectors 1D001 and 1D002 on SLC 1:

Press <**D**> <**0**> <**0**> <**1**> <**ENTER**>

```
NORMAL SMOKE (PHOTO) INTENSIVE CARE UNIT NURSE LOUNGE  Z050  020%AB 6 CV30 1D001
```

Press <**NEXT**>

```
NORMAL SMOKE (PHOTO) DETECTOR ADR 1D002               Z002  000%AB 6 **   1D002
```

C.3.4 Display Devices in Alarm or Trouble

From the “Read Status” menu, select option **2** - Read Alarms/Troubles. The CRT-2 will display the alarm and trouble history.
The semicolon, a control character in networking applications, separates the hour and minute of events displayed from history. If events display as they occur, a colon separates the hour and minute.

Press <**2**> <**ENTER**>

```
TROUBL SMOKE(PHOTO) DETECTOR ADDR 1D003            INVREP 01;09P 041615 1D003
TROUBL SMOKE (ION)  DETECTOR ADDR 1D004            INVREP 01;09P 041615 1D004
TROUBL HEAT(FIXED)  DETECTOR ADDR 1D006            INVREP 01;09P 041615 1D006
TROUBL MONITOR      MODULE ADDR 1M041              INVREP 01;09P 041615 1M041
TROUBL IN SYSTEM     GROUND FAULT                         01;09P 041615 Wed
TROUBL IN SYSTEM     BATTERY                              01;09P 041615 Wed
```

C.3.5 Display All Programmed Points

From the "Read Status" menu, select option **3** - Read All Points. The CRT-2 displays a list of the status of all addressable detectors, modules, system parameters and software zones:

Press <**3**> <**ENTER**>

```
NORMAL SMOKE(PHOTO) DETECTOR ADDR 1D002              Z003   000%AB B **   1D002
NORMAL SMOKE (ION)  DETECTOR ADDR 1D003              Z002   020%A6 6 **   1D003
NORMAL HEAT(FIXED)  DETECTOR ADDR 1D006              Z001   050%      *   1D006
NORMAL SMOKE(LASER) DETECTOR ADDR 1D099              Z004   000%A6 6 *V00 1D099
OFF    RELEASE CKT  MODULE ADDR 1M001                ZR00             I**  1M001
NORMAL MONITOR      MODULE ADDR 1M001                ZR00             I**  1M001
OFF    RELAY        MODULE ADDR 1M033                Z000             *FW  1M033
OFF    SOFTWARE ZONE Zone 01                                              Z01
```

C.3.6 Step-through History

From the "Read Status" menu, select option **4** - History-Step. This option lets you step through all history events one event at a time. Step through the history list one event at a time by pressing the Next **F5** or Prior **F6** function keys.

C.3.7 View All History

From the "Read Status" menu, select option **5** - History ALL. The entire history of events will display on the screen.

C.3.8 Step-through Alarm History

From the "Read Status" menu, select option **6** - Alarm-History:Step. This option lets you step through the panel's alarm history one event at a time by pressing the Next **F5** or Prior **F6** function keys.

C.3.9 View All Alarm History

From the "Read Status" menu select option **7** - Alarm History All. This entire history of alarm events will display on the screen, from most recent to oldest event.

Press <**7**> <**ENTER**>

```
************************  ALARM HISTORY START ************************************
ALARM: MAN_RELEASE MODULE ADDR 1M065                    10:21A 011515 1M065
ALARM: MAN_RELEASE MODULE ADDR 1M065                    10:19A 011515 1M065
ALARM: MAN_RELEASE MODULE ADDR 1M065                    03:20P 011515 1M065
ALARM: SMOKE (ION) DETECTOR ADDR 1D129                  03:20P 011515 1M065
```

C.4 Using the CRT-2 for Alter Status

C.4.1 Overview

This section shows how to Alter Status functions from a CRT-2.

NOTE: The panel must be in Local Terminal Mode (LocT) or Local Monitor Mode (LocM).

NOTE: See the *NFS-320 Programming Manual* for instructions on enabling the CRT port.

Function	Lets you...
Disable	Enable or disable detectors or modules.
Alarm/Pre-Alarm	Change the Alarm and Pre-Alarm levels of any addressable detector in the system.
Clear Verification	Clear the verification counter for all the addressable detectors in the system.
Clear History	Clear the contents of the History buffer.
Set Action/Alert	Set the Pre-Alarm for Alert or Action.

Table C.5 Alter Status Functions

C.4.2 Accessing Alter Status Options

Access **Alter Status** function from the CRT-2 by following these steps.

1. Turn on the CRT-2 connected to the control panel.
2. Press the Alter Status function key. The control panel displays the Password screen.

Press <**ALTER STATUS**>

```
Enter Status CHange Password or Escape to Abort
```

3. Enter the Status Change Password. The factory default Status Change Password is 11111.The password does not display on the CRT-2. Five asterisks will appear in place of the password.

Press <**1**><**1**><**1**><**1**><**1**><**ENTER**>

```
*****
```

The Alter Status Options menu appears.

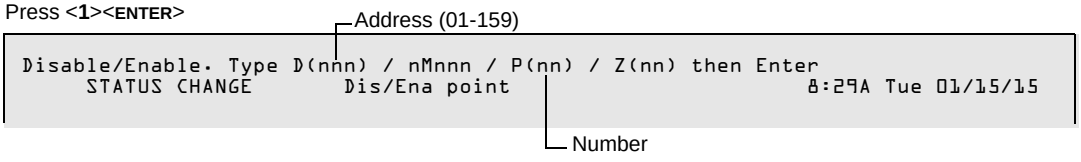
```
1=Disable 2=Alarm/Prealarm 3=Clear Verification 4=Clear History 5=Alert/Action
```

From the Alter Status Options menu, you can select **1**-**5**.

C.4.3 Enable or Disable Detectors, Modules or Zones

From the “Alter Status” menu select option **1** - Disable. Disable lets you enable or disable detectors, modules, or zones.

Press <**1**><**ENTER**>



Enter the following:

1. Enter the first letter to read one of the following, using upper case letters:
2. Detector = **D**
   Module = **M**
   NAC **= P**
   Zone - **Z**
3. Enter the address or number of the device.
4. Press ENTER and a display similar to the following will appear.

EXAMPLE Disable Detector address 101 on SLC1:

Press <**D**><**1**><**0**><**1**><**ENTER**>

```
D101 Now Enabled, Enter E(Enable) / D(Disable) or Esc. to Abort
```

Press **D** to Disable (**E** to Enable); then press ENTER.

Press <**D**><**ENTER**>

```
Device now disabled
TROUBL SMOKE(PHOTO) DETECTOR ADDR 101 Z03 DEVICE DISABLED 08:29A Tue 01/15/15 D101
```

C.4.4 Change Alarm and Pre-Alarm Levels

This option lets you change the Alarm and Pre-alarm levels of any addressable detector in the system. Follow these steps.

1. From the "Alter Status" menu select option **2** - Alarm/Pre-alarm.

Press <**2**><**ENTER**>

```
Det. Alarm/Prealarm level, type address D(
TROUBL SMOKE(PHOTO) DETECTOR ADDR 101 Z03 DEVICE DISABLED 08:29A Tue 01/15/15 D101
```

2. Enter the address of the detector you wish to change. For example, change alarm and pre-alarm levels for detector 102 on SLC 1 to Alarm Level 4 & Pre-alarm Level 2.

Press <**D**><**1**><**0**><**2**><**ENTER**><**A**><**5**><**P**><**2**><**ENTER**>

```
STATUS CHANGE   Alarm/Prealarm level                  08:29A Tue 01/15/15
D102 sens. at level 5, Prealarm at level 3, Enter AxPx to change, Esc. to Abort
D102 now set at new Alarm level 5 and new Pre-alarm level 2
```

C.4.5 Clear Verification Counter

Clear verification lets you clear the verification counter for all the addressable detectors in the system.

Press <**3**><**ENTER**>

```
STATUS CHANGE   Clear verify count                   08:29A Tue 01/15/15
```

C.4.6 Clear the Entire History Buffer

Clear History lets you clear the entire History buffer.

Press <**4**><**ENTER**>

```
***************History Clear*************************
```

C.4.7 Set the Pre-Alarm for Alert or Action

Set Action/Alert lets you set the Pre-alarm for Alert or Action. For example, change Pre-alarm from “Alert” to “Action” as follows:

Press <**5**><**ENTER**>

```
Set Pre-alarm Alert (N0)/Action(YES). Type N or Y then Enter
     STATUS CHANGE   Change Alert/Action                    08:29A Tue 01/15/15
```

Press <**Y**><**ENTER**>

```
Pre-alarm now set for ACTI0N
```

Appendix D: Point and System Troubles Lists

There are a variety of point or system trouble types that may appear in a trouble message. The tables below give lists of the troubles and indications of their cause.

D.1 Point (Device) Troubles

A message from the "Trouble Type" column in the following table will appear in the upper right corner of the panel display when a point (device) trouble occurs. Use this table to help determine what the trouble is.

POINT TROUBLES		
TROUBLE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
AC FAILURE	The auxiliary power supply has lost AC power.	Determine whether there is an AC power loss or whether the power supply and wiring is correct.
ADRFLT	Detector and new sounder base address doesn't match. Or the ACPS address is incorrect.	Readdress the incorrect device.
ALIGN	A beam detector is in configuration mode.	No action is necessary, as the trouble will clear when the configuration is complete. However, the detector will not detect a fire while this trouble exists.
BLOCK	Something has come between the detector's beam and its reflector.	Investigate and clear the blockage.
CHGFLT*	The power supply's battery charger is not working properly.	Correct the fault.
CO 6MN	The CO (carbon monoxide) detection element on the detector has six months left to expiration. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error.)	Replace the detector.
CO EXP	The CO (carbon monoxide) detection element on the detector has reached the expiration date. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error.)	Replace the detector.
CO TBL	The CO element on the detector is not working properly. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error.)	Replace the detector.
DIRTY 1	The detector is dirty and needs cleaning	Clean the detector.
DIRTY 2	The detector requires cleaning immediately. It is a false alarm risk.	Clean the detector immediately.
DISABL	The point has been disabled.	Service and re-enable the point.
DUAL ADDRESS	There is more than one device of a single type (detector or module) with the same SLC address. A detector and a module can share the same address on an SLC, but two detectors, or two modules, can not. Not that some addressable devices (e.g. certain power supplies and RFXs) may not appear to be detectors or modules, but are addressed on the SLC as such.	Readdress the incorrect device.
GNDFLT	There is a ground fault on the main or auxiliary power supply.	Correct the fault.
HI BAT	The auxiliary power supply's battery charge is too high.	Check the batteries for problems. Replace batteries if necessary.
INVREP	The device has returned a response to the panel that the panel did not expect.	Check the device for functionality, addressing and wiring.
IR TBL	The infrared element is not working properly on the detector. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error.)	Replace the detector.
LO BAT	The auxiliary power supply's battery is low.	Check the batteries for problems. Replace batteries if necessary.
LO TEMP	The temperature read by a Heat+ or Acclimate™+ detector is too low.	Raise the heat in the area of the detector.
LO VAL	The detector chamber reading is too low; the detector is not operating properly. Or (CLIP Mode only) the thermistors, CO element, or infra-red element on the detector is not working properly, or they are experiencing a freeze warning.	The detector must be removed and replaced by an authorized service representative.
NO ANS	The device (module or detector) is not responding to the poll. Either the device is not working or it is not connected properly.	Determine whether the device is functional, and connected and addressed properly on the SLC.
NO SIG	The device (module or detector) is not responding to the poll. Either the device is not working or it is not connected properly.	Determine whether the device is functional, and connected and addressed properly on the SLC.
OPEN	The module device has an open circuit on its supervised wiring.	Check the connections from the module to the input or output device to which it is wired.
PRLOSS	The output module or new sounder base lost power.	Turn power back on.
PSFAIL	The power supply is not working properly.	Check the battery for problems. Replace battery if necessary.

Table D.1 Point (Device) Troubles (1 of 2)

POINT TROUBLES		
TROUBLE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
SHORT	The module device has a short circuit on its supervised wiring.	Check the connections from the module to the input or output device to which it is wired.
TEST F	This detector has failed the FACP's periodic detector test for alarm capabilities.	The detector should be removed and replaced by an authorized service representative.
*This trouble may be fire panel or backup battery related. Test and replace backup batteries if necessary.		
THERM	The thermistors are not functioning properly on the detector. (This trouble generates in FlashScan mode only. CLIP mode will generate a LO VAL error.)	Replace the detector.
VER HI	This detector, which has been programmed to participate in alarm verification, has gone into and come out of verification its programmed limit without going into alarm. Either something is wrong with the detector or there is a condition nearby (such as someone smoking) that causes it to go into verification frequently.	Check the detector and the conditions nearby to determine the problem.

Table D.1 Point (Device) Troubles (2 of 2)

D.2 System Troubles

A message from the "Trouble Type" column in the following table will appear in the panel display when a system trouble occurs. Use this table to help determine the cause of the trouble.

SYSTEM TROUBLES		
TROUBLE MESSAGE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
AC FAIL	The main power supply has lost AC power.	Determine whether there is an AC power loss or whether the power supply and wiring is correct.
ADV WALK TEST	There is an Advanced Walk Test in progress.	No action is required.
ANNUN x NO ANSWER	The annunciator at address x is not responding.	Determine whether the device is functional, and connected and addressed properly.
ANNUN x TROUBLE	The annunciator at address x is in trouble.	Determine if the ACS module is functional, correctly installed, and configured properly.
AUXILIARY TROUBLE	An auxiliary device connected to the NFS-320 at J6 is in trouble or the cable is missing.	Check the wiring and source.
BASIC WALK TEST	A Basic Walk Test is in progress.	No action is required.
BATTERY	The main power supply's battery charge is too high or too low.	Check batteries, replace if necessary.
BAT.BACKUP RAM	RAM battery backup is low.	Replace battery.
CHARGER FAIL*	The main power supply's battery charger is not working properly.	Correct the fault.
CORRUPT LOGIC EQUAT	The database that houses the panel's logic equations is corrupt. It must be re-downloaded, or all programming must be cleared and re-entered.	The database must be re-downloaded, or all programming must be cleared and re-entered.
DRILL ACTIVATED	Drill has been initiated.	No action is required.
EPROM ERROR	The application and/or boot code is corrupt.	Service is required.
EXCEEDED CONN. LIMIT	More than two panels have been connected to a high-speed network communications module.	Remove extra panel(s).
EXTERNAL RAM ERROR	The external RAM test failed.	Service is required.
GROUND FAULT	A ground fault has occurred within the panel.	Locate the ground fault and repair.
GROUND FAULT LOOP x	There is a ground fault on loop x.	Locate the ground fault and repair.
HS-NCM SNIFFER ACTIV	The HS-NCM is in a diagnostic mode.	No action is required.
INTERNAL RAM ERROR	The internal RAM test failed.	Service is required.
LCD80 SUPERVISORY	Communication has been lost with theLCD-80.	Check connections to the LCD-80 Annunciator.
LOADING.NO SERVICE	A program or database download is in progress. The panel is NOT providing fire protection during the download. P	Proper authorities should be notified while a download is in progress so that other means of fire protection can be supplied.
MASTER BOX TROUBLE	A TM-4 connected to a municipal box is in trouble.	Reset the master box.
MASTER BOX NO ANSWER	A TM-4 connected to a municipal box is not responding.	Determine whether the device is functional and connected properly.

Table D.2 System Troubles

SYSTEM TROUBLES		
TROUBLE MESSAGE TYPE	**TROUBLE DESCRIPTION**	**ACTION**
*This trouble may be fire panel or backup battery related. Test and replace backup batteries if necessary.		
NCM COMM FAILURE	Communication is lost between the NFS-320 and the network communications module.	Check to see if the NUP cable is properly installed and the network communications module is functional.
NETWORK FAIL PORT x	Communication lost between NCM Port x and corresponding node.	Check wiring and verify the node is online.
NETWORK INCOMPATIBLE	The brand of this panel is incompatible with this network.	Verify all nodes are branded for the same OEM.
NFPA 24HR REMINDER	This message occurs every day at 11 am if any troubles exist.	Resolve any troubles on the system.
NO DEV. INST ON L1	No devices are installed on the system.	Install SLC and run autoprogram.
PANEL DOOR OPEN	The panel door is open.	Close door.
POWER SUPPLY COMM FAIL	There has been a communication failure with the power supply.	Service is required.
PROGRAM CORRUPTED	The database that houses the panel's programming is corrupt.	The database must be re-downloaded, or all programming must be cleared and re-entered. Service is required.
PROGRAM MODE ACTIVATED	A user is currently accessing the panel's programming menus.	No action is required / Exit the Programming mode.
RELEASE DEV. DISABLE	Releasing devices have been disabled.	Enable the devices.
SELF TEST FAILED	Diagnostic test failed.	Call Technical Services.
STYLE 6 POS. LOOP x	There is an open circuit on the positive side of loop x. Style 6 and Style 7 are supervised methods of communicating with addressable devices. If the control panel detects a trouble (open), it will drive both ends of the loop, maintaining communication in an unsupervised method. The latching trouble will display on the panel as a Style 6 trouble until you correct the condition and press RESET. Style 7 configuration of the SLC requires the use of ISO-X modules.	
STYLE 6 NEG. LOOP x	There is an open circuit on the negative side of loop x. Style 6 and Style 7 are supervised methods of communicating with addressable devices. If the control panel detects a trouble (open), it will drive both ends of the loop, maintaining communication in an unsupervised method. The latching trouble will display on the panel as a Style 6 trouble until you correct the condition and press RESET. Style 7 configuration of the SLC requires the use of ISO-X modules.	
STYLE 6 SHORT LOOP x	Style 6 and Style 7 are supervised methods of communicating with addressable devices. If the control panel detects a trouble (open or short), it will drive both ends of the loop, maintaining communication in an unsupervised method. The latching trouble will display on the panel as a Style 6 trouble until you correct the condition and press RESET. Style 7 configuration of the SLC requires the use of ISO-X modules.	
SYS INITIALIZATION	The devices are initializing.	No action is required, as the trouble will clear when initialization is completed. However, the devices will not report off-normal events while this trouble exists.
TERMINAL SUPERVISORY	There is a communication error with the CRT-2.	Check connections to the CRT-2 terminal.
UDACT NO ANSWER	The UDACT or UDACT-2 is not responding.	Determine whether the UDACT/UDACT-2 is functional, and connected and addressed properly.
UDACT TROUBLE	The UDACT or UDACT-2 is in trouble.	Determine if the UDACT/UDACT-2 is functional and wired correctly.

Table D.2 System Troubles

NOTE: A charger fail trouble can be charger or battery related. Batteries near the end of their service life may not accept the periodic charge current required by UL 864 Ninth edition, and can result in the panel displaying a charger fail. Batteries should be tested and replaced as necessary before repairing or replacing the panel.

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Manufacturer Warranties and Limitation of Liability

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ISO 9001
CERTIFIED
ENGINEERING & MANUFACTURING
QUALITY SYSTEMS

Installation Instructions

Explosion Proof, Weather Proof - Manual stations

This product is a high quality initiating device suitable for use in hazardous areas including outdoor applications. It is important to read all information pertaining to this device and its application.

Electrical Rating:

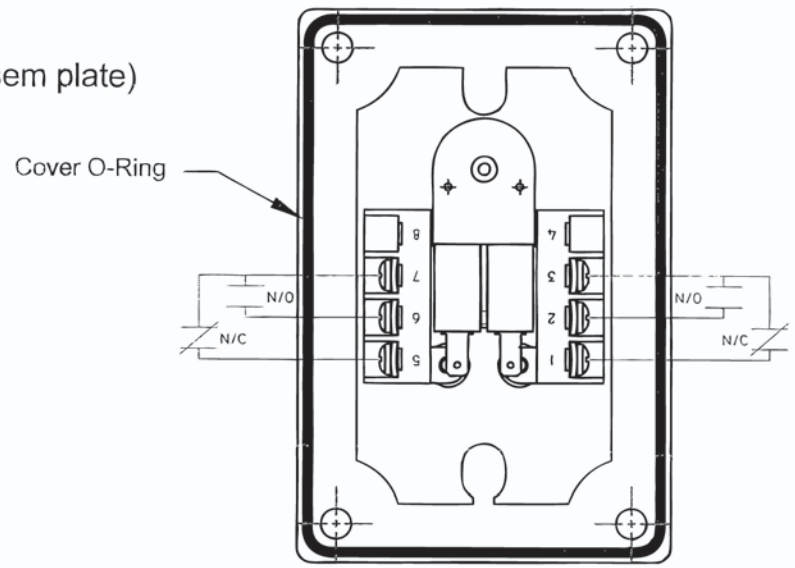
Contacts:	D.P.D.T.
Contact Rating:	10 amps @125/250 VAC
Wire awg:	14 to 22 AWG
Wiring Hookup:	Terminal block (#6-32 w/sem plate)

UL Rating:

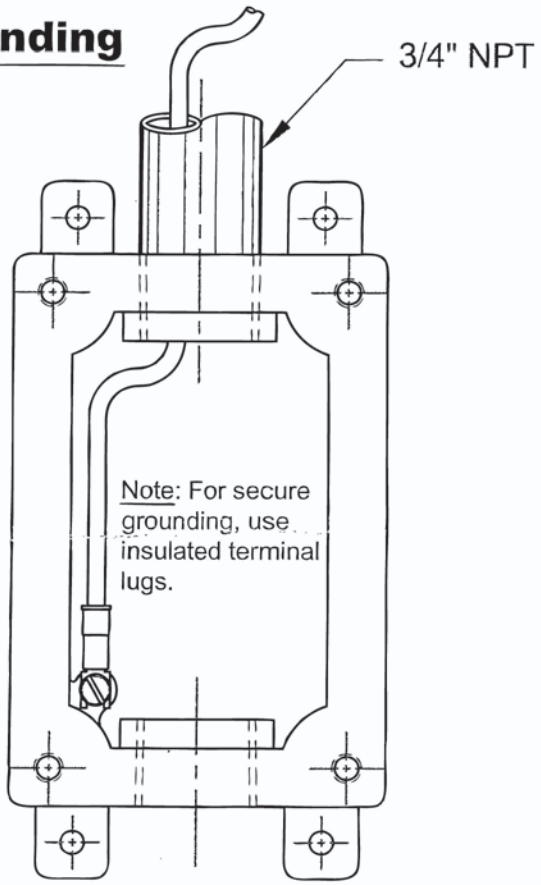
Class	Group
I	B,C,D.
II	E,F,G.
III	

Type 4X (out door)

Terminal Block Layout

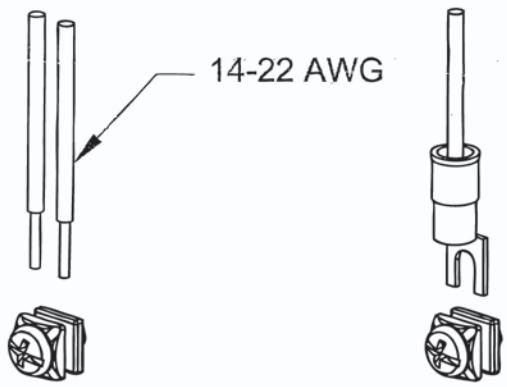


Grounding

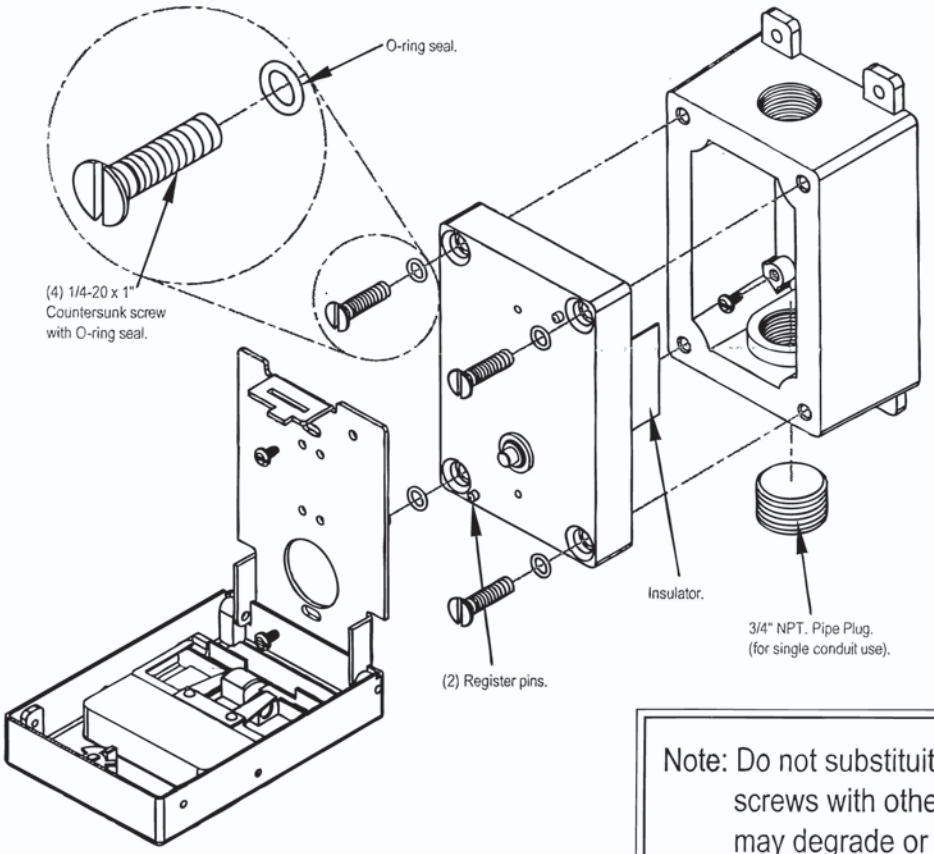


Wiring Hookup:

Method - A **Method - B**



BASIC ASSEMBLY



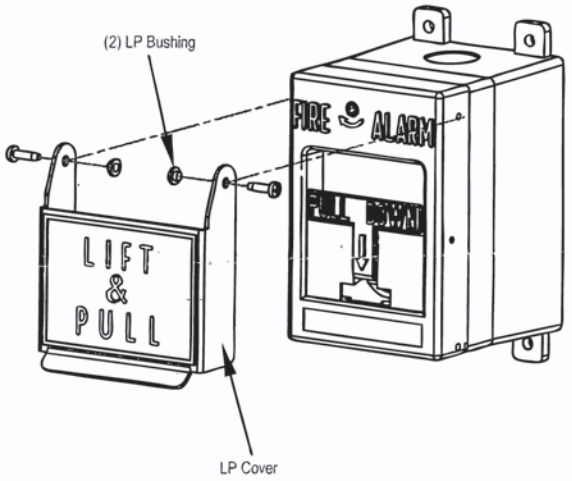
BEFORE CLOSING ASSEMBLY

1. Make sure that mating surfaces are clean and free of debris.
2. Inspect to assure all O-ring seals are in their place. If not, carefully reinstall making sure of proper fit.
3. Squeeze insulator inward and slip cover assembly over back box making sureinsulator are inside back box.
4. Before tightening assembly - check to make sure of proper seating.

Note: Do not substituite O-rings or cover screws with other hardware,as this may degrade or produce failure of device. (Replacement seals and extra hardware are upon request).

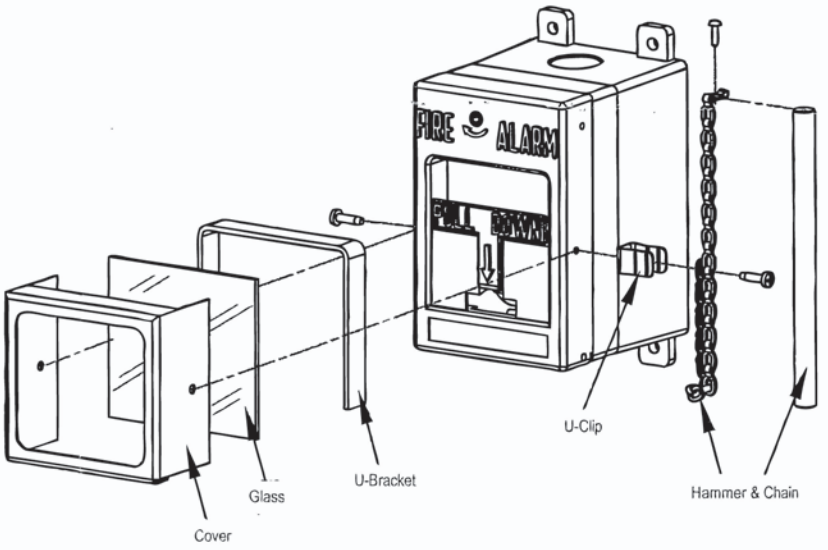
INSTALLING OPTION - LP

(Lift & Pull Dual action)



INSTALLING OPTION - DAH

(Break glass adaptor - Dual action)



INSTALLATION AND MAINTENANCE INSTRUCTIONS

Selectable Output Horn Strobes, Chime Strobes and Strobes – Ceiling Mount

SYSTEM SENSOR®
3825 Ohio Avenue, St. Charles, Illinois 60174
800/736-7672, FAX: 630/377-6495
www.systemsensor.com

For use with the following models:
Ceiling Mount Horn Strobes: PC2RL, PC2WL
Ceiling Mount Chime Strobes: CHSCRL, CHSCWL
Ceiling Mount Strobes: SCRL, SCWL, SCWL-CLR-ALERT

PRODUCT SPECIFICATIONS	
Standard Operating Temperature:	32°F to 120°F (0°C to 49°C)
Humidity Range:	10 to 93% Non-condensing
Strobe Flash Rate	1 flash per second
Nominal Voltage:	Regulated 12VDC or regulated 24DC/FWR
Operating Voltage Range:	8 to 17.5V (12V nominal) or 16 to 33V (24V nominal)
Operating Voltage with MDL3 Sync Module:	8.5 to 17.5V (12V nominal) or 16.5 to 33V (24V nominal)
Input terminal wire gauge:	12 to 18 AWG

DIMENSIONS FOR PRODUCTS AND ACCESSORIES		
CEILING PRODUCTS	Diameter	Depth
Strobe, Chime Strobe and Horn Strobe	6.83" (173.5mm)	2.47" (62.7mm)
Strobe, Chime Strobe, and Horn Strobe with SBBCRL/WL Surface Mount Back Box	6.92" (175.8mm)	2.50" (63.5mm)

MOUNTING BOX OPTIONS
2-Wire Indoor Products
4" x 4" x 1½", Single Gang, Double Gang, 4" Octagon, SBBCRL/WL (ceiling)

NOTICE: This manual shall be left with the owner/user of this equipment.

BEFORE INSTALLING

Please read the System Sensor Audible Visible Application Reference Guide, which provides detailed information on notification devices, wiring and special applications. Copies of this manual are available from System Sensor. NFPA 72 and NEMA guidelines should be observed.

Important: The notification appliance used must be tested and maintained following NFPA 72 requirements.

GENERAL DESCRIPTION

System Sensor series of notification appliances offer a wide range of audible and visible devices for life safety notification. Our 2-wire horn strobes, chime strobes and strobes come with 8 field selectable tone and volume combinations and 7 field selectable candela settings. Intended for indoor applications and approved for ceiling mount installations.

2-wire horn strobes and strobes are public mode notification appliances intended to alert occupants of a life safety event. The 2-wire chime strobe is a private mode notification appliance. The horn is listed to ANSI/UL 464 requirements (public mode) and the strobe is listed to ANSI/UL 1638 (public mode). 2-wire chime strobe is a private mode notification appliances intended to alert trained personnel to investigate a life safety event and take appropriate actions. The chime portion of the chime strobe is listed to ANSI/UL 464 (private mode) and the strobe portion is listed to ANSI/UL 1638 (private mode).

System Sensor strobes are designed to be used in 12 VDC, 24VDC, or 24V FWR (full wave rectified) systems. System Sensor AV devices can be activated by a compatible fire alarm control panel or power supply. Refer to the appropriate fire alarm control panel manufacturer or power supply for more information.

System Sensor ceiling 2-wire horn strobes, 2-wire chime strobes, and strobes are electrically backward compatible with the previous generation, since 1996, of notification appliances. They come enabled with System Sensor synchronization protocol which requires connections to a power supply capable of generating the System Sensor synchronization pulses, a FACP NAC output configured to System Sensor synchronization protocol, or the use of MDL3 module to generate the synchronization protocol.

FIRE ALARM SYSTEM CONSIDERATIONS

The National Fire Alarm and Signaling Code, NFPA 72, requires that all notification appliances, used for building evacuation installed after July 1, 1996, produce temporal coded signals. Signals other than those used for evacuation purposes do not have to produce the temporal coded signal. System Sensor recommends spacing notification appliances in compliance with NFPA 72.

SYSTEM DESIGN

The system designer must make sure that the total current draw by the devices on the loop does not exceed the current capability of the panel supply, and that the last device on the circuit is operated within its rated voltage. The current draw information for making these calculations can be found in the tables within the manual. For convenience and accuracy, use the voltage drop calculator on the System Sensor website (www.systemsensor.com).

When calculating the voltage available to the last device, it is necessary to consider the voltage due to the resistance of the wire. The thicker the wire, the smaller the voltage drop. Wire resistance tables can be obtained from electrical handbooks. Note that if Class A wiring is installed, the wire length may be up to twice as long as it would be for circuits that are not fault tolerant. The total number of strobes on a single NAC must not exceed 69 for 24 volt applications.

AVAILABLE TONES

System Sensor offers a wide variety of tones for your life safety needs, including temporal 3 pattern (½ second on, ½ second off, ½ second on, ½ second off, ½ second on, 1½ off and repeat) which is specified by ANSI and NFPA 72 for standard emergency evacuation signaling.

To select the tone, turn the rotary switch on the back of the product to the desired setting. (See Figure 1.) Available horn settings can be found in Table 1. Available chime settings can be found in Table 2.

AVAILABLE CANDELA SETTINGS

System Sensor offers a wide range of candela settings for your life safety needs. In order to select your candela output, adjust the slide switch on the rear of the product to the desired candela setting on the selector switch. (See Figure 2.)

The candela setting can also be verified by looking into the small window on the front of the unit. See Table 3 for candela settings for ceiling products. All products meet the light output profiles specified in the appropriate UL Standards. (See Figures 3 to 5.)

FIGURE 1. AUDIO SELECTOR

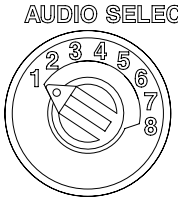


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FIGURE 2. CANDELA SELECTOR

A0486-00

TABLE 1. HORN TONES

Pos	Tone	Volume Setting
1	Temporal	High
2	Temporal	Low
3	Non-Temporal	High
4	Non-Temporal	Low
5	3.1 KHz Temporal	High
6	3.1 KHz Temporal	Low
7	3.1 KHz Non-Temporal	High
8	3.1 KHz Non-Temporal	Low

TABLE 2. CHIME TONES

Pos	Tone	Volume Setting
1	1 Second Chime	High
2	1 Second Chime	Low
3	1/4 Second Chime	High
4	1/4 Second Chime	Low
5	Temporal Chime	High
6	Temporal Chime	Low
7	5 Second Whoop	High
8	5 Second Whoop	Low

TABLE 3. CEILING-MOUNT STROBE CURRENT DRAW (mA)

Candela	8-17.5 Volts	16-33 Volts	
	DC	DC	FWR
15	87	41	60
30	153	63	86
75	-	111	142
95	-	134	164
115	-	158	191
150	-	189	228
177	-	226	264

NOTE: Products set at 15 and 30 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12V DC operation when set to any other candela settings.

CURRENT DRAW AND AUDIBILITY RATINGS

For the horn strobe, the current draw and audibility ratings for each setting is listed in Table 4. For the chime strobe, the current draw and audibility ratings for each setting is listed in Table 5. For the strobe, the current draw for each setting is listed in Table 3.

FIGURE 3. LIGHT OUTPUT - VERTICAL DISPERSION, CEILING TO WALLS TO FLOOR

Degrees*	Percent of Rating
0	100
5-25	90
30-45	75
50	55
60	45
65	35
70	35
75	30
80	30
85	25
90	25

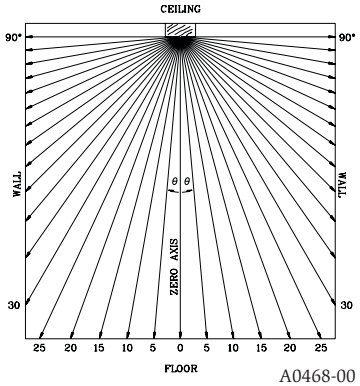

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FIGURE 4. LIGHT OUTPUT – HORIZONTAL DISPERSION

Degrees*	Percent of Rating
0	100
5-25	90
30-45	75
50	55
55	45
60	40
65	35
70	35
75	30
80	30
85	25
90	25
Compound 45 to the left	24
Compound 45 to the right	24

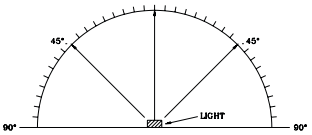

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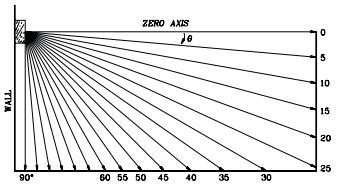
FIGURE 5. VERTICAL DISPERSION, WALL TO FLOOR

Degrees*	Percent of Rating
0	100
5-30	90
35	65
40	46
45	34
50	27
55	22
60	18
65	16
70	15
75	13
80	12
85	12
90	12



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*Tolerance of ±1 degree is permitted.

TABLE 4. CEILING--MOUNT HORN STROBE CURRENT DRAW (mA) AND SOUND OUTPUT (dBA)

			Current draw (mA)																Sound Output (dBA)		
Pos	Tone	Volume Setting	8-17.5 VDC		16-33 VDC							16-33 FWR							8-17.5 V	16-33 V	
			15	30	15	30	75	95	115	150	177	15	30	75	95	115	150	177	DC	DC	FWR
1	Temporal	High	103	167	71	90	143	165	187	217	254	107	135	179	198	223	254	286	84	89	89
2	Temporal	Low	96	165	54	71	137	161	185	211	249	78	101	151	172	199	229	262	75	83	83
3	Non-Temporal	High	106	173	71	90	141	165	187	230	273	107	135	179	198	223	254	286	85	90	90
4	Non-Temporal	Low	95	166	54	71	124	161	170	216	258	78	101	151	172	199	229	262	76	84	84
5	3.1 KHz Temporal	High	111	164	69	94	147	163	184	229	257	108	135	179	200	225	255	289	83	88	88
6	3.1 KHz Temporal	Low	103	163	54	88	143	155	185	212	252	79	101	150	171	196	229	260	76	82	82
7	3.1 KHz Non-Temporal	High	111	172	69	94	144	164	202	229	271	108	135	179	200	225	255	289	84	89	89
8	3.1 KHz Non-Temporal	Low	103	169	54	88	131	155	187	217	259	79	101	150	171	196	229	260	77	83	83

NOTE: Products set at 15 and 30 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12VDC operation when set to any other candela settings.

WIRING AND MOUNTING

All wiring must be installed in compliance with the National Electric Code and the local codes as well as the authority having jurisdiction. Wiring must not be of such length or wire size which would cause the notification appliance to operate outside of its published specifications. Improper connections can prevent the system from alerting occupants in the event of an emergency.

Wire sizes up to 12 AWG (2.5 mm²) may be used with the mounting plate. The mounting plate ships with the terminals set for 12 AWG wiring.

Make wire connections by stripping about 3/8"of insulation from the end of the wire. Then slide the bare end of the wire under the appropriate clamping plate and tighten the clamping plate screw. We provide a wire strip guide. See Figure 6 for wiring terminals and strip guide reference.

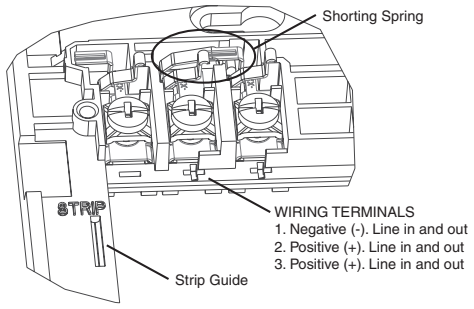
⚠CAUTION

Factory finish should not be altered: Do not paint!

⚠CAUTION

Do not over tighten mounting plate screws; this may cause mounting plate to flex.

FIGURE 6. WIRING TERMINALS, SHORTING SPRING, AND STRIP GUIDE



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SYSTEM WIRING

The 2-wire horn strobe, chime strobe and strobe only require two wires for power and supervision. (See Figure 7.) Please consult your FACP manufacturer or power supply manufacturer for specific wiring configurations and special cases.

FIGURE 7. 2-WIRE CIRCUIT

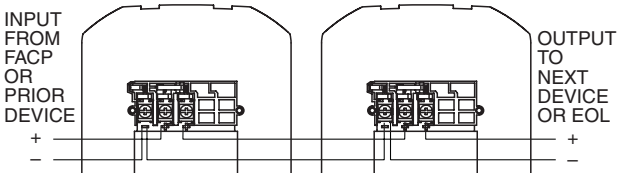

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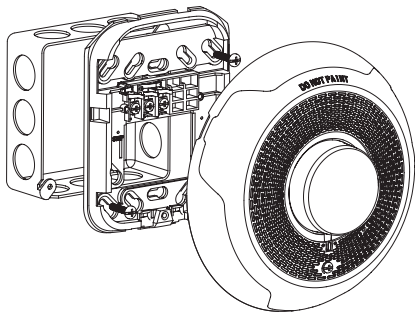
FIGURE 8. MOUNTING



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SHORTING SPRING FEATURE

System Sensor notification appliances come with a shorting spring that is provided between terminals 2 and 3 of the mounting plate to enable system continuity checks after the system has been wired, but prior to installation of the final product. (See Figure 6.) This spring will automatically disengage when the product is installed, to enable supervision of the final system.

MOUNTING

1. Attach mounting plate to junction box. The mounting plate is compatible with 4" square, single gang, double gang, and 4" octagon junction boxes. (See Figure 8.)

2. Connect field wiring according to terminal designations. (See Figures 6 and 7.)

3. If the product is not to be installed at this point, use the protective dust cover to prevent contamination of the wiring terminals on the mounting plate.

4. To attach product to mounting plate, hook tabs on the top of the product housing into the grooves on mounting plate. Then, hinge the product into position to engage the pins on the product with the terminals on the mounting plate. Make sure that the tabs on the back of the product housing fully engage with the mounting plate.

5. Secure product by tightening the single mounting screw in the front of the product housing.

TAMPER SCREW

For tamper resistance, the standard captive screw may be replaced with the enclosed Torx screw.

1. To remove the captive screw, back out the screw and apply pressure to the back of the screw until it disengages from the housing. Replace with the supplied Torx screw. (See Figure 9.)

FIGURE 9. TAMPER SCREW

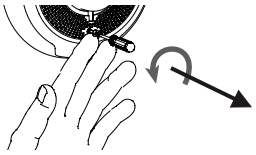

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TABLE 5. CEILING-MOUNT CHIME STROBE CURRENT DRAW (mA) AND SOUND OUTPUT (dBA)

			Current draw (mA)																Sound Output (dBA)		
Pos	Chime Tone	Volume Setting	8-17.5 VDC		16-33 VDC							16-33 FWR							8-17.5 V	16-33 V	
			15	30	15	30	75	95	115	150	177	15	30	75	95	115	150	177	DC	DC	FWR
1	1 Second	High	96	165	47	69	117	137	165	202	238	63	90	147	169	184	212	245	61	62	62
2	1 Second	Low	93	162	47	68	116	137	165	200	238	63	88	147	169	183	212	244	56	55	55
3	1/4 Second	High	94	161	48	70	117	138	166	202	237	65	90	149	170	184	213	246	67	70	70
4	1/4 Second	Low	93	157	48	69	116	137	164	199	236	64	89	148	168	184	216	244	61	61	61
5	Temporal	High	93	163	48	70	116	138	165	199	238	64	89	148	169	184	212	245	64	66	66
6	Temporal	Low	92	160	47	69	116	136	164	198	237	63	88	147	169	183	212	245	59	60	60
7	5 Second Whoop	High	98	169	54	77	124	146	173	206	245	75	100	155	178	193	221	255	76	78	78
8	5 Second Whoop	Low	95	166	49	71	117	144	168	202	239	68	91	148	170	186	217	248	62	64	64

NOTE: Products set at 15 and 30 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12VDC operation when set to any other candela settings.

FIGURE 10. CEILING SURFACE MOUNT BACK BOX MOUNTING:

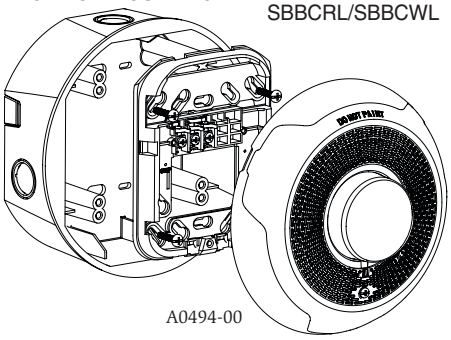


FIGURE 11. CUT-OUTS FOR SPK AND STR

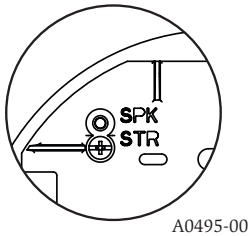
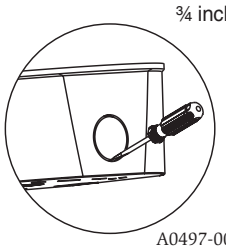
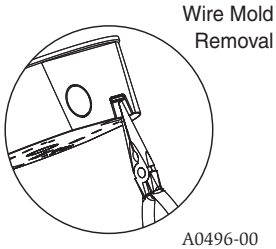


FIGURE 12. KNOCKOUT AND V500/V700 REMOVAL FOR SURFACE MOUNT BACK BOX





SURFACE MOUNT BACK BOX MOUNTING

1. The ceiling surface mount back box may be secured directly to the wall or ceiling. A grounding bracket with ground screw capability is provided if needed. (See Figure 10.)

2. The ceiling mount box can be used on ceiling horn strobe, chime strobe, strobe as well as ceiling speaker and speaker strobe models. Use the ST cut-outs for ceiling horn strobe, chime strobe and strobe installation needs. (See Figure 11.)

3. Threaded knockout holes are provided for the sides of the box for ¾ inch conduit adapter. Knockout holes in the back of the box can be used for ¾ inch rear entry.

4. To remove the ¾ inch knockout, we recommend you use a flat head screwdriver, place the blade of the flat head screwdriver in the inner edge of the knockout. Strike the screwdriver as you work your way around as shown in Figure 12.

NOTE: For ¾ in. installation, use caution not to strike the knockout near the top edge of the surface mount back box.

5. V500 and V700 raceway knockouts are also provided. Use V500 for low profile applications and V700 for high profile applications.

6. To remove the knockout turn pliers up, as shown in Figure 12.

Please refer to insert for the Limitations of Fire Alarm Systems

⚠WARNING

THE LIMITATIONS OF HORN/STROBES

The horn and/or strobe will not work without power. The horn/strobe gets its power from the fire/security panel monitoring the alarm system. If power is cut off for any reason, the horn/strobe will not provide the desired audio or visual warning.

The horn may not be heard. The loudness of the horn meets (or exceeds) current Underwriters Laboratories' standards. However, the horn may not alert a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. The horn may not be heard if it is placed on a different floor from the person in hazard or if placed too far away to be heard over the ambient noise such as traffic, air conditioners, machinery or music appliances that may prevent alert persons from hearing the alarm. The horn may not be heard by persons who are hearing impaired.

NOTE: Strobes must be powered continuously for horn operation.

The signal strobe may not be seen. The electronic visual warning signal uses an extremely reliable xenon flash tube. It flashes at least once every second. The strobe must not be installed in direct sunlight or areas of high light intensity (over 60 foot candles) where the visual flash might be disregarded or not seen. The strobe may not be seen by the visually impaired.

The signal strobe may cause seizures. Individuals who have positive photoic response to visual stimuli with seizures, such as persons with epilepsy, should avoid prolonged exposure to environments in which strobe signals, including this strobe, are activated.

The signal strobe cannot operate from coded power supplies. Coded power supplies produce interrupted power. The strobe must have an uninterrupted source of power in order to operate correctly. System Sensor recommends that the horn and signal strobe always be used in combination so that the risks from any of the above limitations are minimized.

THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: Honeywell, 12220 Rojas Drive, Suite 700, El Paso TX 79936. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

FCC STATEMENT

System Sensor Strobes and Horn/Strobes have been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CO1224T/CO1224TR
Carbon Monoxide Detector

3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6583
www.systemsensor.com

SPECIFICATIONS

Electrical Specifications

System Voltage	Nominal:	12/24 VDC
	Min:	10 VDC
	Max:	33 VDC
Avg. Standby Current:	20 mA	
Max Alarm Current:	40 mA (75 mA test)	
Alarm Contact Ratings:	30 VDC @ 0.5 A	
Trouble Contact Ratings:	30 VDC @ 0.5 A	
Audible Signal (temp 4 tone):	85 dBA min. in alarm (at 10ft)	
Max. Start-up Capacitance:	20 uF	

Physical Specifications

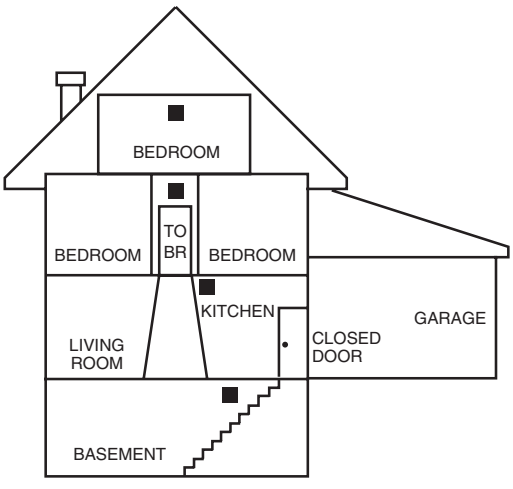
Operating Temperature Range:	0° to 40°C (32° to 104°F)
Operating Humidity Range:	22 – 90% %RH
Diameter:	6.0″
Height:	1.25″
Weight:	7 oz
Wire Gauge Acceptance:	14-22 AWG

NOTICE: This manual shall be left with the owner/user of this equipment. This product is intended for use in ordinary indoor locations.

GENERAL DESCRIPTION

- Listed to UL standard 2075
- Round shape allows for mounting in aesthetically demanding areas
- Six-wire, system monitored
- Optional CO detector replacement plate for previously installed detectors
- Local sounder
- Low current draw
- Alarm relay, Form C
- Trouble relay, Form A
- Dual LED's
- Test/Hush button
- SEMS wiring terminals
- Mount to single gang electrical box or surface mount to wall or ceiling
- Optional drywall anchors included

FIGURE 1. ALARM LOCATION DIAGRAM:



■ – CARBON MONOXIDE/SMOKE ALARM LOCATION FOR MULTI-LEVEL RESIDENCE S0295-01

TABLE 1. DETECTOR OPERATION MODES:

OPERATION MODE	GREEN LED	RED LED	SOUNDER
Normal (standby)	Blink 1 per minute	OFF	OFF
Alarm	OFF	Temp 4*pattern	Temp 4* pattern
Alarm Test	OFF	Temp 4 pattern	Temp 4 pattern
RealTest® Mode	Blink 1 per second	OFF	Temp 4 pattern (after CO is sprayed)
End of Life	OFF	OFF	OFF
CO Trouble	OFF	Blink 1 per minute	OFF
Power Loss/ Cell Fault	OFF	OFF	OFF

Alarm Test: Will send alarm signal to panel.

Hush feature/Alarm Silence: If required, the audible alarm can be silenced for 5 minutes by pushing the button marked "Test/Hush". The red alarm light will continue to flash in temp-4 pattern. If carbon monoxide is still present after the 5 minute hush period, the audible alarm will sound. The hush facility will not operate at levels above 350 ppm (parts per million) carbon monoxide.

RealTest® Alarm Silence: Alarm will automatically silence after about 20 seconds of alarm from spraying canned CO into the detector. Alarm Reset: Alarm automatically resets after CO has cleared from the sensor.

Trouble feature: When the sensor supervision is in a trouble condition (e.g. such as a sensor that has been tampered with, or the cell itself has prematurely dried out due to environmental conditions, etc.), the detector will send a trouble signal to the panel. The detector must then be replaced. The green LED turns off and the red LED blinks every minute when the detector is in trouble.

End of Life Timer feature: When the detector has reached the end of its life, the trouble contact will open. This indicates that the CO sensor inside the detector has passed the end of its life and must be replaced. This detector's lifespan is approximately ten years from the date of manufacture. The green LED turns off when the detector is in trouble. Periodically check the "Replace by" sticker located under the detector cover. The detector must be replaced by this date. Refer to Detector Replacement on page 3.

Per UL 2075, it is mandatory that a trouble signal be sent to the panel upon CO cell trouble or cell end of life. Refer to Figure 4 for wiring of the trouble relay.

INSTALLATION GUIDELINES

Ceiling: Detector should be at least 12 inches from any wall.

Wall: Detector should be at least as high as a light switch, and at least six inches from the ceiling.

- Do not install in any environment that does not comply with the detector's environmental specifications
- Install in accordance with NFPA 720–the Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment
- As of 2009, NFPA 720 defines standards for both commercial and residential installations of CO detectors. If the installation can be interpreted as a commercial application, consult the section of NFPA 720 that outlines commercial applications.
- For example, Chapter 5.5.5.3.1 states that carbon monoxide detectors shall be installed in accordance with manufacturers published instructions in the following locations:
  (1) On the ceiling in the same room as permanently installed fuel burning appliances
  (2) Centrally located on every habitable level and in every HVAC zone of the building
- If the installation can be interpreted as residential, consult the section of NFPA 720 that outlines residential applications.
- For example, chapter 9.4.1.1 states that carbon monoxide alarms or detectors shall be installed as follows:
  (1) Outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms
  (2) On every level of a dwelling unit, including basements
  (3) Other locations where required by applicable laws, codes or standards

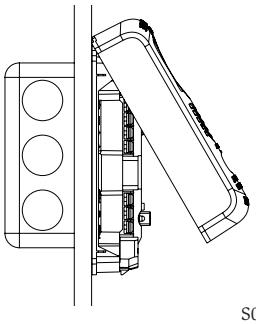
MOUNTING

The CO1224T/CO1224TR can be ceiling-mounted or wall-mounted:

1. To a single gang box.
2. Direct mount to ceiling or to wall using drywall fasteners.

FIGURE 2. MOUNTING OF DETECTOR:

CO1224T



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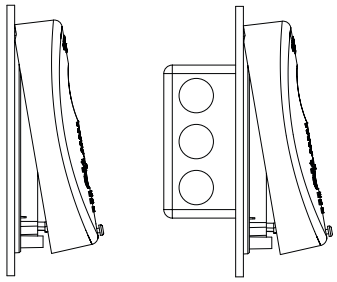
CO1224TR



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INSTALLATION

WIRING INSTALLATION GUIDELINES

All wiring must be installed in compliance with the NFPA 70, National Electrical Code, applicable state and local codes, and any special requirements of the local Authority Having Jurisdiction (AHJ).

Proper wire gauges should be used. The conductors used to connect carbon monoxide detectors to the alarm control panel and accessory devices should be color-coded to reduce the likelihood of wiring errors. Improper connections can prevent a system from responding properly in the event of a CO.

The screw terminals in the mounting base will accept 14-22 gauge wire. Wire connections are made by stripping approximately ¼″ of insulation from the end of the feed wire, inserting it into the proper base terminal, and tightening the screw to secure the wire in place. Do not put wires more than 2 gauge apart under the same clamping plate.

WARNING: This product does not have a local audible trouble signal, and may fail without supervision if trouble loop remains unconnected.

WARNING: Gas detectors on a zone that is bypassed may not signal a trouble condition. Do not bypass zones used for gas detectors.

Wiring diagrams located on page 4, Figure 4.

⚠WARNING

Remove power from alarm control unit or initiating device circuits before installing detectors.

1. Using a small, flat head screw driver, push in the small tab located on the underside of the detector. Once the snap is loosened, lift the bottom end of the cover up and unhinge the top to remove the cover.
2. Wire the detector base screw terminals per Figure 5.
3. Screw the base of the detector onto a single gang electrical box, or to the surface of the wall or ceiling. Use the hardware included in the packaging.
4. If mounting with the System Sensor replacement plate model CO-PLATE*:
   * Hold replacement plate over desired mounting area.
   * Use hook feature to hold CO1224T onto the replacement plate.
   * Mount detector and plate together using hardware provided with the CO1224T.
5. Hinge the top portion of the cover onto the base; with the cover at a 45 degree angle, fit the hinges into the slots of the base.
6. Push the unhinged bottom portion of the cover down until it snaps into place.
7. After all detectors have been installed, apply power to the alarm control unit.
8. Test each detector as described in Testing.
9. Notify the proper authorities that the system is in operation.

⚠CAUTION

Airborne dust particles can enter the detector. System Sensor recommends the installation of detectors after construction or any other dust producing activity. Carbon monoxide detectors are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose.

TESTING

Detector must be tested after installation.

NOTE: Before testing, notify the proper authorities to avoid any nuisance alarms.

Ensure proper wiring and power is applied. After power up, allow 80 seconds for the detector to stabilize before testing.

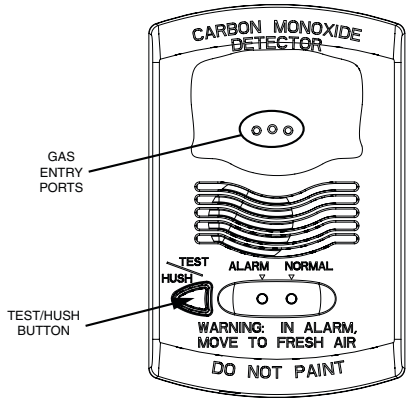
Test the CO1224T/CO1224TR detector as follows:

1. A test button is located on the detector housing (See Figure 4).
2. Use the tip of your finger to press and hold the test button for 1-4 seconds.
3. If the sounder beeps twice in the Temporal 4 tone and the LED's light up, the detector is operational.
4. The detector now enters Realtest speed up test mode indicated by a quickly blinking green LED. See Functional Gas Test section for instructions on testing with canned CO.

If a detector fails the above test method, its wiring should be checked. If the detector still fails after rewiring, it should be replaced.

FIGURE 4. TEST BUTTON LOCATION AND OPERATION:

C01224T



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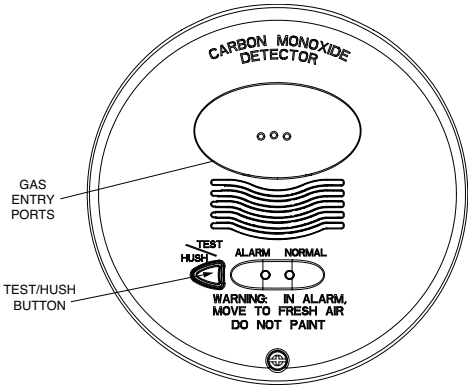
C01224TR



S0321-00

FUNCTIONAL GAS TEST

NOTE: Check with local codes and the AHJ to determine whether or not a functional gas test is necessary for an installation.

Solo C6 brand canned CO testing agent may be used to verify the detector's ability to sense CO by utilizing the RealTest® feature of the CO1224T/CO1224TR as follows:

1. Press the test button as described in Testing above.
2. Once the alarm has entered the speed-up test mode, indicated by a quickly flashing green LED, spray a small mount of CO agent within 1/4" of the alarm's gas entry ports (see Figure 3). The unit will go into alarm if gas entry is successful.
3. The detector will automatically exit the speed-up test mode 20-60 seconds after entering speed-up test mode.

Testing the detector will activate the alarm relay and send a signal to the panel.

CAUTION: This carbon monoxide detector is designed for indoor use only. Do not expose to rain or moisture. Do not knock or drop the detector. Do not open or tamper with the detector as this could cause malfunction. The detector will not protect against the risk of carbon monoxide poisoning if not properly wired. The detector will only indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide gas may be present in other areas.

This carbon monoxide detector is NOT:

- Designed to detect smoke, fire or any gas other than carbon monoxide
- To be seen as a substitute for the proper servicing of fuel-burning appliances or the sweeping of chimneys.
- To be used on an intermittent basis, or as a portable alarm for the spillage of combustion products from fuel-burning appliances or chimneys.
- To be used in airplanes or any other aeronautical vehicle.

Carbon monoxide gas is a highly poisonous gas which is released when fuels are burnt. It is invisible, has no smell and is therefore impossible to detect with the human senses. Under normal conditions in a room where fuel burning appliances are well maintained and correctly ventilated, the amount of carbon monoxide released into the room by appliances should not be dangerous.

Symptoms of carbon monoxide poisoning: Carbon monoxide bonds to the hemoglobin in the blood and reduces the amount of oxygen being circulated in the body. The following symptoms are examples taken from NFPA 720. They represent approximate values for healthy adults:

Concentration (ppm CO)	Symptoms
200	Mild headache after 2-3 hours of exposure
400	Headache and nausea after 1-2 hours of exposure
800	headache, nausea, and dizziness after 45 minutes of exposure; collapse and unconsciousness after 2 hours of exposure

Many causes of reported carbon monoxide poisoning indicate that while victims are aware that they are not well, they become so disoriented that they are unable to save themselves by either exiting the building or calling for assistance. Young children and pets may be the first to be affected.

Per UL standard 2075, the CO1224T/CO1224TR has been tested to the sensitivity limits defined in UL standard 2034.

Alarm thresholds are as follows:

Parts Per Million	Detector response time, min.
30 ± 3ppm	No alarm within 30 days
70 ± 5ppm	60-240
150 ± 5ppm	10-50
400 ± 10ppm	4-15

What to do if the carbon monoxide detector goes into alarm:

Immediately move to a spot where fresh air is available, preferably outdoors. Find a phone in an area where the air is safe and call your security service provider. Tell your provider the detector alarm status, and that you require professional assistance in ridding your home of the carbon monoxide.

IMPORTANT: This detector should be tested and maintained regularly following National Fire Protection Association (NFPA) 720 requirements.

MAINTENANCE

Occasionally clean the outside casing with a cloth. Ensure that the holes on the front of the alarm are not blocked with dirt and dust.

Do not paint, and do not use cleaning agents, bleach, or polish on the detector.

DETECTOR REPLACEMENT

This detector is manufactured with a long-life carbon monoxide sensor. Over time the sensor will lose sensitivity, and will need to be replaced with a new System Sensor carbon monoxide detector. This detector's lifespan is approximately ten years from the date of manufacture.

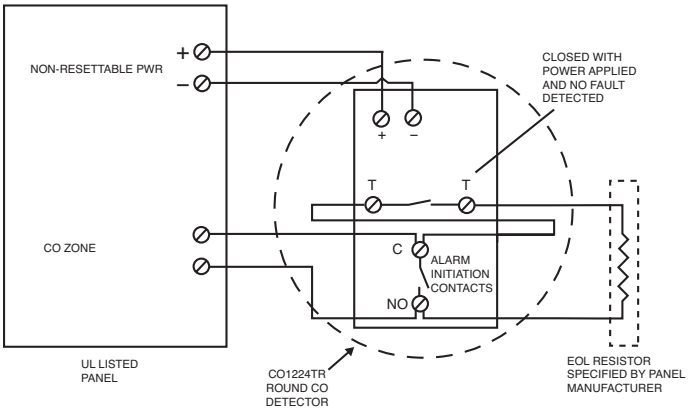
Periodically check the detector's replacement date. Remove the detector cover and refer to the sticker placed on the inside of the detector. The sticker will indicate the date that the detector shall be replaced.

This detector is also equipped with a feature that will open the trouble relay once it has reached the end of its useful life. If this occurs, it is time to replace the detector.

NOTE: Before replacing the detector, notify the proper authorities that maintenance is being performed and the system will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent any unwanted alarms. Dispose of detector in accordance with any local regulations.

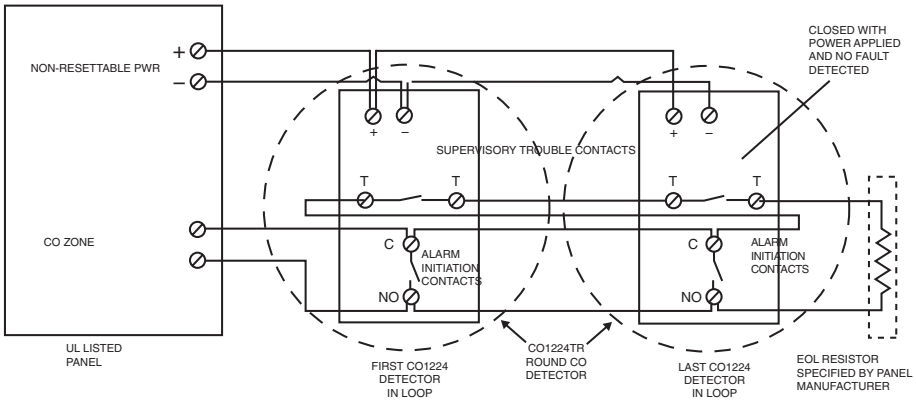
FIGURE 5. WIRING DIAGRAM:

SINGLE UNIT, SINGLE ZONE, 4 CONDUCTOR CABLE



S0313-01

MULTIPLE UNIT, SINGLE ZONE, 6 CONDUCTOR CABLE



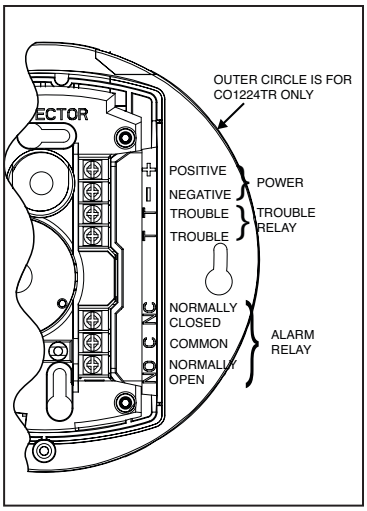
Input powered (12 or 24 VDC) from UL Listed Fire/Burg Control Panel (Class 2).

S0314-01

⚠CAUTION

It should be noted the installation, operation, testing and maintenance of the CO1224T/CO1224TR is different than System Sensor conventional 4-wire smoke detectors, such as the i3 Series. Below are specific installation requirements for the CO1224T/CO1224TR:

- Connect to a non-resettable power supply
- Connect to a non-fire zone: Per NFPA 720 section 9.6.7.2 the CO1224T/CO1224TR shall not be connected to a zone that signals a fire condition
- Per NFPA 720 section 9.6.7, do not connect the CO1224T/CO1224TR on a zone with other fire or intrusion initiating devices - i.e. do not connect on the same zone as smoke detectors
- Wiring of the trouble relay is mandatory: Per UL Standard 2075 section 17.1.1 a detector shall send a trouble signal to the control panel upon an open circuit, a ground fault, sensor removal or sensor end of life
- If wiring one CO1224T/CO1224TR per zone: Use 4 conductors
- If wiring multiple CO1224T/CO1224TR detectors per zone: Use 4 conductors from panel to first CO1224T/CO1224TR, then use 6 conductors from the second CO1224T/CO1224TR to other detectors on the zone



S0322-01

Please refer to insert for the limitations of Carbon Monoxide Detectors

FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for the enclosed product. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: Honeywell, 12220 Rojas Drive, Suite 700, El Paso TX 79936, USA. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

NOTIFIER® by Honeywell

Power Supply Expanders
PSE-6(C)(E)(R) & PSE-10(E)(C)(R)
Instruction Manual

Document LS10227-000NF-E Rev: A
9/1/2020 ECN: 151067

Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premises to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/ 32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Units with a touchscreen display should be cleaned with a dry, clean, lint free/microfiber cloth. If additional cleaning is required, apply a small amount of Isopropyl alcohol to the cloth and wipe clean. Do not use detergents, solvents, or water for cleaning. Do not spray liquid directly onto the display.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

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FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are 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 his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

Documentation Feedback

Your feedback helps us keep our documentation up-to-date and accurate. If you have any comments or suggestions about our online Help or printed manuals, you can email us.

Please include the following information:

- Product name and version number (if applicable)
- Printed manual or online Help
- Topic Title (for online Help)
- Page number (for printed manual)
- Brief description of content you think should be improved or corrected
- Your suggestion for how to correct/improve documentation

Send email messages to:

FireSystems.TechPubs@honeywell.com

Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.

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It is imperative that the installer understand the requirements of the Authority Having Jurisdiction (AHJ) and be familiar with the standards set forth by the following regulatory agencies:

- Underwriters Laboratories Standards
- NFPA 72 National Fire Alarm Code

Before proceeding, the installer should be familiar with the following documents.

NFPA Standards

NFPA 72 National Fire Alarm Code
NFPA 70 National Electrical Code

Underwriters Laboratories Documents:

UL 464 Audible Signaling Appliances
UL 864 Standard for Control Units for Fire Protective Signaling Systems
UL 1638 Visual Signaling Appliances
UL 1971 Signaling Devices for Hearing Impaired
UL 2572 Standard for Mass Notification Systems

CAN/ULC - S524 Standard for Installation of Fire Alarm Systems
CAN/ULC - S527 Standard for Control Units for Fire Alarm Systems

Other:

NEC Article 250 Grounding
NEC Article 300 Wiring Methods
NEC Article 760 Fire Protective Signaling Systems
Applicable Local and State Building Codes
Requirements of the Local Authority Having Jurisdiction (LAHJ)
Canadian Electrical Code, Part 1

Other Notifier Documents:

Device Compatibility Document	Document #15378
SLC Wiring Manual	Document #51253
CHG-75 Manual	Document #51315
CHG-120 Manual	Document #50641

This product has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, 10th Edition. Operation of this product with products not tested for UL 864, 9th/10th Edition has not been evaluated. Such operation requires the approval of the local Authority Having Jurisdiction (AHJ).

This symbol (shown left) on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, contact your local authorities or dealer and ask for the correct method of disposal.

Electrical and electronic equipment contains materials, parts and substances, which can be dangerous to the environment and harmful to human health if the waste of electrical and electronic equipment (WEEE) is not disposed of correctly.

Section 1: System Overview

The PSE-6 is a 6 amp and the PSE-10 is a 10 amp remote power supply with battery charger. Both models provide ADA compatible strobe synchronization and a filtered 24 VDC output that can be configured to drive five (6 amp model) or seven (10 amp model) Class B NACs (Notification Appliance Circuits). NAC circuits can be configured for Class A wiring with the optional ZNAC-PS Class A converter module. NAC output circuits may be configured as 24 VDC resettable or non-resettable power outputs, or Class D door holder outputs. The input circuits, which control the power supply operation, are triggered by the reverse polarity of a NAC or by a 12 VDC or 24 VDC power source. The PSE power supplies are compatible with 12 VDC and 24 VDC control panels.

The PSE-6E and PSE-10E offer the same features as the PSE-6 and PSE-10 respectively, but allow connection to 240 VAC. Unless otherwise specified, the information in this manual applies to both the 120 VAC models and the 240 VAC models.

The PSE-6C and PSE-10C offer the same features as the PSE-6 and PSE-10 respectively, but are intended for Canadian applications and adds an additional relay for ground fault reporting. Unless otherwise specified, the information in this manual applies to all models.

The PSE-6R and PSE-10R offer the same features as the PSE-6 and PSE-10 respectively, but come installed in a red cabinet.

1.1 General

PSE power supplies can be used as remotely mounted power supplies and battery chargers to power non-coded or coded NACs. The Main FACP (Fire Alarm Control Panel) NAC(s) is connected to the remote power supply input circuit(s). When the command input circuit activates due to reverse polarity of the NAC from the FACP, the power supply will activate its Notification Appliance Circuits.

During the inactive or non-alarm state, the power supply supervises its NAC field wiring for short and open conditions. AC fail, battery, charger and ground fault troubles will also be monitored by the power supply and will activate the AC Fail, Battery Fault, and Ground Fault relay, respectively. If a NAC fault is detected, the input end-of-line will open to indicate the fault to the main panel.

If an alarm condition occurs and the NAC is activated, the supervision is disabled and the Notification Appliance Circuit is no longer supervised (except for shorts). Supervision of other power supply faults such as low battery, overcharged battery, ground fault, and battery charger trouble will continue and will be monitored by their respective trouble relays.

1.2 Features

- Self-contained in a lockable cabinet
- 24 VDC remote power supply
- Outputs are completely power-limited (Class 2)
- Two (PSE-6) or three (PSE-10) optically-isolated input/command circuits, compatible with 12 VDC and 24 VDC control panel NACs
- Five (PSE-6) or seven (PSE-10) output circuits:
  - Fully filtered power
  - Five or seven 24 VDC Class B NACs
  - Optional ZNAC-PS Class A converter module for conversion to Class A NACs
  - Alternatively, all output circuits may be configured as 24 VDC special application power outputs or Class D door holder power outputs
  - Output circuits may be configured as resettable or non-resettable
- Individual NAC Power (red) and Trouble (yellow) LEDs for each output
- Maximum current available:
  - PSE-6: TB8-TB9 – 1A Regulated, 3A special applications; TB10-TB12 – 0.3A Regulated, 3A special applications
  - PSE-10: TB8-TB11 – 1.5A Regulated, 3A special applications; TB12-TB14 – 0.3A Regulated, 3A special applications
- Maximum total current available (alarm and standby):
  - 6.0 amps for PSE-6 alarm; 3.0 amps standby
  - 10.0 amps for PSE-10 alarm; 3.0 amps standby
- Integral supervised battery charger for lead acid batteries only
- Capable of charging 7.0 AH - 33.0 AH (Amp Hour) batteries (cabinet fits 7 or 18 AH batteries)
- Fully supervised power supply, battery and NACs
- Selectable Strobe Synchronization for NACs (System Sensor, Gentex, Wheelock, and Amseco)
- Coded signal synchronization
- Removable terminal blocks for field wiring capable of accepting 12 - 18 AWG wire
- Selectable Ground Fault detection by switch SW1
- LED trouble diagnostics and history
- Power supply trouble, AC Loss, and Ground Fault (Canadian models only) Form-C relay contacts (fail-safe)
- Optional delay of AC loss reporting for 0, 2, 12, or 30 hours
- Mounting location for optional addressable module
- Up to four PS Series units can be cascaded

1.3 Specifications

Refer to Figure 1.1 on page 10 for terminal locations.

NOTE: The PSE-6 uses the same PCB layout as the PSE-10, however some terminals will be depopulated, leaving the PSE-6 with five output circuits and two input circuits.

Primary AC Power - TB4

- PSE-6(C): 120 VAC, 50/60 Hz, 5.0 amps maximum
- PSE-10(C): 120 VAC, 50/60 Hz, 6.2 amps maximum
- PSE-6E: 240 VAC, 50/60 Hz, 2.7 amps maximum
- PSE-10E: 240 VAC, 50/60 Hz, 3.5 amps maximum
- Wire size: #12-14 AWG wire with 600V insulation

Command Input Circuits - TB5, TB6, TB7

- Trigger Input Voltage: 9 - 32 VDC
- Input Current Draw in Alarm Polarity: 9 - 32 volts, 14.0 mA maximum per input

Output Circuits - TB8-TB14

- Supervised and power-limited
- Voltage Rating: 24 VDC filtered
- Current:
  - PSE-6: TB8-TB9 – 1A Regulated, 3A special applications; TB10-TB12 – 0.3A Regulated, 3A special applications
  - PSE-10: TB8-TB11 – 1.5A Regulated, 3A special applications; TB12-TB14 – 0.3A Regulated, 3A special applications
  - Maximum total alarm current for all output:
    PSE-6 - 6.0 amps
    PSE-10 - 10.0 amps
- Output Circuit Types:
  - Class B NACs (require 2kΩ - 27kΩ End-of-Line Resistors) and/or Class A NACs using the optional ZNAC-PS Class A converter module. Use Listed ELRs supplied by the FACP or compatible equipment manufacturer.
  - Resettable or non-resettable outputs for 24 VDC power outputs or Class D door holder (max ripple voltage: 780mV$_{RMS}$)
- Refer to the *Notifier Device Compatibility Document #15378* for listed compatible devices.
- For wiring requirements, refer to “Wire Requirements” on page 34.

Trouble, AC Loss, and Ground Fault (Canadian models only) Relay Contact Rating - TB1-TB3

- Fail-safe Form-C relay (normally energized, transfers with loss of power) for AC Loss and Trouble
- 4.0 amps @ 30 VDC resistive

Secondary Power (battery) Charging Circuit - TB15

- Supervised, non-power-limited
- Supports lead acid type batteries only
- Float Charge Voltage: 27.6 VDC
- Maximum Peak Charge Current: 2.47A
- Maximum Nominal Charge Current: 1.5 A
- Maximum Battery Capacity: 33.0 AH (with onboard battery charger)
- Minimum Battery Capacity: 7.0 AH

NOTE: The PSE only supports 7AH or 18AH batteries in the cabinet. Other battery capacities up to 33AH will not fit in the cabinet due to physical dimensions and require a separate battery cabinet.

1.4 Open/Short/Ground Fault Trip Values in Standby

Table 1.1 lists the earth fault resistance detection in standby for each applicable terminal on the FACP.

Output Circuit	Terminal	Trip Resistance (in ohms)
NAC 1-5/7	+	9.9K or lower
NAC 1-5/7	-	9.2K or lower
ZNAC-PS 1-5/7	+	9.9K or lower
ZNAC-PS 1-5/7	-	9K or lower

Table 1.1 Earth Fault Trip Values

Value of the resistance in between any circuit terminal to Earth, which will cause the Ground Fault detection, depends on the ELR chosen for inputs and output circuits. This resistance will vary from 9.9K down to 0 Ohm.

Table 1.2 lists the open/short trip values and restoral values in standby for the NAC circuits on the FACP.

Circuit	Fault	Trip Resistance (in ohms)	Restore Value
NAC 1-5/7	Short	1.6K or lower	1.7K or higher
NAC 1-5/7	Open	55K or higher	33K or lower
ZNAC-PS 1-5/7	Short	1.6K or lower	1.7K or higher
ZNAC-PS 1-5/7	Open	45K or higher	21K or lower

Table 1.2 NAC Open/Short Trip Values

1.5 Switch SW1 - Ground Fault Detection

The Ground Fault Detection circuit monitors for ground faults. Switch SW1 is located on the lower left section of the power supply circuit board. Sliding SW1 to the left will disable ground fault detection by the power supply. This should only be done if ground faults are being monitored by an FACP connected to the PSE power supply or in a cascading application as shown in Section 2.8 on page 18.

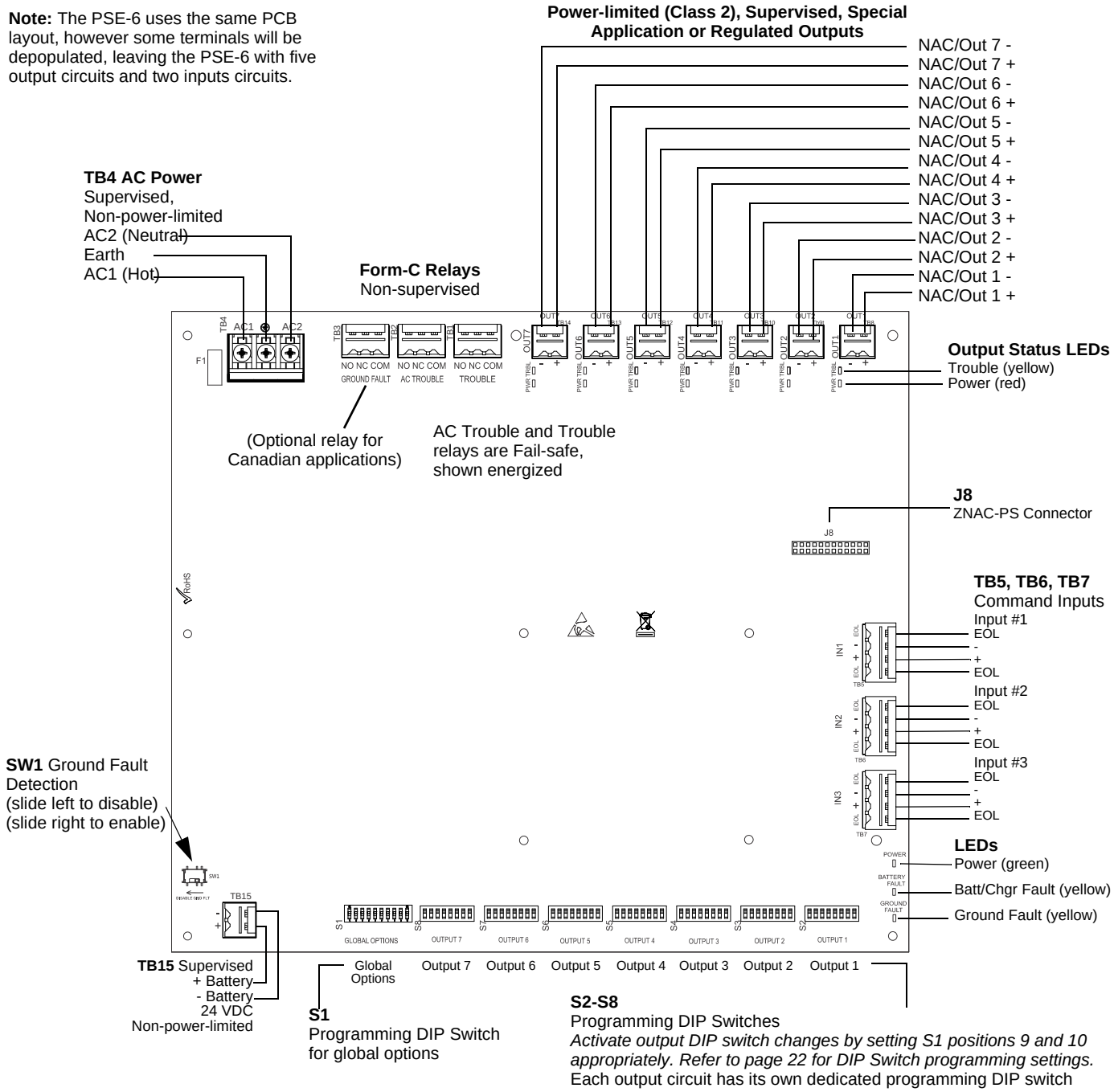


Figure 1.1 PSE-10 Board Layout

1.6 Applications

The PSE may be used in a number of different applications. It may be used as a remotely-mounted power supply and battery charger where it can provide up to seven coded or non-coded, synchronized or non-synchronized NACs (Notification Appliance Circuits). Alternatively, any output can be used as a door holder circuit which will provide a steady 24 VDC output until an alarm condition or AC fail condition causes it to drop to 0 VDC following a selectable delay. See the DIP switch settings for S1 global options on page 21. All outputs can also provide power.

One possible application for the PSE remote power supply utilizes the NAC repeater feature. In this application, one or two NACs are connected from the main FACP to the remote power supply command input circuits. When the command input circuits are activated by the reverse polarity of the NACs, the power supply will activate its corresponding output circuits as programmed by its DIP switch configuration (refer to Table 3.7 on page 23).

During the inactive state, the remote power supply supervises its NAC field wiring for short and open conditions. If a fault is detected, the power supply will enter a trouble condition and illuminate the NAC Trouble LED. When the NACs are activated, the supervision is disabled and the circuits are no longer supervised (except for short circuit conditions). Supervision of other power supply faults such as low battery, battery charger trouble, ground fault and AC loss will continue and may be monitored via their respective trouble relay.

If an application requires that all outputs activate at the same time, only one NAC is required from the FACP. For this application, the NAC is connected to command input circuit #1 and the DIP switch is set for this operation.

1.7 Start-up Procedure

1. Configure the power supply switch as described in “Switch SW1 - Ground Fault Detection” on page 10.
2. Install the power supply as described in “Installation” on page 12.
3. Program the power supply as described in “Programming Options” on page 20.
4. Wire the power supply circuits, referring to the options described in “Trouble Supervision” on page 29 and the application examples in “Application Examples” on page 35.
5. Connect primary power source wiring while observing the following:
   – Ensure the AC mains circuit breaker is **off** before making any wiring connections between the mains and the power supply.
   – Make certain primary power source is:
   120 VAC, 50/60 Hz, 5.0 (6 amp model) 6.2 amps (10 amp model) or
   240 VAC, 50/60 Hz, 2.7 (6 amp model) 3.5 (10 amp model)
   – Run a pair of wires (with ground conductor) from the protected premises main breaker box to TB4 of the power supply main circuit board.
   – Use #12-14 AWG gauge wire with 600V insulation.
6. Apply power to the power supply using the following procedure:
   – Apply AC power by turning on the AC mains circuit breaker connected to the power supply.
   – Connect a properly charged battery to connector TB15 on the power supply main circuit board.
7. Clear trouble history using global DIP switch S1 positions 9 and 10. See DIP switch settings in Table 3.6 on page 22.

Section 2: Installation

Carefully unpack the system and check for shipping damage. Select a location for the cabinet that is in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the power supply. With the hinge mounting on the left, determine the number of conductors required for the devices to be installed and determine the appropriate knockouts. All wiring must be in accordance with the National and/or Local codes for fire alarm systems and power supplies.

2.1 Backbox Mounting

CAUTION: STATIC SENSITIVE COMPONENTS

THE CIRCUIT BOARD CONTAINS STATIC-SENSITIVE COMPONENTS. ALWAYS GROUND YOURSELF WITH A PROPER WRIST STRAP BEFORE HANDLING ANY BOARDS SO THAT STATIC CHARGES ARE REMOVED FROM THE BODY. USE STATIC SUPPRESSIVE PACKAGING TO PROTECT ELECTRONIC ASSEMBLIES.

1. Mark and pre-drill holes for the top two keyhole mounting bolts.
2. Install two upper fasteners in the wall with the screw heads protruding approximately ¼".
3. Using the upper keyholes, mount the backbox over the two screws.
4. Mark the lower two holes, remove the backbox from the wall and drill the mounting holes.
5. Mount the backbox, install the remaining fasteners and tighten all screws..

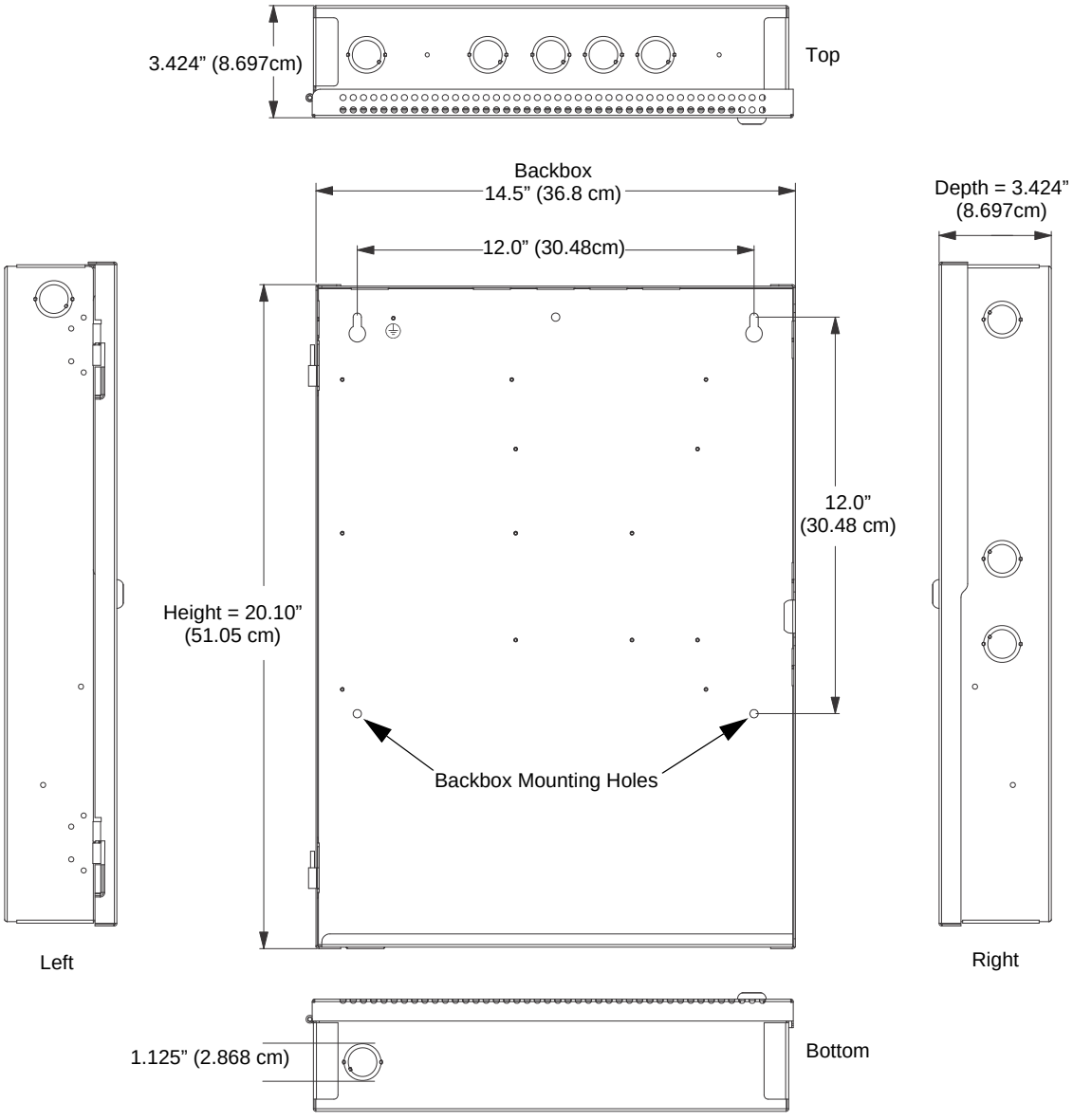


Figure 2.1 Backbox Mounting Dimensions

2.2 NAC Circuit Wiring

2.2.1 Class B

The standard configuration for NACs is Class B as shown below. Use Listed ELRs supplied by the FACP or compatible equipment manufacturer.

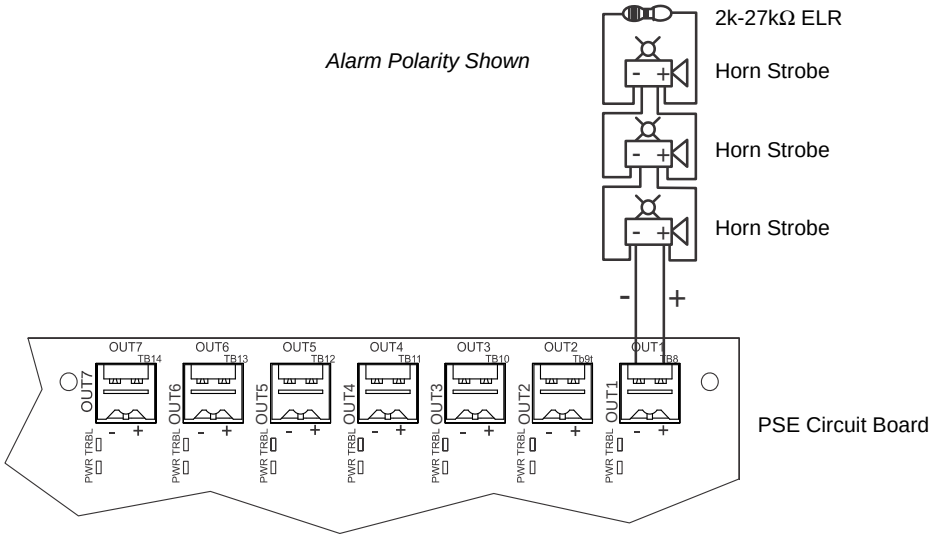


Figure 2.2 NAC Class B

2.2.2 ZNAC-PS Class A Option Module

The ZNAC-PS is an optional Class A conversion module which mounts to connector J8 on the upper right side of the circuit board. This module allows the PSE-6 or PSE-10 to support Class A Notification Appliance Circuits on all outputs. Class A *power* supervision is also supported on output circuits #1 and #2 when either of these outputs are configured as resettable or non-resettable Auxiliary power.

Two slide switches are located on the right side of the ZNAC-PS module to properly configure output circuits #1 and #2 for either NAC or Auxiliary Power operation, as described below. Note that there are no slide switches for the remaining outputs as these outputs do not support Class A power supervision.

- For output #1, set the upper switch to either “NAC1” or “AUX1” depending on the intended operation.
- For output #2, set the lower switch to either “NAC2” or “AUX2” depending on the intended operation.

NOTE: Class A supervision and the ZNAC-PS module are not intended for use with door holder operation.

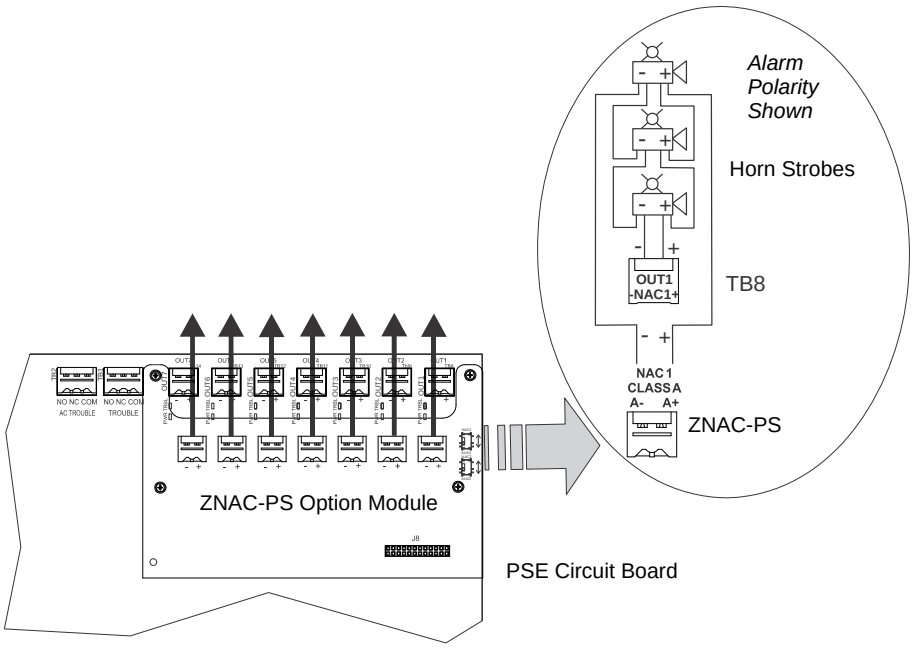
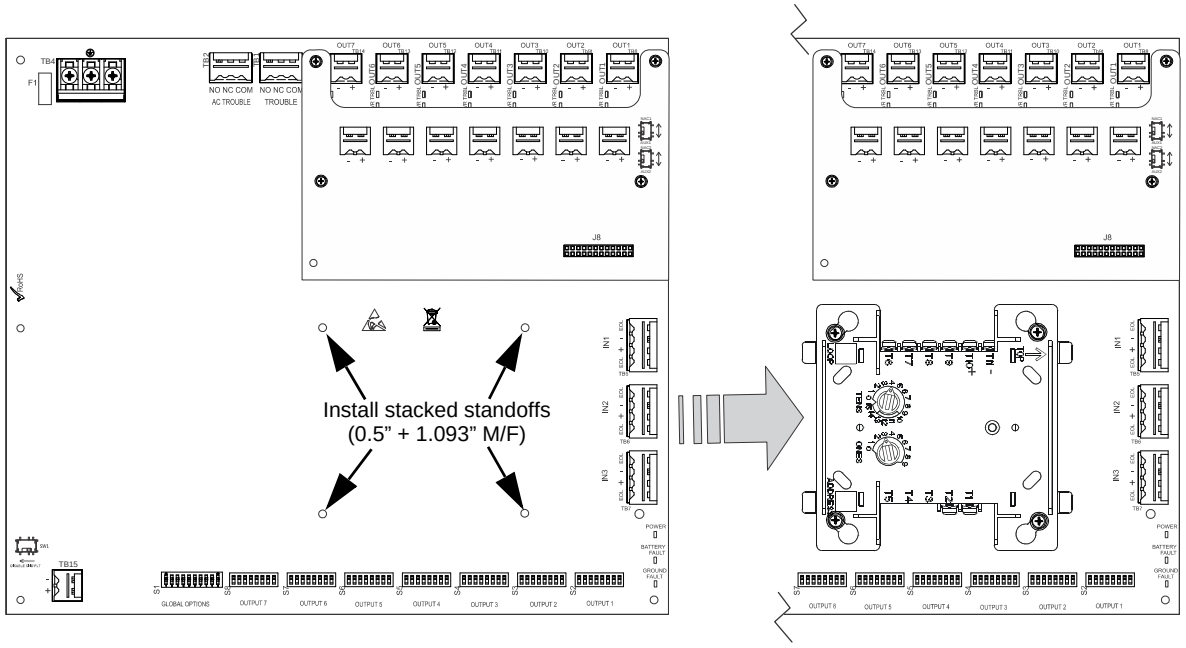


Figure 2.3 Class A NACs using ZNAC-PS Option Module

2.3 Addressable Module Mounting

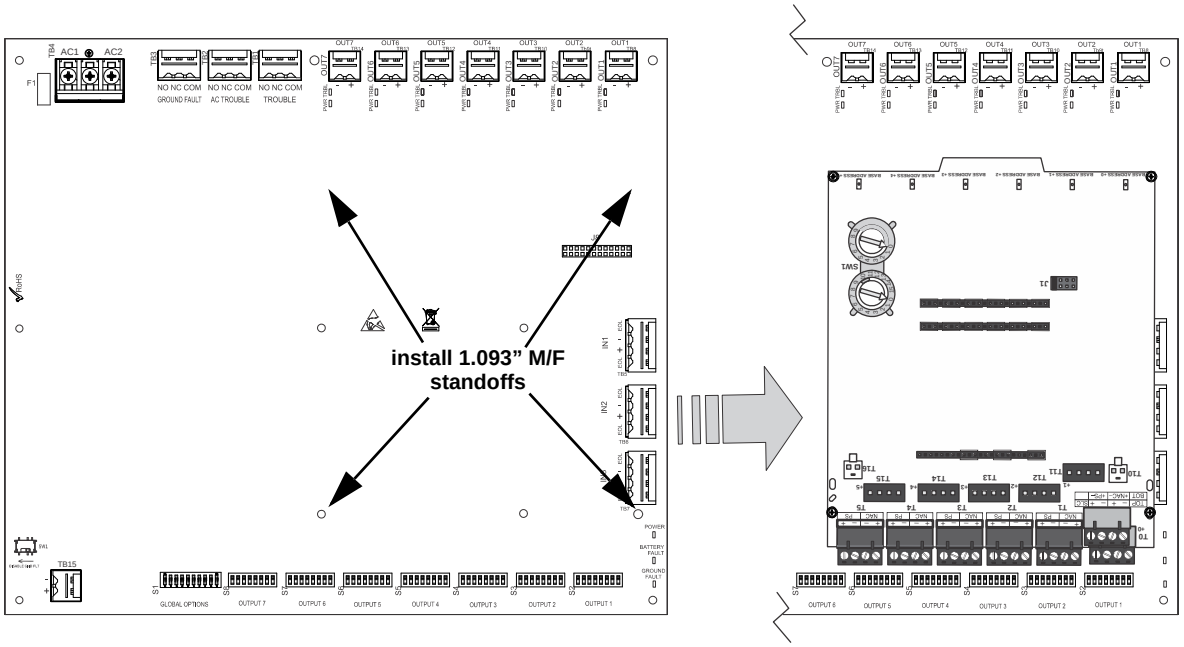
The PSE has been designed to allow the mounting of an addressable control, relay, or monitor module on the main circuit board inside the power supply cabinet. This allows power to be fed from a PSE output circuit directly to the module, if needed, without running the power wires outside the cabinet. Remove mounting screws from the positions indicated below and replace with standoffs (included in hardware kit). Mount the module over the standoffs and secure with screws.

Compatible modules include the FCM-1(A), FDM-1(A), FMM-1(A), FRM-1(A), FDRM-1, XP6-C(A), XP6-R(A), XP10-M(A), NC-100, NDM-100, NMM-100, NC-100R, and NMM-1000-R.



*If the SLC device does not match the one in this figure, refer to the SLC manual wiring conversion charts for legacy and newer versions of the modules.

Figure 2.4 Mounting a Single Module in the PSE Cabinet



Note: For instructions on mounting a multi-module and a ZNAC-PS module, refer to the *ZNAC-PS Install Sheet #LS10228-000GE-E*.
The multi-module *must* be installed upside down when the ZNAC-PS is installed. If the ZNAC-PS is *not* installed, the multi-module may be mounted in either direction.

Figure 2.5 Mounting a Multi-Module in the PSE Cabinet

2.4 NEC Power-limited (Class 2) Wiring Requirements

Power-limited (Class 2) and non-power-limited circuit wiring must remain separated in the cabinet. All power-limited (Class 2) circuit wiring must remain at least 0.25” away from any non-power-limited circuit wiring and all power-limited (Class 2) circuit wiring and non-power-limited circuit wiring must enter and exit the cabinet through different conduits. One such example of this is shown below. Any conduit knockouts may be used. For power-limited (Class 2) applications, use of conduit is optional.

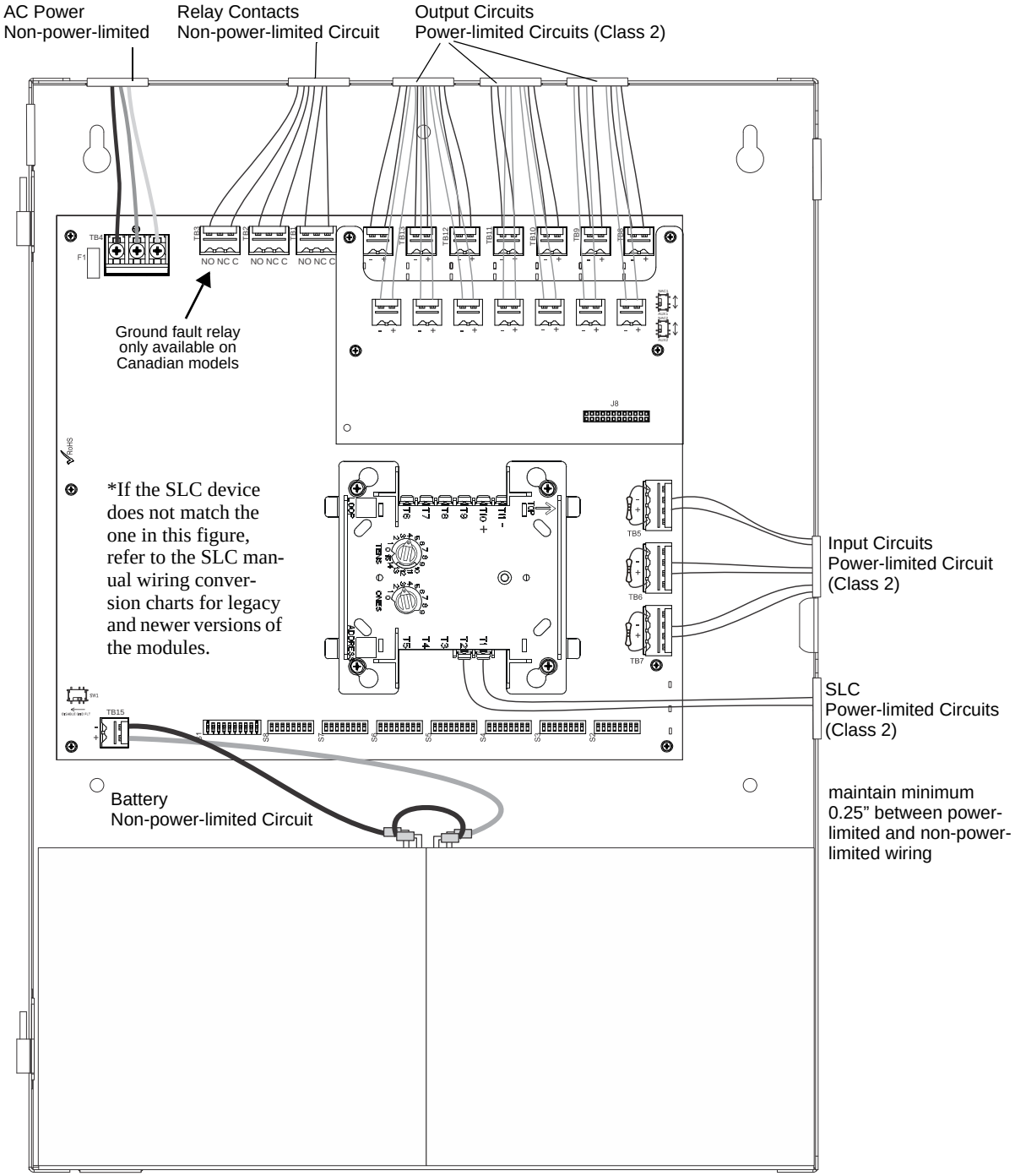


Figure 2.6 Power-limited (Class 2) Wiring Example

2.5 FACP with PSE Power Supply in Slave Mode

In this application, an PSE power supply, configured as a Slave unit, is connected to a master FACP programmed for synchronized output. .

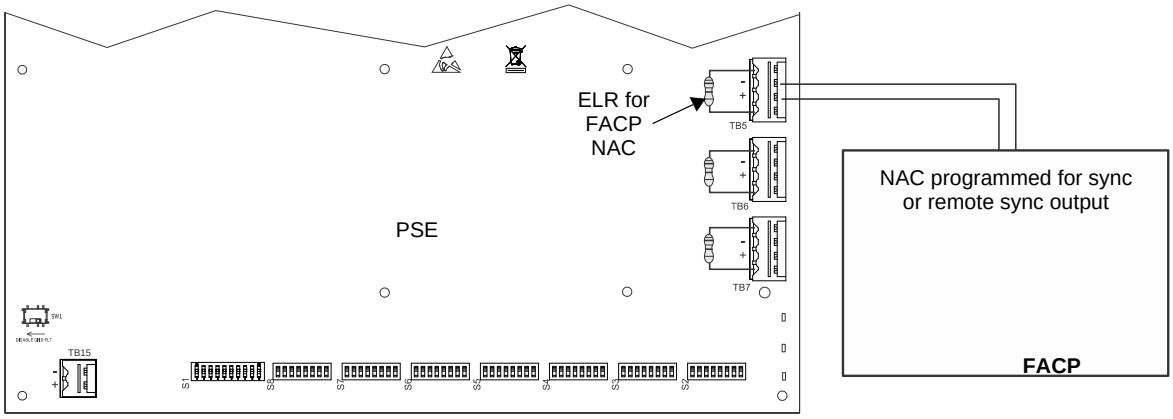


Figure 2.7 Supervised Master/Slave Connections

The following notes apply to Figure 2.7 on page 16

1. Refer to NFPA 72, Chapter 4-4, Visible Characteristics, Public Mode.
2. Use only devices from the same manufacturer in each system.
3. Set Output DIP Switch: position 3=ON, 4 = OFF, 5 = ON, 6 = OFF.
4. If the FACP has a dedicated sync output connector, wire the remote sync output connector to Input #1 terminals 2 and 3.
5. Input#1 is mapped to Slave mode output in this example, but it can programmed to another input using the DIP switches.
6. Notification appliances cannot be installed on the FACP control circuit connecting to the PSE input circuits.

2.6 PSE Power Supply in Master Mode Connected to FACP

In this application, a master PSE power supply, set for synchronization, is connected to an FACP with non-synchronized output.

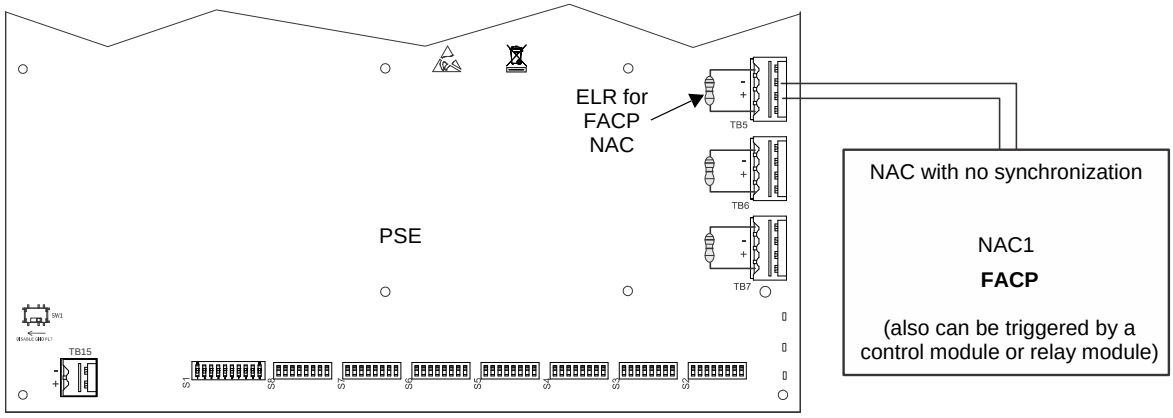


Figure 2.8 Supervised FACP to Master Connections (non-synchronized source)

The following notes apply to Figure 2.8.

1. Refer to NFPA 72, Chapter 4-4, Visible Characteristics, Public Mode.
2. Set Output DIP switches to the desired sync protocol as described below. Refer to the *Device Compatibility Document* for compatible devices.

DIP Switch Position				Synchronization Type
3	4	5	6	
ON	OFF	**ON**	OFF	Slave mode (NAC follower)
OFF	**ON**	**ON**	OFF	Master mode - ANSI Temporal (Temporal 3)
ON	**ON**	**ON**	OFF	Master mode - CO Temporal (Temporal 4)
OFF	OFF	OFF	**ON**	Master mode - Amseco/Potter
OFF	**ON**	OFF	**ON**	Master mode - Gentex
OFF	OFF	**ON**	**ON**	Master mode - System Sensor
OFF	**ON**	**ON**	**ON**	Master mode - Wheelock
ON	OFF	OFF	**ON**	Master mode, Selective Silence - Amseco/Potter
ON	**ON**	OFF	**ON**	Master mode, Selective Silence - Gentex

ON	OFF	**ON**	**ON**	Master mode, Selective Silence - System Sensor
ON	**ON**	**ON**	**ON**	Master mode, Selective Silence - Wheelock

3. Use only devices from the same manufacturer in each zone or field of view.
4. Input#1 is mapped to Master mode output in this example, but it can programmed to another input using the DIP switches.
5. Notification appliances cannot be installed on the FACP control circuit connecting to the PSE input circuits.

2.7 Connecting to an External Charger

The PSE Power Supply can be connected to an external charger to charge systems requiring over 33AH batteries. Ensure all power has been disconnected before wiring. Observe polarity when making connections. Wiring must be in conduit within 20 feet (6.096m) in the same room.

2.7.1 CHG-120

1. Set S1 position 4 on the PSE Power Supply to the OFF position to disable the onboard battery charger.
2. Connect the battery cables between TB15 (+ and –) on the PSE and the CHG-120 charger output circuit (TB2: Out 1+ and Out 1–) as shown in Figure 2.9. Be certain to observe polarity.
3. Connect the batteries to the charger.
4. Connect the battery interconnect cable only after AC power is applied and batteries are connected. Refer to the *CHG-120 Manual* for more information.

Note: If batteries are disconnected at the CHG-120 terminals, battery supervision will be managed by the CHG-120

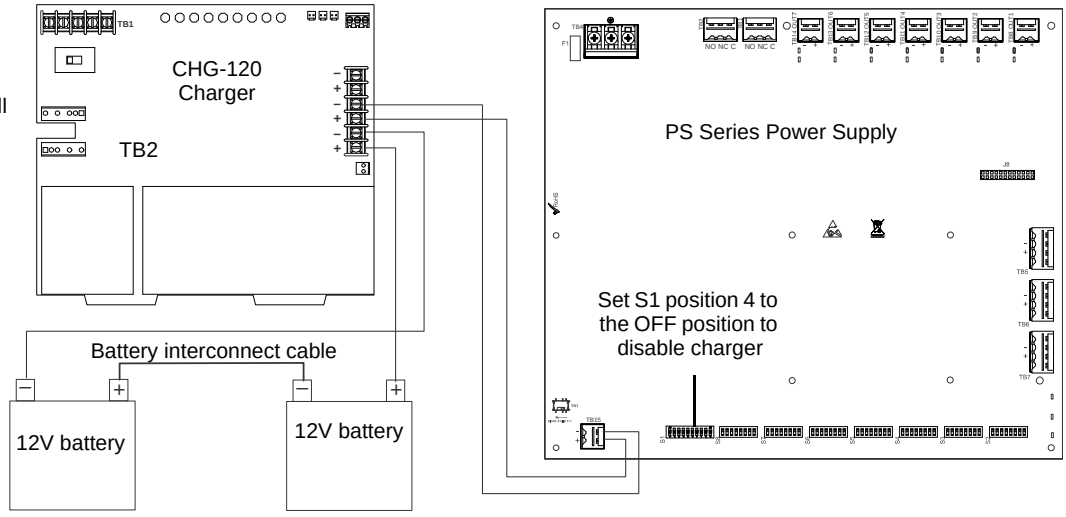


Figure 2.9 Connecting the Power Supply to a CHG-120 Charger

2.7.2 CHG-75

1. Set S1 position 4 on the PSE Power Supply to the OFF position to disable the onboard battery charger.
2. Connect the battery cables between TB15 (+ and –) on the PSE and the CHG-75 charger output circuit (TB2: Out+ and Out–) as shown in Figure 2.10. Be certain to observe polarity.
3. Connect the batteries to the charger.
4. Connect the battery interconnect cable only after AC power is applied and batteries are connected. Refer to the *CHG-75 Manual* for more information.

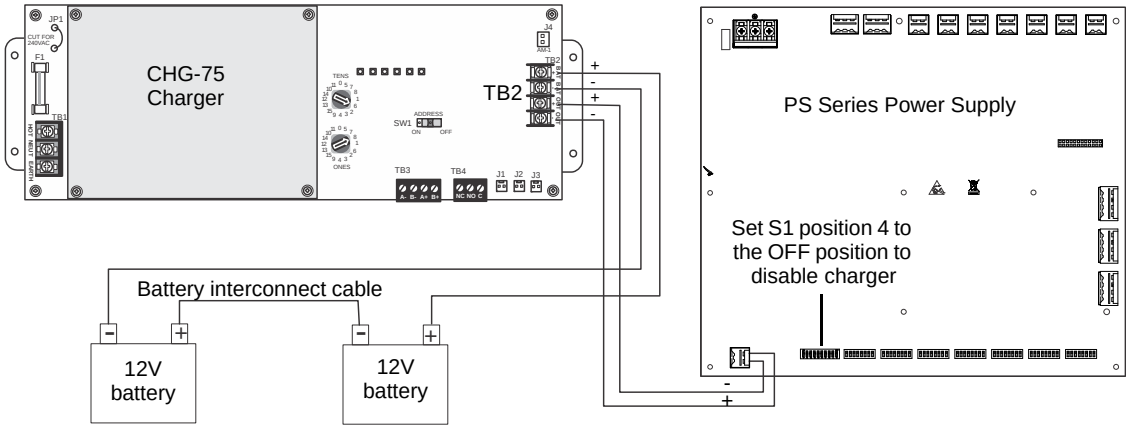


Figure 2.10 Connecting the Power Supply to a CHG-75 Charger

2.8 Cascading Multiple Units

Up to four PSE power supplies can be cascaded together to provide additional NAC extenders for a system. Maintain separation of power-limited and non-power-limited wiring as shown in Figure 2.6 on page 15.

Figures 2.11 and 2.12 show the controlling signal connected to Input 1 of PSE1. However, typically any available Input of PSE1 can be used.

Figures 2.11 and 2.12 show NAC7 of PSE1 - PSE3 as the cascading output. However, any available Output of PSE1 – PSE3 can be used.

NOTE: Any mode of operation that requires an additional control signal (i.e. a trigger signal), such as Selective Silence or Sync Mode, will affect which Inputs may be available on PSE1 for use with cascading. (Triggers signals are usually assigned to Input 2.) Refer to those sections of the manual for specifics.

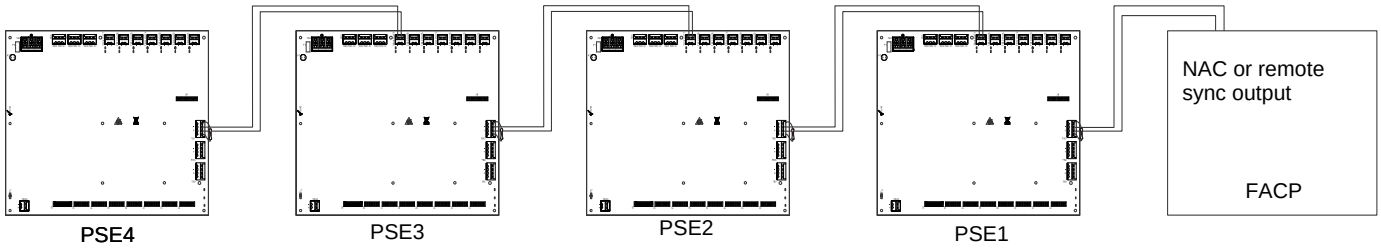


Figure 2.11 System Sync Connections Triggered by FACP

The following notes apply to Figure 2.11.

1. Set all PSE units to Slave (sync follower) mode.
2. The debounce/dejitter setting must be set to 1 msec on all cascaded units. See Table 3.3 on page 21.
3. Any output used for remote sync applications cannot have notification appliances installed on the same circuit.
4. Notification appliances cannot be installed on the interconnecting control circuits.
5. The total line impedance for interconnected units cannot be such that it creates a voltage drop > 3.2 VDC.
6. Ground fault supervision is provided via the general trouble relay for domestic and export models and via the dedicated ground fault relay in the Canadian models. Enable ground fault detection on PSE1 and disable detection on PSE2-4 with negative (-) battery terminals tied together. FACP ground fault supervision will be independent of cascaded PSE1-4. (FACP negative battery terminal is not tied to PSE1).

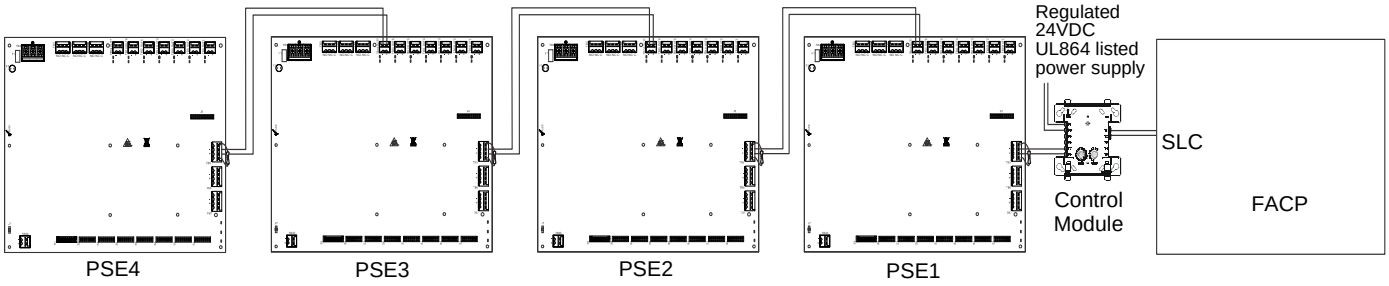


Figure 2.12 System Sync Connections Triggered by Control Module

The following notes apply to Figure 2.12.

1. Set PSE1 to Master Mode, and the desired strobe/horn type. Set remaining PSE units to Slave (sync follower) mode.
2. The debounce/dejitter setting must be set to 1 msec on PSE2 – PSE4 units. See Table 3.3 on page 21.
3. Strobe/Horn devices connected to the PSE units are not guaranteed to be in sync with FACP devices when using this configuration
4. Any output used for remote sync applications cannot have notification appliances installed on the same circuit.
5. Notification appliances cannot be installed on the interconnecting control circuits.
6. The total line impedance for interconnected units cannot be such that it creates a voltage drop > 3.2 VDC.
7. Ground fault supervision is provided via the general trouble relay for domestic and export models and via the dedicated ground fault relay in the Canadian models. Enable ground fault detection on PSE1 and disable detection on PSE2-4 with negative (-) battery terminals tied together. FACP ground fault supervision will be independent of cascaded PSE1-4. (FACP negative battery terminal is not tied to PSE1).

2.9 Canadian Applications

NOTE: Mass Notification is not for use in Canadian applications.

Canadian applications, per ULC, require the following:

- The PSE power supply must be used as a Notification Appliance Circuit extender only unless the power outputs are configured as Class A with the ZNAC-PS option card.
- Connect the AC ground wire to the Ground Stud located at the top left of the backbox as shown below. Connect the incoming earth ground wire to supplied cable #71073 with a wire nut. Position the ring terminal end over the grounding stud. Secure with one of the keps nuts. Place the ring terminal from the other supplied ground cable #71073 over the ground stud and secure with the second keps nut. Wire the ground cable to the middle position of TB4. Ensure that the ground for incoming AC mains is the first wire installed, closest to the backbox. This connection is vital in reducing the panel's susceptibility to transients generated by lightning and electrostatic discharge. Apply AC power to the panel only after the system is completely installed and visually checked. *Note that AC power must be applied to the panel before installing the battery interconnect cable*.

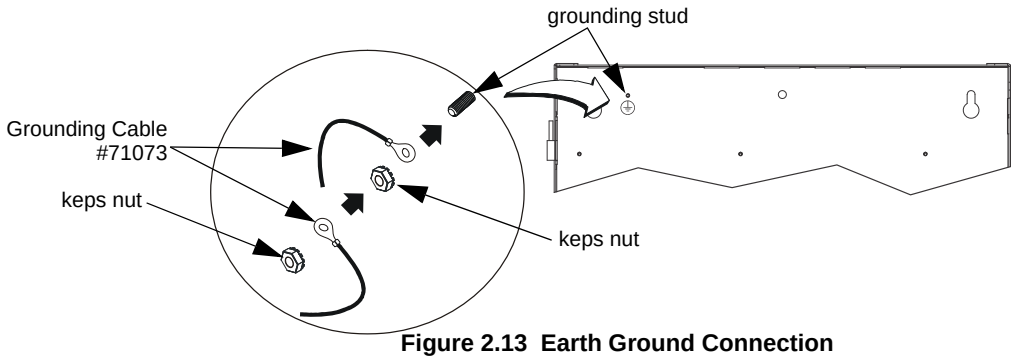


Figure 2.13 Earth Ground Connection

- Refer to Section 5.1 for instructions to meet ULC requirements for trouble monitoring of each zone.
- When connected to an FACP, the host FACP must monitor for all ground fault conditions. The Ground Fault Detection circuit on the PSE power supply must be disabled by sliding SW1 to the left on the bottom left corner of the PCB.
- The negative (-) battery terminal of the PSE power supply must be connected to the negative (-) battery terminal of the host FACP. Battery wiring is nonpower-limited. Power-limited and nonpower-limited wiring must be wired with a minimum of 0.25" spacing in between and enter/exit through different knockouts.
- When cascading multiple power supply units (up to four), continue connecting the negative battery terminals, including FACP battery terminal. Ground faults must then be detected by the first PSE in the chain. Disable ground fault detection on the FACP and on other PSE units by sliding SW1 to the left. Ensure ground fault detection is enabled on PSE1, the first power supply from the FACP, by sliding SW1 to the right.

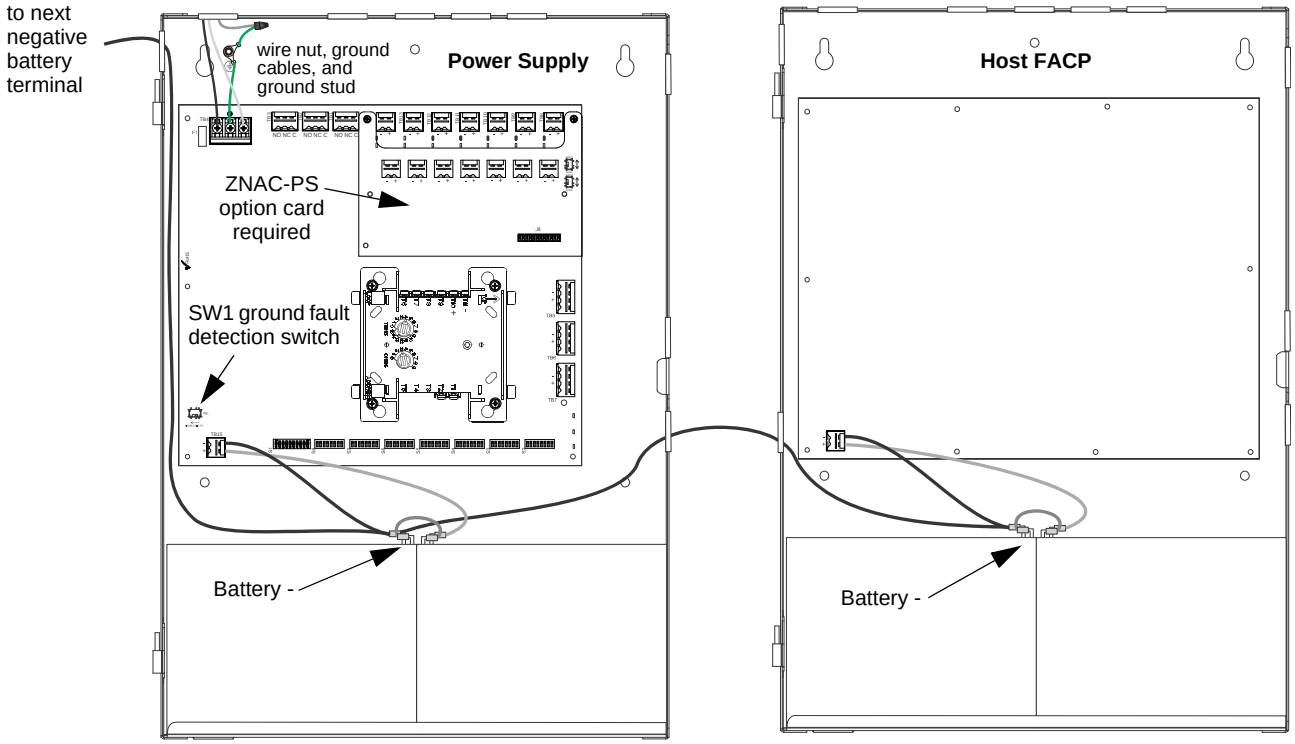


Figure 2.14 Canadian Applications

Section 3: Programming Options

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION AND OTHER INVOLVED PARTIES				
This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below:				
Program feature or option	**Permitted in UL864/2572 and ULC S527? (Y/N)**	**Possible settings**	**Settings permitted in UL 864/ UL2572**	**Settings permitted in ULC S527**
Door Holder Dropout Delay	Y	Refer to “AC Loss Door Holder Dropout Timer” on page 22. • Does not drop • 15 seconds • 5 minutes • 60 seconds	• Does not drop • 15 seconds • 60 seconds • 5 minutes	• Does not drop • 15 seconds • 60 seconds • 5 minutes
AC Loss Delay Timer	Y	Refer to “AC Fail Indication Delay” on page 22. • 30 hours • 12 hours • 2 hours • none	• 2 hours[1] • none	• 2 hours • none

Table 3.1 Agency-Permitted Programming Settings

1 A two hour delay is only permitted on an addressable FACP.

This section describes the programming options available via DIP switch settings. The PSE can be field programmed using DIP switches S1-S8 which are located at the bottom of the circuit board. S1 controls the global options of the power supply and S2-S8 control the functions of each output circuit, respectively. Refer to the following illustration for switch locations and DIP switch placement in the ON and OFF positions.

Important: *Activate output DIP switch changes by setting S1 positions 9 and 10 appropriately. Refer to Table 3.6 on page 22 for DIP Switch programming settings.*

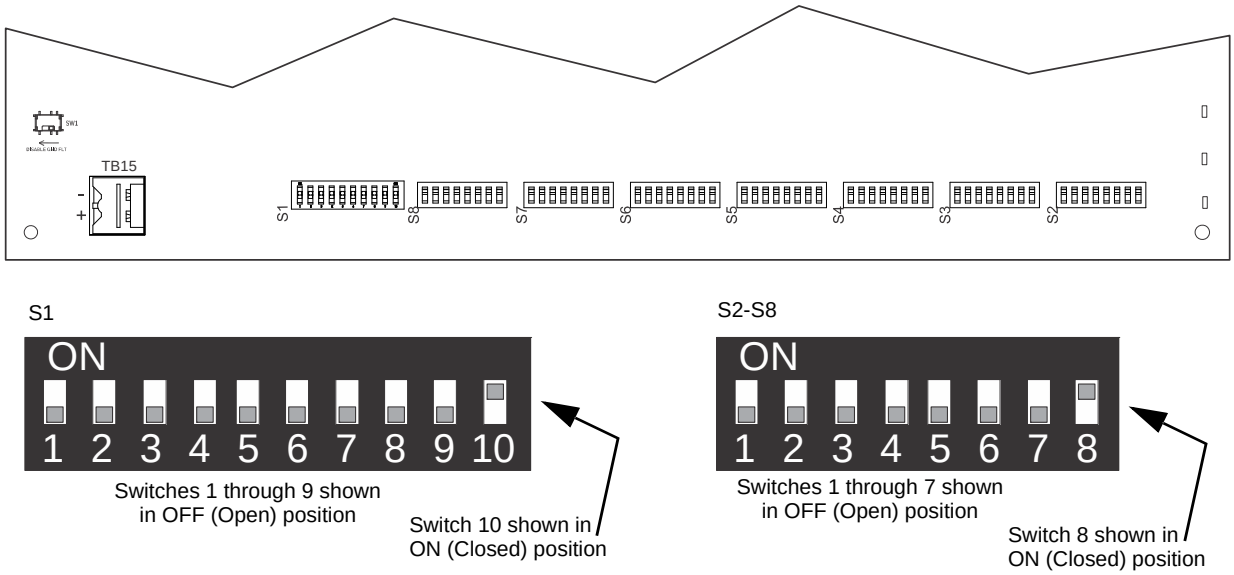


Figure 3.1 Field Programming DIP Switches

3.1 S1 Global Options DIP Switch

The following table lists the global control options for the PSE programmable features and the switch settings required to select a particular feature. A detailed description of each feature is presented in the following pages. Refer to Table 3.1 for UL-compliant settings.

S1 DIP Switch	OFF	ON
1, 2	These switches determine the command input debounce/dejitter setting (Setting applies to ALL inputs)[1]. **1 OFF, 2 OFF** = Temporal (for ANSI temporal signals) **1 ON, 2 OFF** = 50Hz (20 msec, for full wave rectified signals) **1 OFF, 2 ON** = 6 msec (for strobe sync signals, control/relay modules) **1 ON, 2 ON** = 1 msec (for strobe sync signals, control/relay modules)	
3	Command Input #1 configured for Slave Mode Sync[2] input[3]	Command Input #1 configured as normal
4	Internal battery charger = disabled	Internal battery charger = enabled
5, 6	These switches determine door holder dropout delay after AC power loss **5 OFF, 6 OFF**= Power does not drop out **5 ON, 6 OFF** = 5 minutes **5 OFF, 6 ON** = 60 seconds **5 ON, 6 ON** = 15 seconds	
7, 8	These switches determine the AC loss delay timer **7 OFF, 8 OFF** = 30 hours **7 ON, 8 OFF** = 12 hours **7 OFF, 8 ON** = 2 hours **7 ON, 8 ON** = none	
9, 10	These switches determine the operating mode of the power supply. *Return switches to normal mode to exit change output circuit configurations and display trouble history modes!* **9 OFF, 10 OFF** = normal **9 ON, 10 OFF** = change output circuit configurations **9 OFF, 10 ON** = display trouble history **9 ON, 10 ON** = normal	

Table 3.2 S1 Global Options DIP Switch Settings

1 Debounce/dejitter provides settling time for input signals to avoid false triggers.
2 Strobe synchronization only works with non-coded NACs.
3 Output circuit(s) must be set to activate on Input #2. See, "Command Input #1" below.

3.1.1 Global Programmable Features Description

Input Debounce/Dejitter/Delay

Signals from electronic circuits or relay contacts can have a small unstable time when changing state (OFF to ON, or ON to OFF). This means the signal can briefly “bounce” between states before stabilizing to the desired state, causing signal “jitter” during this time. The PSE provides four “debounce/dejitter” settings, as shown in the table below. These settings provide time for a NAC Input signal to stabilize before that NAC Input will recognize it as a valid signal, and not just “noise”, so as to prevent false activation of Output circuits. Input debounce settings can be used as needed.

Unless the system experiences input “noise” issues, apply 1ms setting for general use.

Position 1	Position 2	Setting	Notes
OFF	OFF	Temporal	Debounces ANSI temporal signals. Allows for a 0.5 second ON signal with an almost 2 second OFF signal to trigger a continuous ON input signal. *Do not use for strobe sync signals.*
ON	OFF	50Hz (20msec)	Debounces FWR (full wave rectified signals). Allows an input signal with 50Hz, 33% duty cycle to trigger a continuous (i.e. filters FWR input signal to appear constantly on) ON input signal. May apply to legacy panels. *Do not use for strobe sync signals.*
OFF	**ON**	6 msec	Input delay for strobe sync signals (i.e. Slave mode using sync input), or control/relay modules (i.e. Master or Aux. power mode using trigger input).
ON	**ON**	1 msec	Input delay for strobe sync signals (i.e. Slave mode using sync input), or control/relay modules (i.e. Master or Aux. power mode using trigger input). Must be the only one used when cascading Power Strike units. Refer to Section 2.8, “Cascading Multiple Units”, on page 18.

Table 3.3 Debounce/Dejitter Settings

Command Input #1

Power supply Output circuits can be configured to "follow" a sync pattern that is input to Command Input #1 (TB5), either immediately (Normal Mode), or only after a trigger signal (Sync Input Mode) is applied at Command Input #2 (TB6). In Sync Input Mode an output circuit will only output the Command Input #1 sync pattern when Command Input #2 is receiving a valid (9V - 32V) trigger signal.

See "Command Input #1 - Normal/Sync Mode of Operation" on page 25 for additional information.

Charger Enable/Disable

The PSE battery charger can be disabled to accommodate an external battery charger, such as the CHG-75 or CHG-120. Setting DIP switch position 4 to the OFF position will disable the charger. Setting DIP switch position 4 to the ON position will enable the charger. It should only be disabled if an external battery charger is being used for the PSE.

AC Loss Door Holder Dropout Timer

Any output can be configured as a NAC, aux power, or door closer circuit. Configuring an output circuit as a door closer circuit will provide a steady 24 VDC to door holders until an alarm condition or an AC fail condition. Upon an alarm condition, power to door holder circuits will be removed, causing doors to close immediately. During an AC fail condition, the door holder will remain energized until the programmed AC fail indication delay expires. Programmed delays are only applicable to AC loss conditions. Refer to Table 3.1 for UL-compliant settings.

DIP switch positions 5 and 6 are used to select the door holder dropout timer as listed below:

Position 5	Position 6	Door holder dropout delay after AC loss
OFF	OFF	Power does not drop out with AC loss
ON	OFF	5 minutes
OFF	**ON**	60 seconds
ON	**ON**	15 seconds

Table 3.4 Door Holder Dropout Settings

AC Fail Indication Delay

The AC Fail Indication Delay feature provides the option to delay generation of a trouble signal upon the loss of AC power. Refer to Table 3.1 for UL-compliant settings.

DIP switch positions 7 and 8 are used to select the AC Fail Indication Delay as listed below:

Position 7	Position 8	AC Fail Indication Delay
OFF	OFF	30 hours
ON	OFF	12 hours
OFF	**ON**	2 hours
ON	**ON**	none

Table 3.5 AC Loss Delay Settings

Refer to "AC Trouble Relay" on page 29, for operation of internal NAC trouble relay in response to AC loss.

Special Operating Modes

The PSE power supply can be placed in two special operating modes per settings in Table 3.6. They are Change Output Circuit Configurations and Display Trouble History. *Upon completion of either of these two modes, the system must be placed back in normal operating mode. Note that the current operation of all outputs will not be affected or disturbed while in either of these two special operating modes.*

Change Output Circuit Configurations mode:

NOTE: DIP switch settings may be changed to the desired configuration either before or after entering Change Output Circuit Configurations mode.

1. Enter this mode via the setting shown in Table 3.6. Once entered, the Output trouble LEDs will continually flash from right to left to confirm the PSE is in Change Output Configuration mode.
2. Configure settings on the Output DIP switches as needed (see Note above).
3. Return to Normal Operating mode via either of the two settings shown in Table 3.6. The output trouble LEDs will stop the flash pattern described above to confirm Normal mode has been restored.

The PSE power supply offers a trouble history mode. To see past troubles on the system, place position 9 to OFF and position 10 to ON. Refer to Section 4 for descriptions of troubles. Trouble history will be erased upon returning to Normal operating mode.

DIP switch positions 9 and 10 are used to select the type of operating mode as listed below:

Position 9	Position 10	Operating Mode
OFF	OFF	Normal
ON	OFF	Change output circuit configurations

Table 3.6 Operating Mode

OFF	**ON**	Display Trouble History
ON	**ON**	Normal

Table 3.6 Operating Mode

3.2 Output Circuit Control DIP Switch Settings

Each output circuit has its own programming DIP switch. DIP switches S2-S8 are labeled on the PCB to indicate which output circuit it is controlling. Output circuits are labeled at the top of the PCB, TB8-TB14.The following table applies to DIP Switches S2-S8.

Important! If an output circuit is overloaded, the output will shut off and generate a trouble signal. If this happens, the PSE will need to be reset manually. Either reset circuit configurations by toggling switch S1 position 10 to the OFF position for a minimum of five seconds or turn off primary and secondary power and reapply to the PSE.

DIP Switch Position				**Output Control Setting/Operation**
		1	**2**	
		OFF	OFF	NAC output will activate when Command Input #1 is activated.
		ON	OFF	NAC output will activate when Command Input #2 is activated. (**Exception**: this Input controls Horn silencing during Selective Silence operation.)
		OFF	**ON**	NAC output will activate when Command Input #3 is activated, if available. *(If accidentally programmed on a PSE-6, the system will default to Input #2.)*
		ON	**ON**	NAC output will activate when ANY Command Input is activated.
3	**4**	**5**	**6**	**Output Control Setting/Operation**
OFF	OFF	OFF	OFF	Unused/Unsupervised. Outputs will not activate. *Factory default setting.*
ON	OFF	OFF	OFF	Reserved- Outputs will not activate
OFF	**ON**	OFF	OFF	Non-resettable auxiliary power
OFF	OFF	**ON**	OFF	Resettable aux power
ON	**ON**	OFF	OFF	Door holder auxiliary power
ON	OFF	**ON**	OFF	Slave mode (NAC follower)
OFF	**ON**	**ON**	OFF	Master mode - ANSI Temporal (Temporal 3)
ON	**ON**	**ON**	OFF	Master mode - CO Temporal (Temporal 4)
OFF	OFF	OFF	**ON**	Master mode - Amseco/Potter
OFF	**ON**	OFF	**ON**	Master mode - Gentex
OFF	OFF	**ON**	**ON**	Master mode - System Sensor
OFF	**ON**	**ON**	**ON**	Master mode - Wheelock
ON	OFF	OFF	**ON**	Master mode, Selective Silence - Amseco/Potter
ON	**ON**	OFF	**ON**	Master mode, Selective Silence - Gentex
ON	OFF	**ON**	**ON**	Master mode, Selective Silence - System Sensor
ON	**ON**	**ON**	**ON**	Master mode, Selective Silence - Wheelock
			7	**Output Control Setting/Operation (Only applies when ZNAC-PS is installed)**
			OFF	Class B
			ON	Class A
			8	**Output Control Setting/Operation (Unused)**
			OFF	Unused/Unassigned
			ON	Unused/Unassigned

Table 3.7 S2-S8 Output Circuit DIP Switch Settings

3.2.1 Output Circuit Programmable Features Description

Command Inputs/NAC Circuits

The PSE allows for individual NAC circuit programming. Each NAC can be configured to activate based on the settings selected for up to 3 command inputs.

Position 1	**Position 2**	**Output to Command Input Assignment**
OFF	OFF	NAC will activate when Input #1 activates.
ON	OFF	NAC will activate when input #2 activates. (**Exception**: this Input controls Horn silencing during Selective Silence operation.)

Table 3.8 NAC Activation Settings

OFF	**ON**	NAC will activate when input #3 activates. (Input #3 is only available on the PSE-10 model. If selected on PSE-6, this setting will default to input #2.)
ON	**ON**	NAC will activate when any input (1, 2, or 3) activates.

Table 3.8 NAC Activation Settings

Unused Outputs

The factory default setting for all output circuits is "unused/unsupervised" where positions 3, 4, 5, and 6 are set to the OFF position. Any unused or disabled outputs in the system configuration must be set to OFF as shown below.

Position 3	Position 4	Position 5	Position 6	Auxiliary Power Type
OFF	OFF	OFF	OFF	Unused/Unsupervised. Outputs will not activate. *Factory default setting.*
ON	OFF	OFF	OFF	Reserved- Outputs will not activate

Table 3.9 Auxiliary Power Settings

Remote Supply with Resettable and Non-resettable Power

Each output circuit on the PSE can be used as a remote stand-alone power supply to provide power to any devices that require filtered, resettable or non-resettable power. The PSE can provide up to 3 amps of continuous current. Non-resettable power is suitable for powering annunciators and other peripheral equipment. Resettable power is suitable for four-wire smoke detectors. Resettable outputs reset when the mapped input receives a negative pulse trigger signal from FACP or control module. There will be a three second delay prior to output reset. The output reset will last 10 seconds. Set DIP switches positions indicated in Table 3.10 below to select auxiliary power type.

Position 3	Position 4	Position 5	Position 6	Auxiliary Power Type
OFF	**ON**	OFF	OFF	Non-resettable (constant) aux power
OFF	OFF	**ON**	OFF	Resettable aux power

Table 3.10 Auxiliary Power Settings

Door Holder

Each output circuit can be configured as a door holder circuit. Setting DIP switch positions according to Table 3.11 will configure the selected output circuit as a door holder circuit which will provide a steady 24 VDC to door holders until a mapped input activates an alarm or when an AC fail condition removes the power following a programmable delay. See "AC Loss Door Holder Dropout Timer" on page 22 for more information.

Position 3	Position 4	Position 5	Position 6	Door Holder
ON	**ON**	OFF	OFF	Set as door holder circuit

Table 3.11 Door Holder Power

Synchronization Mode - Master/Slave

The PSE power supply can be configured for Master or Slave Synchronization by setting DIP switches according to Table 3.12. Synchronization is a feature that controls the activation of notification appliances in such a way that all devices will turn on and off at exactly the same time. This is particularly critical when activating strobes which must be synchronized to avoid random activation and a potential hazard or confusion.

In some installations, it is necessary to synchronize the flash timing of all strobes in the system for ADA compliance. Strobes accomplish this by monitoring very short timing pulses on the NAC power which are created by an FACP with synchronization capability. When installed at the end of a NAC wire run, this power supply can track (follow) the strobe synchronization timing pulses on the existing NAC wire run. This maintains the overall system flash timing of the additional strobes attached to this power supply. Note that strobe synchronization works only with non-coded NACs.

When the output circuit is configured as a *sync generator* (Master Synchronization mode), the sync input circuit will only be used to trigger the output. The power supply is the originator of the strobe synchronization pulse on the NAC output. Refer to Table 3.12 to select the desired Master mode sync type.

When the output circuit is configured as a *sync follower* (Slave Synchronization mode), the power supply's NAC outputs track the strobe synchronization pulses present at the supply's Input terminals (based on the settings selected from Table 3.8). The pulses originate from an upstream FACP or other power supply. Some FACPs provide synchronization timing pulses from a dedicated sync output connector. Connect the PSE input terminals to the FACP sync output connector instead of the FACP NAC.

If circuits are configured for both master and slave mode, devices must be installed in different zones or field of view on a circuit basis.

Position 3	Position 4	Position 5	Position 6	Synchronization Type
ON	OFF	**ON**	OFF	Slave mode (NAC follower) - NAC outputs track Command Input Circuits
OFF	**ON**	**ON**	OFF	Master mode - ANSI Temporal (Temporal 3)

Table 3.12 Sync Mode - Master/Slave Settings

ON	**ON**	**ON**	OFF	Master mode - CO Temporal (Temporal 4)
OFF	OFF	OFF	**ON**	Master mode - Amseco/Potter
OFF	**ON**	OFF	**ON**	Master mode - Gentex
OFF	OFF	**ON**	**ON**	Master mode - System Sensor
OFF	**ON**	**ON**	**ON**	Master mode - Wheelock

Table 3.12 Sync Mode - Master/Slave Settings

Master Mode - Selective Silence

Selective Silence allows the silencing of the sounder portion of a horn/strobe combination device without turning off the strobe. Selective Silence is only supported while in Master mode setting for Amseco, Gentex, System Sensor, and Wheelock. Refer to Table 3.13 to select the desired Master mode, Selective Silence sync type.

NOTE: Do not apply synchronization signals to Command Input #1 and 2. Only trigger signals are allowed (i.e. constant 9-32 VDC). Synchronization signal is internally generated by the system when in Master mode.

Only Command Inputs #1 and #2 are used to control the Selective Silence operation. (Command Input #3 on PSE-10 does not support Selective Silence.) Input #1 is for activating the horn/strobe devices, while Input 2 only controls sounding of the horns. Input #1 must be active for Input #2 to have any effect on NAC outputs set for Selective Silence. The list below provides additional detail.

- If only Command Input #1 is active, only the strobes will be activated .
- If both Command Input #1 and #2 are active, strobes and horns will be activated.
- If only Command Input #2 is active, NAC outputs will not be activated.
- If neither Command Input #1 nor #2 is active, NAC outputs will not be activated.

Position 3	Position 4	Position 5	Position 6	Synchronization Type
ON	OFF	OFF	**ON**	Master mode, Selective Silence - Amseco/Potter
ON	**ON**	OFF	**ON**	Master mode, Selective Silence - Gentex
ON	OFF	**ON**	**ON**	Master mode, Selective Silence - System Sensor
ON	**ON**	**ON**	**ON**	Master mode, Selective Silence - Wheelock

Table 3.13 Master Mode - Selective Silence Settings

Command Input #1 - Normal/Sync Mode of Operation

For Normal Mode of operation, see previous section.

Sync Mode is an available option for the Slave Synchronization operating mode (see previous section). Sync Mode differs from the Slave Synchronization Normal Mode of operation because it requires an additional “trigger” signal to activate the output(s). Once the trigger signal is active, the corresponding output(s), as selected by the Output DIP Switch settings, will follow any synchronization signal provided to Input #1.

- Input #1 is dedicated as the follower input for any synchronization signal received into this input. Do not apply the **trigger** signal to this input.
- Input #2 is used for the trigger input for either the 6 amp or 10 amp models. Do not apply the **synchronization** signal to this input.
- Input #3 can also be used for the trigger input, but is only available on the 10 amp model. Do not apply the **synchronization** signal to this input.
- Use only one input (Input #2 or #3) at any one time for the trigger input.
- A trigger signal between 9-32VDC is required for proper operation.
- Set the Global DIP switch, S1 position 3, to the OFF position. See below:

NOTE: If Input #1 signal is lost while Input #2 (or Input #3, if available) trigger is active, output circuits will deactivate.

S1 DIP Switch	OFF	ON
3	Command Input #1 configured for Sync input	Command Input #1 configured as normal

Set DIP switch positions 1 and 2 according to which input circuit, #2 or #3, is used as the trigger input as shown below.

Position 1	Position 2	Trigger Input Assignment For Sync Mode Operation
ON	OFF	NAC will activate when Input #2 activates
OFF	**ON**	NAC will activate when Input #3 activates (Input #3 is only available on the PSE-10 model. If selected on PSE-6, this setting will default to input #2.)

DIP switch positions 4, 5, and 6 should be set to Slave Mode as shown below:

Position 3	Position 4	Position 5	Position 6	Synchronization Type for Sync Mode Operation
ON	OFF	**ON**	OFF	Slave mode (NAC follower) - NAC outputs track Command Input Circuits

Table 3.14 Sync Mode Settings

Class A Wiring

NAC circuits (all outputs) and aux power circuits (outputs 1 and 2) can be converted to Class A wiring using the ZNAC-PS option card. Setting DIP switch position 7=ON when a selected output circuit is configured for Class A wiring. The default setting is OFF for Class B wiring.

■ Maximum Number of Strobes for Synchronization

The total current draw for each Notification Appliance Circuit cannot exceed 3.0 amps special application, 1A (6 amp model) or 1.5A (10 amp model) regulated. Refer to the manufacturer's documentation supplied with the strobe to determine the maximum current draw for each strobe and ensure that the circuit maximum is not exceeded.

To ensure proper strobe and circuit operation, there is also a limit to the number of strobes that can be attached to each circuit. Following is a table of the strobes that have been tested with the power supply and the maximum number that can be connected to each NAC when using the lowest candela settings. *Make sure that the NAC maximum current is not exceeded:*

Manufacturer	max. number of strobes[1]
System Sensor	69
Gentex	42
Wheelock	50
Amseco/Potter	34

Table 3.15 Maximum Number of Strobes

1 These values are for strobe-only devices at the minimum candela setting. Values will be different for strobe/horn and horn-only devices. Refer to the manufacturer's installation documents for values on these devices.

Section 4: LED Indicators

The PSE power supply has 3 system LED indicators for Power, Batt/Chgr Fault, and Ground Fault. In addition, each available output circuit also has 2 status LEDs. Refer to Figure 1.1 on page 10 for LED locations. A description of each PSE LED indication is given below.

Ground Fault LED (yellow)

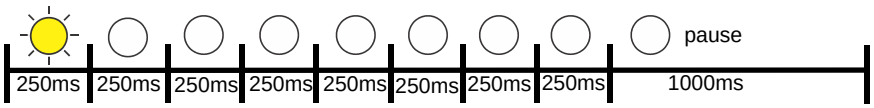
No Fault	LED is OFF
Fault Condition: ground fault	LED is ON constant

Power LED (green)

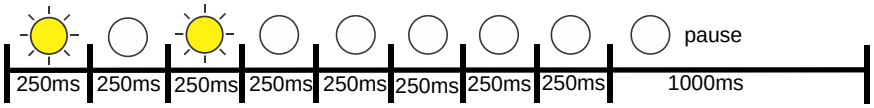
No Fault	LED is ON constant
Fault Condition: AC power loss (or brownout) 1 short blink (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode)

Battery fault LED (yellow)

No Fault	LED is OFF
Fault Condition: Charging path (FETs) failure 1 short blink (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode)

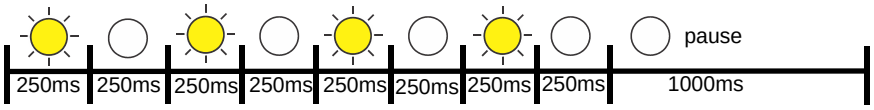


Fault Condition: Charger voltage too low or Charger Diode Fault 2 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode)



Fault Condition: Battery discharged/overcharged 3 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode)

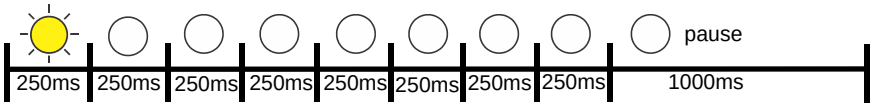
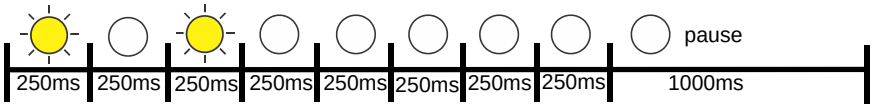
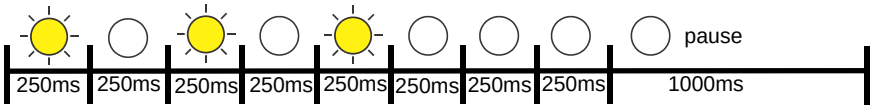
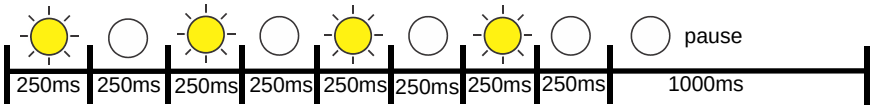
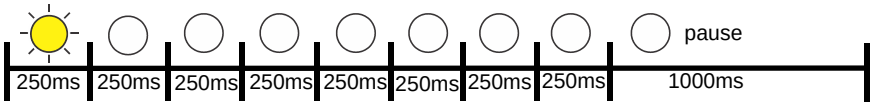
Fault Condition: Battery disconnected/fully discharged 4 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode)



Output Circuit Status LEDs (red)

Output inactive	LED is OFF 
Output active	LED is ON constant 

Output Circuit Trouble LEDs (yellow)

No Fault	LED is OFF 
Fault Condition (Normal/Standby Mode): Wire Supervision Class A or B Open circuit 1 short blink (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition (Normal/Standby Mode): Wire Supervision Class A or B Short Circuit 2 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition: Aux Power Supervision Class A Open circuit (ZNAC-PS Circuit #1 and #2 only) 3 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition: Power limit condition (individual ckt overload) 4 short blinks per individual circuit (250ms) Fault Condition: Power limit condition (panel overload) 4 short blinks on all output circuits (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Operating Mode Fault: Power Supply not in Normal Operating mode 1 short blink from right to left across all output circuits. Set positions 9 and 10 on S1 to the ON position.	Repeating LED blink pattern (non-diagnostic mode) 

Section 5: Trouble Supervision

The FACP will detect PSE power supply faults. Any of the following conditions will cause the trouble contact to open, provided the FACP Notification Appliance Circuit is *not* in alarm.

5.1 Trouble Supervision Using Input Circuits

The FACP (Fire Alarm Control Panel) supervises the connection between itself and the PSE via the control panel's NAC End-of-Line Resistor (ELR). To supervise the PSE, an ELR must be installed across terminals 1 & 4 of Command Inputs #1 and #2 (and #3 for the 10 amp models). A field wiring fault on the NAC output of the PSE will trigger a disconnection of the ELR at the related Command Input, causing a general NAC trouble at the FACP provided the FACP's NAC is *not* in alarm. Refer to Section 3.2, "Output Circuit Control DIP Switch Settings", on page 23 for input/output configuration assignment. The following are exceptions.

1. Resettable Aux Power, Non-Resettable Aux Power, and Door Holder Aux Power outputs that trigger the Trouble relay during an output trouble instead of breaking the ELR connection at the Command Input regardless of the output to input relationship (i.e. mapping). Refer to 5.2, "Trouble Relay" below.
2. Faults are only reported by Command Input #1 when Selective Silence output mode is controlled by Command Input #1 and #2.
3. Faults are only reported by the trigger input when Command Input #1 is configured for Sync Input mode operation controlled by a sync and trigger input.

If the PSE is in alarm, only a short circuit on the NAC will be detected as a trouble.

If other trouble monitoring is required when the power supply is in alarm, the Trouble Relay at TB1, and AC Trouble at TB2, and Ground Fault Trouble at TB3 (Canadian applications only) can be used for this purpose.

5.2 Trouble Relay

The PSE power supply has a fail-safe Form-C trouble relay located at TB1. The contacts can be monitored by an FACP input circuit or an addressable monitor module as illustrated in Figure 5.1. Note that any faults reported by Command Inputs are not repeated by the trouble relay, offering limited trouble reporting.

Trouble conditions that will cause the normally energized trouble relay to change states regardless of whether the panel is in alarm or standby:

- A battery fail condition at the power supply
- A battery charger fail on the power supply
- A ground fault condition on the power supply (non-Canadian models only)
- A field wiring fault on the PSE output in Resettable Aux Power, Non-Resettable Aux Power, or Door Holder Aux Power mode
- A total panel overload fault

If trouble monitoring is required when the power supply is in alarm, the Trouble Relay at TB1 can be used for this purpose. Refer to Figure 5.1 below.

NOTE: The individual NAC Trouble LED will indicate which NAC circuit is in trouble.

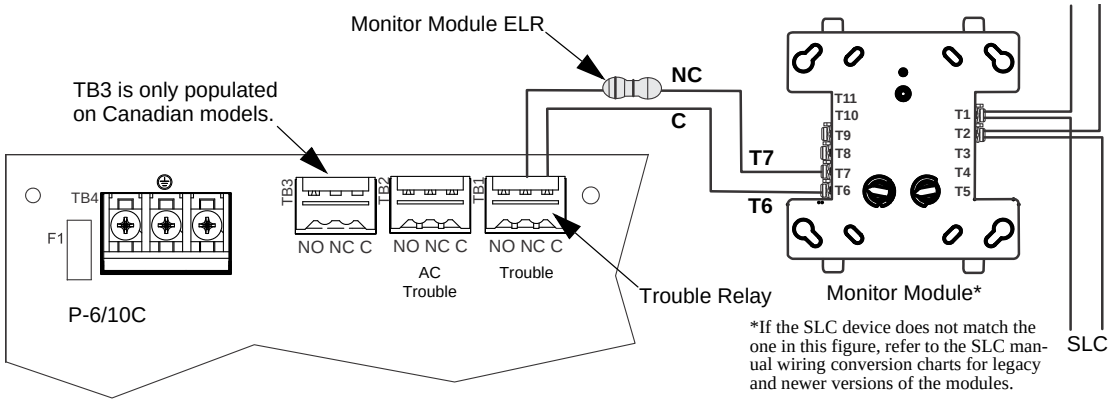


Figure 5.1 Monitoring the Trouble Relay

5.3 AC Trouble Relay

The PSE power supply has a fail-safe Form-C trouble relay located at TB2. The contacts can be monitored by an FACP input circuit or an addressable monitor module similar to the drawing illustrated in Figure 5.1. The AC Trouble Relay responds to an AC fail condition on the PSE immediately, or after a programmed delay time, depending on the setting of S1 switches 7 and 8.

The reporting of AC loss to a central station is usually delayed in order to prevent multiple transmissions of AC loss and restoral, allowing AC power to stabilize. When a host FACP is programmed to delay AC loss reporting, the PSE must be configured to delay the reporting of AC fail. This is accomplished by setting S1 positions 7 and 8. Refer to the DIP switch setting chart in Table 3.5 on page 22. This will prevent AC loss from being reported as a trouble condition for 30, 12, 2, or 0 hours. Note that only no delay and the 2 hour delay are acceptable per UL 864 and UL 2572.

5.4 Ground Fault Relay (Canadian Applications Only)

The PSE-6/10C power supply has a form-C trouble relay located at TB3. The contacts can be monitored by an FACP input circuit or an addressable monitor module similar to the drawing illustrated in Figure 5.1. Ground fault conditions will cause the relay to change states regardless of whether the panel is in alarm or standby.

Section 6: Power Supply Requirements

6.1 Overview

This section contains instructions and tables for calculating power supply currents in alarm and standby conditions. This is a four-step process, consisting of the following:

1. Calculating the total amount of AC branch circuit current required to operate the system
2. Calculating the power supply load current for non-fire and fire alarm conditions and calculating the secondary (battery) load
3. Calculating the size of batteries required to support the system if an AC power loss occurs
4. Selecting the proper batteries for your system

6.2 Calculating the AC Branch Circuit

The power supply requires connection to a separate, dedicated AC branch circuit, which must be labeled **FIRE ALARM**. This branch circuit must connect to the line side of the main power feed of the protected premises. No other non-fire alarm equipment may be powered from the fire alarm branch circuit. The branch circuit wire must run continuously, without any disconnect devices, from the power source to the power supply. Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Codes as well as local codes. Use a minimum of 14 AWG (2.00 mm^2) wire with 600 volt insulation for this branch circuit.

Use Table 6.1 to determine the total amount of current, in AC amperes, that must be supplied to the system.

Device Type	Number of Devices		Current Draw (AC amps)		Total Current per Device
PSE-6(C)(R) or PSE-10(C)(R) or PSE-6E or PSE-10E	1	x	5.0 or 6.2 or 2.7 or 3.5	=	
[ ]	[ ]	x	[ ]	=	
[ ]	[ ]	x	[ ]	=	
Sum Column for AC Branch Current Required				=	

Table 6.1 120/240 VAC Branch Circuit Requirements

6.3 Calculating the System Current Draw

6.3.1 Overview

The power supply must be able to power all internal and external devices continuously during a fire alarm condition. The secondary power source (batteries) must be able to power the system during a primary power loss.To calculate the non-fire alarm load on the power supply when secondary power is applied, use Calculation Column 1 in Table 6.3 on page 32. The power supply must support a larger load current during a fire alarm condition. To calculate the fire alarm load on the power supply as secondary power, use Calculation Column 2 in Table 6.3 on page 32.

When calculating current draw and the battery size, note the following:

- *Primary* refers to the main power source for the power supply.
- *Secondary* refers to the power supply's backup batteries.
- All currents are given in amperes (A). Table 6.2 shows how to convert milliamperes and microamperes to full amperes.

To convert...	Multiply	Example
Milliamperes (mA) to amperes (A)	mA x 0.001	3 mA x 0.001 = 0.003 A
Microamperes (μA) to amperes (A)	μA x 0.000001	300 μA x 0.000001 = 0.0003 A

Table 6.2 Converting to Full Amperes

6.3.2 How to Calculate System Current Draw

Use Table 6.3 on page 32 to calculate current draws as follows:

1. Enter the quantity of devices in both columns.
2. Enter the current draw where required. Refer to the *Notifier Device Compatibility Document* for compatible devices and their current draws.
3. Calculate the current draws for each in both columns.
4. Sum the total current for each column.

Following are the types of current that can be entered into Table 6.3.

✓**Calculation Column 1** - The secondary supply current load that the power supply must support during a non-fire alarm condition, with AC power applied

✓**Calculation Column 2** - The secondary supply current load the power supply must support during a fire alarm condition, with AC power applied

Table 6.3 contains two columns for calculating current draws. For each column, calculate the current and enter the total (in amperes) in the bottom row. When finished, use the data to select the proper size batteries in Tables 6.4 and 6.5.

Device Type	Calculation Column 1 Secondary, Non-Fire Alarm Current (amps)			Calculation Column 2 Secondary, Fire Alarm Current (amps)		
	Qty	X (current draw) =	Total	Qty	X (current draw) =	Total
Main Circuit Board - PSE-6	1	X [0.233] =		1	X [0.208] =	
Main Circuit Board - PSE-6 with ZNAC-PS Class A option card	1	X [0.183] =		1	X [0.154] =	
Main Circuit Board - PSE-10	1	X [0.293] =		1	X [0.247] =	
Main Circuit Board - PSE-10 with ZNAC-PS Class A option card	1	X [0.219] =		1	X [0.169] =	
NAC/Output #1	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #2	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #3	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #4	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #5	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #6	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #7	[ ]	X [ ] =		[ ]	X [ ] =	
EOLR-1 Power Supervision Relay	[ ]	X [0.020] =		[ ]	X [0.020] =	
Sum each column for totals	**Secondary Non-Alarm =**			**Secondary Alarm =**		

Table 6.3 System Current Draw Calculations

6.4 Selecting and Locating Batteries

Select batteries that meet or exceed the total ampere hours determined in Tables 6.4 and 6.5. The power supply can charge batteries from 7 AH to 33 AH range. The power supply cabinet is capable of housing industry standard 7 AH or 18 AH batteries. Other ampere batteries (e.g. 12AH, 26AH, 33AH) will not fit physically inside the PSE cabinet and require a separate battery box.

6.4.1 NFPA Battery Requirements

NFPA 72 Local and Proprietary Fire Alarm Systems require 24 hours of standby power followed by 5 minutes in alarm for normal operations, 15 minutes for mass notification systems, or 30 minutes for Canadian applications.

NOTE: When using carbon monoxide detection, the system must be monitored by a Supervising Station meeting the Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment, NFPA 720.

6.4.2 Maximum Battery Standby Load

Tables 6.4 and 6.5 show the standby load calculations for the power supply based on 24 hours of standby. The standby load calculations in the Table 6.3 must be less than the number shown in Tables 6.4 and 6.5 for the selected battery size, standby hour and alarm time. The numbers below have a built in 20% derating factor for the battery ampere capacity.

Battery Capacity (AH)	Alarm Time (min)				
	5	10	15	20	30
7	0.212 A	0.190 A	0.168 A	0.147 A	N/A
12	0.378 A	0.357 A	0.335 A	0.313 A	0.270 A
18	0.578 A	0.557 A	0.535 A	0.513 A	0.470 A
33	1.078 A	1.057 A	1.035 A	1.013 A	0.970 A
75	2.478 A	2.457 A	2.435 A	2.413 A	2.370 A
120	3.000 A	3.000 A	3.000 A	3.000 A	3.000 A

Table 6.4 Maximum Battery Standby Loads for 24 Hour Standby on the PSE-6

Battery Capacity (AH)	Alarm Time (min)				
	5	10	15	20	30
7	0.198 A	0.162 A	N/A	N/A	N/A
12	0.365 A	0.329 A	0.294 A	0.258 A	0.187 A
18	0.565 A	0.529 A	0.494 A	0.458 A	0.387 A
33	1.065 A	1.029 A	0.994 A	0.958 A	0.887 A
75	2.465 A	2.429 A	2.394 A	2.358 A	2.287 A
120	3.000 A	3.000 A	3.000 A	3.000 A	3.000 A

Table 6.5 Maximum Battery Standby Loads for 24 Hour Standby on the PSE-10

Section 7: Testing and Maintenance

7.1 Periodic Testing and Service

Periodic testing and servicing of equipment is essential to ensure proper and reliable operation. Test and service the power supply according to the schedules and procedures outlined in the following documents:

- NFPA Standard 72's section on Inspection, Testing and Maintenance
- All test and maintenance instruction codes and software necessary to provide test and inspection requirements of CAN/ULC-S536, Standard for the Inspection and Testing of Fire Alarm Systems

7.2 Battery Checks and Maintenance

Maintenance-free sealed lead-acid batteries used in the system do not require the addition of water or electrolyte. These batteries are charged and maintained in a fully charged state by the main power supply's charger during normal system operation. A discharged battery typically reaches the voltage of 27.6 VDC within 48 hours;. Sealed lead-acid batteries must be replaced within at most 5 years from their date of manufacture. Minimal replacement battery capacity appears on the control panel marking label. Immediately replace a leaking or damaged battery. Replacement batteries are available from the manufacturer.

WARNING: SULFURIC ACID

BATTERIES CONTAIN SULFURIC ACID WHICH CAN CAUSE SEVERE BURNS TO THE SKIN AND EYES AND DAMAGE TO FABRICS.

F1 Fuse Replacement	Not Allowed
Rechargeable Battery Replacement	Recommended Part Numbers: • **BAT-1270** (12V,7AH) • **BAT-12120** (12V, 12AH) • **BAT-12180** (12V 18AH) • **BAT-12260** (12V, 26AH) • **BAT-12330** (12V, 33AH)

Appendix A: Wire Requirements

Connecting external system accessories to the main circuits must be carefully considered to ensure proper operation. It is important to use the correct type of wire, gauge and run length for each circuit. The following table lists NAC wiring requirements for the PSE-6 and PSE-10 Power Supply.

The numbers documented in this chart are worst case numbers, based on the conditions listed below. The maximum voltage drop, maximum loop resistance, and wire length ratings can be increased with lower system current loading.

1. The PSE-6/10 is full capacity loaded at 6A/10A.
2. The PSE-6/10 is running at the Low Battery voltage of 20.4VDC (at Battery Connector TB15).

Wire lengths apply to Class B wiring, and to Class A wiring returned to the ZNAC-PS card.

Max Load (Amps)	Max Loop Resistance (Ohms)	AWG 12 (Solid)	AWG 14 (Solid)	AWG 16 (Solid)	AWG 18 (Solid)
0.25	12.804	3320	2087	1310	823
0.50	6.402	1660	1044	655	412
0.75	4.268	1107	696	437	274
1.00	3.201	830	522	327	206
1.25	2.561	664	417	262	165
1.50	2.134	553	348	218	137
1.75	1.829	474	298	187	118
2.00	1.601	415	261	164	103
2.25	1.423	369	232	146	91
2.50	1.280	332	209	131	82
2.75	1.164	302	190	119	75
3.00	1.067	277	174	109	69

Table A.1 Wiring Requirements for Power Supply

NOTE: Calculations are based on Direct-Current Resistance data for uncoated copper wire, per National Electrical Code (2005 Edition) Table 8, Conductor Properties.

NOTE: These distances reflect the worst case scenario and are based on the correct draw of the highest candela strobes at the low end of the supported NAC voltage with the entire load at the end of the circuit. Further distances can be achieved by performing a point to point voltage calculation that more accurately reflects the specific devices used and how they are dispersed on the circuit.

Appendix B: Application Examples

B.1 Controlling NACs For Selective Silence Operation Using a Control Module

In this application, the power supply has been set as a master with synchronized outputs and selective silence (see DIP switch settings and Selective Silence Operation information in Section 3). This application requires Input #1 to be controlled by the FACP. Input #2 is required for controlling selective silence via a control/relay module, *programmed as an alarm output and a silenceable point*. *Only Mass Notification, Fire, or combo Mass Notification/Fire NACs are allowed in this configuration*. The control module can be powered by one of the PSE output circuits, configured as aux power (24VDC).

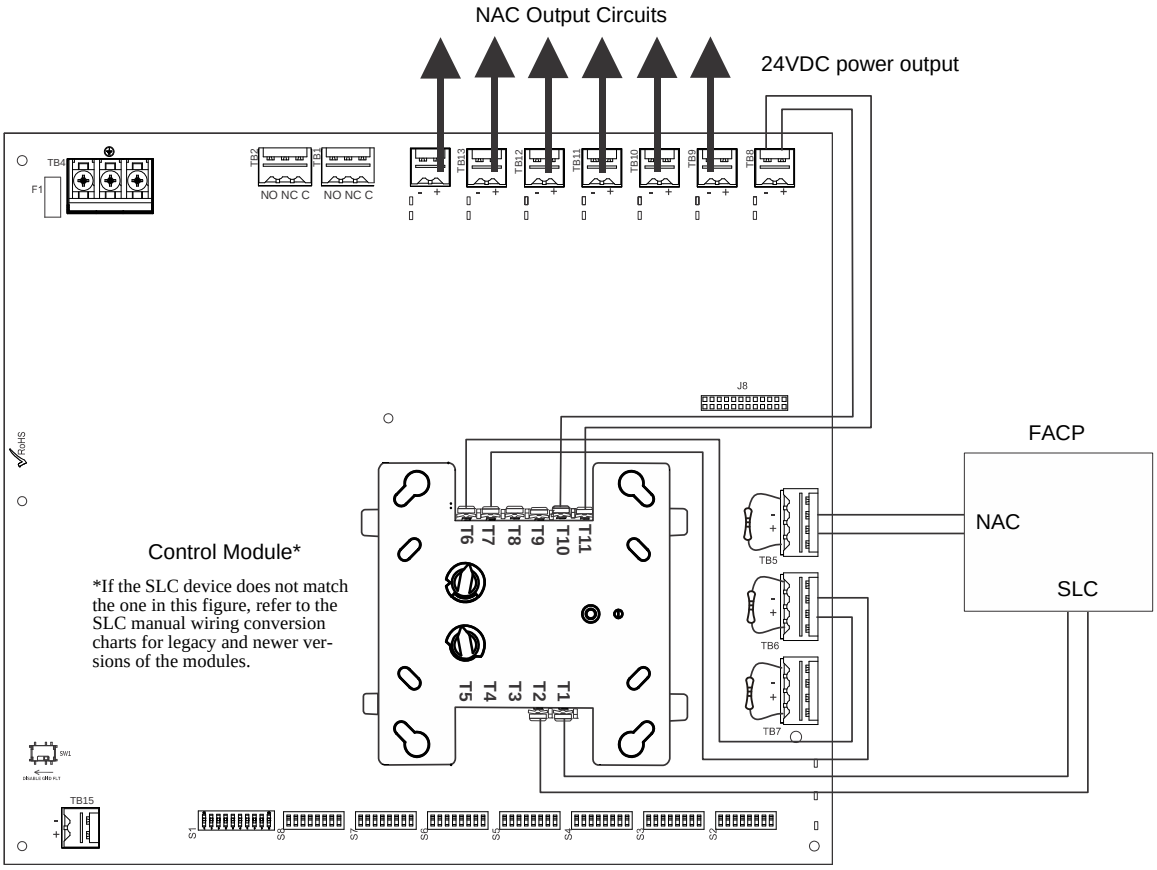


Figure B.1 Controlling Multiple Outputs with One Input

The following notes apply to Figure B.1.

When the PSE power supply is in an inactive state (FACP NAC not active), a trouble on the NAC circuit will result in an open circuit condition on the FACP (monitored by End-of-Line Resistor across TB5, Terminals 1 and 4). As an alternative, the trouble contacts at TB1 of the power supply can also be used for limited trouble monitoring excluding Selective Silence output faults. Refer to Section 5 for more information.

- Refer to Section 3 for instructions on setting the DIP switches.
- Selective Silence output faults are only reported via Command Input #1 (not Command Input #2).
- Wire NACs as shown on page 13.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed across all input circuits, Terminals 1 and 4, for control module wiring supervision (the ELR value is dependent on the module/FACP employed).
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.2 Controlling NACs For Sync Follower Operation Using a Control Module

In this application, the power supply has been set to operate in slave mode and will follow the sync signal from the FACP. This application requires Input #1 to be controlled by the FACP sync output. Input #1 may be wired to the next PSE or terminate in and ELR. Input #2 (or Input #3, if available) will act as the trigger signal for the output circuits. The control module can be powered by one of the PSE output circuits, configured as aux power (24VDC). See Table 3.14 on page 25 DIP switch settings.

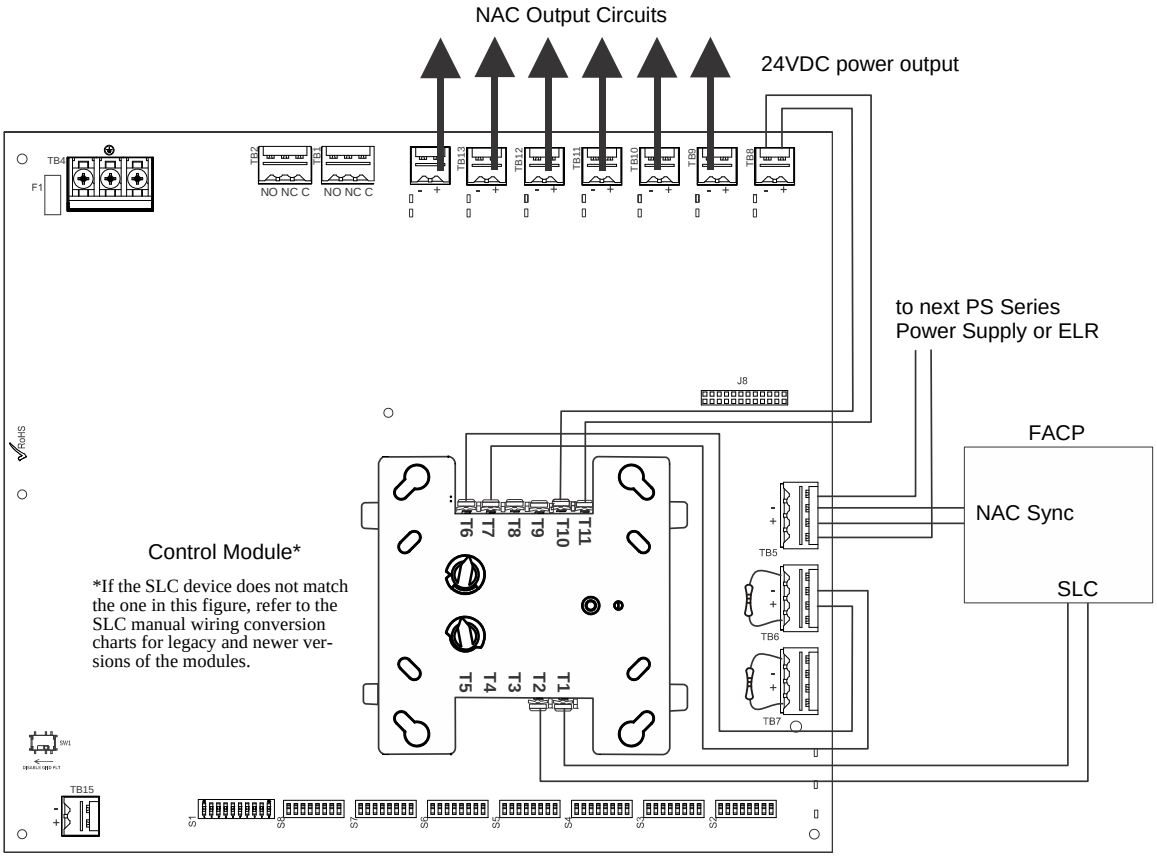


Figure B.2 Controlling Multiple Outputs with One Input as Sync Follower

The following notes apply to Figure B.2.

- When the PSE power supply is in an inactive state (control module not active), a trouble on the NAC circuits mapped to TB6 will result in an open circuit condition on the control module output circuit (monitored by End-of-Line Resistor across TB6, Terminals 1 and 4). As an alternative, the trouble contacts at TB1 of the power supply can also be used for limited trouble monitoring excluding faults reported by Command Input #2 related to Command Input#1 configured for Sync Input mode. Refer to Section 5 for more information.
- Refer to Section 3 for instructions on setting the DIP switches.
- Output faults are reported via Command Input#2 with Command Input#1 configured for Sync Input mode operation.
- Refer to the FACP manual for load restrictions and line length limitations when wiring multiple power supplies at the input.
- Wire NACs as shown on page 13.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed across all input circuits, Terminals 1 and 4, for control module wiring supervision (the ELR value is dependent on the module/FACP employed).
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.3 Controlling NACs, Aux Power, or Door Holders Using a Control Module

All output circuits, NACs, aux power (non-resettable power – active regardless of control module state), or door holders, can be controlled from one input such as an addressable control module as illustrated in Figure B.3. The control module can be powered from one of the PSE output circuits, as 24 VDC power. In this example, Output #1 will be configured as 24VDC non-resettable aux power.

The control module is shown to demonstrate the use of an internally mounted device associated with an addressable fire alarm control panel. The module could be replaced with any circuit capable of polarity reversal, such as an FACP Notification Appliance Circuit.

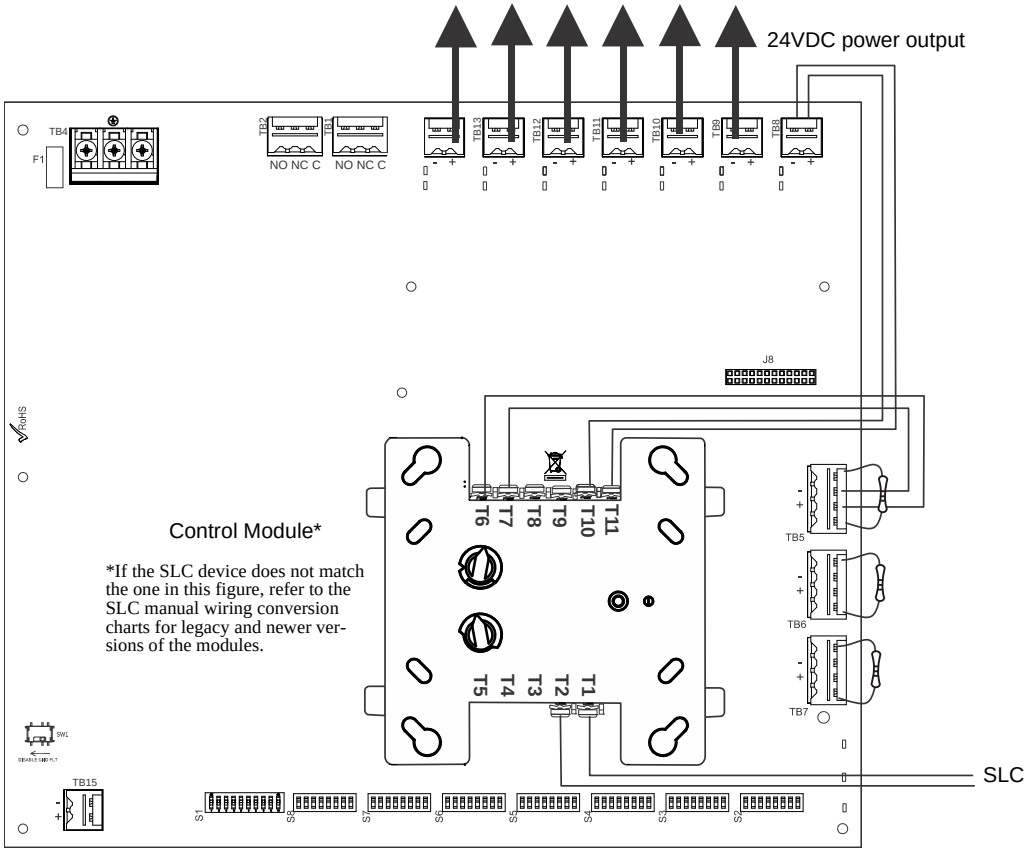


Figure B.3 Controlling NACs, Aux Power, and Door Holders with One Input

The following notes apply to Figure B.3.

- Any output circuit can be configured as NAC, door holder, or 24VDC power.
- Wire NACs as shown on page 13.
- Refer to Section 3 for instructions on setting the DIP switches.
- When the PSE power supply is in an inactive state (control module not active), a trouble on the NAC circuits mapped to TB5 will result in an open circuit condition on the control module output circuit (monitored by an End-of-Line Resistor across Terminals 1 and 4). Additionally, the trouble contacts at TB1 of the power supply can also be used for limited trouble monitoring excluding output faults reporting to Command Input #1. Refer to Section 5 for more information.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed between terminals 1 and 4 for control module wiring supervision (the ELR value is dependent on the module/FACP employed).
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.4 Controlling NACs, Aux Power, and Door Holders with NAC Sync

In this application, use of a single FDRM-1 mounted inside the cabinet can monitor the two power supply trouble relays and trigger two independent inputs via relay circuits. PSE outputs #1 and #2 are being used for 24 VDC aux power triggered by the module's relay circuits. Any PSE output circuit can be configured to follow any input circuit.

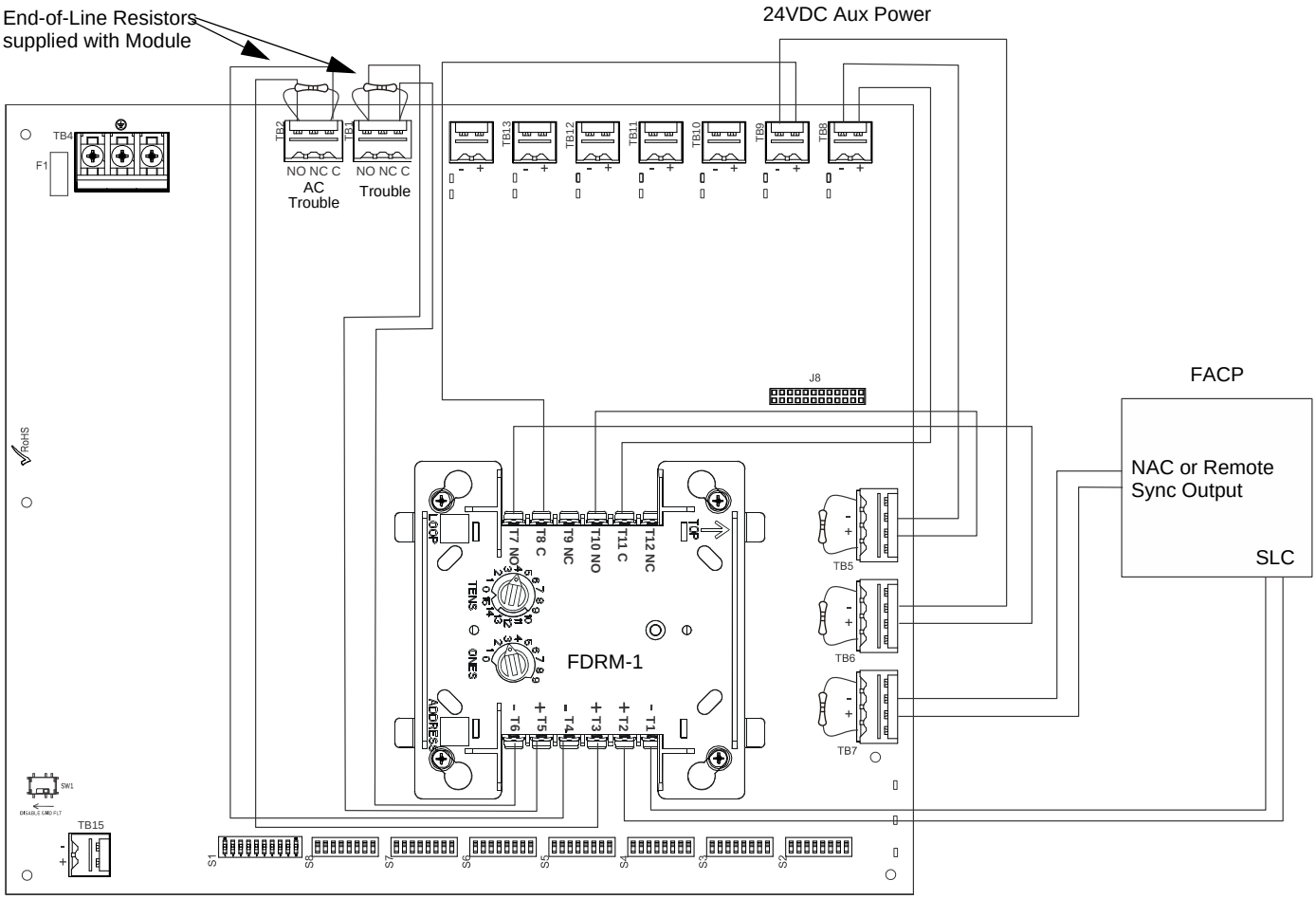


Figure B.4 Controlling NACs, Aux Power, and Door Holders with One Input and NAC Sync

The following notes apply to Figure B.4.

- Any output circuit can be configured as NAC, door holder, or 24VDC power.
- Refer to Section 3 for instructions on setting the DIP switches.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed between terminals 1 and 4 for module wiring supervision (the ELR value is dependent on the module/FACP employed).
- An End-of-line Resistor on input circuits#1-2 (TB5-6) are optional for this particular application.
- Ensure that the FDRM-1 is programmed appropriately at the FACP where the inputs are *not* mapped to the same zone as its outputs.
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.5 Controlling all Three Inputs with One Control Module

In this application, all three command inputs are being controlled by one multi-module, the XP6-C mounted inside the cabinet. Output #1 is being used for 24 VDC aux power. Any output circuit may be configured to any input.

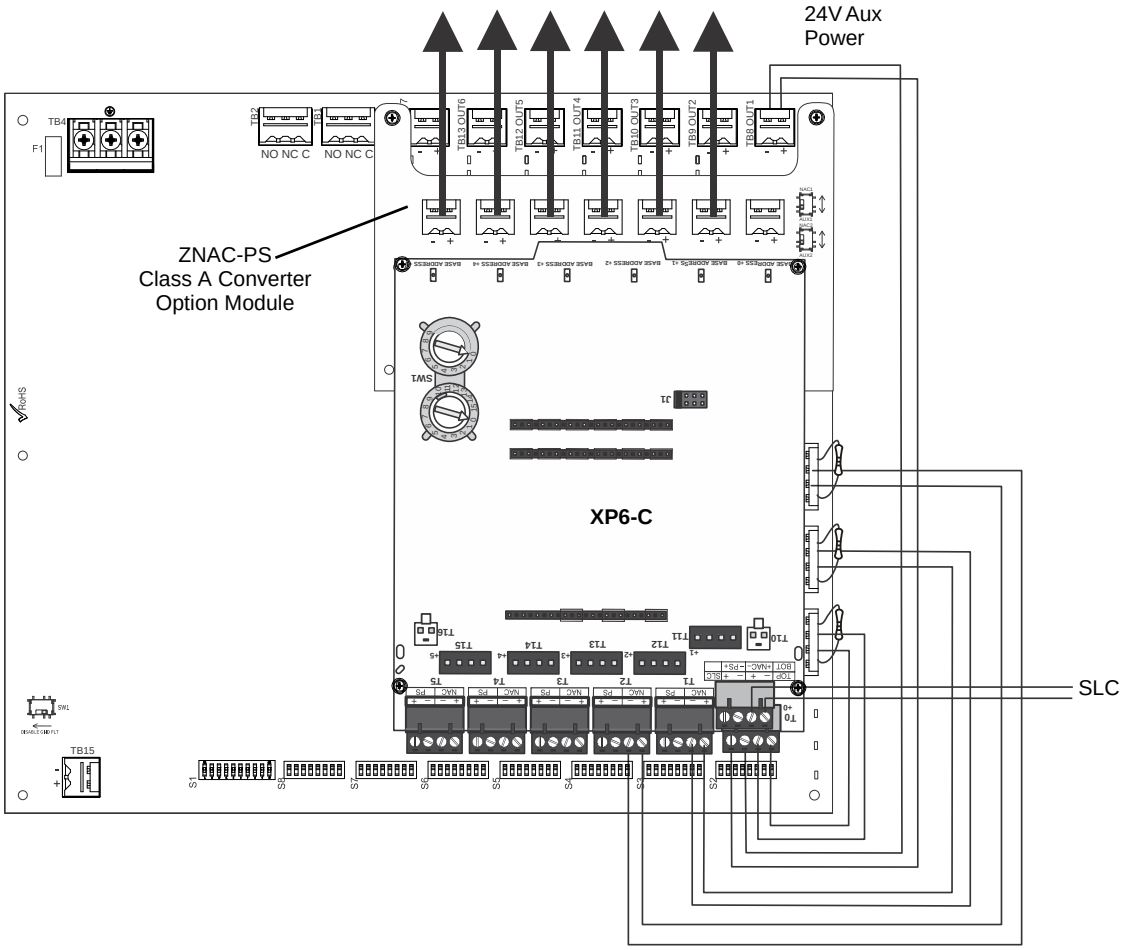


Figure B.5 Controlling Three Inputs with One Module

The following notes apply to Figure B.5.

- An End-of-Line Resistor must be installed between terminals 1 and 4 for control module wiring supervision (the ELR value is dependent on the module/FACP employed).
- Either disable the unused addresses or install ELRs across unused outputs on the XP6-C.
- Refer to Section 3 for instructions on setting the DIP switches.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.6 AC Trouble Reporting with a Conventional FACP

In this application, the PSE is being used with a conventional FACP that does not have a type-coded input zone for AC Power loss with a delay. AC Trouble Delay on the PSE must be set to none (S1-7 ON, 8 ON). AC Fail delay timers must be set on the DACT. The DACT must be installed in close proximity to the conventional FACP so the audible and visual signaling can be given locally at the FACP as required by UL 864.

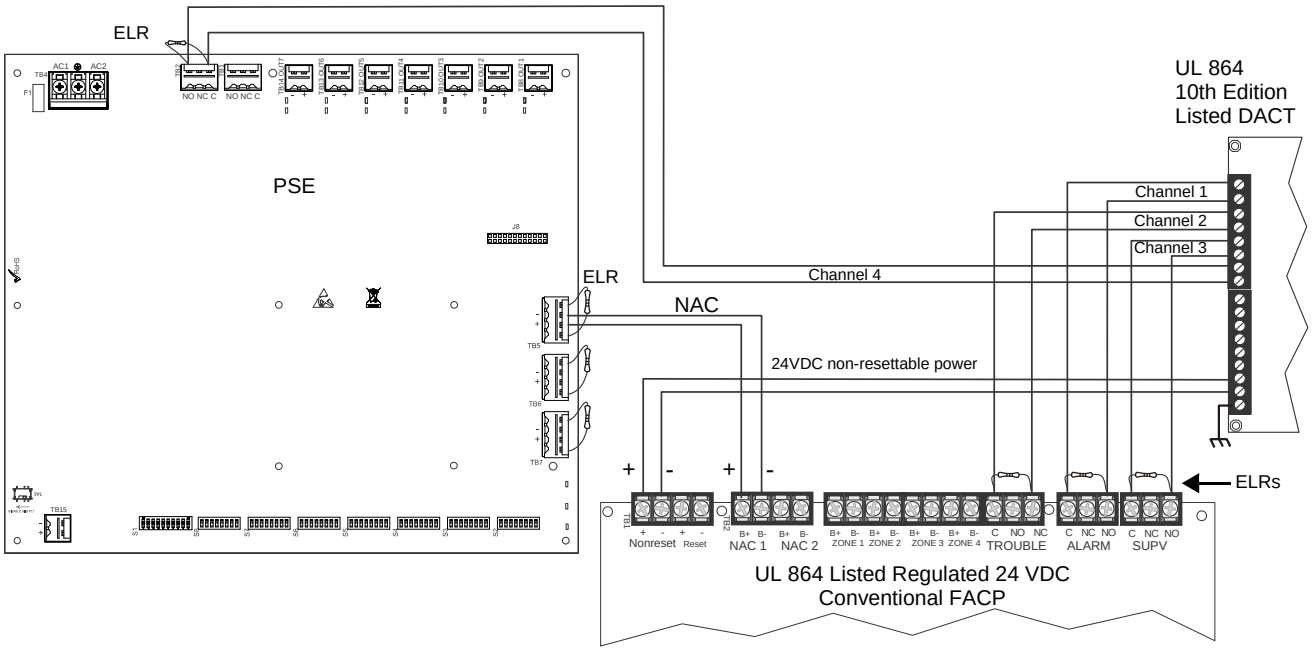


Figure B.6 AC Trouble Reporting with a Conventional FACP

The following notes apply to Figure B.6.

- Wiring from the power supply to the DACT must be in metal conduit within 20 feet of the FACP.
- Refer to Section 3 for instructions on setting the DIP switches.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed between terminals 1 and 4 on the input circuits that require wiring supervision. (The ELR value is dependent on the FACP employed).
- Refer to panel/DACT documentation for programming information.

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Manufacturer Warranties and Limitation of Liability

Manufacturer Warranties. Subject to the limitations set forth herein, Manufacturer warrants that the Products manufactured by it in its Northford, Connecticut facility and sold by it to its authorized Distributors shall be free, under normal use and service, from defects in material and workmanship for a period of thirty six months (36) months from the date of manufacture (effective Jan. 1, 2009). The Products manufactured and sold by Manufacturer are date stamped at the time of production. Manufacturer does not warrant Products that are not manufactured by it in its Northford, Connecticut facility but assigns to its Distributor, to the extent possible, any warranty offered by the manufacturer of such product. This warranty shall be void if a Product is altered, serviced or repaired by anyone other than Manufacturer or its authorized Distributors. This warranty shall also be void if there is a failure to maintain the Products and the systems in which they operate in proper working conditions.

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Warn-HL-08-2009.fm

NOTIFIER
12 Clintonville Road
Northford, CT 06472-1610 USA
203-484-7161
www.notifier.com

Figure 5. Typical wiring for speaker supervision and switching, NFPA Style Y:

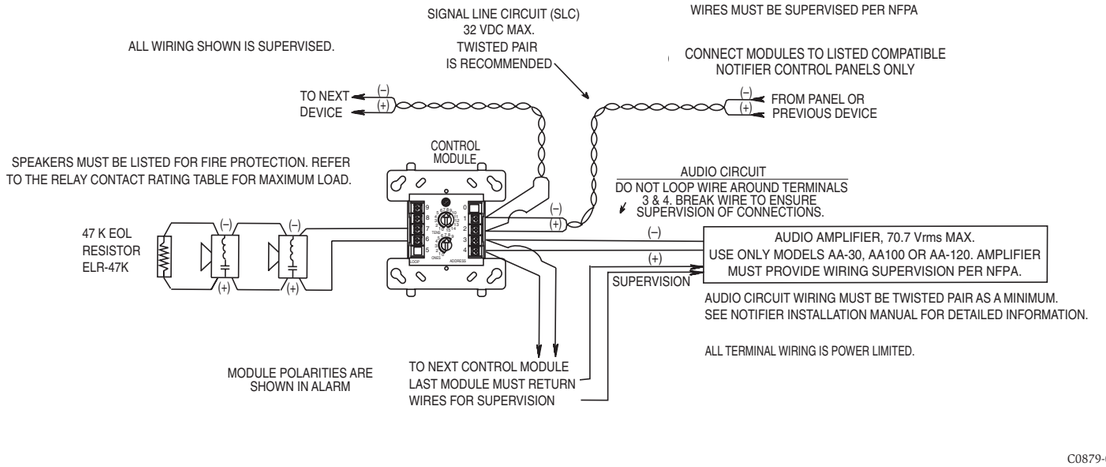
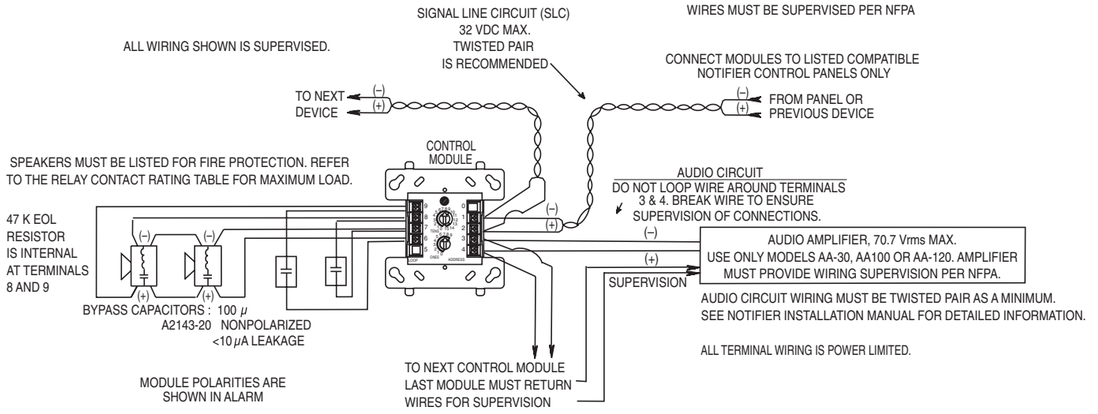


Figure 6. Typical fault tolerant wiring for speaker supervision and switching, NFPA Style Z:



⚠WARNING

All relay switch contacts are shipped in the standby state (open) state, but may have transferred to the activated (closed) state during shipping. To ensure that the switch contacts are in their correct state, modules must be made to communicate with the panel before connecting circuits controlled by the module.

NOTIFIER®

FCM-1 Supervised Control Module
Installation And Maintenance Instructions

Specifications

Normal Operating Voltage:	15 to 32 VDC
Maximum Current Draw:	6.5 mA (LED on)
Average Operating Current:	375μA (LED flashing - in group poll mode) 350μA (LED of flashing - in direct poll mode)
	485μA Max. (LED flashing, NAC shorted)
Maximum NAC Line Loss:	4 VDC
External Supply Voltage:	(between Terminals T3 and T4)
Maximum (NAC):	Regulated 24 VDC
Maximum (Speakers):	70.7 V RMS, 50 W
Drain on External Supply:	1.7 mA Maximum using 24 VDC supply; 2.2 mA Maximum using 80 VRMS supply
Max NAC Current Ratings:	For class B wiring system, the current rating is 3A
	For class A wiring system, the current rating is 2A
Temperature Range:	32°F to 120°F (0°C to 49°C)
Humidity:	10% to 93% Non-condensing
Dimensions:	41/2″ H × 4″ W × 11/4″ D (Mounts to a 4″ square by 21/8″ deep box.)
Accessories:	SMB500 Electrical Box; CB500 Barrier

Before Installing

This information is included as a quick reference installation guide. Refer to the control panel installation manual for detailed system information. If the modules will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect power to the control panel before installing the modules.

NOTICE: This manual should be left with the owner/user of this equipment.

General Description

FCM-1 Supervised Control Modules are intended for use in intelligent, two-wire systems, where the individual address of each module is selected using the built-in rotary switches. This module is used to switch an external power supply, which can be a DC power supply or an audio amplifier (up to 80 VRMS), to notification appliances. It also supervises the wiring to the connected loads and reports their status to the panel as NORMAL, OPEN, or SHORT CIRCUIT. The FCM-1 has two pairs of output termination points available for fault-tolerant wiring and a panel-controlled LED indicator. This module can be used to replace a CMX-2 module that has been configured for supervised wiring operation.

Compatibility Requirements

To ensure proper operation, this module shall be connected to a compatible Notifier system control panels only (list available from Notifier).

Mounting

The FCM-1 mounts directly to 4″ square electrical boxes (see Figure 2A). The box must have a minimum depth of $2^{1}/_{8}$″. Surface mounted electrical boxes (SMB500) are available.

Notifier, 12 Clintonville Rd., Northford, CT 06472

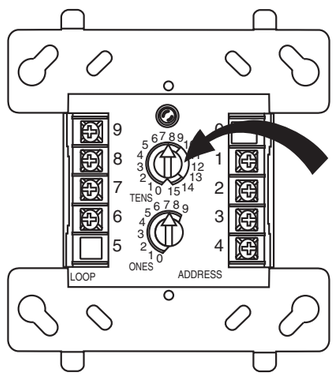
Wiring

NOTE: All wiring must conform to applicable local codes, ordinances, and regulations. When using control modules in nonpower limited applications, the CB500 Module Barrier must be used to meet UL requirements for the separation of power-limited and nonpower-limited terminals and wiring. The barrier must be inserted into a 4″ × 4″ × 2 1/8″ junction box, and the control module must be placed into the barrier and attached to the junction box (Figure 2A). The power-limited wiring must be placed into the isolated quadrant of the module barrier (Figure 2B).

1. Install module wiring in accordance with the job drawings and appropriate wiring diagrams.
2. Set the address on the module per job drawings.
   Note: Some panels support extended addressing. In order to set the module above address 99 on compatible systems, carefully remove the stop on the upper rotary switch with thumb in the direction shown in Figure 1A.
3. Secure module to electrical box (supplied by installer), as shown in Figure 2A.

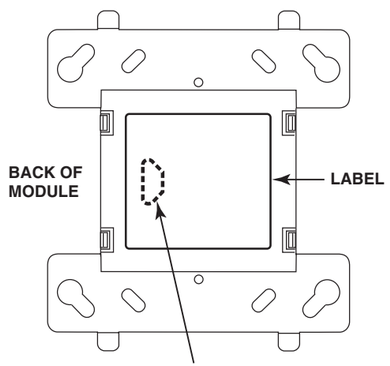
IMPORTANT: When using the FCM-1 for fire fighter telephone applications, remove Jumper (J1) and discard. The Jumper is located on the back under the product label as shown in Figure 1B. The module does not provide ring back when used as a firefighter telephone circuit.

Figure 1A. Removing rotary switch stop:



C0218-00

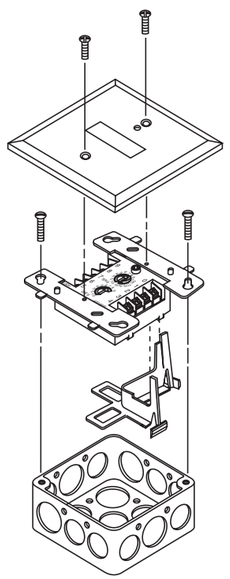
Figure 1B. Jumper location:



C0458-00

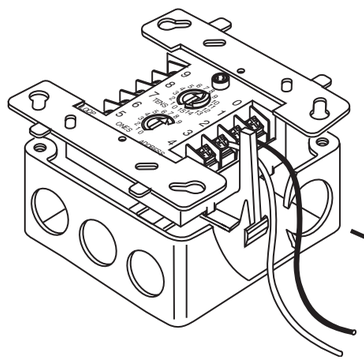
J1 UNDER LABEL

Figure 2A. Module mounting with barrier:



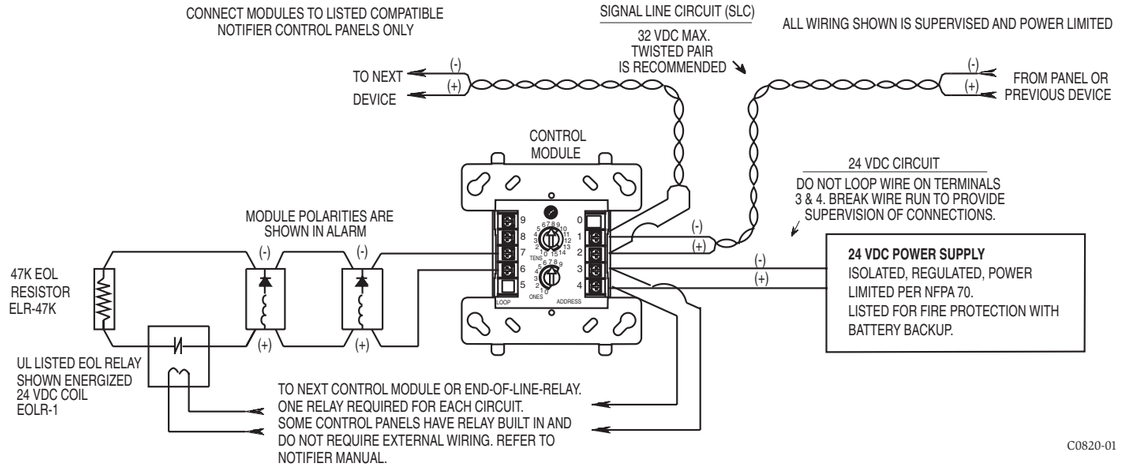
C0217-00

Figure 2B:



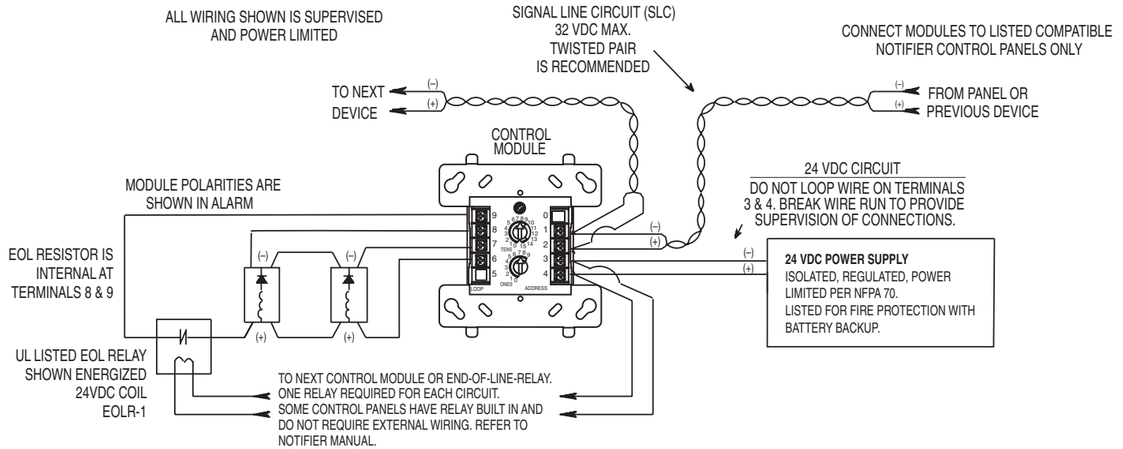
C0219-00

Figure 3. Typical notification appliance circuit configuration, NFPA Style Y:



C0820-01

Figure 4. Typical fault tolerant notification appliance circuit configuration, NFPA Style Z:



C0821-01

NOTIFIER® by Honeywell

Power Supply Expanders

PSE-6(C)(E)(R) & PSE-10(E)(C)(R)

Instruction Manual

Document LS10227-000NF-E Rev: A
9/1/2020 ECN: 151067

Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premises to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

Limit-D2-2016

Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/ 32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Units with a touchscreen display should be cleaned with a dry, clean, lint free/microfiber cloth. If additional cleaning is required, apply a small amount of Isopropyl alcohol to the cloth and wipe clean. Do not use detergents, solvents, or water for cleaning. Do not spray liquid directly onto the display.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

Precau-D2-11-2017

FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are 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 his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

Documentation Feedback

Your feedback helps us keep our documentation up-to-date and accurate. If you have any comments or suggestions about our online Help or printed manuals, you can email us.

Please include the following information:

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- Printed manual or online Help
- Topic Title (for online Help)
- Page number (for printed manual)
- Brief description of content you think should be improved or corrected
- Your suggestion for how to correct/improve documentation

Send email messages to:

FireSystems.TechPubs@honeywell.com

Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.

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It is imperative that the installer understand the requirements of the Authority Having Jurisdiction (AHJ) and be familiar with the standards set forth by the following regulatory agencies:

- Underwriters Laboratories Standards
- NFPA 72 National Fire Alarm Code

Before proceeding, the installer should be familiar with the following documents.

NFPA Standards

NFPA 72 National Fire Alarm Code
NFPA 70 National Electrical Code

Underwriters Laboratories Documents:

UL 464 Audible Signaling Appliances
UL 864 Standard for Control Units for Fire Protective Signaling Systems
UL 1638 Visual Signaling Appliances
UL 1971 Signaling Devices for Hearing Impaired
UL 2572 Standard for Mass Notification Systems

CAN/ULC - S524 Standard for Installation of Fire Alarm Systems
CAN/ULC - S527 Standard for Control Units for Fire Alarm Systems

Other:

NEC Article 250 Grounding
NEC Article 300 Wiring Methods
NEC Article 760 Fire Protective Signaling Systems
Applicable Local and State Building Codes
Requirements of the Local Authority Having Jurisdiction (LAHJ)
Canadian Electrical Code, Part 1

Other Notifier Documents:

Device Compatibility Document	Document #15378
SLC Wiring Manual	Document #51253
CHG-75 Manual	Document #51315
CHG-120 Manual	Document #50641

This product has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, 10th Edition. Operation of this product with products not tested for UL 864, 9th/10th Edition has not been evaluated. Such operation requires the approval of the local Authority Having Jurisdiction (AHJ).

This symbol (shown left) on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, contact your local authorities or dealer and ask for the correct method of disposal.

Electrical and electronic equipment contains materials, parts and substances, which can be dangerous to the environment and harmful to human health if the waste of electrical and electronic equipment (WEEE) is not disposed of correctly.

Section 1: System Overview

The PSE-6 is a 6 amp and the PSE-10 is a 10 amp remote power supply with battery charger. Both models provide ADA compatible strobe synchronization and a filtered 24 VDC output that can be configured to drive five (6 amp model) or seven (10 amp model) Class B NACs (Notification Appliance Circuits). NAC circuits can be configured for Class A wiring with the optional ZNAC-PS Class A converter module. NAC output circuits may be configured as 24 VDC resettable or non-resettable power outputs, or Class D door holder outputs. The input circuits, which control the power supply operation, are triggered by the reverse polarity of a NAC or by a 12 VDC or 24 VDC power source. The PSE power supplies are compatible with 12 VDC and 24 VDC control panels.

The PSE-6E and PSE-10E offer the same features as the PSE-6 and PSE-10 respectively, but allow connection to 240 VAC. Unless otherwise specified, the information in this manual applies to both the 120 VAC models and the 240 VAC models.

The PSE-6C and PSE-10C offer the same features as the PSE-6 and PSE-10 respectively, but are intended for Canadian applications and adds an additional relay for ground fault reporting. Unless otherwise specified, the information in this manual applies to all models.

The PSE-6R and PSE-10R offer the same features as the PSE-6 and PSE-10 respectively, but come installed in a red cabinet.

1.1 General

PSE power supplies can be used as remotely mounted power supplies and battery chargers to power non-coded or coded NACs. The Main FACP (Fire Alarm Control Panel) NAC(s) is connected to the remote power supply input circuit(s). When the command input circuit activates due to reverse polarity of the NAC from the FACP, the power supply will activate its Notification Appliance Circuits.

During the inactive or non-alarm state, the power supply supervises its NAC field wiring for short and open conditions. AC fail, battery, charger and ground fault troubles will also be monitored by the power supply and will activate the AC Fail, Battery Fault, and Ground Fault relay, respectively. If a NAC fault is detected, the input end-of-line will open to indicate the fault to the main panel.

If an alarm condition occurs and the NAC is activated, the supervision is disabled and the Notification Appliance Circuit is no longer supervised (except for shorts). Supervision of other power supply faults such as low battery, overcharged battery, ground fault, and battery charger trouble will continue and will be monitored by their respective trouble relays.

1.2 Features

- Self-contained in a lockable cabinet
- 24 VDC remote power supply
- Outputs are completely power-limited (Class 2)
- Two (PSE-6) or three (PSE-10) optically-isolated input/command circuits, compatible with 12 VDC and 24 VDC control panel NACs
- Five (PSE-6) or seven (PSE-10) output circuits:
  - Fully filtered power
  - Five or seven 24 VDC Class B NACs
  - Optional ZNAC-PS Class A converter module for conversion to Class A NACs
  - Alternatively, all output circuits may be configured as 24 VDC special application power outputs or Class D door holder power outputs
  - Output circuits may be configured as resettable or non-resettable
- Individual NAC Power (red) and Trouble (yellow) LEDs for each output
- Maximum current available:
  - PSE-6: TB8-TB9 – 1A Regulated, 3A special applications; TB10-TB12 – 0.3A Regulated, 3A special applications
  - PSE-10: TB8-TB11 – 1.5A Regulated, 3A special applications; TB12-TB14 – 0.3A Regulated, 3A special applications
- Maximum total current available (alarm and standby):
  - 6.0 amps for PSE-6 alarm; 3.0 amps standby
  - 10.0 amps for PSE-10 alarm; 3.0 amps standby
- Integral supervised battery charger for lead acid batteries only
- Capable of charging 7.0 AH - 33.0 AH (Amp Hour) batteries (cabinet fits 7 or 18 AH batteries)
- Fully supervised power supply, battery and NACs
- Selectable Strobe Synchronization for NACs (System Sensor, Gentex, Wheelock, and Amseco)
- Coded signal synchronization
- Removable terminal blocks for field wiring capable of accepting 12 - 18 AWG wire
- Selectable Ground Fault detection by switch SW1
- LED trouble diagnostics and history
- Power supply trouble, AC Loss, and Ground Fault (Canadian models only) Form-C relay contacts (fail-safe)
- Optional delay of AC loss reporting for 0, 2, 12, or 30 hours
- Mounting location for optional addressable module
- Up to four PS Series units can be cascaded

1.3 Specifications

Refer to Figure 1.1 on page 10 for terminal locations.

NOTE: The PSE-6 uses the same PCB layout as the PSE-10, however some terminals will be depopulated, leaving the PSE-6 with five output circuits and two input circuits.

Primary AC Power - TB4

- PSE-6(C): 120 VAC, 50/60 Hz, 5.0 amps maximum
- PSE-10(C): 120 VAC, 50/60 Hz, 6.2 amps maximum
- PSE-6E: 240 VAC, 50/60 Hz, 2.7 amps maximum
- PSE-10E: 240 VAC, 50/60 Hz, 3.5 amps maximum
- Wire size: #12-14 AWG wire with 600V insulation

Command Input Circuits - TB5, TB6, TB7

- Trigger Input Voltage: 9 - 32 VDC
- Input Current Draw in Alarm Polarity: 9 - 32 volts, 14.0 mA maximum per input

Output Circuits - TB8-TB14

- Supervised and power-limited
- Voltage Rating: 24 VDC filtered
- Current:
  - PSE-6: TB8-TB9 – 1A Regulated, 3A special applications; TB10-TB12 – 0.3A Regulated, 3A special applications
  - PSE-10: TB8-TB11 – 1.5A Regulated, 3A special applications; TB12-TB14 – 0.3A Regulated, 3A special applications
  - Maximum total alarm current for all output:
    PSE-6 - 6.0 amps
    PSE-10 - 10.0 amps
- Output Circuit Types:
  - Class B NACs (require 2kΩ - 27kΩ End-of-Line Resistors) and/or Class A NACs using the optional ZNAC-PS Class A converter module. Use Listed ELRs supplied by the FACP or compatible equipment manufacturer.
  - Resettable or non-resettable outputs for 24 VDC power outputs or Class D door holder (max ripple voltage: 780mV$_{RMS}$)
- Refer to the *Notifier Device Compatibility Document #15378* for listed compatible devices.
- For wiring requirements, refer to “Wire Requirements” on page 34.

Trouble, AC Loss, and Ground Fault (Canadian models only) Relay Contact Rating - TB1-TB3

- Fail-safe Form-C relay (normally energized, transfers with loss of power) for AC Loss and Trouble
- 4.0 amps @ 30 VDC resistive

Secondary Power (battery) Charging Circuit - TB15

- Supervised, non-power-limited
- Supports lead acid type batteries only
- Float Charge Voltage: 27.6 VDC
- Maximum Peak Charge Current: 2.47A
- Maximum Nominal Charge Current: 1.5 A
- Maximum Battery Capacity: 33.0 AH (with onboard battery charger)
- Minimum Battery Capacity: 7.0 AH

NOTE: The PSE only supports 7AH or 18AH batteries in the cabinet. Other battery capacities up to 33AH will not fit in the cabinet due to physical dimensions and require a separate battery cabinet.

1.4 Open/Short/Ground Fault Trip Values in Standby

Table 1.1 lists the earth fault resistance detection in standby for each applicable terminal on the FACP.

Output Circuit	Terminal	Trip Resistance (in ohms)
NAC 1-5/7	+	9.9K or lower
NAC 1-5/7	-	9.2K or lower
ZNAC-PS 1-5/7	+	9.9K or lower
ZNAC-PS 1-5/7	-	9K or lower

Table 1.1 Earth Fault Trip Values

Value of the resistance in between any circuit terminal to Earth, which will cause the Ground Fault detection, depends on the ELR chosen for inputs and output circuits. This resistance will vary from 9.9K down to 0 Ohm.

Table 1.2 lists the open/short trip values and restoral values in standby for the NAC circuits on the FACP.

Circuit	Fault	Trip Resistance (in ohms)	Restore Value
NAC 1-5/7	Short	1.6K or lower	1.7K or higher
NAC 1-5/7	Open	55K or higher	33K or lower
ZNAC-PS 1-5/7	Short	1.6K or lower	1.7K or higher
ZNAC-PS 1-5/7	Open	45K or higher	21K or lower

Table 1.2 NAC Open/Short Trip Values

1.5 Switch SW1 - Ground Fault Detection

The Ground Fault Detection circuit monitors for ground faults. Switch SW1 is located on the lower left section of the power supply circuit board. Sliding SW1 to the left will disable ground fault detection by the power supply. This should only be done if ground faults are being monitored by an FACP connected to the PSE power supply or in a cascading application as shown in Section 2.8 on page 18.

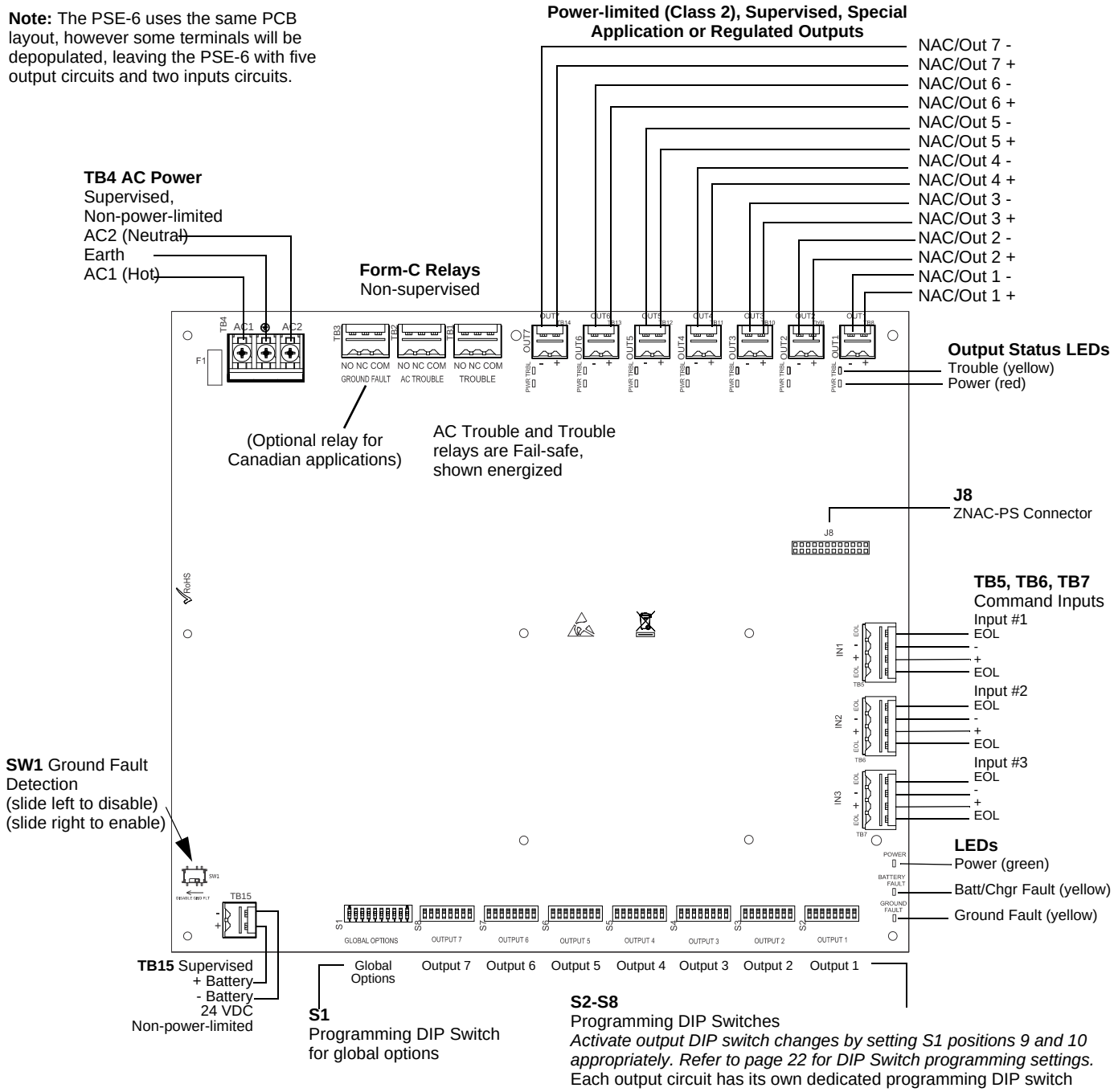


Figure 1.1 PSE-10 Board Layout

1.6 Applications

The PSE may be used in a number of different applications. It may be used as a remotely-mounted power supply and battery charger where it can provide up to seven coded or non-coded, synchronized or non-synchronized NACs (Notification Appliance Circuits). Alternatively, any output can be used as a door holder circuit which will provide a steady 24 VDC output until an alarm condition or AC fail condition causes it to drop to 0 VDC following a selectable delay. See the DIP switch settings for S1 global options on page 21. All outputs can also provide power.

One possible application for the PSE remote power supply utilizes the NAC repeater feature. In this application, one or two NACs are connected from the main FACP to the remote power supply command input circuits. When the command input circuits are activated by the reverse polarity of the NACs, the power supply will activate its corresponding output circuits as programmed by its DIP switch configuration (refer to Table 3.7 on page 23).

During the inactive state, the remote power supply supervises its NAC field wiring for short and open conditions. If a fault is detected, the power supply will enter a trouble condition and illuminate the NAC Trouble LED. When the NACs are activated, the supervision is disabled and the circuits are no longer supervised (except for short circuit conditions). Supervision of other power supply faults such as low battery, battery charger trouble, ground fault and AC loss will continue and may be monitored via their respective trouble relay.

If an application requires that all outputs activate at the same time, only one NAC is required from the FACP. For this application, the NAC is connected to command input circuit #1 and the DIP switch is set for this operation.

1.7 Start-up Procedure

1. Configure the power supply switch as described in “Switch SW1 - Ground Fault Detection” on page 10.
2. Install the power supply as described in “Installation” on page 12.
3. Program the power supply as described in “Programming Options” on page 20.
4. Wire the power supply circuits, referring to the options described in “Trouble Supervision” on page 29 and the application examples in “Application Examples” on page 35.
5. Connect primary power source wiring while observing the following:
   – Ensure the AC mains circuit breaker is **off** before making any wiring connections between the mains and the power supply.
   – Make certain primary power source is:
   120 VAC, 50/60 Hz, 5.0 (6 amp model) 6.2 amps (10 amp model) or
   240 VAC, 50/60 Hz, 2.7 (6 amp model) 3.5 (10 amp model)
   – Run a pair of wires (with ground conductor) from the protected premises main breaker box to TB4 of the power supply main circuit board.
   – Use #12-14 AWG gauge wire with 600V insulation.
6. Apply power to the power supply using the following procedure:
   – Apply AC power by turning on the AC mains circuit breaker connected to the power supply.
   – Connect a properly charged battery to connector TB15 on the power supply main circuit board.
7. Clear trouble history using global DIP switch S1 positions 9 and 10. See DIP switch settings in Table 3.6 on page 22.

Section 2: Installation

Carefully unpack the system and check for shipping damage. Select a location for the cabinet that is in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the power supply. With the hinge mounting on the left, determine the number of conductors required for the devices to be installed and determine the appropriate knockouts. All wiring must be in accordance with the National and/or Local codes for fire alarm systems and power supplies.

2.1 Backbox Mounting

CAUTION: STATIC SENSITIVE COMPONENTS

THE CIRCUIT BOARD CONTAINS STATIC-SENSITIVE COMPONENTS. ALWAYS GROUND YOURSELF WITH A PROPER WRIST STRAP BEFORE HANDLING ANY BOARDS SO THAT STATIC CHARGES ARE REMOVED FROM THE BODY. USE STATIC SUPPRESSIVE PACKAGING TO PROTECT ELECTRONIC ASSEMBLIES.

1. Mark and pre-drill holes for the top two keyhole mounting bolts.
2. Install two upper fasteners in the wall with the screw heads protruding approximately ¼".
3. Using the upper keyholes, mount the backbox over the two screws.
4. Mark the lower two holes, remove the backbox from the wall and drill the mounting holes.
5. Mount the backbox, install the remaining fasteners and tighten all screws..

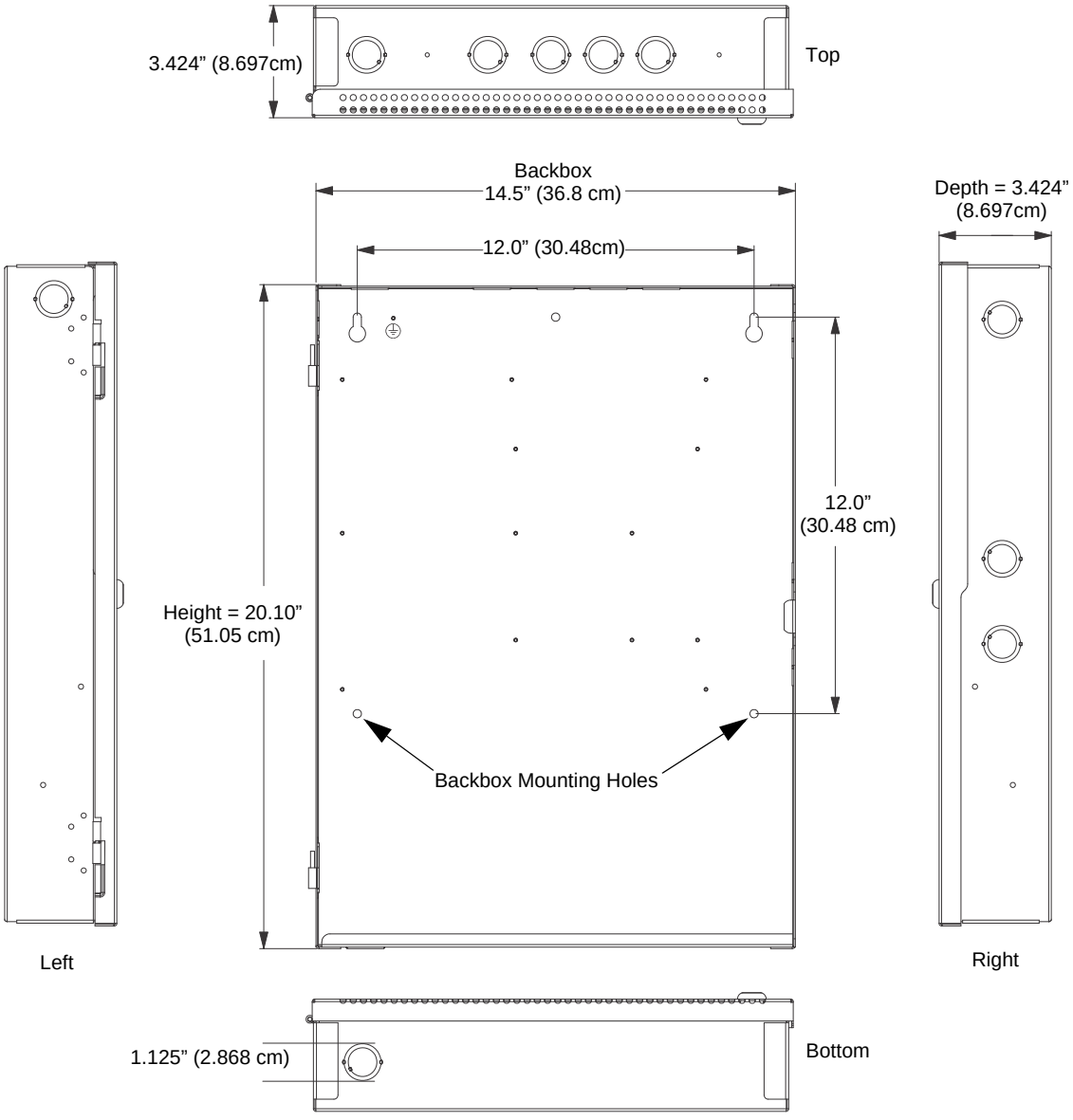


Figure 2.1 Backbox Mounting Dimensions

2.2 NAC Circuit Wiring

2.2.1 Class B

The standard configuration for NACs is Class B as shown below. Use Listed ELRs supplied by the FACP or compatible equipment manufacturer.

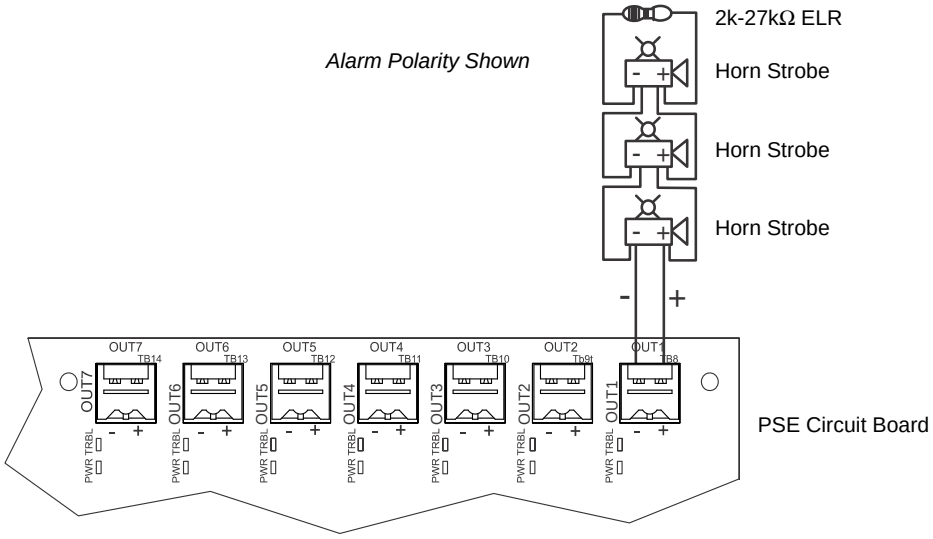


Figure 2.2 NAC Class B

2.2.2 ZNAC-PS Class A Option Module

The ZNAC-PS is an optional Class A conversion module which mounts to connector J8 on the upper right side of the circuit board. This module allows the PSE-6 or PSE-10 to support Class A Notification Appliance Circuits on all outputs. Class A *power* supervision is also supported on output circuits #1 and #2 when either of these outputs are configured as resettable or non-resettable Auxiliary power.

Two slide switches are located on the right side of the ZNAC-PS module to properly configure output circuits #1 and #2 for either NAC or Auxiliary Power operation, as described below. Note that there are no slide switches for the remaining outputs as these outputs do not support Class A power supervision.

- For output #1, set the upper switch to either “NAC1” or “AUX1” depending on the intended operation.
- For output #2, set the lower switch to either “NAC2” or “AUX2” depending on the intended operation.

NOTE: Class A supervision and the ZNAC-PS module are not intended for use with door holder operation.

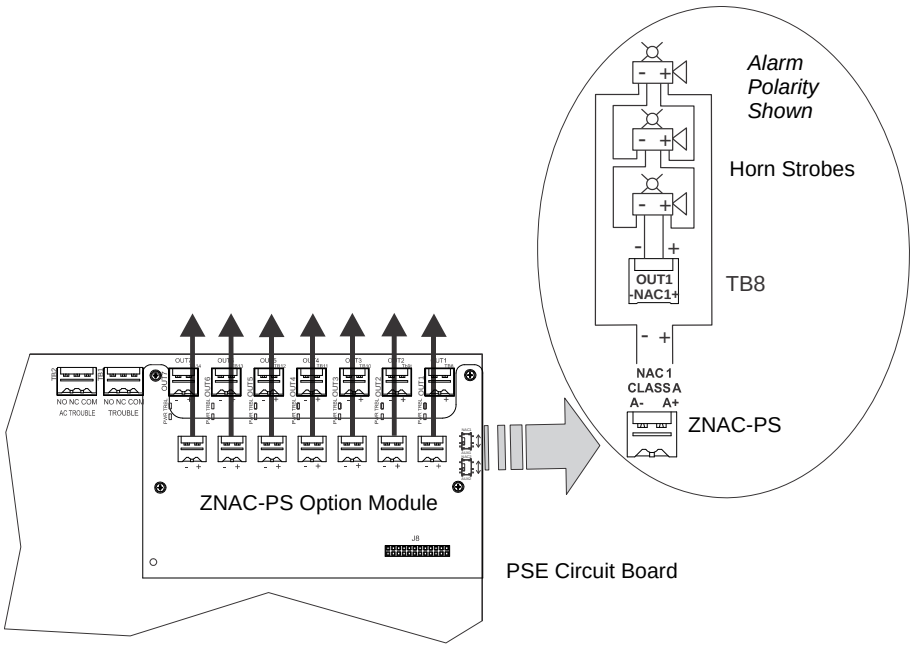
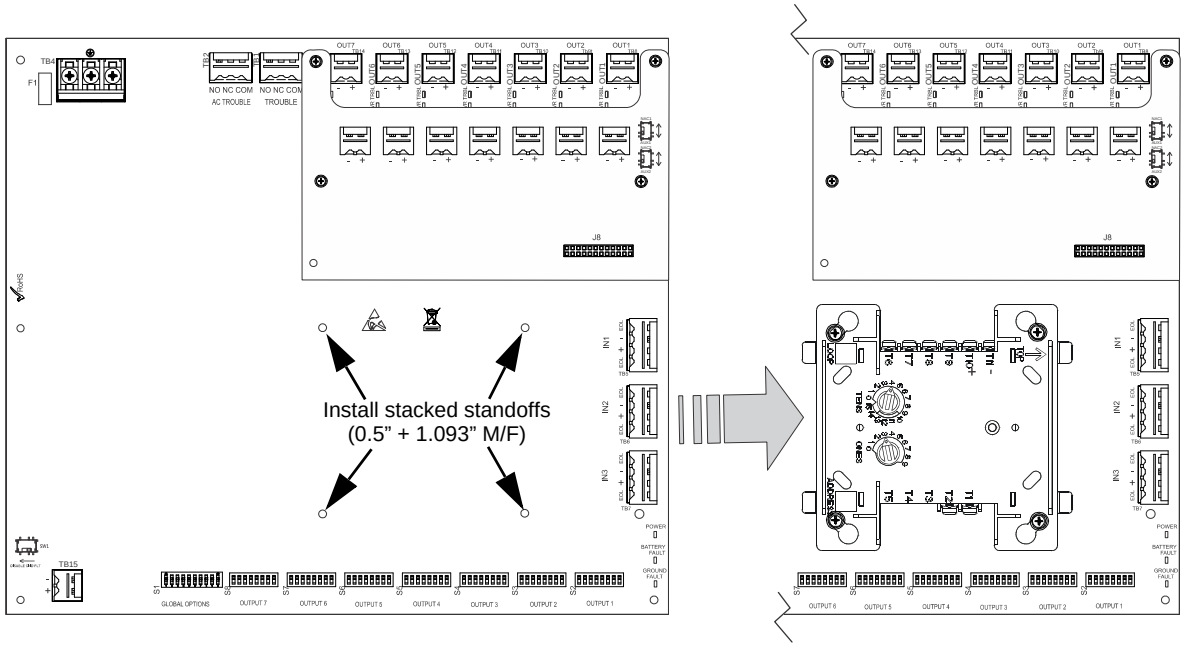


Figure 2.3 Class A NACs using ZNAC-PS Option Module

2.3 Addressable Module Mounting

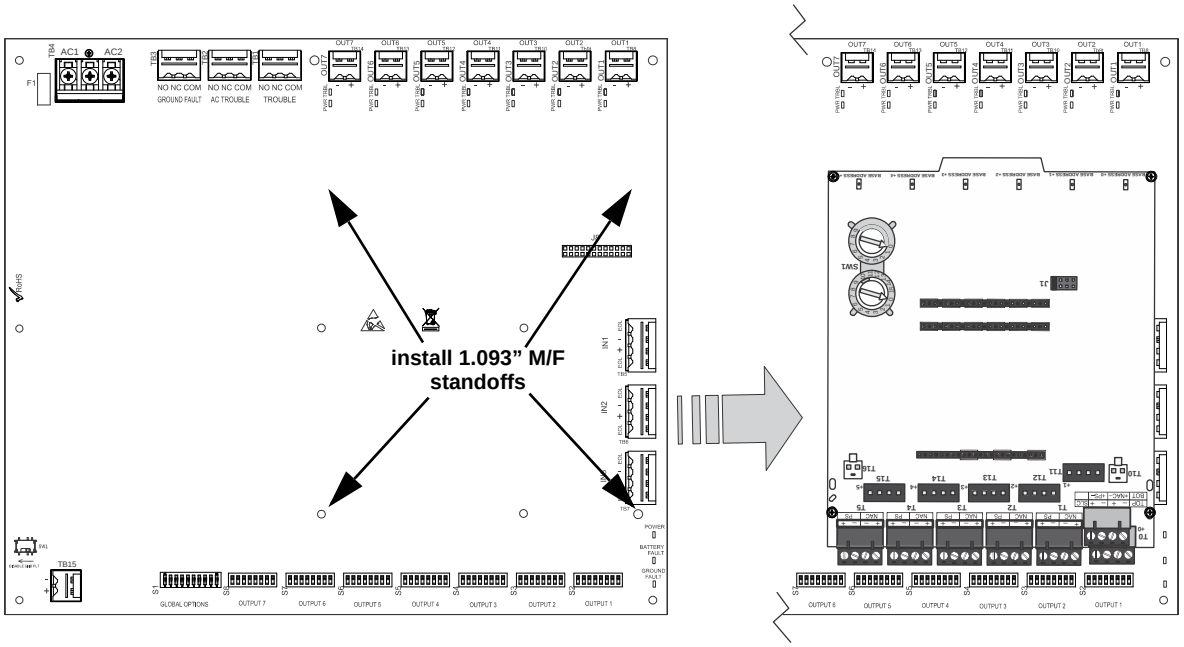
The PSE has been designed to allow the mounting of an addressable control, relay, or monitor module on the main circuit board inside the power supply cabinet. This allows power to be fed from a PSE output circuit directly to the module, if needed, without running the power wires outside the cabinet. Remove mounting screws from the positions indicated below and replace with standoffs (included in hardware kit). Mount the module over the standoffs and secure with screws.

Compatible modules include the FCM-1(A), FDM-1(A), FMM-1(A), FRM-1(A), FDRM-1, XP6-C(A), XP6-R(A), XP10-M(A), NC-100, NDM-100, NMM-100, NC-100R, and NMM-1000-R.



*If the SLC device does not match the one in this figure, refer to the SLC manual wiring conversion charts for legacy and newer versions of the modules.

Figure 2.4 Mounting a Single Module in the PSE Cabinet



Note: For instructions on mounting a multi-module and a ZNAC-PS module, refer to the *ZNAC-PS Install Sheet #LS10228-000GE-E*.
The multi-module *must* be installed upside down when the ZNAC-PS is installed. If the ZNAC-PS is *not* installed, the multi-module may be mounted in either direction.

Figure 2.5 Mounting a Multi-Module in the PSE Cabinet

2.4 NEC Power-limited (Class 2) Wiring Requirements

Power-limited (Class 2) and non-power-limited circuit wiring must remain separated in the cabinet. All power-limited (Class 2) circuit wiring must remain at least 0.25” away from any non-power-limited circuit wiring and all power-limited (Class 2) circuit wiring and non-power-limited circuit wiring must enter and exit the cabinet through different conduits. One such example of this is shown below. Any conduit knockouts may be used. For power-limited (Class 2) applications, use of conduit is optional.

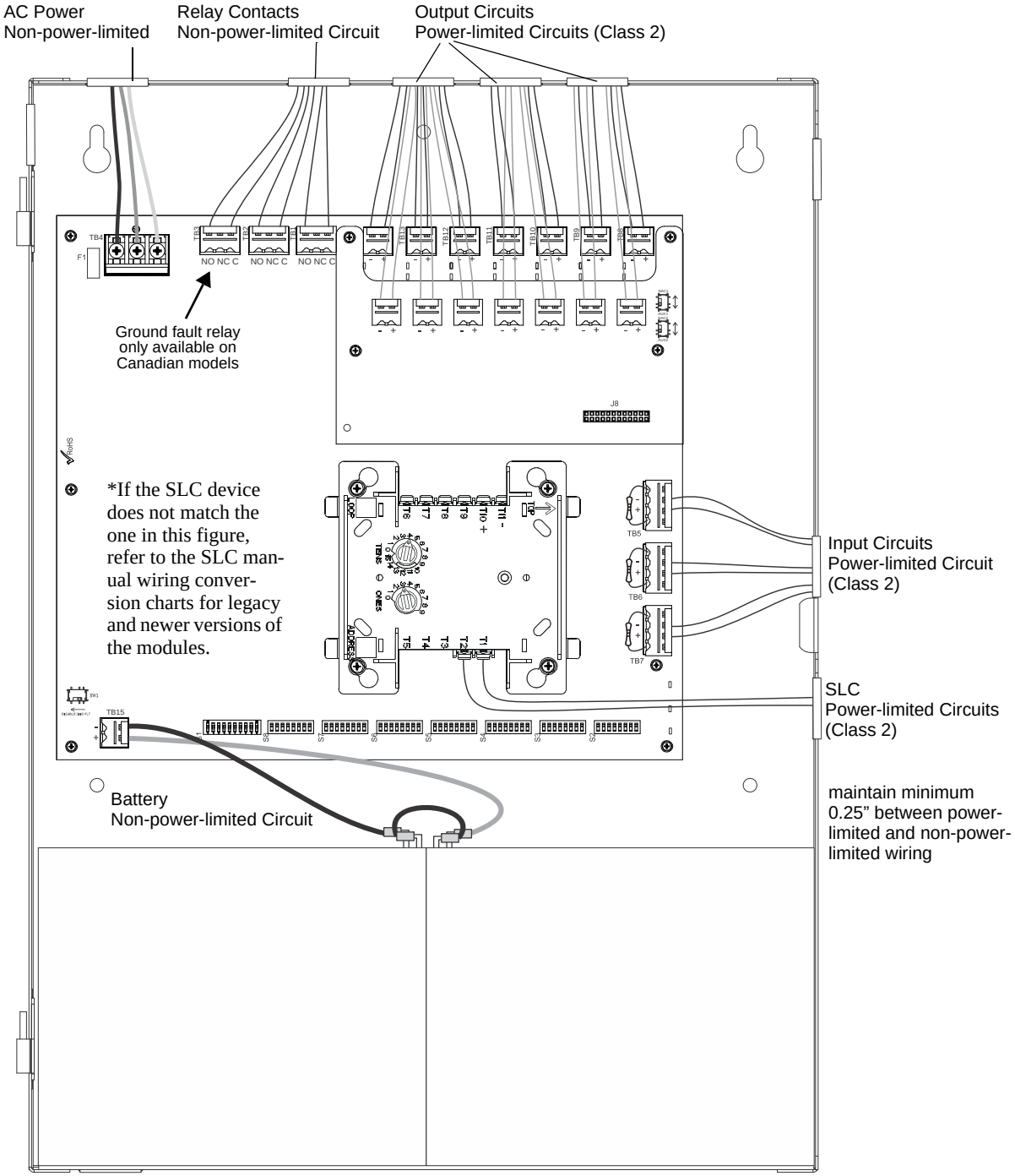


Figure 2.6 Power-limited (Class 2) Wiring Example

2.5 FACP with PSE Power Supply in Slave Mode

In this application, an PSE power supply, configured as a Slave unit, is connected to a master FACP programmed for synchronized output. .

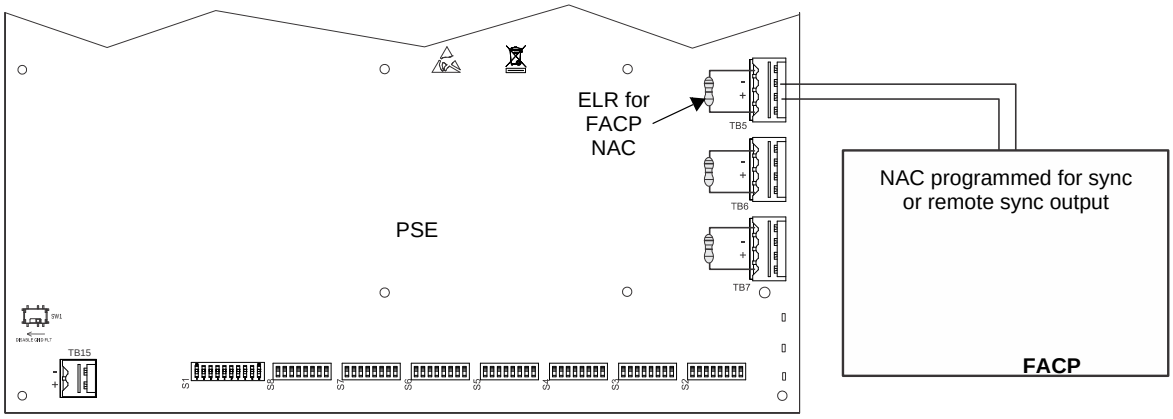


Figure 2.7 Supervised Master/Slave Connections

The following notes apply to Figure 2.7 on page 16

1. Refer to NFPA 72, Chapter 4-4, Visible Characteristics, Public Mode.
2. Use only devices from the same manufacturer in each system.
3. Set Output DIP Switch: position 3=ON, 4 = OFF, 5 = ON, 6 = OFF.
4. If the FACP has a dedicated sync output connector, wire the remote sync output connector to Input #1 terminals 2 and 3.
5. Input#1 is mapped to Slave mode output in this example, but it can programmed to another input using the DIP switches.
6. Notification appliances cannot be installed on the FACP control circuit connecting to the PSE input circuits.

2.6 PSE Power Supply in Master Mode Connected to FACP

In this application, a master PSE power supply, set for synchronization, is connected to an FACP with non-synchronized output.

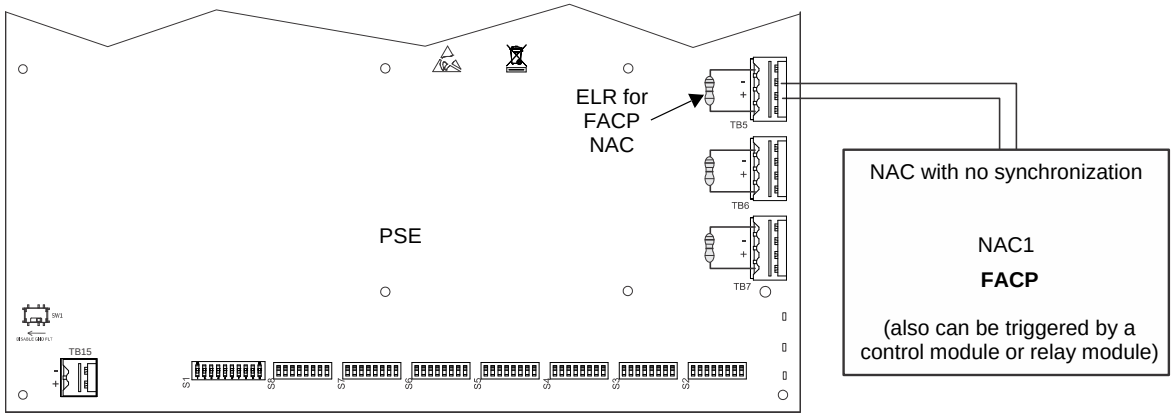


Figure 2.8 Supervised FACP to Master Connections (non-synchronized source)

The following notes apply to Figure 2.8.

1. Refer to NFPA 72, Chapter 4-4, Visible Characteristics, Public Mode.
2. Set Output DIP switches to the desired sync protocol as described below. Refer to the *Device Compatibility Document* for compatible devices.

DIP Switch Position				Synchronization Type
3	4	5	6	
ON	OFF	**ON**	OFF	Slave mode (NAC follower)
OFF	**ON**	**ON**	OFF	Master mode - ANSI Temporal (Temporal 3)
ON	**ON**	**ON**	OFF	Master mode - CO Temporal (Temporal 4)
OFF	OFF	OFF	**ON**	Master mode - Amseco/Potter
OFF	**ON**	OFF	**ON**	Master mode - Gentex
OFF	OFF	**ON**	**ON**	Master mode - System Sensor
OFF	**ON**	**ON**	**ON**	Master mode - Wheelock
ON	OFF	OFF	**ON**	Master mode, Selective Silence - Amseco/Potter
ON	**ON**	OFF	**ON**	Master mode, Selective Silence - Gentex

ON	OFF	**ON**	**ON**	Master mode, Selective Silence - System Sensor
ON	**ON**	**ON**	**ON**	Master mode, Selective Silence - Wheelock

3. Use only devices from the same manufacturer in each zone or field of view.
4. Input#1 is mapped to Master mode output in this example, but it can programmed to another input using the DIP switches.
5. Notification appliances cannot be installed on the FACP control circuit connecting to the PSE input circuits.

2.7 Connecting to an External Charger

The PSE Power Supply can be connected to an external charger to charge systems requiring over 33AH batteries. Ensure all power has been disconnected before wiring. Observe polarity when making connections. Wiring must be in conduit within 20 feet (6.096m) in the same room.

2.7.1 CHG-120

1. Set S1 position 4 on the PSE Power Supply to the OFF position to disable the onboard battery charger.
2. Connect the battery cables between TB15 (+ and –) on the PSE and the CHG-120 charger output circuit (TB2: Out 1+ and Out 1–) as shown in Figure 2.9. Be certain to observe polarity.
3. Connect the batteries to the charger.
4. Connect the battery interconnect cable only after AC power is applied and batteries are connected. Refer to the *CHG-120 Manual* for more information.

Note: If batteries are disconnected at the CHG-120 terminals, battery supervision will be managed by the CHG-120

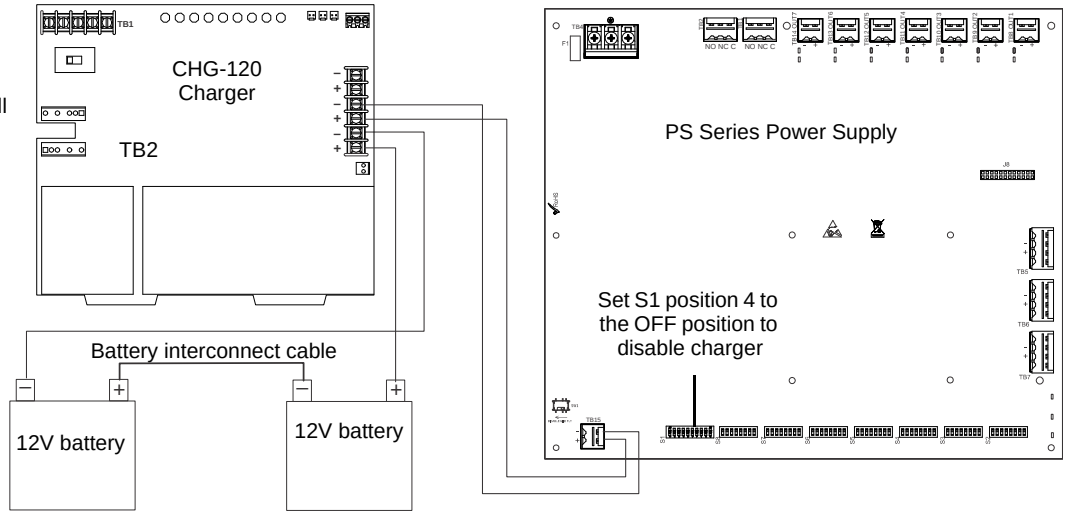


Figure 2.9 Connecting the Power Supply to a CHG-120 Charger

2.7.2 CHG-75

1. Set S1 position 4 on the PSE Power Supply to the OFF position to disable the onboard battery charger.
2. Connect the battery cables between TB15 (+ and –) on the PSE and the CHG-75 charger output circuit (TB2: Out+ and Out–) as shown in Figure 2.10. Be certain to observe polarity.
3. Connect the batteries to the charger.
4. Connect the battery interconnect cable only after AC power is applied and batteries are connected. Refer to the *CHG-75 Manual* for more information.

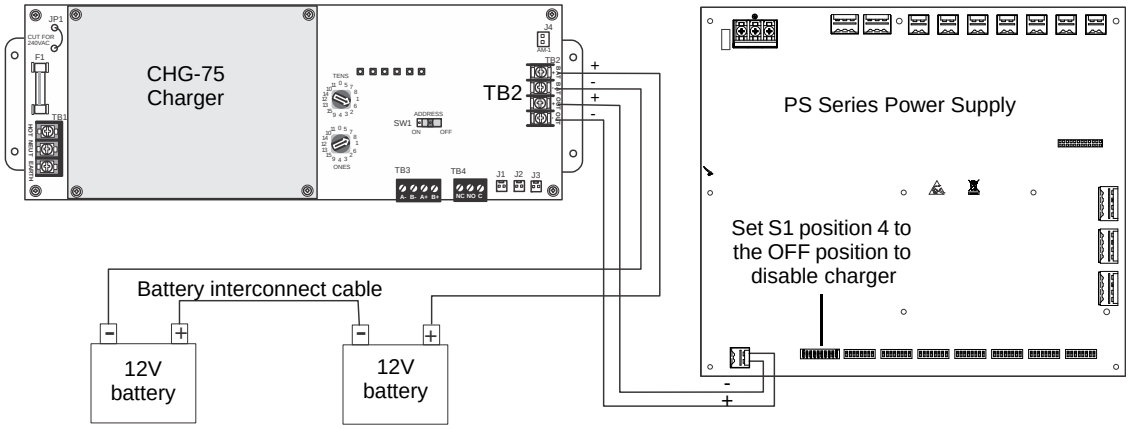


Figure 2.10 Connecting the Power Supply to a CHG-75 Charger

2.8 Cascading Multiple Units

Up to four PSE power supplies can be cascaded together to provide additional NAC extenders for a system. Maintain separation of power-limited and non-power-limited wiring as shown in Figure 2.6 on page 15.

Figures 2.11 and 2.12 show the controlling signal connected to Input 1 of PSE1. However, typically any available Input of PSE1 can be used.

Figures 2.11 and 2.12 show NAC7 of PSE1 - PSE3 as the cascading output. However, any available Output of PSE1 – PSE3 can be used.

NOTE: Any mode of operation that requires an additional control signal (i.e. a trigger signal), such as Selective Silence or Sync Mode, will affect which Inputs may be available on PSE1 for use with cascading. (Triggers signals are usually assigned to Input 2.) Refer to those sections of the manual for specifics.

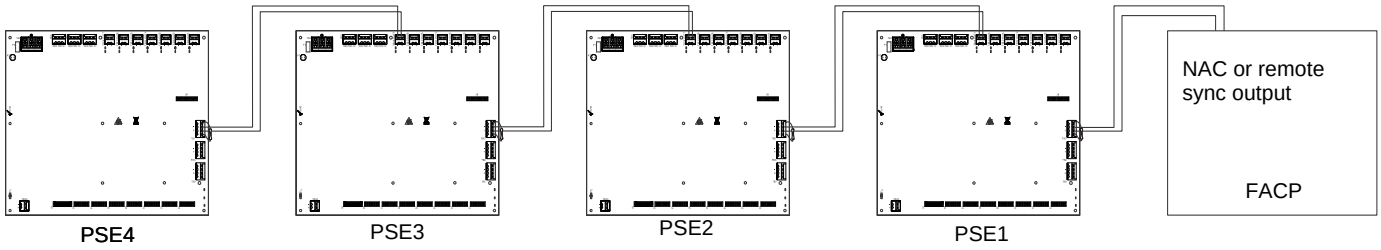


Figure 2.11 System Sync Connections Triggered by FACP

The following notes apply to Figure 2.11.

1. Set all PSE units to Slave (sync follower) mode.
2. The debounce/dejitter setting must be set to 1 msec on all cascaded units. See Table 3.3 on page 21.
3. Any output used for remote sync applications cannot have notification appliances installed on the same circuit.
4. Notification appliances cannot be installed on the interconnecting control circuits.
5. The total line impedance for interconnected units cannot be such that it creates a voltage drop > 3.2 VDC.
6. Ground fault supervision is provided via the general trouble relay for domestic and export models and via the dedicated ground fault relay in the Canadian models. Enable ground fault detection on PSE1 and disable detection on PSE2-4 with negative (-) battery terminals tied together. FACP ground fault supervision will be independent of cascaded PSE1-4. (FACP negative battery terminal is not tied to PSE1).

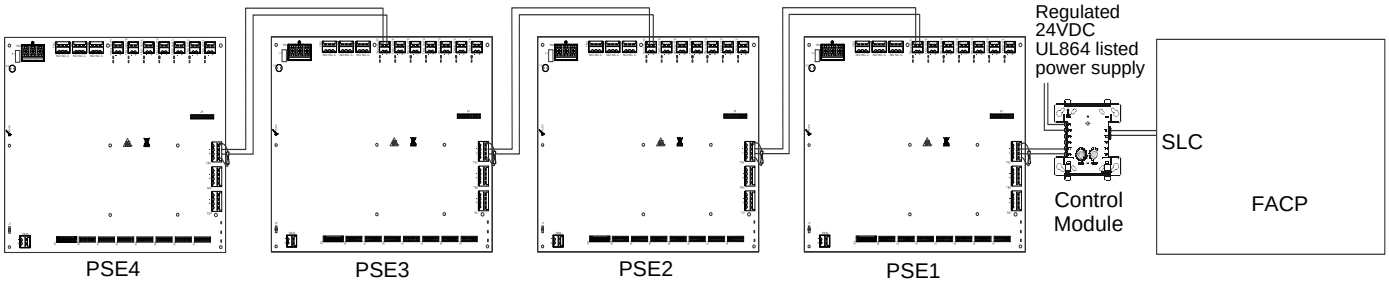


Figure 2.12 System Sync Connections Triggered by Control Module

The following notes apply to Figure 2.12.

1. Set PSE1 to Master Mode, and the desired strobe/horn type. Set remaining PSE units to Slave (sync follower) mode.
2. The debounce/dejitter setting must be set to 1 msec on PSE2 – PSE4 units. See Table 3.3 on page 21.
3. Strobe/Horn devices connected to the PSE units are not guaranteed to be in sync with FACP devices when using this configuration
4. Any output used for remote sync applications cannot have notification appliances installed on the same circuit.
5. Notification appliances cannot be installed on the interconnecting control circuits.
6. The total line impedance for interconnected units cannot be such that it creates a voltage drop > 3.2 VDC.
7. Ground fault supervision is provided via the general trouble relay for domestic and export models and via the dedicated ground fault relay in the Canadian models. Enable ground fault detection on PSE1 and disable detection on PSE2-4 with negative (-) battery terminals tied together. FACP ground fault supervision will be independent of cascaded PSE1-4. (FACP negative battery terminal is not tied to PSE1).

2.9 Canadian Applications

NOTE: Mass Notification is not for use in Canadian applications.

Canadian applications, per ULC, require the following:

- The PSE power supply must be used as a Notification Appliance Circuit extender only unless the power outputs are configured as Class A with the ZNAC-PS option card.
- Connect the AC ground wire to the Ground Stud located at the top left of the backbox as shown below. Connect the incoming earth ground wire to supplied cable #71073 with a wire nut. Position the ring terminal end over the grounding stud. Secure with one of the keps nuts. Place the ring terminal from the other supplied ground cable #71073 over the ground stud and secure with the second keps nut. Wire the ground cable to the middle position of TB4. Ensure that the ground for incoming AC mains is the first wire installed, closest to the backbox. This connection is vital in reducing the panel's susceptibility to transients generated by lightning and electrostatic discharge. Apply AC power to the panel only after the system is completely installed and visually checked. *Note that AC power must be applied to the panel before installing the battery interconnect cable*.

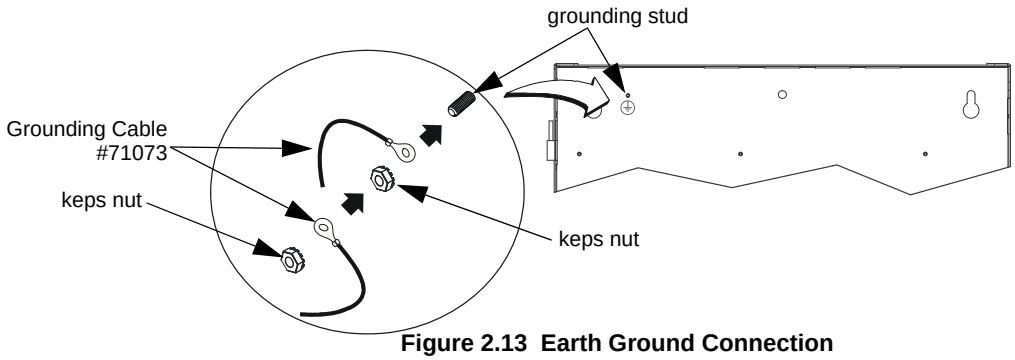


Figure 2.13 Earth Ground Connection

- Refer to Section 5.1 for instructions to meet ULC requirements for trouble monitoring of each zone.
- When connected to an FACP, the host FACP must monitor for all ground fault conditions. The Ground Fault Detection circuit on the PSE power supply must be disabled by sliding SW1 to the left on the bottom left corner of the PCB.
- The negative (-) battery terminal of the PSE power supply must be connected to the negative (-) battery terminal of the host FACP. Battery wiring is nonpower-limited. Power-limited and nonpower-limited wiring must be wired with a minimum of 0.25" spacing in between and enter/exit through different knockouts.
- When cascading multiple power supply units (up to four), continue connecting the negative battery terminals, including FACP battery terminal. Ground faults must then be detected by the first PSE in the chain. Disable ground fault detection on the FACP and on other PSE units by sliding SW1 to the left. Ensure ground fault detection is enabled on PSE1, the first power supply from the FACP, by sliding SW1 to the right.

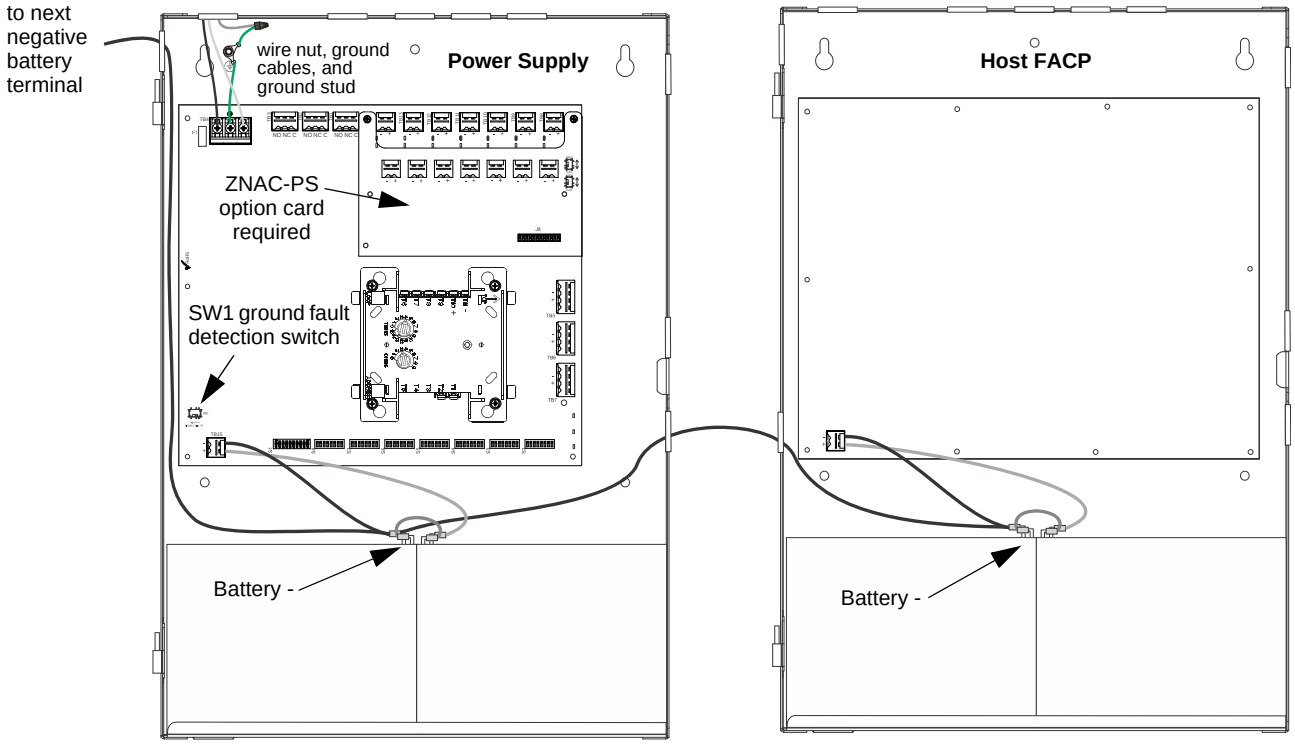


Figure 2.14 Canadian Applications

Section 3: Programming Options

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION AND OTHER INVOLVED PARTIES				
This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below:				
Program feature or option	**Permitted in UL864/2572 and ULC S527? (Y/N)**	**Possible settings**	**Settings permitted in UL 864/ UL2572**	**Settings permitted in ULC S527**
Door Holder Dropout Delay	Y	Refer to “AC Loss Door Holder Dropout Timer” on page 22. • Does not drop • 15 seconds • 5 minutes • 60 seconds	• Does not drop • 15 seconds • 60 seconds • 5 minutes	• Does not drop • 15 seconds • 60 seconds • 5 minutes
AC Loss Delay Timer	Y	Refer to “AC Fail Indication Delay” on page 22. • 30 hours • 12 hours • 2 hours • none	• 2 hours[1] • none	• 2 hours • none

Table 3.1 Agency-Permitted Programming Settings

1 A two hour delay is only permitted on an addressable FACP.

This section describes the programming options available via DIP switch settings. The PSE can be field programmed using DIP switches S1-S8 which are located at the bottom of the circuit board. S1 controls the global options of the power supply and S2-S8 control the functions of each output circuit, respectively. Refer to the following illustration for switch locations and DIP switch placement in the ON and OFF positions.

Important: *Activate output DIP switch changes by setting S1 positions 9 and 10 appropriately. Refer to Table 3.6 on page 22 for DIP Switch programming settings.*

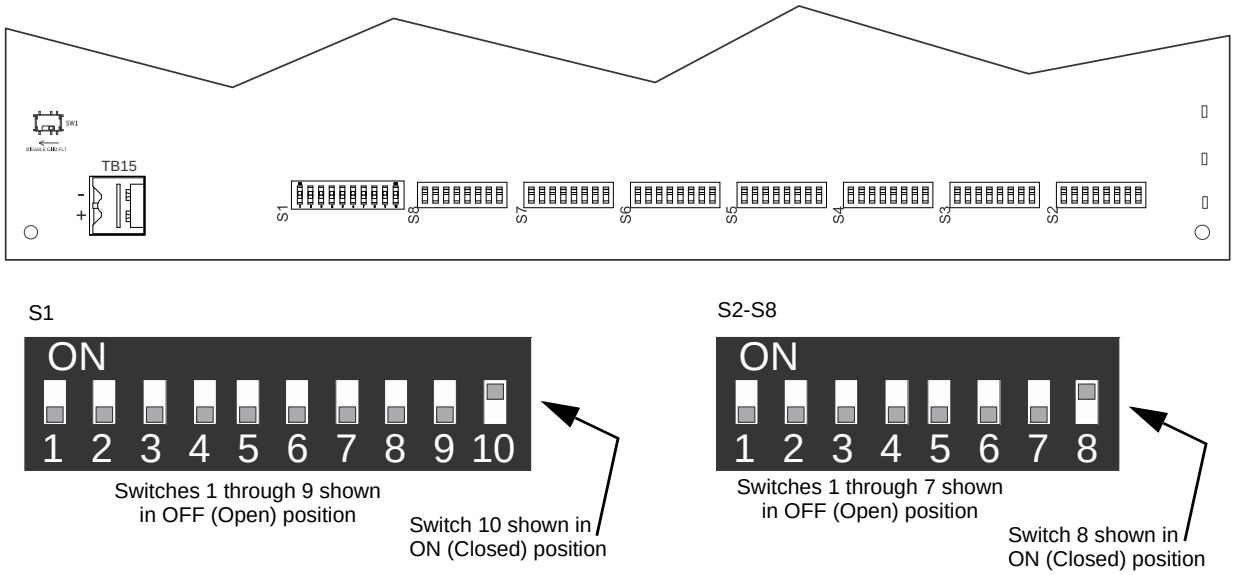


Figure 3.1 Field Programming DIP Switches

3.1 S1 Global Options DIP Switch

The following table lists the global control options for the PSE programmable features and the switch settings required to select a particular feature. A detailed description of each feature is presented in the following pages. Refer to Table 3.1 for UL-compliant settings.

S1 DIP Switch	OFF	ON
1, 2	These switches determine the command input debounce/dejitter setting (Setting applies to ALL inputs)[1]. **1 OFF, 2 OFF** = Temporal (for ANSI temporal signals) **1 ON, 2 OFF** = 50Hz (20 msec, for full wave rectified signals) **1 OFF, 2 ON** = 6 msec (for strobe sync signals, control/relay modules) **1 ON, 2 ON** = 1 msec (for strobe sync signals, control/relay modules)	
3	Command Input #1 configured for Slave Mode Sync[2] input[3]	Command Input #1 configured as normal
4	Internal battery charger = disabled	Internal battery charger = enabled
5, 6	These switches determine door holder dropout delay after AC power loss **5 OFF, 6 OFF**= Power does not drop out **5 ON, 6 OFF** = 5 minutes **5 OFF, 6 ON** = 60 seconds **5 ON, 6 ON** = 15 seconds	
7, 8	These switches determine the AC loss delay timer **7 OFF, 8 OFF** = 30 hours **7 ON, 8 OFF** = 12 hours **7 OFF, 8 ON** = 2 hours **7 ON, 8 ON** = none	
9, 10	These switches determine the operating mode of the power supply. *Return switches to normal mode to exit change output circuit configurations and display trouble history modes!* **9 OFF, 10 OFF** = normal **9 ON, 10 OFF** = change output circuit configurations **9 OFF, 10 ON** = display trouble history **9 ON, 10 ON** = normal	

Table 3.2 S1 Global Options DIP Switch Settings

1 Debounce/dejitter provides settling time for input signals to avoid false triggers.
2 Strobe synchronization only works with non-coded NACs.
3 Output circuit(s) must be set to activate on Input #2. See, "Command Input #1" below.

3.1.1 Global Programmable Features Description

Input Debounce/Dejitter/Delay

Signals from electronic circuits or relay contacts can have a small unstable time when changing state (OFF to ON, or ON to OFF). This means the signal can briefly “bounce” between states before stabilizing to the desired state, causing signal “jitter” during this time. The PSE provides four “debounce/dejitter” settings, as shown in the table below. These settings provide time for a NAC Input signal to stabilize before that NAC Input will recognize it as a valid signal, and not just “noise”, so as to prevent false activation of Output circuits. Input debounce settings can be used as needed.

Unless the system experiences input “noise” issues, apply 1ms setting for general use.

Position 1	Position 2	Setting	Notes
OFF	OFF	Temporal	Debounces ANSI temporal signals. Allows for a 0.5 second ON signal with an almost 2 second OFF signal to trigger a continuous ON input signal. *Do not use for strobe sync signals.*
ON	OFF	50Hz (20msec)	Debounces FWR (full wave rectified signals). Allows an input signal with 50Hz, 33% duty cycle to trigger a continuous (i.e. filters FWR input signal to appear constantly on) ON input signal. May apply to legacy panels. *Do not use for strobe sync signals.*
OFF	**ON**	6 msec	Input delay for strobe sync signals (i.e. Slave mode using sync input), or control/relay modules (i.e. Master or Aux. power mode using trigger input).
ON	**ON**	1 msec	Input delay for strobe sync signals (i.e. Slave mode using sync input), or control/relay modules (i.e. Master or Aux. power mode using trigger input). Must be the only one used when cascading Power Strike units. Refer to Section 2.8, “Cascading Multiple Units”, on page 18.

Table 3.3 Debounce/Dejitter Settings

Command Input #1

Power supply Output circuits can be configured to "follow" a sync pattern that is input to Command Input #1 (TB5), either immediately (Normal Mode), or only after a trigger signal (Sync Input Mode) is applied at Command Input #2 (TB6). In Sync Input Mode an output circuit will only output the Command Input #1 sync pattern when Command Input #2 is receiving a valid (9V - 32V) trigger signal.

See "Command Input #1 - Normal/Sync Mode of Operation" on page 25 for additional information.

Charger Enable/Disable

The PSE battery charger can be disabled to accommodate an external battery charger, such as the CHG-75 or CHG-120. Setting DIP switch position 4 to the OFF position will disable the charger. Setting DIP switch position 4 to the ON position will enable the charger. It should only be disabled if an external battery charger is being used for the PSE.

AC Loss Door Holder Dropout Timer

Any output can be configured as a NAC, aux power, or door closer circuit. Configuring an output circuit as a door closer circuit will provide a steady 24 VDC to door holders until an alarm condition or an AC fail condition. Upon an alarm condition, power to door holder circuits will be removed, causing doors to close immediately. During an AC fail condition, the door holder will remain energized until the programmed AC fail indication delay expires. Programmed delays are only applicable to AC loss conditions. Refer to Table 3.1 for UL-compliant settings.

DIP switch positions 5 and 6 are used to select the door holder dropout timer as listed below:

Position 5	Position 6	Door holder dropout delay after AC loss
OFF	OFF	Power does not drop out with AC loss
ON	OFF	5 minutes
OFF	**ON**	60 seconds
ON	**ON**	15 seconds

Table 3.4 Door Holder Dropout Settings

AC Fail Indication Delay

The AC Fail Indication Delay feature provides the option to delay generation of a trouble signal upon the loss of AC power. Refer to Table 3.1 for UL-compliant settings.

DIP switch positions 7 and 8 are used to select the AC Fail Indication Delay as listed below:

Position 7	Position 8	AC Fail Indication Delay
OFF	OFF	30 hours
ON	OFF	12 hours
OFF	**ON**	2 hours
ON	**ON**	none

Table 3.5 AC Loss Delay Settings

Refer to "AC Trouble Relay" on page 29, for operation of internal NAC trouble relay in response to AC loss.

Special Operating Modes

The PSE power supply can be placed in two special operating modes per settings in Table 3.6. They are Change Output Circuit Configurations and Display Trouble History. *Upon completion of either of these two modes, the system must be placed back in normal operating mode. Note that the current operation of all outputs will not be affected or disturbed while in either of these two special operating modes.*

Change Output Circuit Configurations mode:

NOTE: DIP switch settings may be changed to the desired configuration either before or after entering Change Output Circuit Configurations mode.

1. Enter this mode via the setting shown in Table 3.6. Once entered, the Output trouble LEDs will continually flash from right to left to confirm the PSE is in Change Output Configuration mode.
2. Configure settings on the Output DIP switches as needed (see Note above).
3. Return to Normal Operating mode via either of the two settings shown in Table 3.6. The output trouble LEDs will stop the flash pattern described above to confirm Normal mode has been restored.

The PSE power supply offers a trouble history mode. To see past troubles on the system, place position 9 to OFF and position 10 to ON. Refer to Section 4 for descriptions of troubles. Trouble history will be erased upon returning to Normal operating mode.

DIP switch positions 9 and 10 are used to select the type of operating mode as listed below:

Position 9	Position 10	Operating Mode
OFF	OFF	Normal
ON	OFF	Change output circuit configurations

Table 3.6 Operating Mode

OFF	**ON**	Display Trouble History
ON	**ON**	Normal

Table 3.6 Operating Mode

3.2 Output Circuit Control DIP Switch Settings

Each output circuit has its own programming DIP switch. DIP switches S2-S8 are labeled on the PCB to indicate which output circuit it is controlling. Output circuits are labeled at the top of the PCB, TB8-TB14.The following table applies to DIP Switches S2-S8.

Important! If an output circuit is overloaded, the output will shut off and generate a trouble signal. If this happens, the PSE will need to be reset manually. Either reset circuit configurations by toggling switch S1 position 10 to the OFF position for a minimum of five seconds or turn off primary and secondary power and reapply to the PSE.

DIP Switch Position				**Output Control Setting/Operation**
		1	**2**	
		OFF	OFF	NAC output will activate when Command Input #1 is activated.
		ON	OFF	NAC output will activate when Command Input #2 is activated. (**Exception**: this Input controls Horn silencing during Selective Silence operation.)
		OFF	**ON**	NAC output will activate when Command Input #3 is activated, if available. *(If accidentally programmed on a PSE-6, the system will default to Input #2.)*
		ON	**ON**	NAC output will activate when ANY Command Input is activated.
3	**4**	**5**	**6**	**Output Control Setting/Operation**
OFF	OFF	OFF	OFF	Unused/Unsupervised. Outputs will not activate. *Factory default setting.*
ON	OFF	OFF	OFF	Reserved- Outputs will not activate
OFF	**ON**	OFF	OFF	Non-resettable auxiliary power
OFF	OFF	**ON**	OFF	Resettable aux power
ON	**ON**	OFF	OFF	Door holder auxiliary power
ON	OFF	**ON**	OFF	Slave mode (NAC follower)
OFF	**ON**	**ON**	OFF	Master mode - ANSI Temporal (Temporal 3)
ON	**ON**	**ON**	OFF	Master mode - CO Temporal (Temporal 4)
OFF	OFF	OFF	**ON**	Master mode - Amseco/Potter
OFF	**ON**	OFF	**ON**	Master mode - Gentex
OFF	OFF	**ON**	**ON**	Master mode - System Sensor
OFF	**ON**	**ON**	**ON**	Master mode - Wheelock
ON	OFF	OFF	**ON**	Master mode, Selective Silence - Amseco/Potter
ON	**ON**	OFF	**ON**	Master mode, Selective Silence - Gentex
ON	OFF	**ON**	**ON**	Master mode, Selective Silence - System Sensor
ON	**ON**	**ON**	**ON**	Master mode, Selective Silence - Wheelock
			7	**Output Control Setting/Operation (Only applies when ZNAC-PS is installed)**
			OFF	Class B
			ON	Class A
			8	**Output Control Setting/Operation (Unused)**
			OFF	Unused/Unassigned
			ON	Unused/Unassigned

Table 3.7 S2-S8 Output Circuit DIP Switch Settings

3.2.1 Output Circuit Programmable Features Description

Command Inputs/NAC Circuits

The PSE allows for individual NAC circuit programming. Each NAC can be configured to activate based on the settings selected for up to 3 command inputs.

Position 1	**Position 2**	**Output to Command Input Assignment**
OFF	OFF	NAC will activate when Input #1 activates.
ON	OFF	NAC will activate when input #2 activates. (**Exception**: this Input controls Horn silencing during Selective Silence operation.)

Table 3.8 NAC Activation Settings

OFF	**ON**	NAC will activate when input #3 activates. (Input #3 is only available on the PSE-10 model. If selected on PSE-6, this setting will default to input #2.)
ON	**ON**	NAC will activate when any input (1, 2, or 3) activates.

Table 3.8 NAC Activation Settings

Unused Outputs

The factory default setting for all output circuits is "unused/unsupervised" where positions 3, 4, 5, and 6 are set to the OFF position. Any unused or disabled outputs in the system configuration must be set to OFF as shown below.

Position 3	Position 4	Position 5	Position 6	Auxiliary Power Type
OFF	OFF	OFF	OFF	Unused/Unsupervised. Outputs will not activate. *Factory default setting.*
ON	OFF	OFF	OFF	Reserved- Outputs will not activate

Table 3.9 Auxiliary Power Settings

Remote Supply with Resettable and Non-resettable Power

Each output circuit on the PSE can be used as a remote stand-alone power supply to provide power to any devices that require filtered, resettable or non-resettable power. The PSE can provide up to 3 amps of continuous current. Non-resettable power is suitable for powering annunciators and other peripheral equipment. Resettable power is suitable for four-wire smoke detectors. Resettable outputs reset when the mapped input receives a negative pulse trigger signal from FACP or control module. There will be a three second delay prior to output reset. The output reset will last 10 seconds. Set DIP switches positions indicated in Table 3.10 below to select auxiliary power type.

Position 3	Position 4	Position 5	Position 6	Auxiliary Power Type
OFF	**ON**	OFF	OFF	Non-resettable (constant) aux power
OFF	OFF	**ON**	OFF	Resettable aux power

Table 3.10 Auxiliary Power Settings

Door Holder

Each output circuit can be configured as a door holder circuit. Setting DIP switch positions according to Table 3.11 will configure the selected output circuit as a door holder circuit which will provide a steady 24 VDC to door holders until a mapped input activates an alarm or when an AC fail condition removes the power following a programmable delay. See "AC Loss Door Holder Dropout Timer" on page 22 for more information.

Position 3	Position 4	Position 5	Position 6	Door Holder
ON	**ON**	OFF	OFF	Set as door holder circuit

Table 3.11 Door Holder Power

Synchronization Mode - Master/Slave

The PSE power supply can be configured for Master or Slave Synchronization by setting DIP switches according to Table 3.12. Synchronization is a feature that controls the activation of notification appliances in such a way that all devices will turn on and off at exactly the same time. This is particularly critical when activating strobes which must be synchronized to avoid random activation and a potential hazard or confusion.

In some installations, it is necessary to synchronize the flash timing of all strobes in the system for ADA compliance. Strobes accomplish this by monitoring very short timing pulses on the NAC power which are created by an FACP with synchronization capability. When installed at the end of a NAC wire run, this power supply can track (follow) the strobe synchronization timing pulses on the existing NAC wire run. This maintains the overall system flash timing of the additional strobes attached to this power supply. Note that strobe synchronization works only with non-coded NACs.

When the output circuit is configured as a *sync generator* (Master Synchronization mode), the sync input circuit will only be used to trigger the output. The power supply is the originator of the strobe synchronization pulse on the NAC output. Refer to Table 3.12 to select the desired Master mode sync type.

When the output circuit is configured as a *sync follower* (Slave Synchronization mode), the power supply's NAC outputs track the strobe synchronization pulses present at the supply's Input terminals (based on the settings selected from Table 3.8). The pulses originate from an upstream FACP or other power supply. Some FACPs provide synchronization timing pulses from a dedicated sync output connector. Connect the PSE input terminals to the FACP sync output connector instead of the FACP NAC.

If circuits are configured for both master and slave mode, devices must be installed in different zones or field of view on a circuit basis.

Position 3	Position 4	Position 5	Position 6	Synchronization Type
ON	OFF	**ON**	OFF	Slave mode (NAC follower) - NAC outputs track Command Input Circuits
OFF	**ON**	**ON**	OFF	Master mode - ANSI Temporal (Temporal 3)

Table 3.12 Sync Mode - Master/Slave Settings

ON	**ON**	**ON**	OFF	Master mode - CO Temporal (Temporal 4)
OFF	OFF	OFF	**ON**	Master mode - Amseco/Potter
OFF	**ON**	OFF	**ON**	Master mode - Gentex
OFF	OFF	**ON**	**ON**	Master mode - System Sensor
OFF	**ON**	**ON**	**ON**	Master mode - Wheelock

Table 3.12 Sync Mode - Master/Slave Settings

Master Mode - Selective Silence

Selective Silence allows the silencing of the sounder portion of a horn/strobe combination device without turning off the strobe. Selective Silence is only supported while in Master mode setting for Amseco, Gentex, System Sensor, and Wheelock. Refer to Table 3.13 to select the desired Master mode, Selective Silence sync type.

NOTE: Do not apply synchronization signals to Command Input #1 and 2. Only trigger signals are allowed (i.e. constant 9-32 VDC). Synchronization signal is internally generated by the system when in Master mode.

Only Command Inputs #1 and #2 are used to control the Selective Silence operation. (Command Input #3 on PSE-10 does not support Selective Silence.) Input #1 is for activating the horn/strobe devices, while Input 2 only controls sounding of the horns. Input #1 must be active for Input #2 to have any effect on NAC outputs set for Selective Silence. The list below provides additional detail.

- If only Command Input #1 is active, only the strobes will be activated .
- If both Command Input #1 and #2 are active, strobes and horns will be activated.
- If only Command Input #2 is active, NAC outputs will not be activated.
- If neither Command Input #1 nor #2 is active, NAC outputs will not be activated.

Position 3	Position 4	Position 5	Position 6	Synchronization Type
ON	OFF	OFF	**ON**	Master mode, Selective Silence - Amseco/Potter
ON	**ON**	OFF	**ON**	Master mode, Selective Silence - Gentex
ON	OFF	**ON**	**ON**	Master mode, Selective Silence - System Sensor
ON	**ON**	**ON**	**ON**	Master mode, Selective Silence - Wheelock

Table 3.13 Master Mode - Selective Silence Settings

Command Input #1 - Normal/Sync Mode of Operation

For Normal Mode of operation, see previous section.

Sync Mode is an available option for the Slave Synchronization operating mode (see previous section). Sync Mode differs from the Slave Synchronization Normal Mode of operation because it requires an additional “trigger” signal to activate the output(s). Once the trigger signal is active, the corresponding output(s), as selected by the Output DIP Switch settings, will follow any synchronization signal provided to Input #1.

- Input #1 is dedicated as the follower input for any synchronization signal received into this input. Do not apply the **trigger** signal to this input.
- Input #2 is used for the trigger input for either the 6 amp or 10 amp models. Do not apply the **synchronization** signal to this input.
- Input #3 can also be used for the trigger input, but is only available on the 10 amp model. Do not apply the **synchronization** signal to this input.
- Use only one input (Input #2 or #3) at any one time for the trigger input.
- A trigger signal between 9-32VDC is required for proper operation.
- Set the Global DIP switch, S1 position 3, to the OFF position. See below:

NOTE: If Input #1 signal is lost while Input #2 (or Input #3, if available) trigger is active, output circuits will deactivate.

S1 DIP Switch	OFF	ON
3	Command Input #1 configured for Sync input	Command Input #1 configured as normal

Set DIP switch positions 1 and 2 according to which input circuit, #2 or #3, is used as the trigger input as shown below.

Position 1	Position 2	Trigger Input Assignment For Sync Mode Operation
ON	OFF	NAC will activate when Input #2 activates
OFF	**ON**	NAC will activate when Input #3 activates (Input #3 is only available on the PSE-10 model. If selected on PSE-6, this setting will default to input #2.)

DIP switch positions 4, 5, and 6 should be set to Slave Mode as shown below:

Position 3	Position 4	Position 5	Position 6	Synchronization Type for Sync Mode Operation
ON	OFF	**ON**	OFF	Slave mode (NAC follower) - NAC outputs track Command Input Circuits

Table 3.14 Sync Mode Settings

Class A Wiring

NAC circuits (all outputs) and aux power circuits (outputs 1 and 2) can be converted to Class A wiring using the ZNAC-PS option card. Setting DIP switch position 7=ON when a selected output circuit is configured for Class A wiring. The default setting is OFF for Class B wiring.

■ Maximum Number of Strobes for Synchronization

The total current draw for each Notification Appliance Circuit cannot exceed 3.0 amps special application, 1A (6 amp model) or 1.5A (10 amp model) regulated. Refer to the manufacturer's documentation supplied with the strobe to determine the maximum current draw for each strobe and ensure that the circuit maximum is not exceeded.

To ensure proper strobe and circuit operation, there is also a limit to the number of strobes that can be attached to each circuit. Following is a table of the strobes that have been tested with the power supply and the maximum number that can be connected to each NAC when using the lowest candela settings. *Make sure that the NAC maximum current is not exceeded:*

Manufacturer	max. number of strobes[1]
System Sensor	69
Gentex	42
Wheelock	50
Amseco/Potter	34

Table 3.15 Maximum Number of Strobes

1 These values are for strobe-only devices at the minimum candela setting. Values will be different for strobe/horn and horn-only devices. Refer to the manufacturer's installation documents for values on these devices.

Section 4: LED Indicators

The PSE power supply has 3 system LED indicators for Power, Batt/Chgr Fault, and Ground Fault. In addition, each available output circuit also has 2 status LEDs. Refer to Figure 1.1 on page 10 for LED locations. A description of each PSE LED indication is given below.

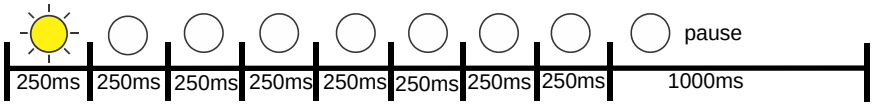
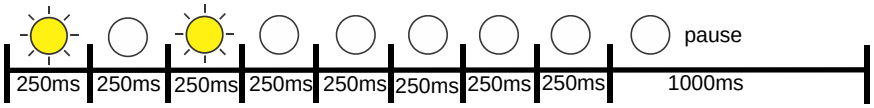
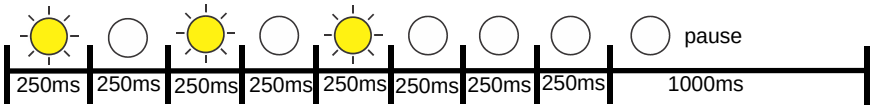
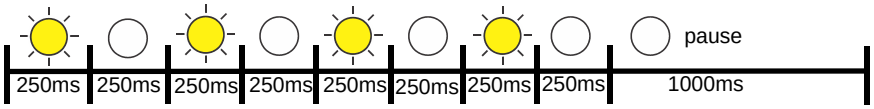
Ground Fault LED (yellow)

No Fault	LED is OFF 
Fault Condition: ground fault	LED is ON constant 

Power LED (green)

No Fault	LED is ON constant 
Fault Condition: AC power loss (or brownout) 1 short blink (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 

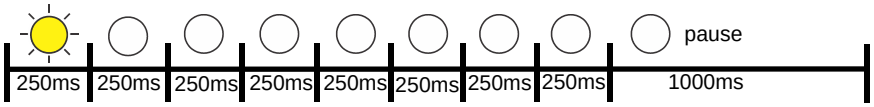
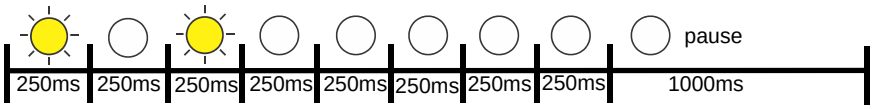
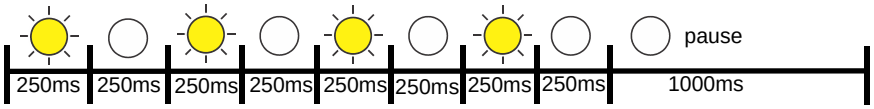
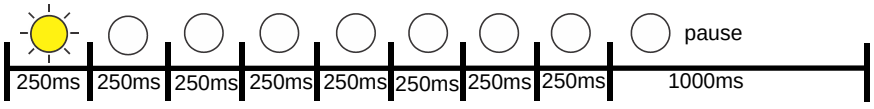
Battery fault LED (yellow)

No Fault	LED is OFF 
Fault Condition: Charging path (FETs) failure 1 short blink (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition: Charger voltage too low or Charger Diode Fault 2 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition: Battery discharged/overcharged 3 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition: Battery disconnected/fully discharged 4 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 

Output Circuit Status LEDs (red)

Output inactive	LED is OFF 
Output active	LED is ON constant 

Output Circuit Trouble LEDs (yellow)

No Fault	LED is OFF 
Fault Condition (Normal/Standby Mode): Wire Supervision Class A or B Open circuit 1 short blink (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition (Normal/Standby Mode): Wire Supervision Class A or B Short Circuit 2 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition: Aux Power Supervision Class A Open circuit (ZNAC-PS Circuit #1 and #2 only) 3 short blinks (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Fault Condition: Power limit condition (individual ckt overload) 4 short blinks per individual circuit (250ms) Fault Condition: Power limit condition (panel overload) 4 short blinks on all output circuits (250ms)	Repeating LED blink pattern (non-diagnostic mode and diagnostic mode) 
Operating Mode Fault: Power Supply not in Normal Operating mode 1 short blink from right to left across all output circuits. Set positions 9 and 10 on S1 to the ON position.	Repeating LED blink pattern (non-diagnostic mode) 

Section 5: Trouble Supervision

The FACP will detect PSE power supply faults. Any of the following conditions will cause the trouble contact to open, provided the FACP Notification Appliance Circuit is *not* in alarm.

5.1 Trouble Supervision Using Input Circuits

The FACP (Fire Alarm Control Panel) supervises the connection between itself and the PSE via the control panel's NAC End-of-Line Resistor (ELR). To supervise the PSE, an ELR must be installed across terminals 1 & 4 of Command Inputs #1 and #2 (and #3 for the 10 amp models). A field wiring fault on the NAC output of the PSE will trigger a disconnection of the ELR at the related Command Input, causing a general NAC trouble at the FACP provided the FACP's NAC is *not* in alarm. Refer to Section 3.2, "Output Circuit Control DIP Switch Settings", on page 23 for input/output configuration assignment. The following are exceptions.

1. Resettable Aux Power, Non-Resettable Aux Power, and Door Holder Aux Power outputs that trigger the Trouble relay during an output trouble instead of breaking the ELR connection at the Command Input regardless of the output to input relationship (i.e. mapping). Refer to 5.2, "Trouble Relay" below.
2. Faults are only reported by Command Input #1 when Selective Silence output mode is controlled by Command Input #1 and #2.
3. Faults are only reported by the trigger input when Command Input #1 is configured for Sync Input mode operation controlled by a sync and trigger input.

If the PSE is in alarm, only a short circuit on the NAC will be detected as a trouble.

If other trouble monitoring is required when the power supply is in alarm, the Trouble Relay at TB1, and AC Trouble at TB2, and Ground Fault Trouble at TB3 (Canadian applications only) can be used for this purpose.

5.2 Trouble Relay

The PSE power supply has a fail-safe Form-C trouble relay located at TB1. The contacts can be monitored by an FACP input circuit or an addressable monitor module as illustrated in Figure 5.1. Note that any faults reported by Command Inputs are not repeated by the trouble relay, offering limited trouble reporting.

Trouble conditions that will cause the normally energized trouble relay to change states regardless of whether the panel is in alarm or standby:

- A battery fail condition at the power supply
- A battery charger fail on the power supply
- A ground fault condition on the power supply (non-Canadian models only)
- A field wiring fault on the PSE output in Resettable Aux Power, Non-Resettable Aux Power, or Door Holder Aux Power mode
- A total panel overload fault

If trouble monitoring is required when the power supply is in alarm, the Trouble Relay at TB1 can be used for this purpose. Refer to Figure 5.1 below.

NOTE: The individual NAC Trouble LED will indicate which NAC circuit is in trouble.

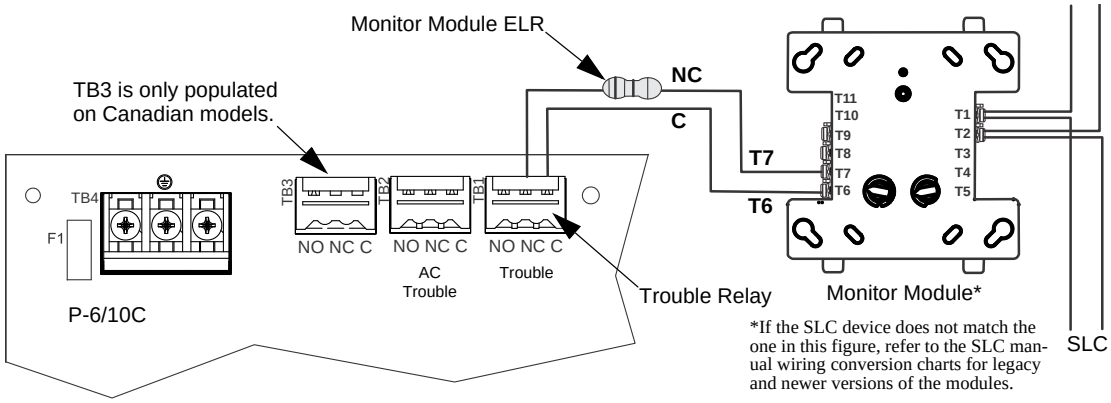


Figure 5.1 Monitoring the Trouble Relay

5.3 AC Trouble Relay

The PSE power supply has a fail-safe Form-C trouble relay located at TB2. The contacts can be monitored by an FACP input circuit or an addressable monitor module similar to the drawing illustrated in Figure 5.1. The AC Trouble Relay responds to an AC fail condition on the PSE immediately, or after a programmed delay time, depending on the setting of S1 switches 7 and 8.

The reporting of AC loss to a central station is usually delayed in order to prevent multiple transmissions of AC loss and restoral, allowing AC power to stabilize. When a host FACP is programmed to delay AC loss reporting, the PSE must be configured to delay the reporting of AC fail. This is accomplished by setting S1 positions 7 and 8. Refer to the DIP switch setting chart in Table 3.5 on page 22. This will prevent AC loss from being reported as a trouble condition for 30, 12, 2, or 0 hours. Note that only no delay and the 2 hour delay are acceptable per UL 864 and UL 2572.

5.4 Ground Fault Relay (Canadian Applications Only)

The PSE-6/10C power supply has a form-C trouble relay located at TB3. The contacts can be monitored by an FACP input circuit or an addressable monitor module similar to the drawing illustrated in Figure 5.1. Ground fault conditions will cause the relay to change states regardless of whether the panel is in alarm or standby.

Section 6: Power Supply Requirements

6.1 Overview

This section contains instructions and tables for calculating power supply currents in alarm and standby conditions. This is a four-step process, consisting of the following:

1. Calculating the total amount of AC branch circuit current required to operate the system
2. Calculating the power supply load current for non-fire and fire alarm conditions and calculating the secondary (battery) load
3. Calculating the size of batteries required to support the system if an AC power loss occurs
4. Selecting the proper batteries for your system

6.2 Calculating the AC Branch Circuit

The power supply requires connection to a separate, dedicated AC branch circuit, which must be labeled **FIRE ALARM**. This branch circuit must connect to the line side of the main power feed of the protected premises. No other non-fire alarm equipment may be powered from the fire alarm branch circuit. The branch circuit wire must run continuously, without any disconnect devices, from the power source to the power supply. Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Codes as well as local codes. Use a minimum of 14 AWG (2.00 mm^2) wire with 600 volt insulation for this branch circuit.

Use Table 6.1 to determine the total amount of current, in AC amperes, that must be supplied to the system.

Device Type	Number of Devices		Current Draw (AC amps)		Total Current per Device
PSE-6(C)(R) or PSE-10(C)(R) or PSE-6E or PSE-10E	1	x	5.0 or 6.2 or 2.7 or 3.5	=	
[ ]	[ ]	x	[ ]	=	
[ ]	[ ]	x	[ ]	=	
Sum Column for AC Branch Current Required				=	

Table 6.1 120/240 VAC Branch Circuit Requirements

6.3 Calculating the System Current Draw

6.3.1 Overview

The power supply must be able to power all internal and external devices continuously during a fire alarm condition. The secondary power source (batteries) must be able to power the system during a primary power loss.To calculate the non-fire alarm load on the power supply when secondary power is applied, use Calculation Column 1 in Table 6.3 on page 32. The power supply must support a larger load current during a fire alarm condition. To calculate the fire alarm load on the power supply as secondary power, use Calculation Column 2 in Table 6.3 on page 32.

When calculating current draw and the battery size, note the following:

- *Primary* refers to the main power source for the power supply.
- *Secondary* refers to the power supply's backup batteries.
- All currents are given in amperes (A). Table 6.2 shows how to convert milliamperes and microamperes to full amperes.

To convert...	Multiply	Example
Milliamperes (mA) to amperes (A)	mA x 0.001	3 mA x 0.001 = 0.003 A
Microamperes (μA) to amperes (A)	μA x 0.000001	300 μA x 0.000001 = 0.0003 A

Table 6.2 Converting to Full Amperes

6.3.2 How to Calculate System Current Draw

Use Table 6.3 on page 32 to calculate current draws as follows:

1. Enter the quantity of devices in both columns.
2. Enter the current draw where required. Refer to the *Notifier Device Compatibility Document* for compatible devices and their current draws.
3. Calculate the current draws for each in both columns.
4. Sum the total current for each column.

Following are the types of current that can be entered into Table 6.3.

✓**Calculation Column 1** - The secondary supply current load that the power supply must support during a non-fire alarm condition, with AC power applied

✓**Calculation Column 2** - The secondary supply current load the power supply must support during a fire alarm condition, with AC power applied

Table 6.3 contains two columns for calculating current draws. For each column, calculate the current and enter the total (in amperes) in the bottom row. When finished, use the data to select the proper size batteries in Tables 6.4 and 6.5.

Device Type	Calculation Column 1 Secondary, Non-Fire Alarm Current (amps)			Calculation Column 2 Secondary, Fire Alarm Current (amps)		
	Qty	X (current draw) =	Total	Qty	X (current draw) =	Total
Main Circuit Board - PSE-6	1	X [0.233] =		1	X [0.208] =	
Main Circuit Board - PSE-6 with ZNAC-PS Class A option card	1	X [0.183] =		1	X [0.154] =	
Main Circuit Board - PSE-10	1	X [0.293] =		1	X [0.247] =	
Main Circuit Board - PSE-10 with ZNAC-PS Class A option card	1	X [0.219] =		1	X [0.169] =	
NAC/Output #1	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #2	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #3	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #4	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #5	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #6	[ ]	X [ ] =		[ ]	X [ ] =	
NAC/Output #7	[ ]	X [ ] =		[ ]	X [ ] =	
EOLR-1 Power Supervision Relay	[ ]	X [0.020] =		[ ]	X [0.020] =	
Sum each column for totals	**Secondary Non-Alarm =**			**Secondary Alarm =**		

Table 6.3 System Current Draw Calculations

6.4 Selecting and Locating Batteries

Select batteries that meet or exceed the total ampere hours determined in Tables 6.4 and 6.5. The power supply can charge batteries from 7 AH to 33 AH range. The power supply cabinet is capable of housing industry standard 7 AH or 18 AH batteries. Other ampere batteries (e.g. 12AH, 26AH, 33AH) will not fit physically inside the PSE cabinet and require a separate battery box.

6.4.1 NFPA Battery Requirements

NFPA 72 Local and Proprietary Fire Alarm Systems require 24 hours of standby power followed by 5 minutes in alarm for normal operations, 15 minutes for mass notification systems, or 30 minutes for Canadian applications.

NOTE: When using carbon monoxide detection, the system must be monitored by a Supervising Station meeting the Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment, NFPA 720.

6.4.2 Maximum Battery Standby Load

Tables 6.4 and 6.5 show the standby load calculations for the power supply based on 24 hours of standby. The standby load calculations in the Table 6.3 must be less than the number shown in Tables 6.4 and 6.5 for the selected battery size, standby hour and alarm time. The numbers below have a built in 20% derating factor for the battery ampere capacity.

Battery Capacity (AH)	Alarm Time (min)				
	5	10	15	20	30
7	0.212 A	0.190 A	0.168 A	0.147 A	N/A
12	0.378 A	0.357 A	0.335 A	0.313 A	0.270 A
18	0.578 A	0.557 A	0.535 A	0.513 A	0.470 A
33	1.078 A	1.057 A	1.035 A	1.013 A	0.970 A
75	2.478 A	2.457 A	2.435 A	2.413 A	2.370 A
120	3.000 A	3.000 A	3.000 A	3.000 A	3.000 A

Table 6.4 Maximum Battery Standby Loads for 24 Hour Standby on the PSE-6

Battery Capacity (AH)	Alarm Time (min)				
	5	10	15	20	30
7	0.198 A	0.162 A	N/A	N/A	N/A
12	0.365 A	0.329 A	0.294 A	0.258 A	0.187 A
18	0.565 A	0.529 A	0.494 A	0.458 A	0.387 A
33	1.065 A	1.029 A	0.994 A	0.958 A	0.887 A
75	2.465 A	2.429 A	2.394 A	2.358 A	2.287 A
120	3.000 A	3.000 A	3.000 A	3.000 A	3.000 A

Table 6.5 Maximum Battery Standby Loads for 24 Hour Standby on the PSE-10

Section 7: Testing and Maintenance

7.1 Periodic Testing and Service

Periodic testing and servicing of equipment is essential to ensure proper and reliable operation. Test and service the power supply according to the schedules and procedures outlined in the following documents:

- NFPA Standard 72's section on Inspection, Testing and Maintenance
- All test and maintenance instruction codes and software necessary to provide test and inspection requirements of CAN/ULC-S536, Standard for the Inspection and Testing of Fire Alarm Systems

7.2 Battery Checks and Maintenance

Maintenance-free sealed lead-acid batteries used in the system do not require the addition of water or electrolyte. These batteries are charged and maintained in a fully charged state by the main power supply's charger during normal system operation. A discharged battery typically reaches the voltage of 27.6 VDC within 48 hours;. Sealed lead-acid batteries must be replaced within at most 5 years from their date of manufacture. Minimal replacement battery capacity appears on the control panel marking label. Immediately replace a leaking or damaged battery. Replacement batteries are available from the manufacturer.

WARNING: SULFURIC ACID

BATTERIES CONTAIN SULFURIC ACID WHICH CAN CAUSE SEVERE BURNS TO THE SKIN AND EYES AND DAMAGE TO FABRICS.

F1 Fuse Replacement	Not Allowed
Rechargeable Battery Replacement	Recommended Part Numbers: • **BAT-1270** (12V,7AH) • **BAT-12120** (12V, 12AH) • **BAT-12180** (12V 18AH) • **BAT-12260** (12V, 26AH) • **BAT-12330** (12V, 33AH)

Appendix A: Wire Requirements

Connecting external system accessories to the main circuits must be carefully considered to ensure proper operation. It is important to use the correct type of wire, gauge and run length for each circuit. The following table lists NAC wiring requirements for the PSE-6 and PSE-10 Power Supply.

The numbers documented in this chart are worst case numbers, based on the conditions listed below. The maximum voltage drop, maximum loop resistance, and wire length ratings can be increased with lower system current loading.

1. The PSE-6/10 is full capacity loaded at 6A/10A.
2. The PSE-6/10 is running at the Low Battery voltage of 20.4VDC (at Battery Connector TB15).

Wire lengths apply to Class B wiring, and to Class A wiring returned to the ZNAC-PS card.

Max Load (Amps)	Max Loop Resistance (Ohms)	AWG 12 (Solid)	AWG 14 (Solid)	AWG 16 (Solid)	AWG 18 (Solid)
0.25	12.804	3320	2087	1310	823
0.50	6.402	1660	1044	655	412
0.75	4.268	1107	696	437	274
1.00	3.201	830	522	327	206
1.25	2.561	664	417	262	165
1.50	2.134	553	348	218	137
1.75	1.829	474	298	187	118
2.00	1.601	415	261	164	103
2.25	1.423	369	232	146	91
2.50	1.280	332	209	131	82
2.75	1.164	302	190	119	75
3.00	1.067	277	174	109	69

Table A.1 Wiring Requirements for Power Supply

NOTE: Calculations are based on Direct-Current Resistance data for uncoated copper wire, per National Electrical Code (2005 Edition) Table 8, Conductor Properties.

NOTE: These distances reflect the worst case scenario and are based on the correct draw of the highest candela strobes at the low end of the supported NAC voltage with the entire load at the end of the circuit. Further distances can be achieved by performing a point to point voltage calculation that more accurately reflects the specific devices used and how they are dispersed on the circuit.

Appendix B: Application Examples

B.1 Controlling NACs For Selective Silence Operation Using a Control Module

In this application, the power supply has been set as a master with synchronized outputs and selective silence (see DIP switch settings and Selective Silence Operation information in Section 3). This application requires Input #1 to be controlled by the FACP. Input #2 is required for controlling selective silence via a control/relay module, *programmed as an alarm output and a silenceable point*. *Only Mass Notification, Fire, or combo Mass Notification/Fire NACs are allowed in this configuration*. The control module can be powered by one of the PSE output circuits, configured as aux power (24VDC).

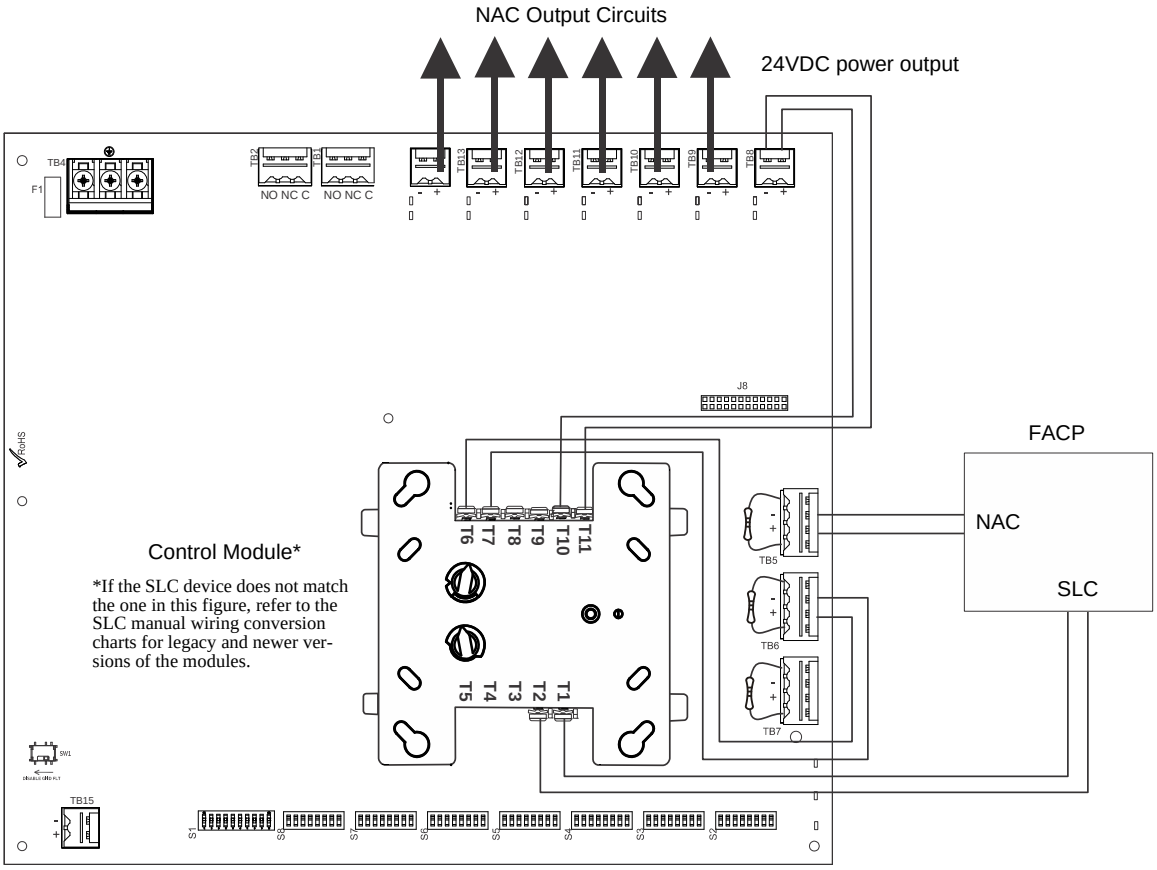


Figure B.1 Controlling Multiple Outputs with One Input

The following notes apply to Figure B.1.

When the PSE power supply is in an inactive state (FACP NAC not active), a trouble on the NAC circuit will result in an open circuit condition on the FACP (monitored by End-of-Line Resistor across TB5, Terminals 1 and 4). As an alternative, the trouble contacts at TB1 of the power supply can also be used for limited trouble monitoring excluding Selective Silence output faults. Refer to Section 5 for more information.

- Refer to Section 3 for instructions on setting the DIP switches.
- Selective Silence output faults are only reported via Command Input #1 (not Command Input #2).
- Wire NACs as shown on page 13.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed across all input circuits, Terminals 1 and 4, for control module wiring supervision (the ELR value is dependent on the module/FACP employed).
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.2 Controlling NACs For Sync Follower Operation Using a Control Module

In this application, the power supply has been set to operate in slave mode and will follow the sync signal from the FACP. This application requires Input #1 to be controlled by the FACP sync output. Input #1 may be wired to the next PSE or terminate in and ELR. Input #2 (or Input #3, if available) will act as the trigger signal for the output circuits. The control module can be powered by one of the PSE output circuits, configured as aux power (24VDC). See Table 3.14 on page 25 DIP switch settings.

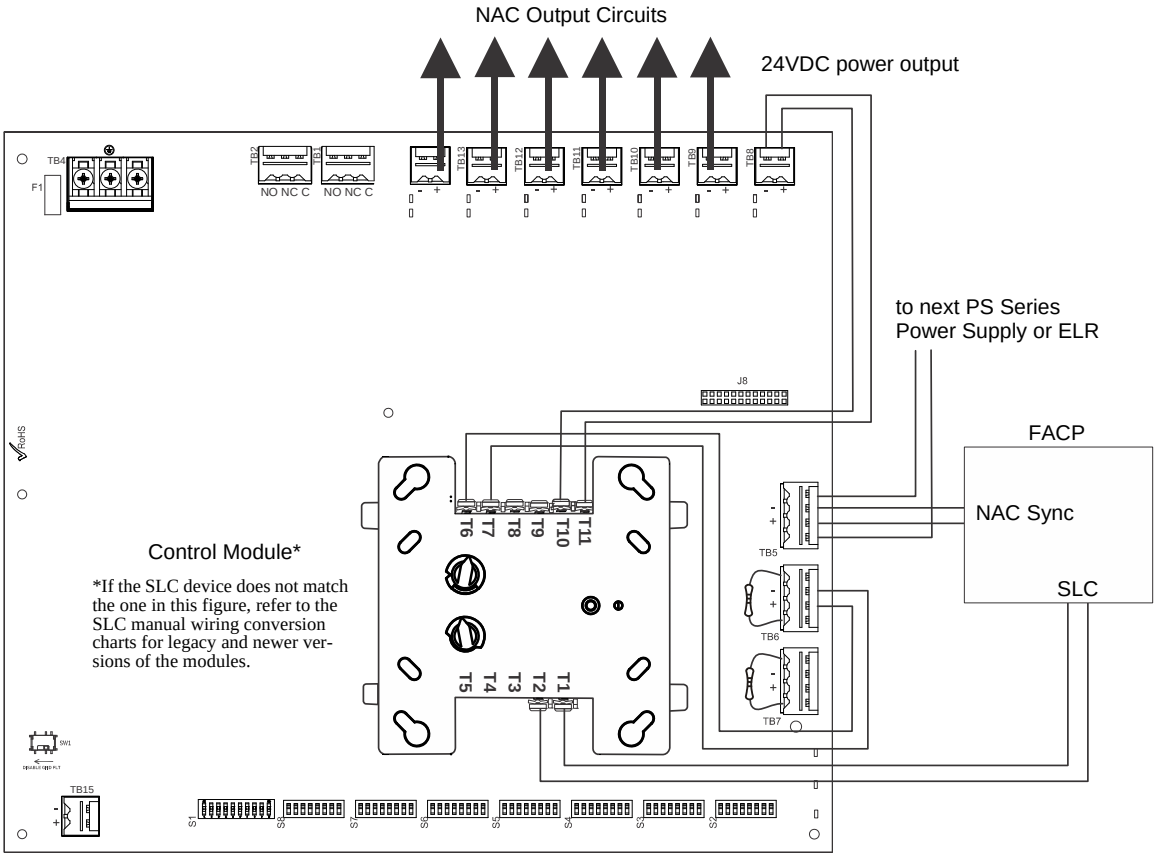


Figure B.2 Controlling Multiple Outputs with One Input as Sync Follower

The following notes apply to Figure B.2.

- When the PSE power supply is in an inactive state (control module not active), a trouble on the NAC circuits mapped to TB6 will result in an open circuit condition on the control module output circuit (monitored by End-of-Line Resistor across TB6, Terminals 1 and 4). As an alternative, the trouble contacts at TB1 of the power supply can also be used for limited trouble monitoring excluding faults reported by Command Input #2 related to Command Input#1 configured for Sync Input mode. Refer to Section 5 for more information.
- Refer to Section 3 for instructions on setting the DIP switches.
- Output faults are reported via Command Input#2 with Command Input#1 configured for Sync Input mode operation.
- Refer to the FACP manual for load restrictions and line length limitations when wiring multiple power supplies at the input.
- Wire NACs as shown on page 13.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed across all input circuits, Terminals 1 and 4, for control module wiring supervision (the ELR value is dependent on the module/FACP employed).
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.3 Controlling NACs, Aux Power, or Door Holders Using a Control Module

All output circuits, NACs, aux power (non-resettable power – active regardless of control module state), or door holders, can be controlled from one input such as an addressable control module as illustrated in Figure B.3. The control module can be powered from one of the PSE output circuits, as 24 VDC power. In this example, Output #1 will be configured as 24VDC non-resettable aux power.

The control module is shown to demonstrate the use of an internally mounted device associated with an addressable fire alarm control panel. The module could be replaced with any circuit capable of polarity reversal, such as an FACP Notification Appliance Circuit.

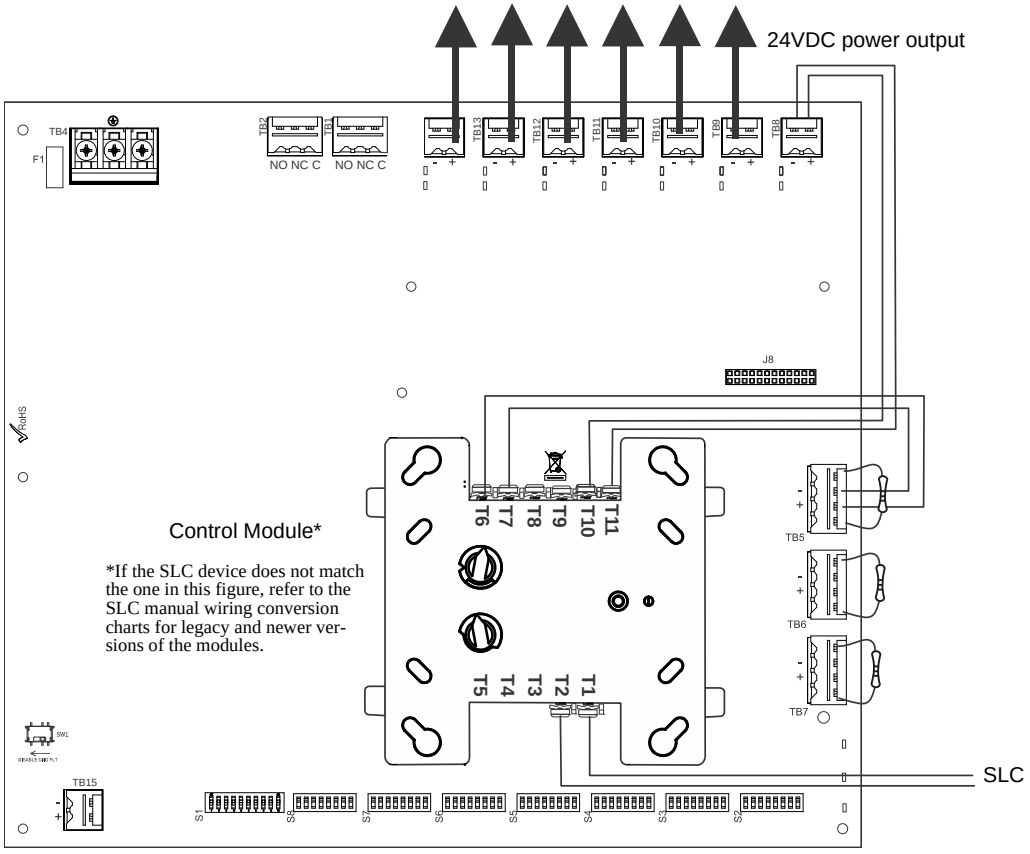


Figure B.3 Controlling NACs, Aux Power, and Door Holders with One Input

The following notes apply to Figure B.3.

- Any output circuit can be configured as NAC, door holder, or 24VDC power.
- Wire NACs as shown on page 13.
- Refer to Section 3 for instructions on setting the DIP switches.
- When the PSE power supply is in an inactive state (control module not active), a trouble on the NAC circuits mapped to TB5 will result in an open circuit condition on the control module output circuit (monitored by an End-of-Line Resistor across Terminals 1 and 4). Additionally, the trouble contacts at TB1 of the power supply can also be used for limited trouble monitoring excluding output faults reporting to Command Input #1. Refer to Section 5 for more information.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed between terminals 1 and 4 for control module wiring supervision (the ELR value is dependent on the module/FACP employed).
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.4 Controlling NACs, Aux Power, and Door Holders with NAC Sync

In this application, use of a single FDRM-1 mounted inside the cabinet can monitor the two power supply trouble relays and trigger two independent inputs via relay circuits. PSE outputs #1 and #2 are being used for 24 VDC aux power triggered by the module's relay circuits. Any PSE output circuit can be configured to follow any input circuit.

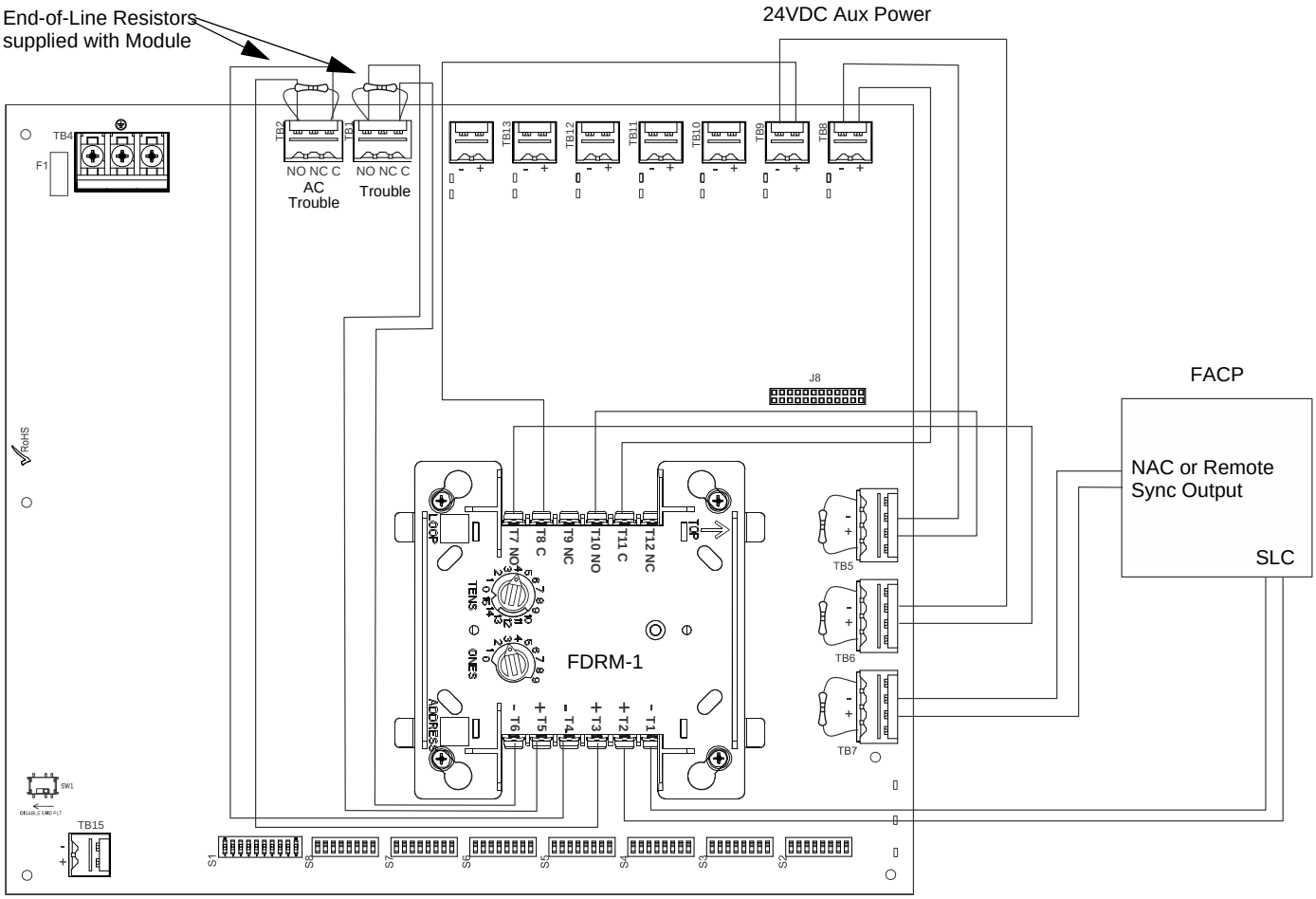


Figure B.4 Controlling NACs, Aux Power, and Door Holders with One Input and NAC Sync

The following notes apply to Figure B.4.

- Any output circuit can be configured as NAC, door holder, or 24VDC power.
- Refer to Section 3 for instructions on setting the DIP switches.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed between terminals 1 and 4 for module wiring supervision (the ELR value is dependent on the module/FACP employed).
- An End-of-line Resistor on input circuits#1-2 (TB5-6) are optional for this particular application.
- Ensure that the FDRM-1 is programmed appropriately at the FACP where the inputs are *not* mapped to the same zone as its outputs.
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.5 Controlling all Three Inputs with One Control Module

In this application, all three command inputs are being controlled by one multi-module, the XP6-C mounted inside the cabinet. Output #1 is being used for 24 VDC aux power. Any output circuit may be configured to any input.

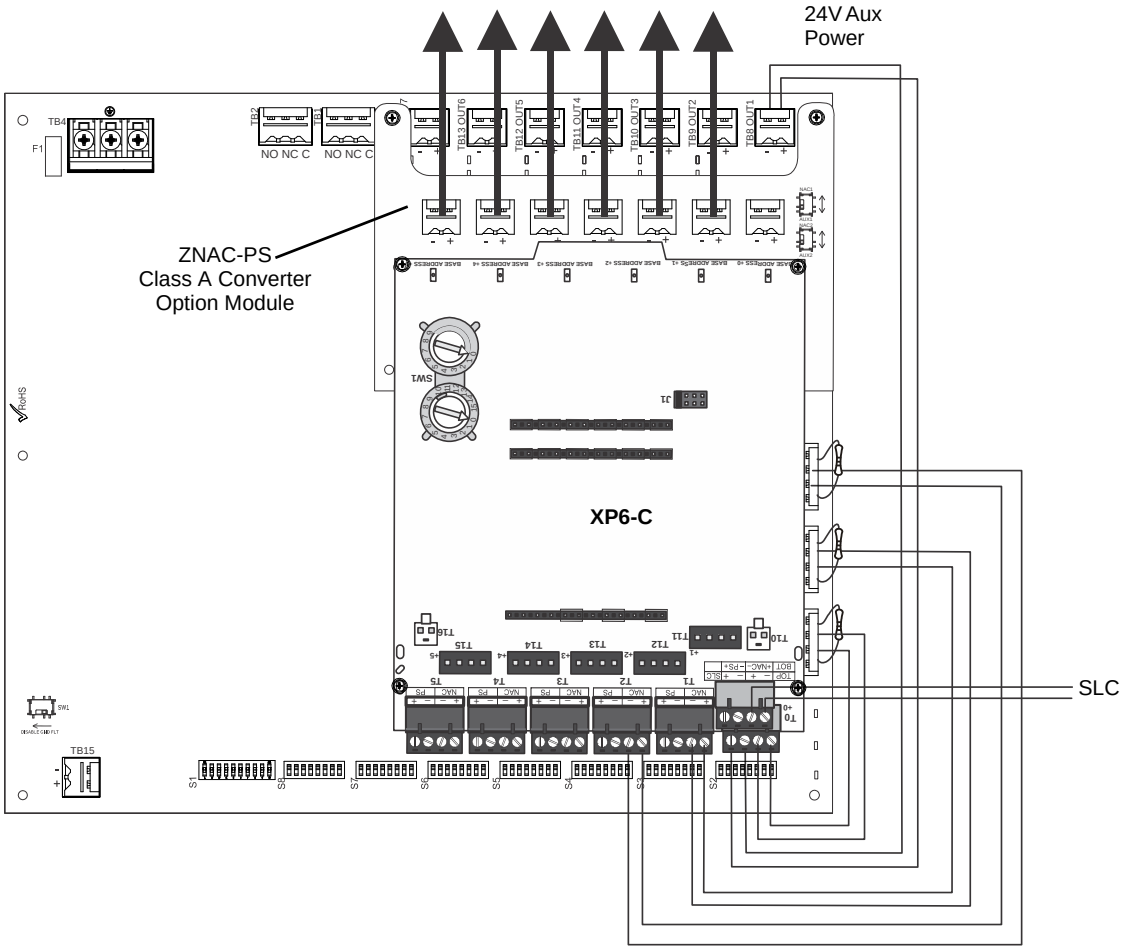


Figure B.5 Controlling Three Inputs with One Module

The following notes apply to Figure B.5.

- An End-of-Line Resistor must be installed between terminals 1 and 4 for control module wiring supervision (the ELR value is dependent on the module/FACP employed).
- Either disable the unused addresses or install ELRs across unused outputs on the XP6-C.
- Refer to Section 3 for instructions on setting the DIP switches.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- For a list of compatible devices, refer to the *Notifier Device Compatibility Document* #15378.
- Refer to the *SLC Wiring Manual* for more information.

B.6 AC Trouble Reporting with a Conventional FACP

In this application, the PSE is being used with a conventional FACP that does not have a type-coded input zone for AC Power loss with a delay. AC Trouble Delay on the PSE must be set to none (S1-7 ON, 8 ON). AC Fail delay timers must be set on the DACT. The DACT must be installed in close proximity to the conventional FACP so the audible and visual signaling can be given locally at the FACP as required by UL 864.

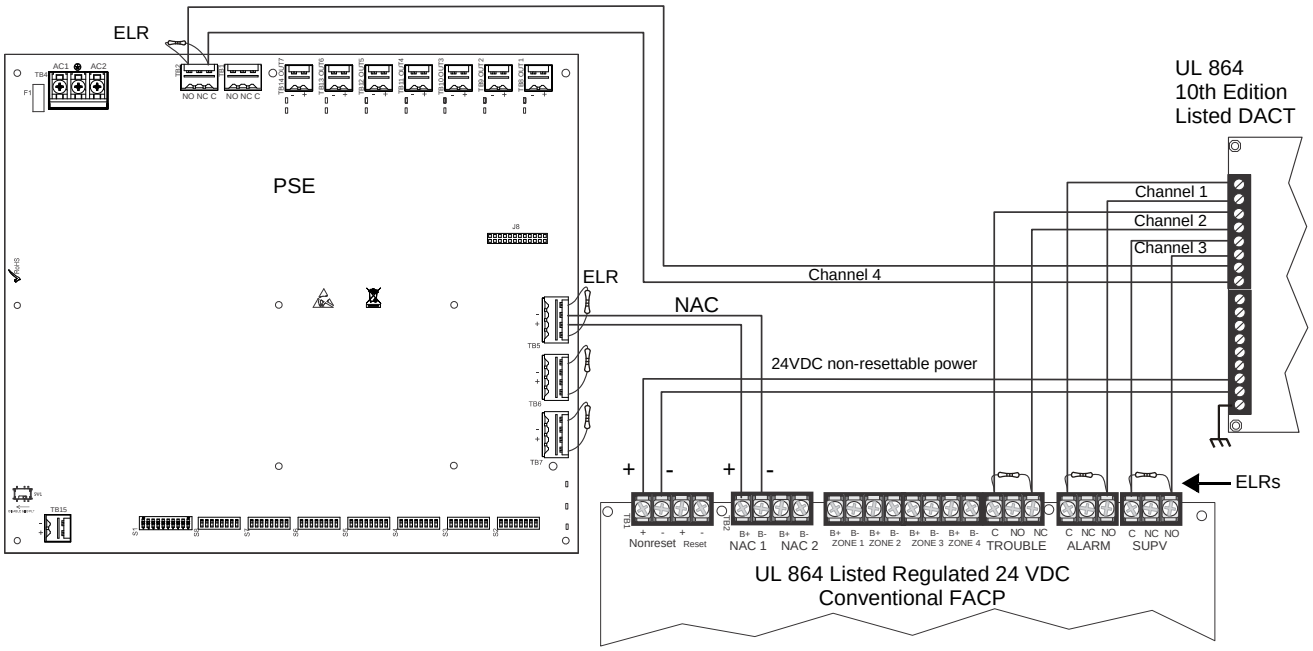


Figure B.6 AC Trouble Reporting with a Conventional FACP

The following notes apply to Figure B.6.

- Wiring from the power supply to the DACT must be in metal conduit within 20 feet of the FACP.
- Refer to Section 3 for instructions on setting the DIP switches.
- Do not loop wires under screw terminals. Break wires to maintain proper supervision.
- An End-of-Line Resistor must be installed between terminals 1 and 4 on the input circuits that require wiring supervision. (The ELR value is dependent on the FACP employed).
- Refer to panel/DACT documentation for programming information.

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see also Class A Converter Module **8**

Manufacturer Warranties and Limitation of Liability

Manufacturer Warranties. Subject to the limitations set forth herein, Manufacturer warrants that the Products manufactured by it in its Northford, Connecticut facility and sold by it to its authorized Distributors shall be free, under normal use and service, from defects in material and workmanship for a period of thirty six months (36) months from the date of manufacture (effective Jan. 1, 2009). The Products manufactured and sold by Manufacturer are date stamped at the time of production. Manufacturer does not warrant Products that are not manufactured by it in its Northford, Connecticut facility but assigns to its Distributor, to the extent possible, any warranty offered by the manufacturer of such product. This warranty shall be void if a Product is altered, serviced or repaired by anyone other than Manufacturer or its authorized Distributors. This warranty shall also be void if there is a failure to maintain the Products and the systems in which they operate in proper working conditions.

MANUFACTURER MAKES NO FURTHER WARRANTIES, AND DISCLAIMS ANY AND ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS, TRADEMARKS, PROGRAMS AND SERVICES RENDERED BY MANUFACTURER INCLUDING WITHOUT LIMITATION, INFRINGEMENT, TITLE, MERCHANTABILITY, OR FITNESS FOR ANY PARTICULAR PURPOSE. MANUFACTURER SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY OR DEATH WHICH MAY ARISE IN THE COURSE OF, OR AS A RESULT OF, PERSONAL, COMMERCIAL OR INDUSTRIAL USES OF ITS PRODUCTS.

This document constitutes the only warranty made by Manufacturer with respect to its products and replaces all previous warranties and is the only warranty made by Manufacturer. No increase or alteration, written or verbal, of the obligation of this warranty is authorized. Manufacturer does not represent that its products will prevent any loss by fire or otherwise.

Warranty Claims. Manufacturer shall replace or repair, at Manufacturer's discretion, each part returned by its authorized Distributor and acknowledged by Manufacturer to be defective, provided that such part shall have been returned to Manufacturer with all charges prepaid and the authorized Distributor has completed Manufacturer's Return Material Authorization form. The replacement part shall come from Manufacturer's stock and may be new or refurbished. THE FOREGOING IS DISTRIBUTOR'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A WARRANTY CLAIM.

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NOTIFIER
12 Clintonville Road
Northford, CT 06472-1610 USA
203-484-7161
www.notifier.com

NOTIFIER by Honeywell

12 Clintonville Road
Northford, CT 06472-1653
Phone: 203.484.7161

FMM-1 Monitor Module

SPECIFICATIONS

Normal Operating Voltage:	15 to 32 VDC
Maximum Current Draw:	5.0 mA (LED on)
Average Operating Current:	375 µA (group poll); 350 µA (direct poll); 600 µA Max. (Communicating, IDC Shorted)
EOL Resistance:	47K Ohms
Maximum IDC Wiring Resistance:	1,500 Ohms
Maximum IDC Voltage:	11 Volts
Maximum IDC Current:	450µA
Temperature Range:	32°F to 120°F (0°C to 49°C)
Humidity:	10% to 93% Non-condensing
Dimensions:	4½″ H x 4″ W x 1¼″ D (Mounts to a 4″ square by 2⅛″ deep box.)
Accessories:	SMB500 Electrical Box

BEFORE INSTALLING

This information is included as a quick reference installation guide. Refer to the control panel installation manual for detailed system information. If the modules will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect power to the control panel before installing the modules.

NOTICE: This manual should be left with the owner/user of this equipment.

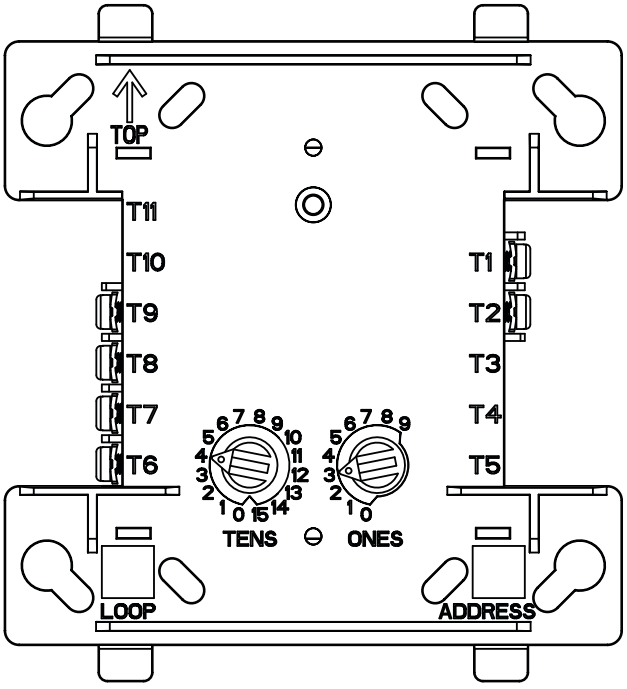
GENERAL DESCRIPTION

The FMM-1 Monitor Module is intended for use in intelligent, two-wire systems, where the individual address of each module is selected using the built-in rotary switches. It provides either a 2-wire or 4-wire fault tolerant initiating device circuit (IDC) for normally open contact fire alarm and supervisory devices, or either normally open or normally closed security devices. The module has a panel controlled LED indicator. The FMM-1 can be used to replace an MMX-1 module in existing systems. FMM-1 is also UL Listed as a commercial proprietary burglar alarm accessory and a commercial central station burglar alarm accessory.

COMPATIBILITY REQUIREMENTS

To ensure proper operation, this module shall be connected to a compatible Notifier system control panel (list available from Notifier).

FIGURE 1. CONTROLS AND INDICATORS:



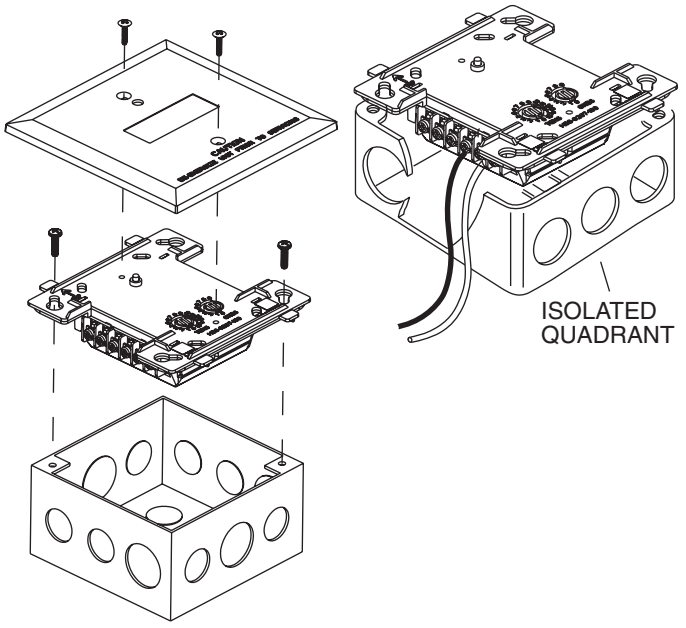
C1067-00

MOUNTING

The FMM-1 mounts directly to 4-inch square electrical boxes (see Figure 2). The box must have a minimum depth of 2⅛ inches. Surface mounted electrical boxes (SMB500) are available from Notifier.

FIGURE 2. MODULE MOUNTING:

NOTE: For UL Listed security installations, the FMM-1 must be mounted within the control panel enclosure.



C1066-00

WIRING

NOTE: All wiring must conform to applicable local codes, ordinances, and regulations. This module is intended for power limited wiring only.

1. Install module wiring in accordance with the job drawings and appropriate wiring diagrams.
2. Set the address on the module per job drawings.
3. Secure module to electrical box (supplied by installer), as shown in Figure 2.

FIGURE 3. TYPICAL 2-WIRE INITIATING CIRCUIT CONFIGURATION, NFPA STYLE B OR SECURITY SYSTEMS:

NOTE: For UL Listed security installations, the FMM-1 must be mounted within the control panel enclosure.

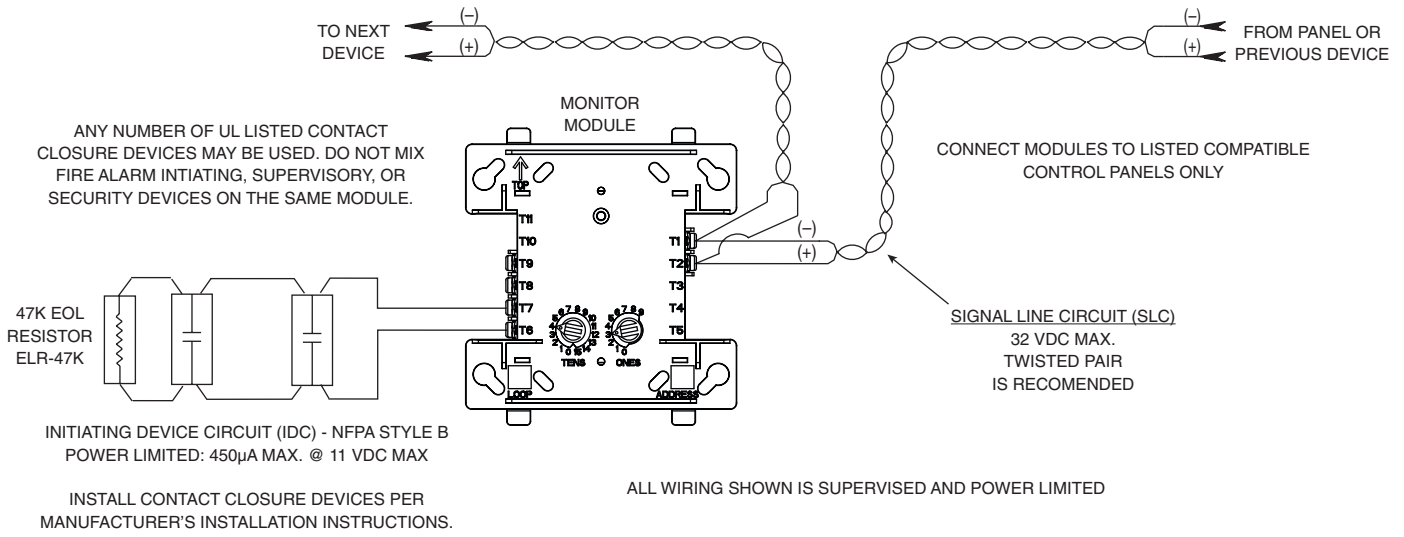


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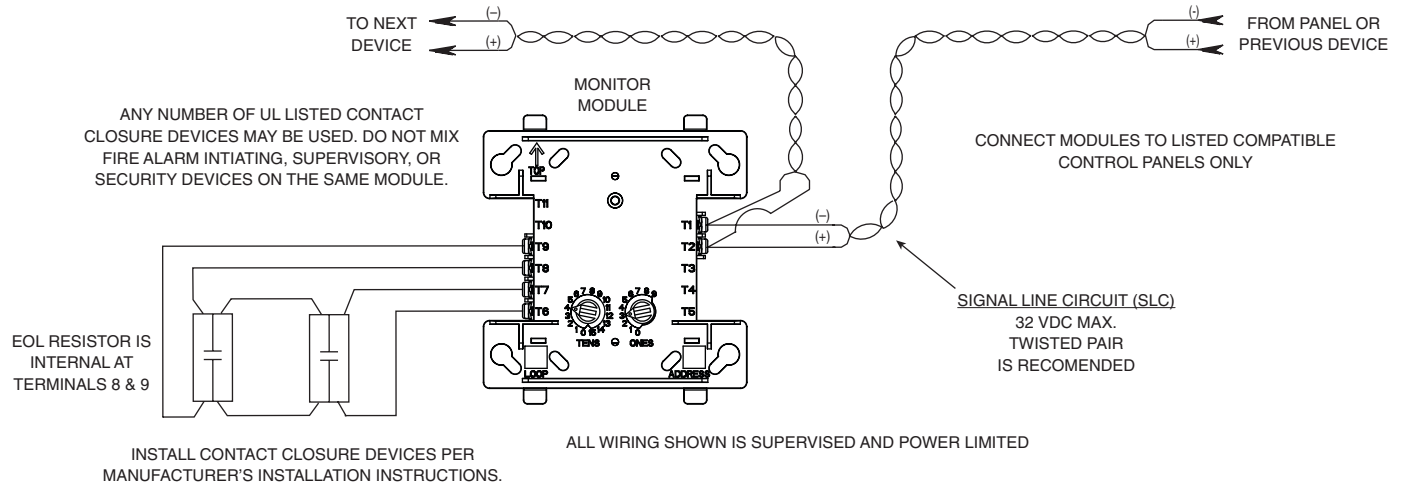
FIGURE 4. TYPICAL 4-WIRE FAULT TOLERANT INITIATING CIRCUIT CONFIGURATION, NFPA STYLE D:



C0919-02

302 Series

Rate-Anticipation Heat Detectors

NOTIFIER® by Honeywell

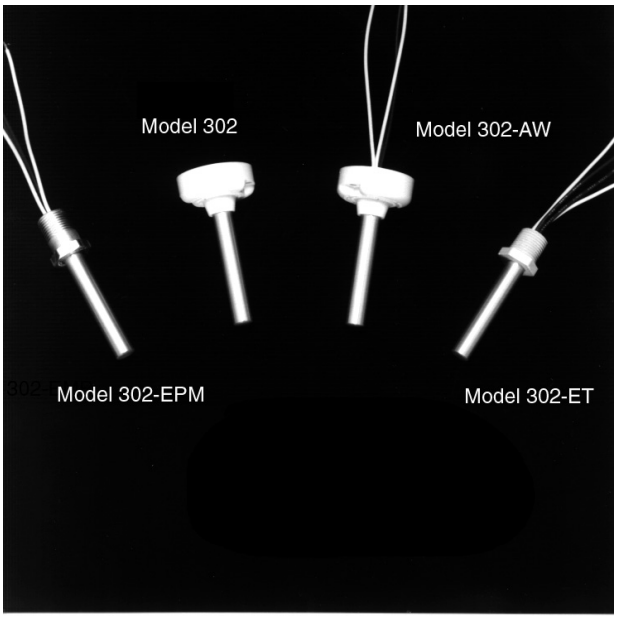
General

The **Thermotech 302 Series** rate-anticipation heat detectors operate within a controlled range of two to three degrees of their set points, regardless of the speed or rate of temperature rise. These detectors are available in either 135°F (57.2°C) or 194°F (90°C) ratings.

The 302 Series are normally-open devices designed especially for fire detection and alarm systems.

Features

- **Immediate response.** The 302 Series activate whenever ambient air temperature reaches a detector's setting, eliminating the thermal time lag inherent in conventional heat detectors.
- **Eliminates false alarms.** The 302 Series do not respond to momentary temperature fluctuations below the selected temperature.
- **Universal application.** The 302 Series can be used in all areas for any type of occupancy.
- **Self-restoring.**
- **Hermetically sealed.** Shock resistant, corrosion resistant, and tamper-proof.



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Principles Of Operation

The 302 Series rate-anticipation heat detectors respond and activate the fire alarm immediately whenever the ambient temperature reaches the preset temperature setting. Under rapid heat rise conditions, the rate-anticipation feature enables the detector to respond one to three degrees ahead of the setting. At the same time, however, it does not respond to momentary temperature fluctuations below the selected protection level, thus eliminating false alarms. When temperature drops back down below the protection level, the detector automatically resets itself.

Dimensions (Model 302)

Total overall length: 4-1/8" (10.48 cm).

Base diameter: 2" (5.08 cm).

Electrical Ratings

Voltage	***Current***
6 - 125 VDC	5 amps
6 - 25 VDC	1 amp
125 VDC	0.5 amp

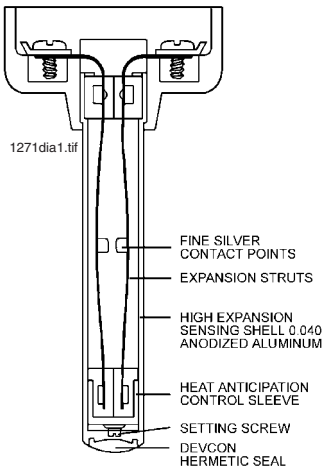
Application Information

302 Series detector have a smooth ceiling UL rating of 50' x 50' (15.24 x 15.24 meters) and are the only type of heat detectors having such a rating on both fixed temperature and rate anticipation.

Agency Listings and Approvals

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL Listed**: S539 (302-AW-135/-194; 302-ET-135/-194; 302-135-194)
- **FM Approved**: (302-AW-135/-194; 302-ET-135/-194; 302-135/-194)
- **CSFM**: 7270-0021:001



Cut-Away View

Thermotech Model 302 Series Rate-Anticipation Heat Detectors		
Model Number	**Description**	**Refer To**
302-135	135°F Interior Vertical Mounting	Note 1 below
302-194	194°F Interior Vertical Mounting	
302-AW-135	135°F All-Weather Vertical Mounting	Note 2 below
302-AW-194	194°F All-Weather Vertical Mounting	
302-ET-135	135°F All-Weather Vertical Mounting	Note 3 below
302-ET-194	194°F All-Weather Vertical Mounting	
302-EPM-135	135°F Explosion Proof Mounting	Note 4 below
302-EPM-194	194°F Explosion Proof Mounting	
AP-P	Decorative white plastic adaptor plate for mounting 302 and 302-AW to 4” outlet box.	

NOTE 1: *For interior mounting in any atmosphere that is compatible with terminal-screw-type connections. UL rating 50' x 50' (15.24 x 15.24 meters).*

NOTE 2: *Hermetically sealed for moisture-proof or dust-proof installations. Requires no special backbox when the all-weather leads are properly spliced to “THW” or equivalent type wire.*

NOTE 3: *Hermetically sealed for moisture-proof or dust-proof installations. Requires no special backbox. Has plastic hexagonal wrench grip bushing with 1/2” (1.27 cm) conduit threads for attachment to threaded hub cover, or any outlet box.*

NOTE 4: *Explosion-proof for installation in hazardous locations. Has hexagonal wrench-grip bushing with 1/2” (1.27 cm) conduit threads for attachment to threaded hub cover of Series JL fixture fitting as manufactured by Killark Electric Co., or equal.*

For more information, contact Notifier. Phone: (203) 484-7161, FAX: (203) 484-7118.
www.notifier.com

INSTALLATION AND SERVICE INSTRUCTIONS FOR FEDERAL MODEL FSEX-HI VISUAL SIGNAL APPLIANCES FOR THE HEARING IMPAIRED FOR USE IN HAZARDOUS LOCATIONS

⚠ SAFETY MESSAGE TO INSTALLERS, USERS AND MAINTENANCE PERSONNEL

It is important to follow all instructions shipped with this product. This device is to be installed by a trained electrician who is thoroughly familiar with the National Electrical and Fire Codes and will follow all local codes.

This device should be considered a part of the warning system and not the entire warning system.

The selection of the mounting location for the device, its controls and the routing of the wiring is to be accomplished under the direction of the facilities engineer and the safety engineer. In addition, listed below are some other important safety instructions and precautions you should follow:

- Read and understand all instructions before installing or operating this equipment.
- Never alter the unit in any manner. Safety may be compromised if additional openings or other alterations are made to the unit.
- Do not connect this light to the system when power is on.
- After installation, ensure that the threaded joints are properly tightened.
- Keep the unit tightly closed when in operation.
- After testing is complete, provide a copy of this instruction sheet to all operating personnel.
- Establish a procedure to routinely check the light installation for integrity and proper operation.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.

I. GENERAL.

The Model FSEX-HI strobe light is a Visual Signaling Device for Hearing Impaired for use in Hazardous Locations and provides about 63 high intensity flashes per minute. The unit is UL Listed for indoor use on a wall or ceiling in a nonsleeping area and complies with the TYPE 4X (watertight and corrosion resistant) enclosure requirements and Marine Visual Signal Device (saltwater).

For the Electrical Ratings and Light Dispersion Pattern of the Model FSEX-HI, reference Table 1 and Figure 1.

This equipment is suitable for Class I, Division 1, Groups C and D; Class I, Division 2, Groups A, B, C and D, Class II, Division 1, Groups E, F and G; Class III and non-hazardous locations.

This device is intended for permanent installation and operation in accordance with Title 46, Code of Regulations, Parts 110-113, or Title 33, Code of Federal Regulations Part 183, Sub-part I, Section 183.410, and the applicable requirements of the American Boat and Yacht Council, Inc. and/or ANSI/NFPA 302, "Fire Protection Standard for Pleasure and Commercial Motor Craft."

II. INSTALLATION

A. *Unpacking*

⚠WARNING

Damaged domes can lead to explosions, which could result in serious injury or death.

After unpacking the unit, examine it for damage that may have occurred in transit. If the equipment has been damaged, do not attempt to install or operate the unit. File a claim immediately with the carrier, stating the extent of damage. Carefully check all envelopes, shipping labels and tags before removing or destroying them.

B. *Mounting.*

The Model FSEX-HI, strobes are designed for hearing impaired applications and should be installed per the NFPA 70 and 72, STATE and LOCAL CODES. Alternate installation locations and/or orientations should only be performed with the approval of the authority having jurisdiction. Reference Figure 1 for the light dispersion pattern of the FSEX-HI.

⚠WARNING

EXPLOSION HAZARD—This light fixture is not backward compatible with older products. Do not use this light fixture with the Series A versions of model CMXC, CMXC-R, PMXC, PMXC-R, WMXC, or WMXC-R mounting accessories. Failure to follow this warning may result in personal injury or death.

Refer to instruction manual 25500050 for ceiling mount, pipe mount, and wall mount instructions.

C. *Electrical Connections*

⚠WARNING

SHOCK HAZARD — To avoid electrical shock hazards, do not connect wires when power is applied.

The DC Model's Operating Voltage Range Limits: 16 – 33 Vdc.

⚠WARNING

TESTED LIMITS — This product was only tested to its rated operating voltage range. It was not tested to 80% and 110% of these limits.

CAUTION

REVERSE POLARITY/MISWIRING — The DC units are polarity sensitive, and MAY BE DAMAGED by incorrect electrical hookup. When connecting the DC strobe unit to the voltage supply lines, POLARITY MUST BE OBSERVED. In addition, damage will result if the voltage rating of the model is exceeded.

Model FSEX units are provided with incoming and outgoing power-connection terminals to allow electrical supervision (see Figures 3 and 4).

1. Connect the incoming (+) positive side of the power source to the terminal marked "L+" and the outgoing (+) positive power source to the terminal marked "B."

2. Connect the incoming (–) negative side of the power source to the terminal marked "N–" and the outgoing (–) negative side of the power source to the terminal marked "A."

3. If required by local building codes, connect the earth ground wire to the green screw in the pendant mount.

C. To prevent galling and ease future maintenance, ensure that the pendant mount threads are clean and lubricated. Thread the fixture clockwise into the pendant mount and tighten it securely.

III. MAINTENANCE

⚠WARNING

EXPLOSION HAZARD—Do not disconnect the equipment while the circuit is live or unless the area is known to be free of ignitable concentrations.

⚠WARNING

EXPLOSION HAZARD—To prevent ignition of hazardous atmospheres, disconnect the fixture from the supply circuit before opening.

⚠WARNING

EXPLOSION HAZARD—Substitution of any component may impair suitability for Class I, Division 2.

⚠ SAFETY MESSAGE TO MAINTENANCE PERSONNEL

Listed below are some important safety instructions and precautions you should follow:

- Read and understand all instructions before operating this system.
- Any maintenance to the light system must be done with the power turned off.
- Any maintenance to the light system must be performed by a trained electrician in accordance with all applicable national and local codes in the country of use.

- Never alter the unit in any manner. The safety of the unit may be compromised if additional openings or other alterations are made.

- The nameplate should not be obscured. It contains cautionary and/or other information of importance to maintenance personnel. Ensure the nameplate remains readable if the housing's exterior is painted.

- If the glass dome is damaged in any way, it MUST be replaced.

- After performing any maintenance, test the light system to ensure that it is operating properly.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death.

A. *Flash Tube Replacement*

As strobe lights are used, the flash tubes begin to darken, causing the light output to decrease. This darkening is characteristic of flash tubes. The darkening will begin near the base of the tube and progress upward. In addition, as flash tubes age, they may have a tendency to misfire (not fire periodically).

After extended operation, occasionally check for flash tube degradation. Should the flash tube misfire, have a noticeable decrease in light output, glow continuously or darken to a point beyond that shown in Figure 5, it should be replaced.

⚠WARNING

SHOCK HAZARD — Strobe and HID light systems generate high voltages. Disconnect power and wait 5 minutes before opening the unit. Failure to follow this warning could result in serious injury or death.

⚠WARNING

HANDLE STROBE LAMPS CAREFULLY — Strobe lamps get hot enough to burn you. Always allow these lamps to cool before handling them. Strobe lamps are also pressurized and, if broken, can result in flying glass. Failure to follow this warning may result in personal injury.

⚠WARNING

DO NOT TOUCH LAMP WITH BARE HANDS — Oil deposits on the glass portion of the strobe lamp can cause the glass to fracture during use. If you are unsure if the glass has been handled without gloves, clean the glass using a soft cloth and isopropyl alcohol before installing the lamp.

To change the flash tube:

1. Disconnect power.

2. Remove the glass dome assembly from the main casting by rotating the dome assembly counterclockwise.

⚠WARNING

EXPLOSION HAZARD — The effectiveness of the explosion-proof enclosure must be maintained. Do not damage the dome or threads while disassembling or reassembling the unit. Lubricated joints exposed for long periods of time may attract small particles of dirt or other foreign materials. Body and cover joints should be reassembled immediately.

4. Gently pull the flash tube from the socket. A rocking motion is most helpful when installing or removing the tube.

5. Replace the flash tube with the appropriate replacement part listed in paragraph III. E. Replacement Parts.

6. Replace the glass dome assembly and tighten it securely.

B. *Cleaning the Enclosure*

NOTE

Maintenance procedures sometime require fixtures to be hosed down for good housekeeping. The circuit must be turned OFF and fixture dome MUST be allowed to cool to ambient room temperature before cleaning.

The fixture should be cleaned periodically to maintain maximum light output. Only mild, non-abrasive cleaning agents should be used. The glass dome should be regularly inspected for scratches and chips, and if damaged, must be replaced.

C. *Lubrication*

The threaded joints should be kept well lubricated with a corrosion-inhibiting grease such as petrolatum or soap-thickened mineral oils. If corrosive products have accumulated on explosion-proof joints and cannot readily be removed with solvents, the parts should be discarded and replaced.

⚠WARNING

EXPLOSION HAZARD — Never use an abrasive material or file to remove corrosive products from threaded surfaces. In extremely corrosive locations, equipment should be periodically inspected to guard against unusual deterioration and possible porosity, since this may weaken the enclosure structurally.

D. *Service*

Federal Signal will service your equipment and provide technical assistance with any problems that cannot be handled locally by Federal Signal's Distributor or Manufacturer Representative.

If any unit returned to Federal Signal for service, inspection, or repair must be accompanied by a Return Material Authorization number with a brief explanation of the service being requested and/or the nature of the malfunction. This R.M.A. can be obtained from the local Federal Signal Distributor or Manufacturer's Representative.

Address all communications and shipments to:

FEDERAL SIGNAL CORPORATION
Industrial Products Division
2645 Federal Signal Drive
University Park, IL 60484-3167
Phone: +1 877 289 3246 • +1 708-534-4756
Fax: +1 708 534 4887
www.federalsignal-indust.com

E. *Replacement Parts*

Description	**Part Number**
Flash Tube	K8107159
Glass Dome Assy., Red	K8436147-01
PCBA Low-Inrush	K2001918-01
Mechanism, 24 Vdc	K8436107-04

F. *Optional Accessories*

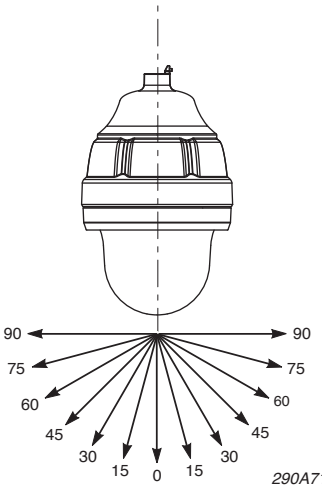
Description	**Model**
Ceiling Mount, Red	CMXC-R-SB
Wall Mount, Red	WMXC-R-SB
Pendant Mount, Red	PMXC-R-SB

Table 1

Electrical Ratings	
Operational Voltage Range	16–33 Vdc
On-Axis Candelas	150
Flashes/minute	63 ± 2
Frequency, Hz	DC
Max. DC Operating Current, A	1.9

Underwriters Laboratories only evaluated this product to the stated operational voltage range. It was not evaluated to 80% to 110% of the voltage range.

1 Model FSEX-HI Signaling Device for the Hearing Impaired Light Dispersion Pattern per UL1971.



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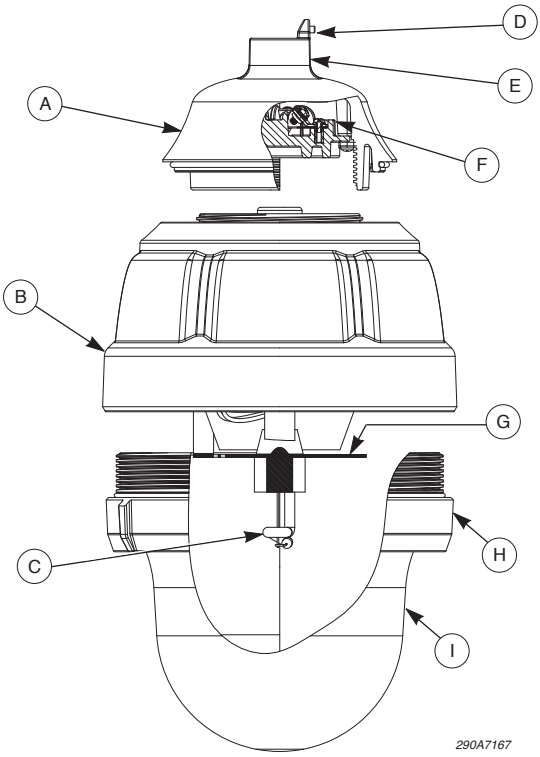
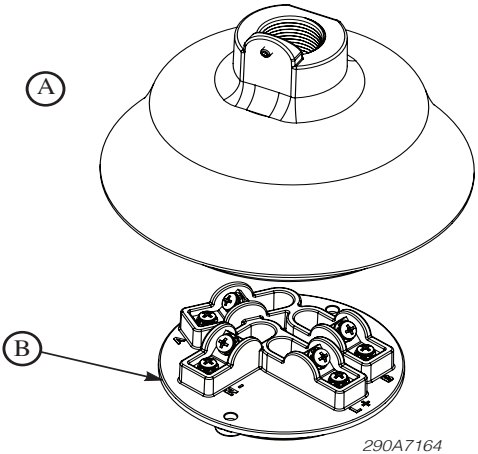
Horizontal Light Dispersion Pattern		
Degrees	Min. Output (cd) w/o Internal Lens	Min. Output (cd) w/ Internal Lens
0°	150.0	15.00
5–25°	135.0	13.50
30–45°	112.5	11.25
50°	82.5	8.25
55°	67.5	6.75
60°	60.0	6.00
65°	52.5	5.25
70°	52.5	5.25
75°	45.0	4.50
80°	45.0	4.50
85°	37.5	3.75
90°	37.5	3.75

2



A. Pendant mount
B. Main housing
C. Strobe flash tube
D. Set screw
E. 3/4" N.P.T. conduit
F. Terminal block
G. Mechanism assembly
H. Glass dome assembly
I. Glass dome

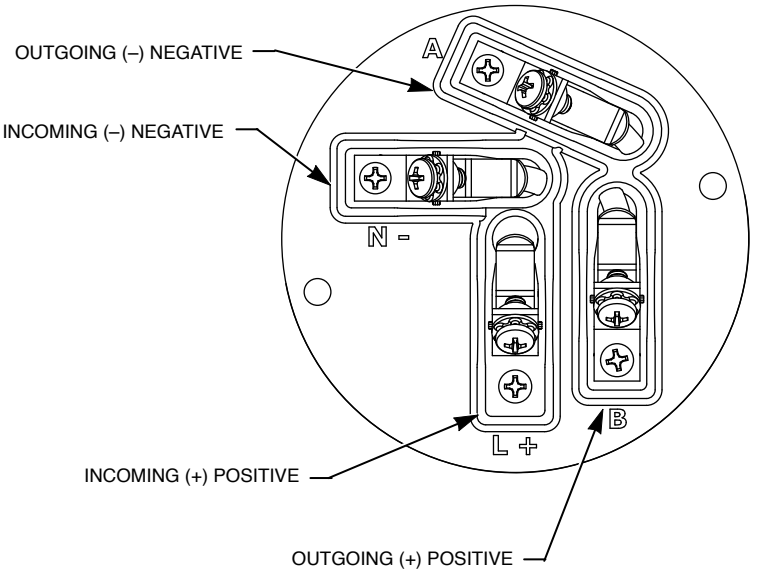
3



A. Not suitable for use with through branch circuit conductors.

B. Terminal block

4



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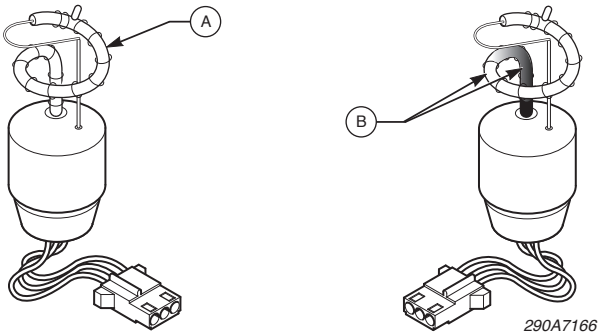
5



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English

A. New flash tube.

B. Used flash tubes tend to discolor in the areas shown, and should be replaced.

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FEDERAL SIGNAL
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Advancing security and well being

INSTALLATION INSTRUCTIONS FOR MODEL FHEX VIBRATONE® EXPLOSION-PROOF VIBRATORY HORN

SAFETY MESSAGE TO INSTALLERS

People's lives depend on your safe installation of our products. It is important to read, understand and follow all instructions shipped with this product.

Selection of mounting location for this device, its controls and routing of wiring should be made by the Facilities Engineer and the Safety Engineer. Listed below are some other important safety instructions and precautions you should follow:

- This unit must be installed by a qualified electrician in accordance with NFPA 72, and National and local Electrical and Fire Codes, under the direction of the authority having jurisdiction.
- Do not connect this unit to system wiring when circuits are energized.
- For optimum sound distribution do not install this device where objects would block any portion of front of speaker.
- All effective warning horns produce loud sounds which, in certain circumstances, may cause permanent hearing loss. Take appropriate precautions such as wearing hearing protection. Recommendations in OSHA Sound Level Standard (29 CFR 1910) should not be exceeded.
- After installation, ensure that all bolts and threaded joints are tightened.
- After installation and completion of initial system test, a program for periodic testing of this device must be established. Refer to NFPA 72, local Fire Codes and the authority having jurisdiction for this information.
- After installation and completion of initial system test provide a copy of this instruction sheet to all personnel responsible for operation, periodic testing and maintenance of this equipment.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you and others.

A. GENERAL.

The Vibratone Model FHEX is a hazardous location, intermittent duty, polarized, 24 Vdc, indoor/outdoor rated, high output, vibratory horn for use with fire alarm systems. This model is suitable for use in hazardous locations NEC Class I, Groups C, and D; Class II, Groups E, F and G and has factory-sealed leads.

B. SPECIFICATIONS.

Operating Voltage	24 Vdc
Current	1.2 A
Duty cycle	5 min. on—5 min. off
Weight (approx.)	9 lb (4.1 kg)
Size	7-5/8" (194 mm) H, 6-7/8" (175 mm) W, 6" (152 mm) D
Construction	Heavy corrosion resistant cast aluminum enclosure.
	Stainless steel diaphragm.
	Exterior painted with red enamel.
	Factory-sealed leads.

Approval Agency Listings:

Underwriters Laboratories Inc.

File E12629 (Guide UJPX) Listed as a HAZARDOUS LOCATION AUDIBLE SIGNAL FOR FIRE ALARM SERVICE.

California State Fire Marshal

Audibility:

94 dBA, UL omni-directional sound pressure rating.
116 dBA, Sound Power measurement.
100 dBA on axis at 10' in Anechoic chamber.

C. INSTALLATION.

1. Unpacking.

After unpacking the horn, examine it carefully for possible damage that may have occurred in transit. If equipment has been damaged, immediately file a claim with carrier stating extent of damage. Carefully check all shipping labels and tags for special instructions before removing or destroying them.

WARNING

Property damage, serious injury or death could occur if this product's explosion-proof housing is damaged. The horn mechanism contains no user serviceable parts. Therefore, DO NOT loosen or remove clamp ring, which holds mechanism into housing, or any of the six screws on the front of the horn grille. Loosening or removing any of these six screws may disturb factory adjustment of horn mechanism and cause the horn to malfunction. Attempting to remove the horn mechanism from the horn housing may damage the horn mechanism.

2. Mounting Arrangements (see Figure 1).

WARNING

Property damage, serious injury, or death could occur if an accumulation of water, snow, dust, etc. resides in the horn's grille, severely reducing or preventing operation of this device. Mount the unit so the grille is pointed horizontally or slightly downward.

This device can be mounted on any relatively flat surface. Conduit connection can be made to 3/4" threaded opening in in the housing attached to this device (see Figure 1).

WARNING

Property damage, serious injury, or death could occur if any objects are in front of the horn's grille, severely reducing optimum sound distribution. For maximum effectiveness, ensure that the front of the grille is clear of obstructions.

a. Select mounting location.

b. Using the horn as a template, scribe drill position marks on the mounting surface. See Figure 1 for mounting hole locations and dimensions.

CAUTION

Before drilling holes in any surface, be sure both sides of surface are clear of anything that could be damaged.

c. Drill holes at the previously scribed drill position marks to accommodate 3/8" diameter bolts.

d. Secure the horn to the mounting surface with 3/8" diameter hex head bolts, lockwashers, and hex nuts.

3. Electrical Connection.

DANGER

To avoid electrical shock, do not connect wires when circuits are energized.

National Electrical Code as well as local codes must be adhered to in the installation of this device. All electrical wiring must be routed through conduit and fittings approved for explosion-proof installations.

WARNING

Property damage, serious injury, or death could occur if independent conductors are terminated together; both wires of the same polarity must be used as two separate connections. NFPA 72 requires that the wires be terminated independently to provide electrical supervision of the connection.

a. See Figure 2. Connect the device's red (+) leads to the power source positive (+) lead. Connect the device's black (–) leads to the power source negative (–) lead.

D. TESTING/OPERATING.

WARNING

Under certain conditions these devices are capable of producing sounds loud enough to cause hearing damage. Adequate hearing protection should be worn if standing within close proximity to device while testing. Recommendations in the OSHA Sound Level Standard (29 CFR 1910) should not be exceeded.

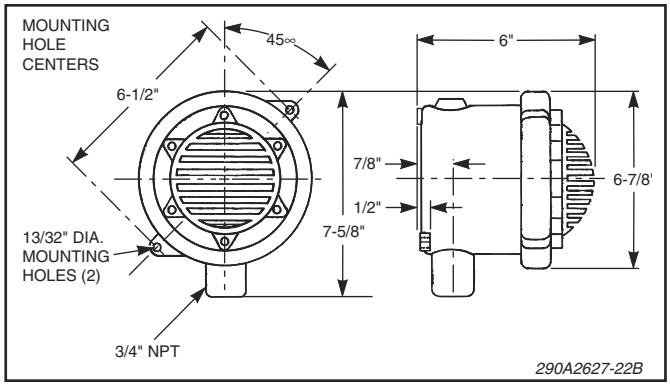

Figure 1. Model FHEX Mounting Dimensions.

1. After installation is complete, be sure to test the system to verify that each horn operates satisfactorily.

2. After completion of initial system test, establish a program for periodic testing of this device. Refer to NFPA 72G, local Fire Codes and the authority having jurisdiction for this information.

3. Provide a copy of these instructions for the Safety Engineer, system operator(s) and maintenance personnel.

SAFETY MESSAGE TO OPERATORS

Even if your warning system is operating properly, it may not be completely effective. People may not hear or heed your warning signal. You must recognize this fact and ensure that your warning signal achieves its intended effect through proper test/training sequences within your specific application(s).

E. MAINTENANCE.

SAFETY MESSAGE TO MAINTENANCE PERSONNEL

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others. People's lives depend on your safe maintenance of our products. Read and understand all warnings in paragraph C. INSTALLATION. In addition, listed below are some other safety messages and precautions you should follow:

- Read and understand all instructions before performing maintenance on this unit.
- Do not perform maintenance on this unit when circuits are energized.
- Periodic checks should be made to ensure that effectiveness of this device has not been reduced because speaker has become clogged with a foreign substance or because objects have been placed in front of the speaker.

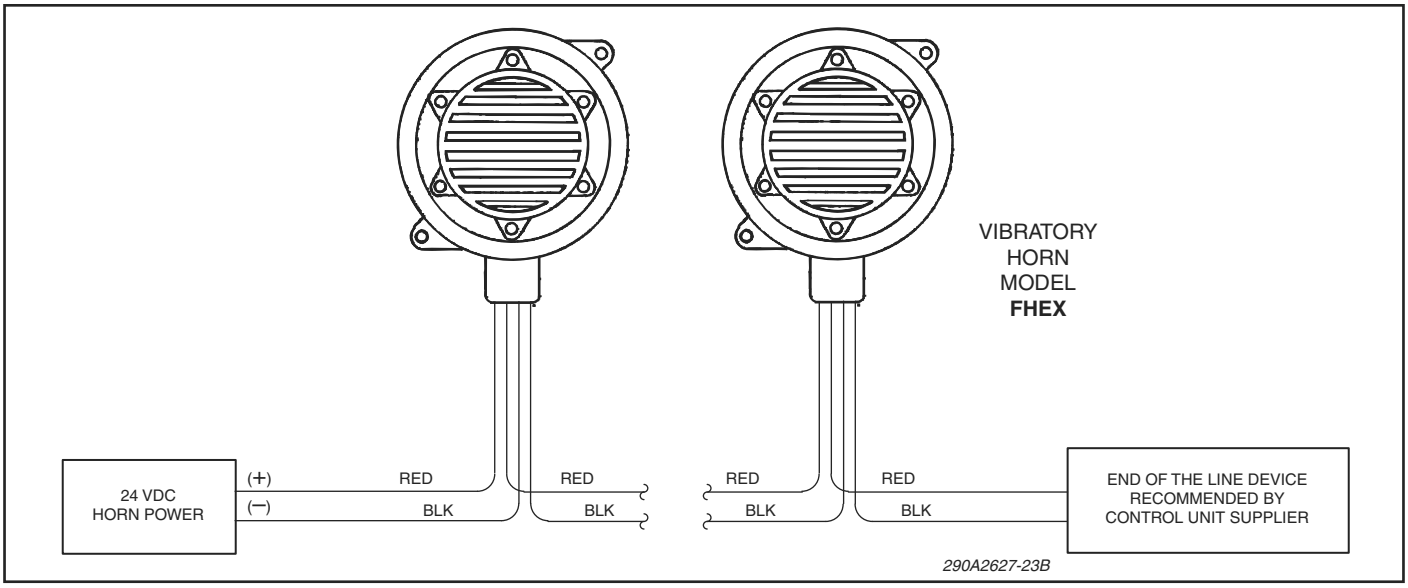

Figure 2. Typical Horn Installation Wiring.

- Any maintenance to this unit MUST be performed by a trained electrician in accordance with NEC guidelines and local codes.

- Never alter this unit in any manner. Safety in hazardous locations may be jeopardized if additional openings or alterations are made to this device.

- The nameplates, which contain cautionary or other information of importance to maintenance personnel, should not be obscured if exterior of device is painted.

1. Periodically check this device to verify that there are no foreign substances in, or in front of, the horn's grille which will reduce its effectiveness.

2. Testing should be periodically performed. Refer to NFPA 72G, local Fire Codes and the authority having jurisdiction for information.

WARNING

Unauthorized repair/servicing of the unit may result in degradation of performance and/or property damage, serious injury, or death to you or others. If a malfunctioning unit is encountered, do not attempt any field repair/retrofit of parts.

F. SERVICE.

The factory will service your equipment or provide technical assistance with any problem that cannot be handled locally with satisfaction or promptness.

If any unit is returned to factory for repair, it can be accepted only if we are notified by mail or phone in advance of its arrival. Such notice should clearly indicate service requested and give all pertinent information regarding nature of problem and, if possible, its cause.

Communications and shipments should be addressed to:

Federal Signal Corporation,
Electrical Systems Division
Service Department
2645 Federal Signal Drive
University Park, IL 60484-3167

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FEDERAL SIGNAL
Safety and Security Systems / Industrial

Advancing security and well being

Industrial Systems
2645 Federal Signal Drive • University Park, IL 60484-3167
Tel: 708-534-4756 • Fax: 708-534-4852
Email: elp@federalsignal.com • www.federalsignal-indust.com

DTX Box Installation Guide

Note: Please see local fire chief or district supervisor for box key.

IMPORTANT: Be sure to notify the fire department or other authority before initializing or servicing the box.

1.1 Mounting the DTX Transmitter Box Housing

IMPORTANT NOTICE - PLEASE READ CAREFULLY

The DTX Transmitter box must be installed in accordance with manufacturer's instruction to maintain the warranty. It is the responsibility of the installer to assure a weather-tight installation. All fittings and joints shall be sealed with an appropriate compound, which will maintain an effective seal over temperature extremes and time. Compression type fittings are not recommended.

***CAUTION**: Do not connect batteries or AC power until completing all steps in Sections 1.1-1.4 Step 4.*

1.1.1 Mounting the NEMA 1 Enclosure

Refer to Drawing **1000-0569-1, Illustration, NEMA 1 Box Enclosure**

If possible, try to locate the box on the side of the building closest to the antenna to minimize the cable run from the box to the antenna.

Below are step-by-step instructions for mounting the NEMA 1 enclosure.

1. Open the enclosure.

2. Loosen the captive screw on the right side of the label plate and undo the 6-32 screws on the left side of the label plate.

3. Disconnect the cables from the printed circuit board making note of which jacks they were plugged into.

4. Remove the label plate and the P.C. board assembly from the enclosure.

5. Remove four 10-32 screws from the corners of the backplate and pull the backplate from the enclosure.

6. Mount the enclosure to the wall using four ¼-inch bolts and the appropriate wall anchors.

1.1.2 Mounting the Cottage-Shape Enclosure

Refer to Drawings **1000-0144, Flush Mount Master Box Installation** and **1000-0172, Surface Mount Master Box Installation**

If possible, try to locate the box on the side of the building closest to the antenna to minimize the cable run from the box to the antenna.

Below are step-by-step instructions for mounting the cottage-shape enclosure.

1. Open the enclosure.

2. Loosen the captive screw on the right side of the label plate and undo the 6-32 screws on the left side of the label plate.

3. Disconnect the cables from the printed circuit board making note of which jacks they were plugged into.

4. Remove the label plate and the P.C. board assembly from the enclosure.

5. Remove four ¼-20 hex-socket head bolts from the corners of the backplate and pull the backplate from the enclosure.

6. Mount the enclosure to the wall using four 3/8-inch bolts and appropriate wall anchors. If the box is to be mounted on a pole, refer to Drawing **1000-0568, Typical Master Box Installation**.

1.2 Antenna & Cable Installation

Refer to Drawing **1000-0173-1, Surface Mounted Antenna Installation**

The standard antenna mounting consists of a short support tube and wall brackets that stand the antenna off the wall to ensure proper radiation characteristics. The antenna should be mounted on the side of the building facing the receive site. The immediate surroundings of the antenna should be free of obstructions such as trees and other buildings that tend to attenuate the radio signal. In certain installations, the support tube may be extended to allow proper clearance over such obstructions. Avoid mounting the antenna near any large metal objects that would distort the propagation pattern of the radio signal or affect the VSWR of the antenna

The antenna cable should be installed in conduit with all joints completely sealed to prevent water entry. The connection from the antenna to the point of entry to the box should be made using RG-

213 cable or equivalent with 50 ohm characteristic impedance. Inside the box, a short section of RG-58 “pigtail” adapter is supplied with the proper connectors to make the final connection to the transmitter. Please refer to Drawing **1000-0173-1** for typical surface mounted antenna installation, and Drawing **1000-0568** for typical pole mounted antenna installation.

Below are step-by-step instructions for installing the antenna, antenna cable and conduit:

1. Determine the mount location for the antenna that will offer the best radio path to the receiving console and minimize the antenna cable length (under 75 ft. is preferred).

2. Mount the two antenna supports (p/n 190-0392) as shown in Drawing **1000-0173**. The antenna supports come complete with hardware necessary for most installations. The top support should be at least 13 ft. from ground level.

3. Secure the antenna mounting tube (p/n 890-1484) in place as shown in the drawing.

4. Insulate the exterior union of the antenna cable to the antenna using the insulation tape provided in the installation kit. Wrap the joint in a clockwise manner tightly and completely, keeping the striped side of the tape to the outside.

1.3 External Wiring

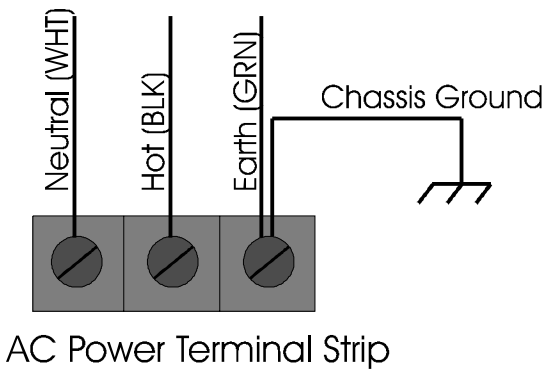
Before power up, the DTX Transmitter box requires connections to the following: The AC power service, the zone input circuits and/or fire alarm control panel, the antenna, and fiber optic cable if applicable. Separate conduit must be used for the AC cable, the zone input cable, and the antenna cable.

See Section **1.2 Antenna & Cable Installation** for details about the antenna installation and connections.

1.3.1 AC Power

The AC power service to the DTX Transmitter box connects to the 3-position terminal block on the top right side of the backplate. The AC power input must be supplied in its own conduit from a 120VAC source with a protective earth ground (green) conductor. If possible, the DTX Transmitter box and the interior fire alarm control panel (if used) should share the same AC power circuit.

The AC power input is protected by a 3/8 Amp slow blow fuse in the power supply assembly (490-0180). The AC fuse is labeled “F2 AC Fuse” on the front of the power supply bracket and it mounts inside a twist-on type of fuse holder. Pulling out the AC fuse holder will disconnect AC power from the system and generate an AC fault transmission. When powering up the system, the AC fuse must be installed before the battery fuse.



1.3.2 Zone Input Circuits

IMPORTANT

The zone input conductors **must not carry any induced AC voltages**. AC voltages / currents on the zone input wires may cause unpredictable effects. Connect to **DRY CONTACT** devices only.

1. It is recommended to run wiring conductors and AC current carrying conductors in separate conduits.

2. For loop conductors longer than 100 feet, it is recommended to use twisted pair shielded cable. The cable should be grounded to the box's frame which is located at the metal backplate.

The Zone Input Circuits (initiating device circuits) to the DTX Transmitter box connect to connectors J1, J3, J5, and J6 on the Zone Input PCB assembly. These terminal blocks can be unplugged from the printed circuit board for wiring purposes. The end of line resistors provided should be removed from the terminal block and installed at the last initiating device in each loop. Once the loop wires are secured to each terminal block, it can be plugged into the corresponding connector. To disconnect a zone input circuit from the system and place it in a fault condition, simply unplug the corresponding terminal block. 18 AWG solid conductor size is adequate for wiring the zone input circuits. However, zone circuit wiring must meet local codes and requirements for low voltage/low current circuits. The zone input terminal blocks can accept up to a size 14 AWG conductor.

Zone input loop wiring is considered low voltage wiring (6vdc max) and it must not be run in the same conduit as AC power circuits. To avoid interference and false alarms keep zone input wiring away from AC power wiring and from any other circuits that carry digital switching currents such as addressable loops, serial communications circuits, and other sources of electromagnetic interference.

Each initiating device circuit can support an unlimited number of devices. The devices installed must have normally open contacts that close for alarm conditions. The maximum wire length of a zone input circuit is dependent on the wire gauge used for the installation. For 18 AWG wire,

zone input circuits of up to ½ mile can be supported, provided that the wiring is properly shielded from noise and interference (consult the factory for applications requiring zone input circuit wiring ½ mile or longer). It is recommended to use twisted pair, overall shielded cable, for installations that have long runs of wiring for the zone input circuits. Adequate lightning protection must be provided for wiring that runs outside in areas that are susceptible to lightning. Lightning protection devices must be installed at the point where the wiring enters the building and not at the DTX Transmitter box. After the wiring is completed, record identifying information regarding each zone or device monitored on the door label provided.

1.3.3 Control Panel

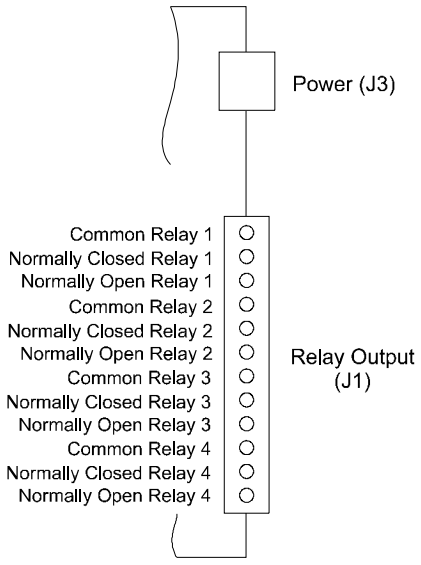
*Note: Do not connect the control panel to the DTX Transmitter until the box parameters have been programmed (see Section **2.0 Programming Software**).*

The control panel connects to the DTX Transmitter through the serial port located on the DTX Main PCB. The serial port's communication parameters and interface (RS-232 or RS-485) are factory programmed. The control panel connects to the serial port via a 9 pin male D connector. The required lines for cables for individual panels are detailed in **Section 3.0**. JP1 should be removed to enable the DTX Transmitter's control panel protocol. *Note: Leave the jumper connected to one pin of JP1 to prevent losing it. This jumper is necessary when box programming is required.* See **Section 4.0** for the serial port and jumper locations.

The DTX Transmitter's intrusion switch overrides the JP1 jumper causing the serial port to revert to the control panel protocol when the DTX Transmitter's door is closed.

1.3.4 Relay Outputs

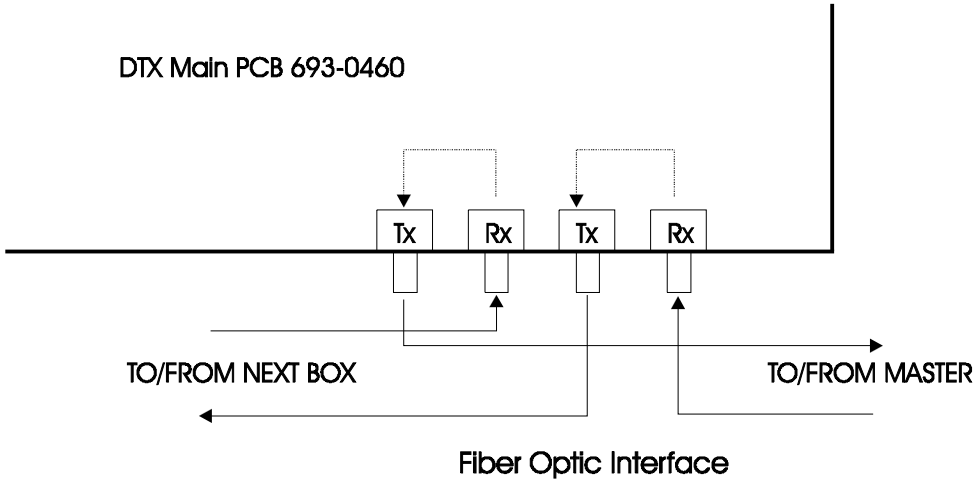
Terminal block J1 provides connections to the Auxiliary Relay contacts. The Auxiliary Relays have a form C contact arrangement where the normally closed, normally open, and the common contacts of each relay are available on terminal block J1. Please refer to the relay connection diagram below for a detailed pinout of terminal block J1. Also refer to the specifications section at the end of this document for the contact ratings of the relays.



Relay Connections

1.3.5 Fiber Optic Interface

The fiber optic interface is integrated on the main printed circuit board and consists of two transmitters and two receivers with integrated ST type connectors to provide two-way fiber optic communications. The system is designed to interface with standard 62.5/125 micron, multi-mode fiber (2 fibers), using 850nm LED sources. In order to maximize the distance between boxes, care should be taken to minimize the attenuation due to connector terminations and splicing in the fiber.



Fiber Optic Interface

1.4 Reassembly & Start Up

Below are step-by-step instructions for reassembling and starting up the DTX Transmitter box.

1. Turn off the circuit breaker supplying AC power to the box.

2. Install the backplate into the enclosure with four 10-32 screws.

3. Connect the zone input circuits to the Zone Input Circuit PCB as described in Section **1.3.2 Zone Input Circuits**.

4. Remove AC terminal strip plastic cover. Attach the AC power wires to the AC terminal block as described in Section **1.3.1 AC Power**. Be sure to replace the plastic cover over the terminal.

5. Attach the antenna cable coax connector to the radio transmitter.

6. Remount the label plate assembly to its brackets using the 6-32 screws. Reconnect the cables to the P.C. board.

7. Remove the 1.0 amp DC battery fuse (F1). Leave the AC fuse F2 in place.

8. You **MUST** notify the fire department before applying power to the box. Turn on the circuit breaker supplying AC power to the box.

9. When AC power is applied to the box, the green AC Power LED indicator will light and the beeper will sound on and off once per second. No other function will be performed until the box is properly configured .

10. Connect the DTX Programmer laptop to the serial port and proceed with programming the box as described in Section **2.0 Programming the DTX Transmitter**.

11. If necessary, connect the control panel to the DTX Transmitter's serial port as described in Section **1.3.3 Control Panel**.

12. After the configuration is complete and the box is reset, the DTX Transmitter box will detect a low battery condition, turn on the Common Fault LED and sound the steady tone indicator.

13. Connect the red and black battery power wires to the positive and negative terminals of the battery respectively. Verify that the battery is properly seated in the enclosure.

14. Install the battery fuse (F1). The low battery fault condition should clear within 10 seconds.

15. Remove the AC fuse (F2), the green AC Power LED will go off. The DTX Transmitter box will transmit an AC fault signal immediately if it is programmed to do so.

16. Replace the AC fuse and verify that all fault conditions clear.

2.0 Programming the DTX Transmitter

The DTX Transmitter can be programmed at any time. All box operations are maintained during the programming except control panel communications.

The DTX Transmitter utilizes its serial port for communicating with a control panel and the DTX Programmer. Therefore, it must be configured via JP1 to identify the connected device. Remove JP1 to allow the DTX Transmitter to communicate with a control panel. Install JP1 to allow the DTX Transmitter to communicate with the DTX Programmer. *Note: closing the DTX Transmitter's door overrides the JP1 jumper setting and the serial port reverts to a control panel port.*

The PC COM port used for the communication must be configured with the same communication parameters used by the control panel attached to the DTX Transmitter (See **Section 3.0**).

2.1 Connecting the DTX Programmer

Steps for connecting the DTX Programmer PC to the DTX Transmitter.

1. Open the DTX Transmitter door
2. Install jumper JP1
3. Disconnect control panel (if any) from the DTX Transmitter's serial port. *Note: the control panel will go into trouble while it is disconnected from the DTX.*
4. Connect the PC cable to the serial port. Consult section **3.0 Serial Port Communications** for the appropriate cable connections for your DTX Transmitter.

2.2 Setting Box Parameters

The following are the basic steps involved in configuring a DTX Transmitter with the DTX Programmer. See the DTX Programmer help file for more detailed instructions on programming the DTX Transmitter.

1. Start the DTX Programmer software.
2. Select and configure a COM port. Consult section **3.0 Serial Port Communications** for the appropriate port settings for your DTX Transmitter.
3. If you have DTX Programmer 1.3 or later click the **Connect** button to initiate communication with the DTX Transmitter. Otherwise, proceed to step 4.
4. Click the **Get Settings** button to get the current settings for the connected box.
5. Click the Settings tab to determine what parameters must be set. *Any parameters displayed in red must be set for the DTX Transmitter to operate.*
6. Optionally, load the settings from a previously saved file or template.
7. Set/change the desired parameters.
8. Save the new box settings to disk.
9. If the DTX Transmitter is being programmed for the first time or is being reprogrammed as the result of an error with the programmed settings, it must be reset after the programming is complete.

2.3 Disconnecting the DTX Programmer

Steps for disconnecting the DTX Programmer PC from the DTX Transmitter.

1. Disconnect the PC cable from the serial port.
2. Reconnect the control panel (if any) to the DTX Transmitter's serial port.
3. Remove jumper JP1
4. Close the DTX Transmitter door.

3.0 Serial Port Communications

Cables

The DTX Transmitter's serial port communicates using three or four wires for RS-232 connections and 2-wire (18 AWG minimum), half-duplex for the RS-485 connection. The following table details the required cable pin connections for the supported interfaces.

Control Panel		**DTX Serial Port Pin**			
		2 (RX)	**3 (TX)**	**5 (GND)**	**7 (RTS)**
IQ-140 Port 3		3	2	-	-
HSC 3030 Port 3		3	2	-	-
Cerberus MXL IQ TB3 or TB 4 (RS-485)		XMIT +	XMIT -	-	-
EST2 RS-232 Terminal Block		TXD	RXD	COM	-
Simplex Port B		Tx	Rx	GND	CTS
Simplex 4010 P6 Port B, CRT/Keyboard		1 (TXD)	2 (RXD)	3 (RTN)	5 (CTS)
Notifier RS-485		Tx +	Tx -	-	-
Notifier NFS-640 Printer Terminal Block		Tx	Rx	REF	
Notifier 3030 TB5		2	1	3	5
DVS/DVS+ J2		4	6	1	-
FCI 7100		Use FCI cable RJ11-DB9PC			
DTX Programmer	RS-232	3	2	5	-
	RS-485	XMIT +	XMIT -	-	-

Device	**DTX Secondary Serial Port U17**		
	3 (RX)	**2 (TX)**	**1 (GND)**
DVS+ J2	4 (T)	6 (R)	1 (G)

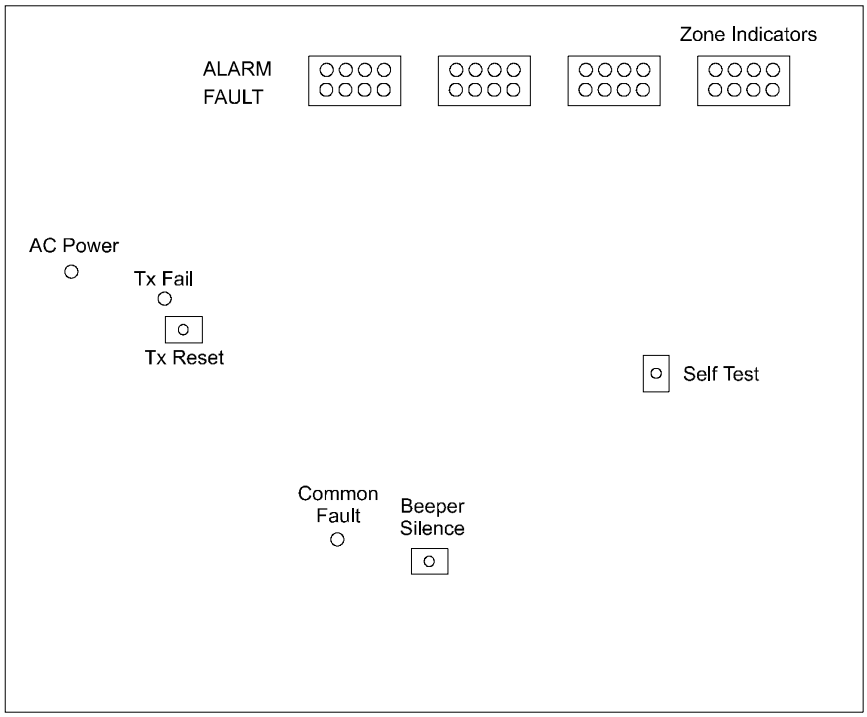
Communication Parameters

The DTX Transmitter's serial port comes preset with the following serial communication parameters based on the factory programmed control panel interface.

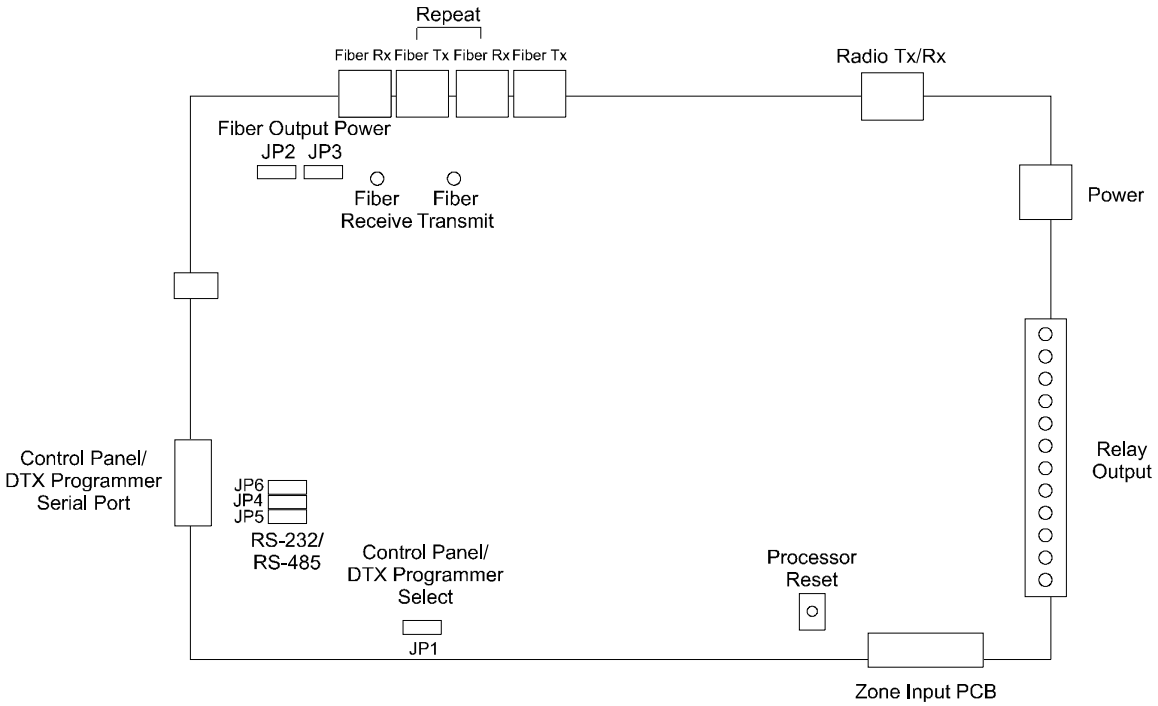
Control Panel	Interface	Baud Rate	Data Bits	Stop Bits	Parity
IQ-140	RS-232	9600	8	1	Even
HSC 3030	RS-232	9600	8	1	Even
Cerberus/Siemens MXL-IQ	RS-485	1200	7	1	Even
EST 2	RS-232	9600	8	1	Even
Simplex with 4100 Computer Port Protocol	RS-232	9600	8	1	Even
Simplex 4010	RS-232	9600	8	1	Even
Notifier w/ SigCom Protocol	RS-485	9600	8	1	None
Notifier AFP-200 or NFS-640	RS-232	2400	8	1	None
Notifier 3030	RS-232	2400	8	1	None
FCI 7100	RS-232	9600	8	1	None
No control panel	RS-232	9600	8	1	None

4.0 DTX Front Panel LEDs, Buttons and Connectors

Front



Back



Drawings

Drawing 1000-0569-1, Illustration, DTX, Enclosure, NEMA 1

Drawing 1000-0144, Flush Mount Master Box Installation

Drawing 1000-0172, Surface Mount Master Box Installation

Drawing 1000-0568, Typical Master Box Installation

Drawing 1000-0173-1, Surface Mounted Antenna Installation

Drawing 1000-0727, Installation, DTX Box, NEMA 1/Cast Enclosure

Drawing 1000-0550-1, DTX Zone Installation

Installation Kit Parts Breakdown, SigCom Assembly #DTX-IK-01

	Quantity	
1. Pn# 190-0713 Antenna Fiberglass 72-75 MHz	1	
2. Pn# 290-0039 Connector Coaxial Plug (PL-259)	2	
3. Pn# 290-0049 Connector Coaxial Adapter (PL-258)	1	
4. Pn# 190-0392 Antenna Mounting Bracket	1	
5. Pn# 590-0055 Antenna Interface Cable	1	
6. Pn# 195-0082 Silicone Insulating Tape	8”	
7. Pn# 890-1484 Antenna Adapter Tube 24”	1	
8. Pn# 291-1195 End of Line Resistor 1W 20K	16	(Note: if 16 zone box)
9. Pn# A10074 End of Line Resistor 1W 10K	4	(Note: if 4 zone box)

Installation Kit Parts Breakdown, SigCom Assembly #DTX-I K-11

	Quantity	
1. Pn# 190-0730 Antenna Fiberglass 120-150 MHz	1	
2. Pn# 290-0039 Connector Coaxial Plug (PL-259)	2	
3. Pn# 290-0049 Connector Coaxial Adapter (PL-258)	1	
4. Pn# 190-0392 Antenna Mounting Bracket	1	
5. Pn# 590-0055 Antenna Interface Cable	1	
6. Pn# 195-0082 Silicone Insulating Tape	8”	
7. Pn# 890-1484 Antenna Adapter Tube 24”	1	
8. Pn# 291-1195 End of Line Resistor 1W 20K	16	(Note: if 16 zone box)
9. Pn# A10074 End of Line Resistor 1W 10K	4	(Note: if 4 zone box)
10. Pn# 190-0718 Hose Clamp	1	

Additional Items for Pole Mount Installations

	Quantity
1. Pn# 890-1123R Pole Clamp	2
2. Pn# 390-0068 Antenna Adapter	1
3. Pn# 290-0016 Ground Strap	1
4. Pn# 191-0056 8-32 3/8 Binder Head Screw	1
5. Pn# 193-0000 #8 Washer	1
6. Pn# 191-0075 3/8-16 1” Hex Head Bolt	4
7. Pn# 190-0119 Sealing Washer	4
8. Pn# 191-0112 ¼-20.3/4 Hex Nut	3
9. Pn# 193-0021 ¼ Lockwasher	3
10. Pn# 590-0148 Antenna Cable	1

All DTX Assemblies will automatically include the following

	Quantity
1. Pn# BATT12V6.5AH Battery	1

UHF Cable Assembly Instructions

PL-259 Connector

PROCEDURE

1) Evenly cut the cable end.

2) Strip the jacket, braid, and dielectric to the dimensions shown in Diagram A. All cuts should be sharp and square. Do not nick the braid, dielectric, or center conductor. After cutting through the dielectric, the braid should be pulled back, not cut. (note 4)

3) Tin the entire length of the exposed center conductor. (note 5)

4) Lightly tin several places around the braid. The braid should have a complete circle of solder while the amount of solder drawn under the insulating jacket is minimized. The connector may not work properly if the conductor and braid are not adequately tinned. (note 5)

5) Slide the coupling ring on the cable. (note 3)

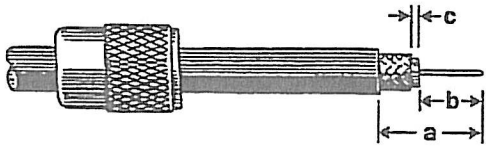
6) Screw the plug sub-assembly onto the cable. See Diagram B.

7) Solder the plug to the braid through the 4 solder holes, making a good bond between the braid and shell. The solder should dimple into the holes.

8) Solder the center conductor to the contact. Do not use excessive heat.

9) For final assembly move the coupling ring for ward and screw into place on the plug sub-assembly. See Diagram C.

Diagram A



	Description	Length
a	Insulation jacket to end	1 ¼ inches
b	Center conductor exposed	⅝ inches
c	Dielectric exposed	1/16 inches

Diagram B

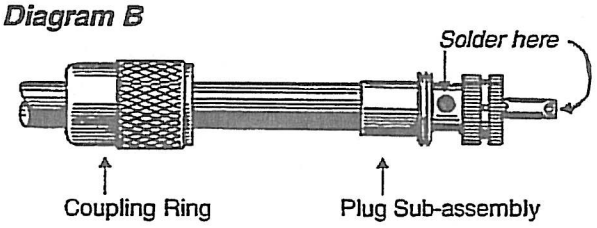
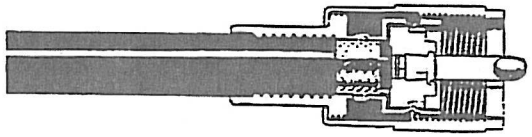


Diagram C



NOTES

1) Use at least a 140 Watt soldering iron.

2) PL-259 Connector is to be used with RG-213 or RG8U cable.

3) A cable cannot be used if the coupling ring is left off. The coupling ring is used to attach the cable to a jack and provides a path for the circuit ground.

4) If many cables need to be assembled a coax cable stripper may be beneficial. The tool may be purchased from SigCom or other suppliers.

5) Tinning is the process of preparing a material before two pieces are soldered together. The material is heated to the melting point of the solder. The solder is placed in contact with the material, not the soldering iron. When the material reaches the appropriate temperature, the solder melts and spreads, creating a solid bond between the solder and material. Failure to properly tin a material results in a cold solder joint which is physically weak and results in a poor electrical connection.

Antenna Installation Precautions

1) Determine the appropriate mounting location for the antenna that offers the best radio path to the receiving console and minimizes the cable length. (A cable length less than 75 feet is desired.)

2) Avoid mounting the antenna where the building is in the transmit path.

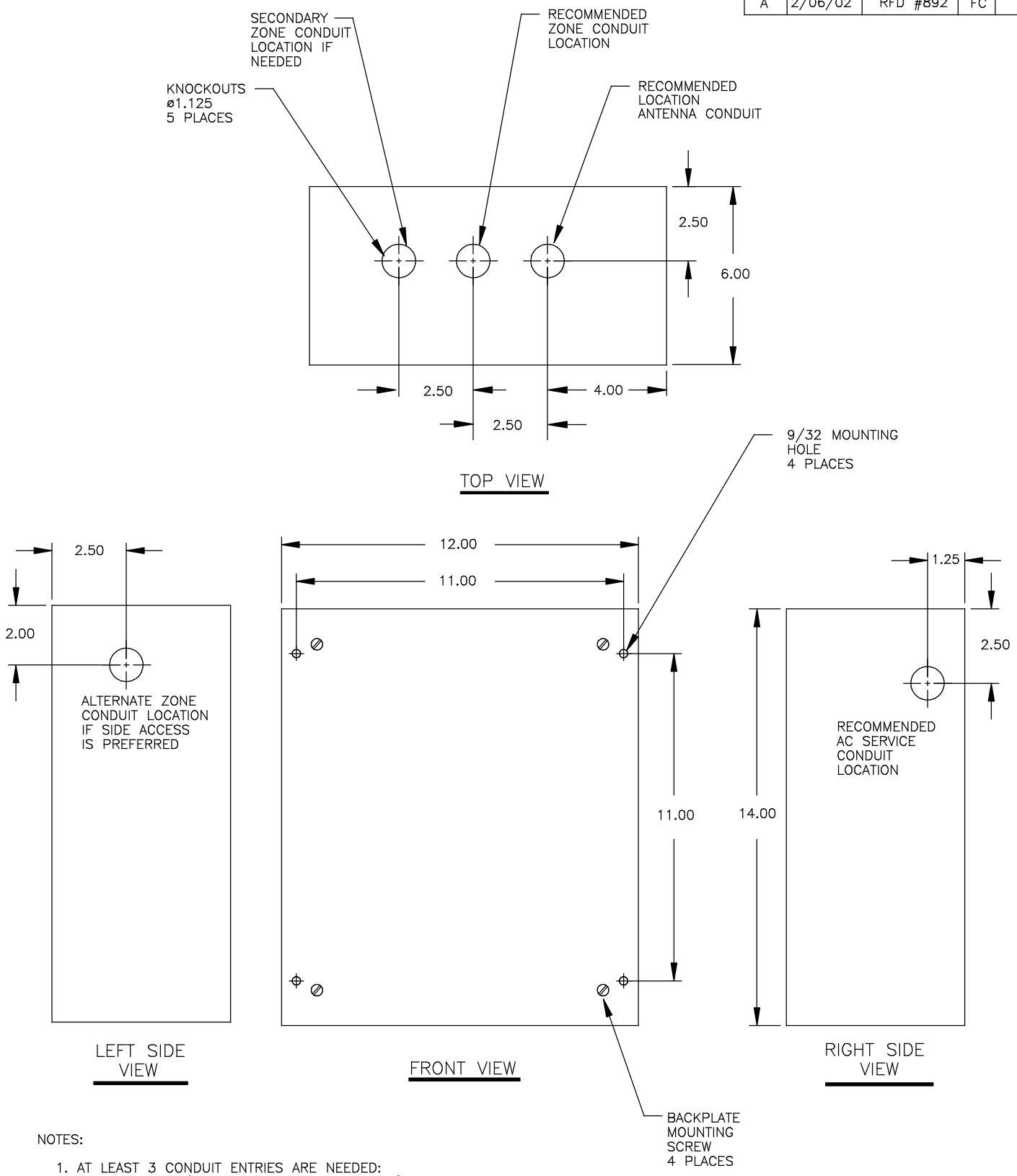
3) Avoid mounting the antenna where the fiberglass portion of the antenna is next to a metal surface, such as drain pipes, gutters, flushing, aluminum siding, etc.

4) Be sure all outdoor conduit connections are water tight. All LB bottoms, or any point where water may gather need to have drain holes.

5) Installation of the PL-259 connectors are a critical part of the antenna system. Great care should be taken to ensure proper preparation of the cable and soldering of the connector.

6) Be sure to test the forward and reflected power of the antenna system. Make sure a good signal is received at the console.

REV	DATE	DESCRIPTION	DR.	APPRVL
A	2/06/02	RFD #892	FC	



NOTES:

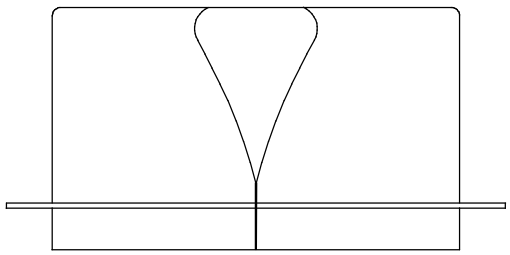
1. AT LEAST 3 CONDUIT ENTRIES ARE NEEDED:
   - AC SERVICE (120V HOT, NEUTRAL, GROUND)
   - ANTENNA COAX
   - ZONE WIRES

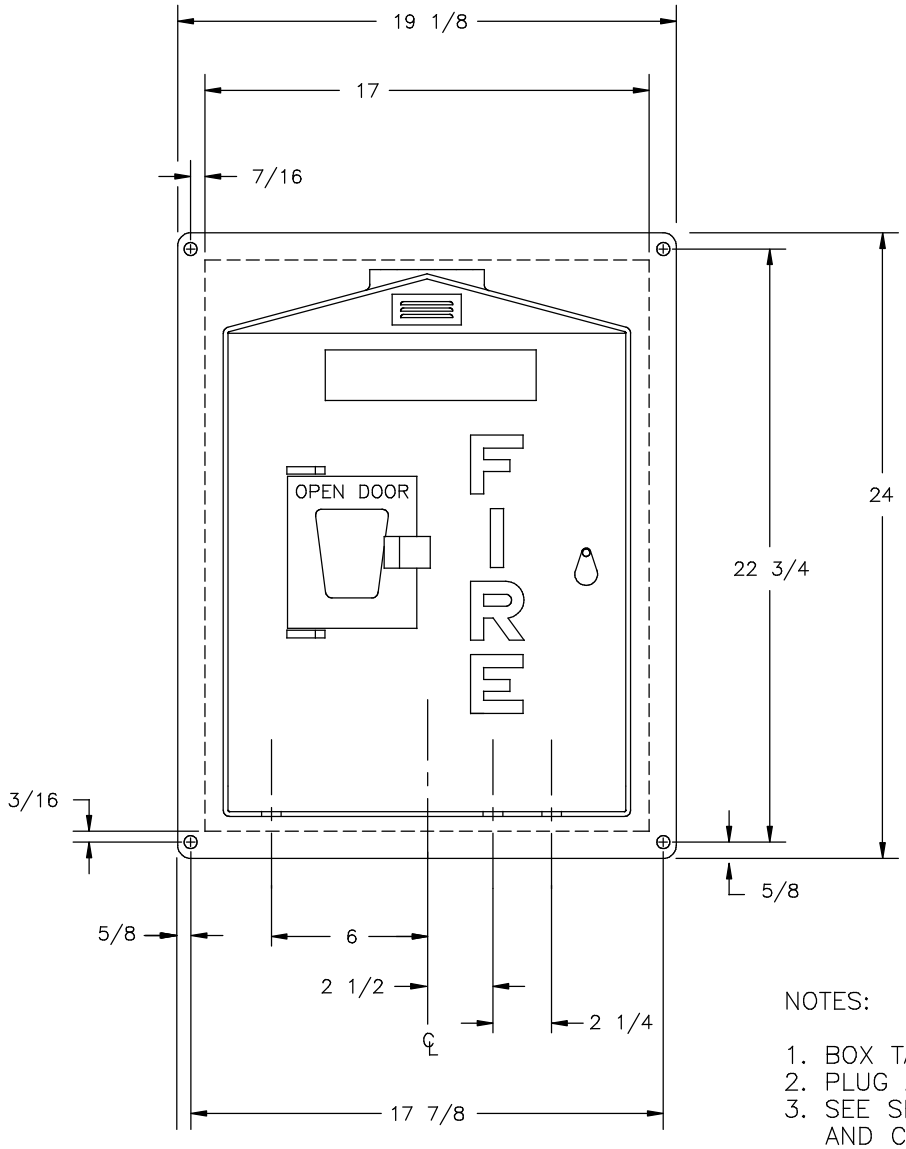
   MORE THAN ONE CONDUIT MAY BE USED FOR ZONE WIRES IF NEEDED, OR PREFERRED, DEPENDING ON INSTALLATION SITE AND ZONE ROUTINGS.
2. HINGES AND DOOR NOT SHOWN.
3. REFER TO DWG. 1000–0727 FOR BACKPLATE INSTALLATION.
4. REFER TO SIGCOM MANUALS FOR MORE INSTALLATION INFORMATION.

DRAWN FC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE ILLUSTRATION, DTx, ENCLOSURE, NEMA 1	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 2/07/02
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000–0569–1; CAD FILE NO. 1000\0569–11A	SHEET 1 OF 1; REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	ECN #1955	BJC	
B	12-1-98	ECN 2313	FC	

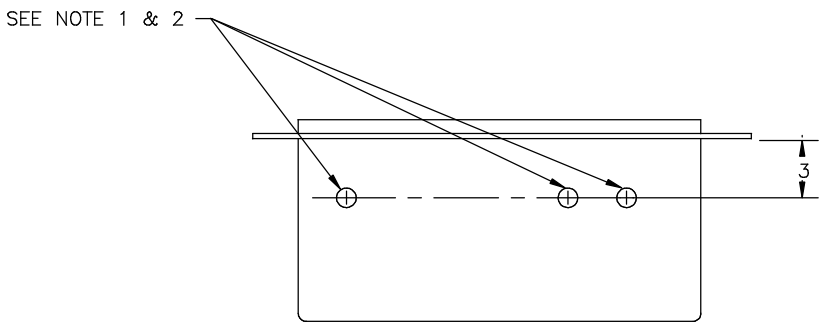
TOP VIEW





NOTES:

1. BOX TAPPED 3/4 NPT, 3 PLACES.
2. PLUG ANY UNUSED HOLES.
3. SEE SHEET 2 FOR WOOD FRAME AND CONCRETE INSTALLATION AND ELEVATION SPECIFICATIONS.
4. THIS VIEW USED FOR ALL FLUSH MOUNTED INSTALLATIONS.

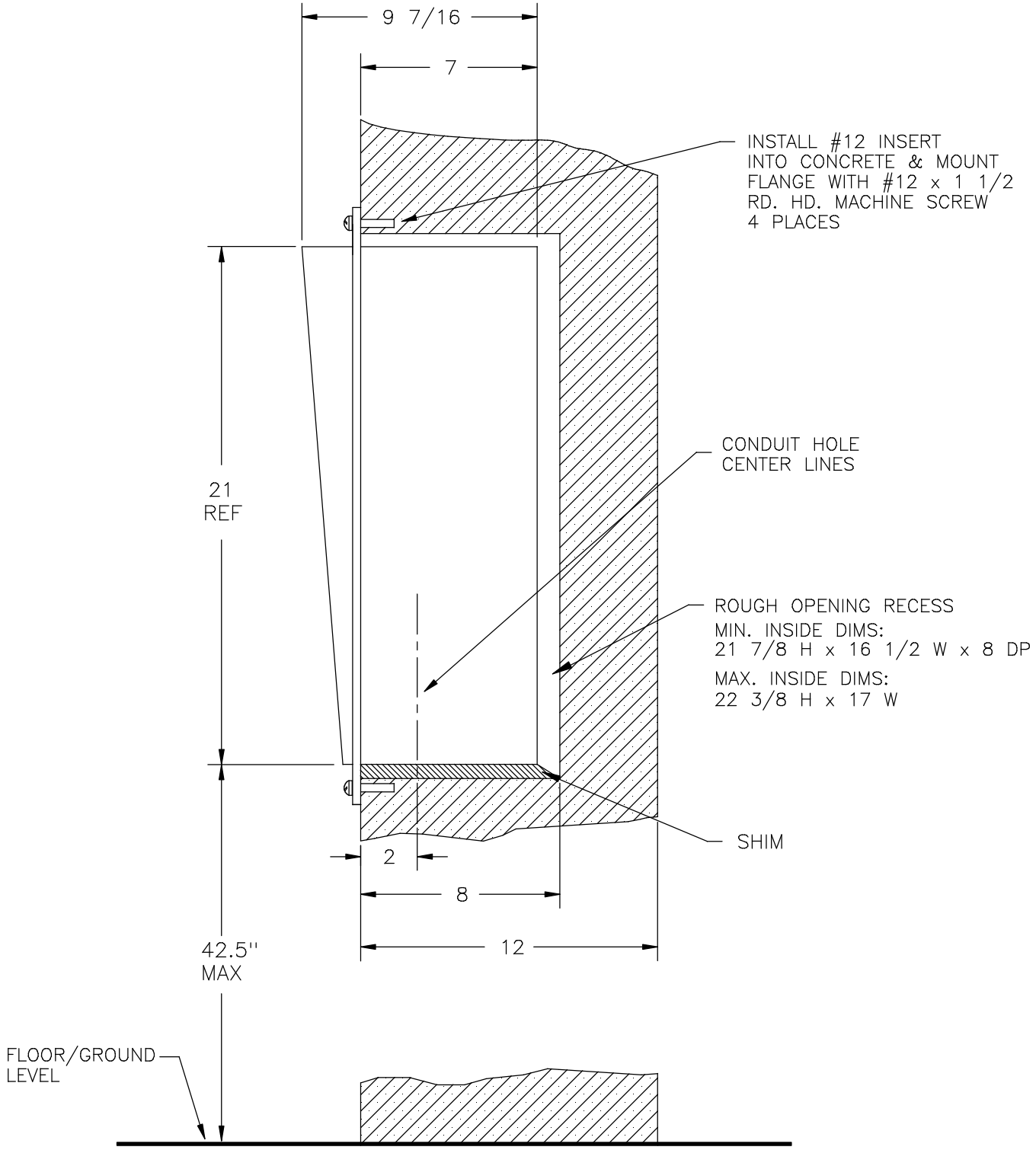


BOTTOM VIEW

DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE FLUSH MOUNTED INSTALLATION MASTER BOX PERMANENT MOLD	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 8/28/92
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000-0144; CAD FILE NO. 1000\0144-01B	SHEET 1 OF 3; REV B

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	ECN #1955	BJC	
B	12-1-98	ECN 2313	FC	

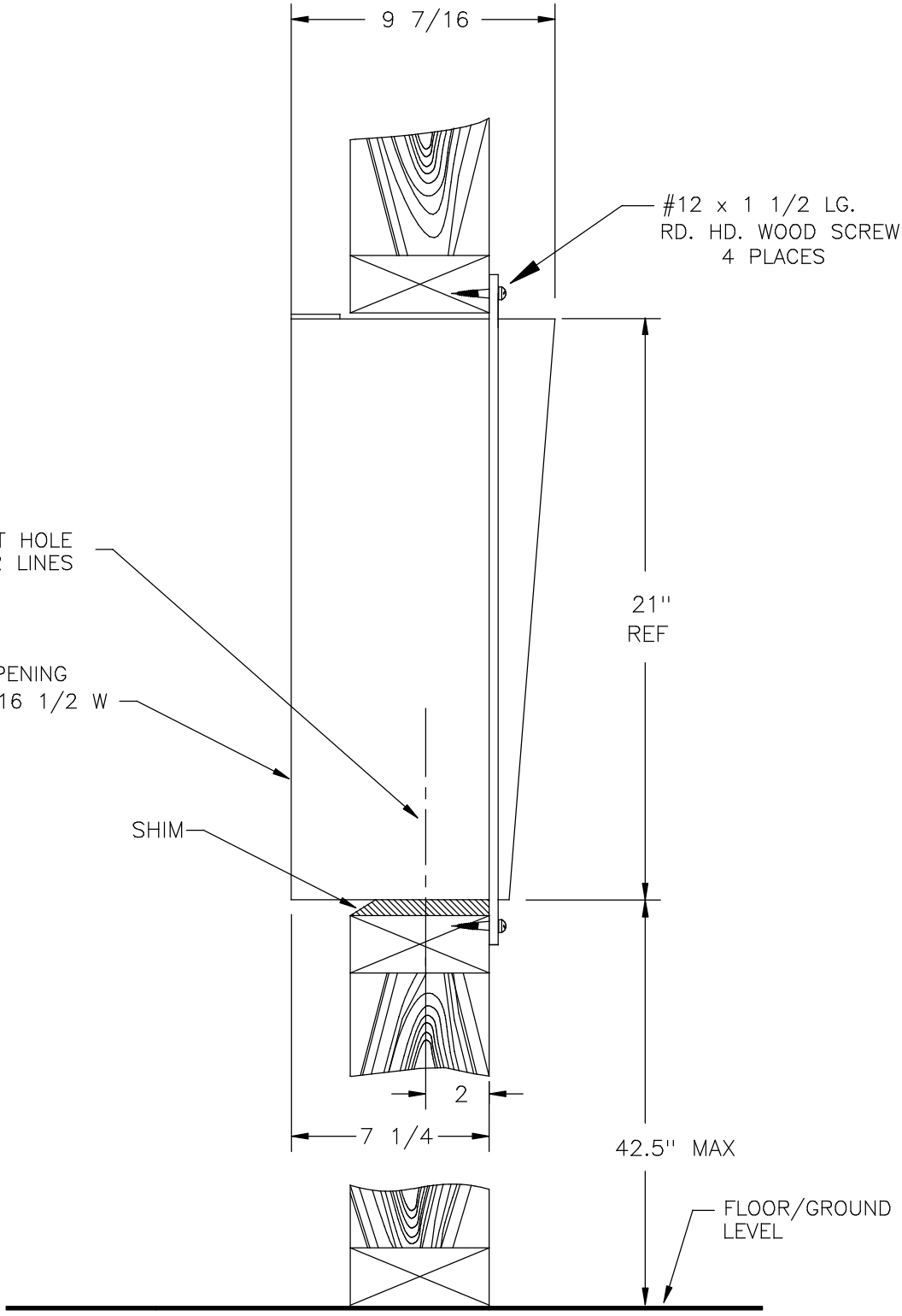
CEMENT BLOCK WALL



DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE FLUSH MOUNTED INSTALLATION MASTER BOX PERMANENT MOLD	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 8/28/92
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000-0144; CAD FILE NO. 1000\0144-02B	SHEET 2 OF 3; REV B

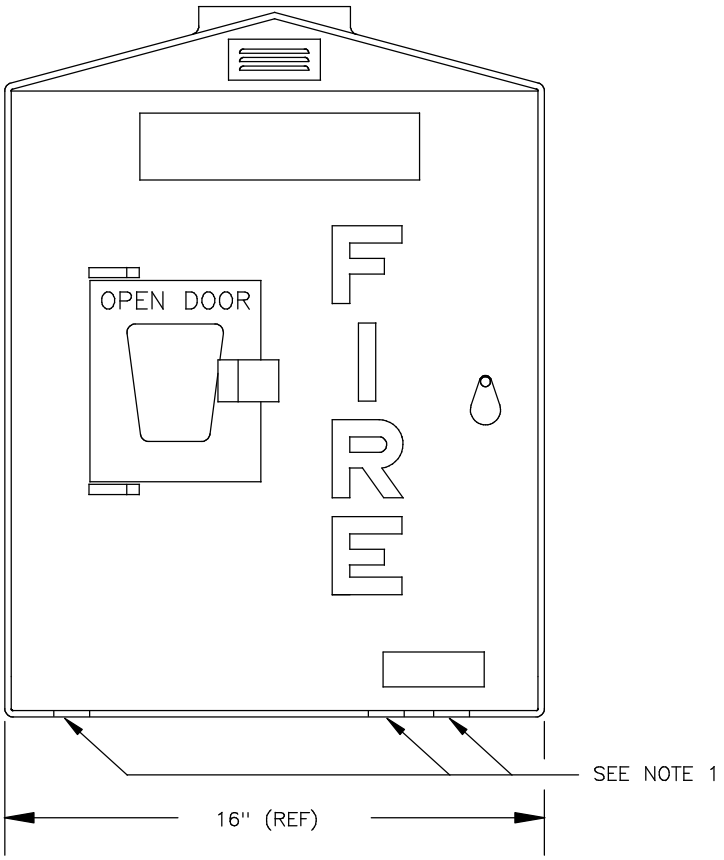
REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	ECN #1955	BJC	
B	12-1-98	ECN 2313	FC	

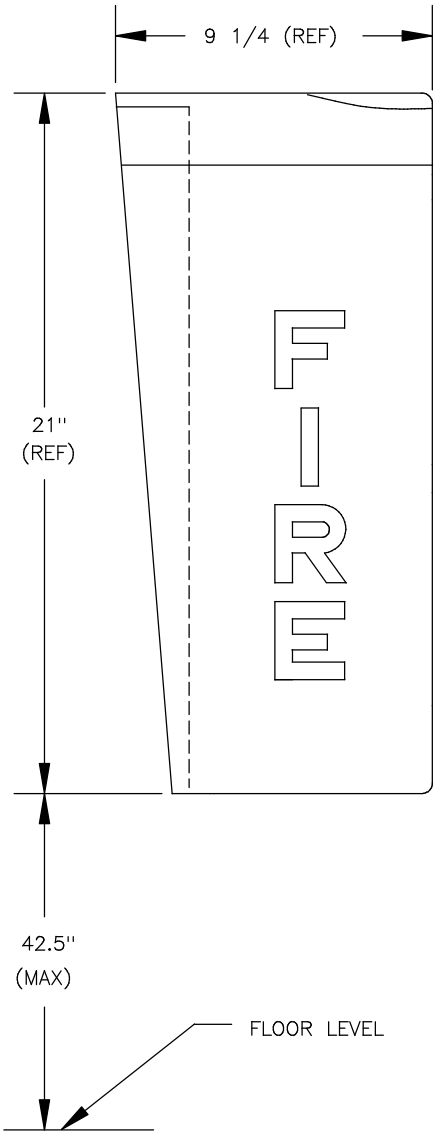
WOOD FRAME WALL



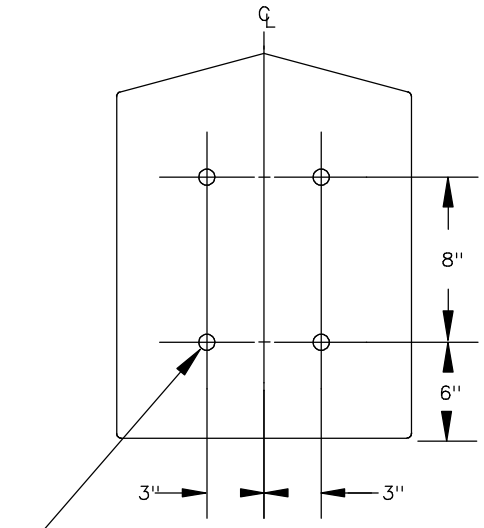
DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE FLUSH MOUNTED INSTALLATION MASTER BOX PERMANENT MOLD	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/1/92
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000-0144; CAD FILE NO. 1000\0144-03B	SHEET 3 OF 3; REV B

REV	DATE	DESCRIPTION	DR.	APPRVL
A	7/27/92	ECN #1944	BJC	
B	10/13/94	ECN #2078	FC	
C	12-1-98	ECN 2313	FC	





MOUNTING PATTERN



Ø7/16 4 HOLES
USE 5/16" x 1 1/2" L
BOLTS OF TYPE COMPATIBLE
WITH WALL CONSTRUCTION

NOTES:

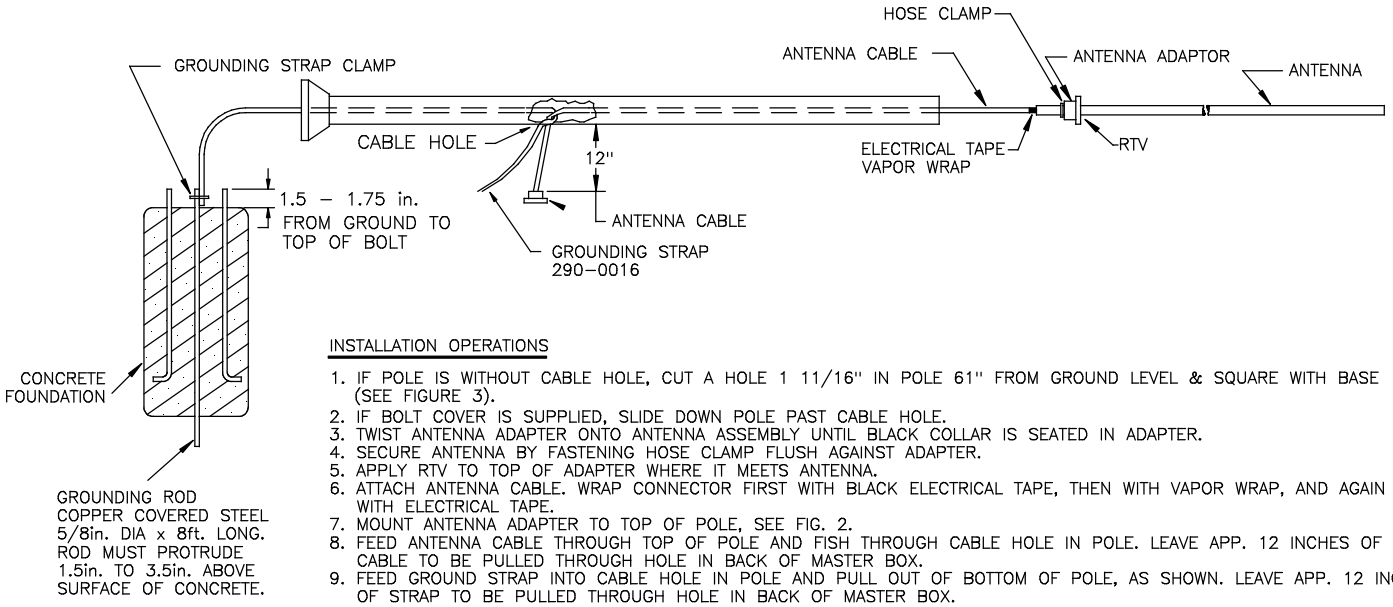
1. ALL CONDUIT ENTRY HOLES 3/4-14. THREADED PIPE ONLY. SEAL WITH TEFLON TAPE.
   3 IN BOTTOM.

DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NTS		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE SURFACE MOUNTED INSTALLATION MASTERBOX	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 8/6/92
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000-0172 / CAD FILE NO. 1000\0172-01C	SHEET 1 OF 1 / REV C

REV	DATE	DESCRIPTION	DR.	APPRVL
A	6/25/92	RFD #338	BJC	

FIG.1

ANTENNA ASSEMBLY & POLE PREPARATION

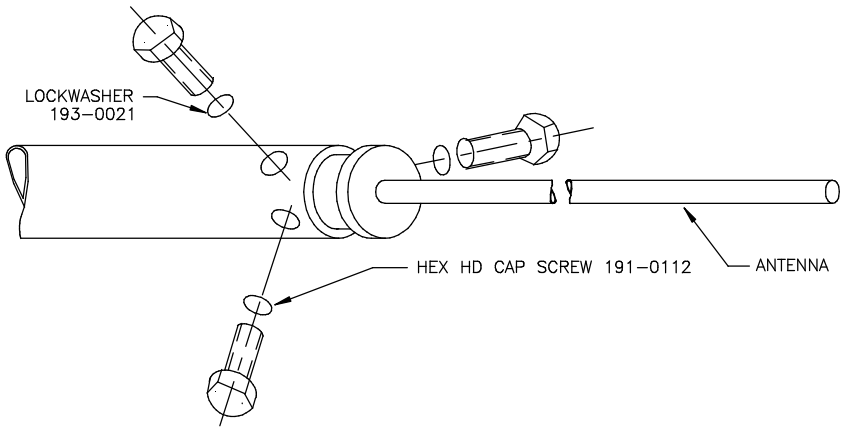


INSTALLATION OPERATIONS

1. IF POLE IS WITHOUT CABLE HOLE, CUT A HOLE 1 11/16" IN POLE 61" FROM GROUND LEVEL & SQUARE WITH BASE (SEE FIGURE 3).
2. IF BOLT COVER IS SUPPLIED, SLIDE DOWN POLE PAST CABLE HOLE.
3. TWIST ANTENNA ADAPTER ONTO ANTENNA ASSEMBLY UNTIL BLACK COLLAR IS SEATED IN ADAPTER.
4. SECURE ANTENNA BY FASTENING HOSE CLAMP FLUSH AGAINST ADAPTER.
5. APPLY RTV TO TOP OF ADAPTER WHERE IT MEETS ANTENNA.
6. ATTACH ANTENNA CABLE. WRAP CONNECTOR FIRST WITH BLACK ELECTRICAL TAPE, THEN WITH VAPOR WRAP, AND AGAIN WITH ELECTRICAL TAPE.
7. MOUNT ANTENNA ADAPTER TO TOP OF POLE, SEE FIG. 2.
8. FEED ANTENNA CABLE THROUGH TOP OF POLE AND FISH THROUGH CABLE HOLE IN POLE. LEAVE APP. 12 INCHES OF CABLE TO BE PULLED THROUGH HOLE IN BACK OF MASTER BOX.
9. FEED GROUND STRAP INTO CABLE HOLE IN POLE AND PULL OUT OF BOTTOM OF POLE, AS SHOWN. LEAVE APP. 12 INCHES OF STRAP TO BE PULLED THROUGH HOLE IN BACK OF MASTER BOX.
10. ATTACH BOTTOM OF GROUND STRAP TO GROUND ROD, USING CLAMPS AS SHOWN.

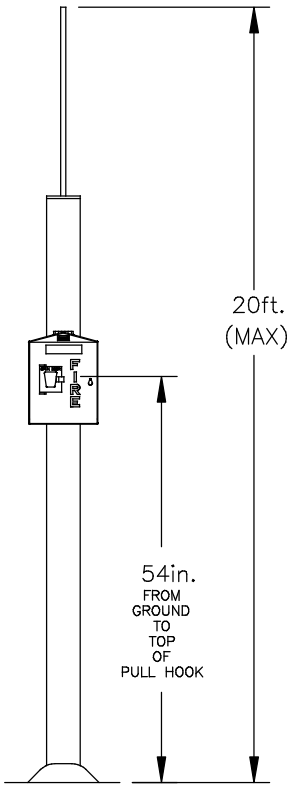
FIG.2

ANTENNA MOUNTING



11. INSERT ANTENNA ASSEMBLY INTO TOP OF POLE AS SHOWN.
12. ATTACH THIS ASSEMBLY – USING 3 BOLTS – AS SHOWN. TAKE CARE TO NOT BEND THE ANTENNA WHIP DURING HANDLING ON THE GROUND.

FIG.3



CAUTION

DO NOT TRANSPORT THE POLE WITH THE ANTENNA ASSEMBLY ATTACHED.
THIS COULD CAUSE SEVERE DAMAGE TO THE ANTENNA.

NOTE:
POLE, POLE BASE, ANCHOR BOLTS AND FOUNDATION MAY VARY PER CONTRACT.

DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE TYPICAL MASTER BOX INSTALLATION	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/2/92
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000–0568; CAD FILE NO. 1000\0568–01A	SHEET 1 OF 3; REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	RFD #338	BJC	

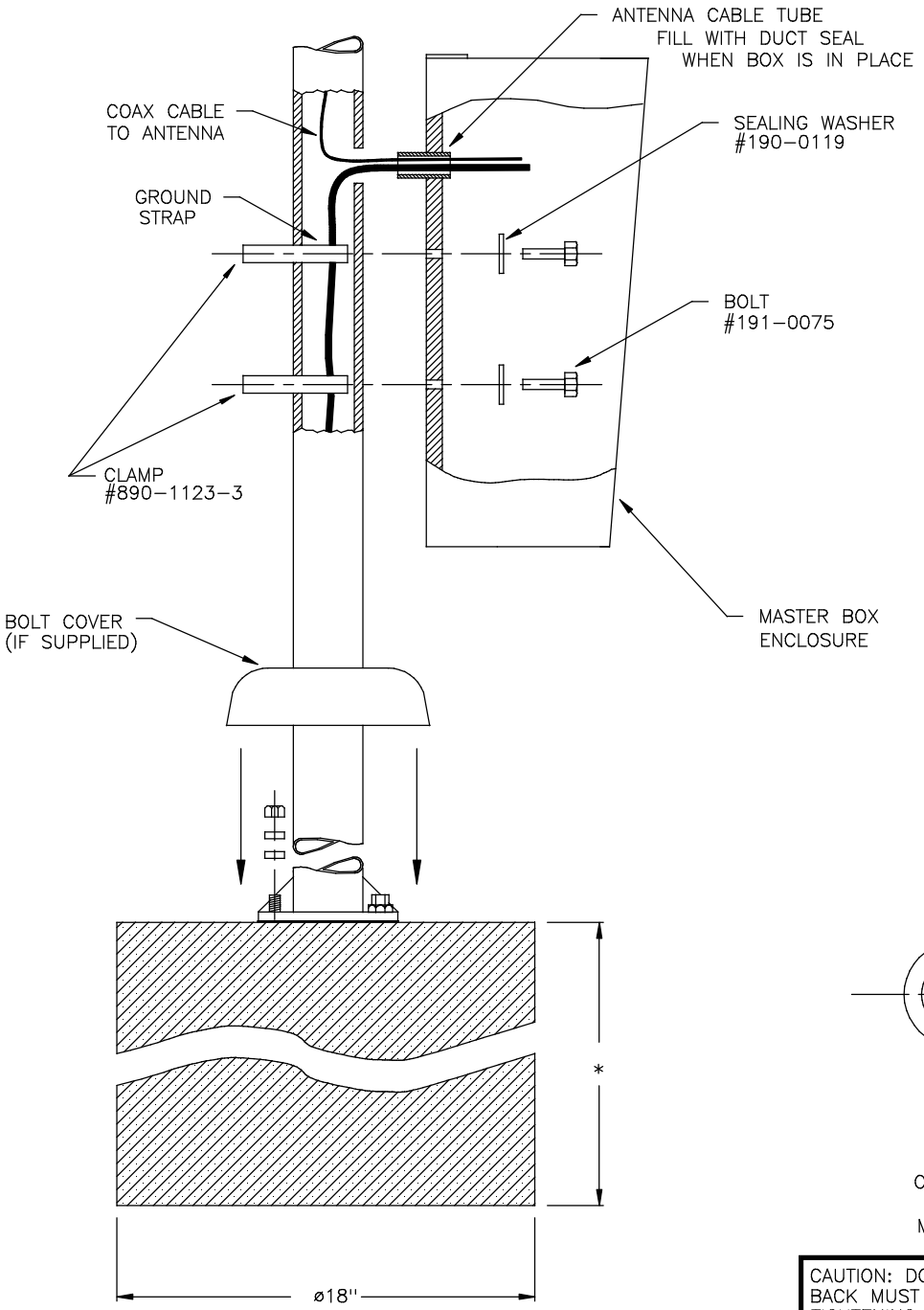
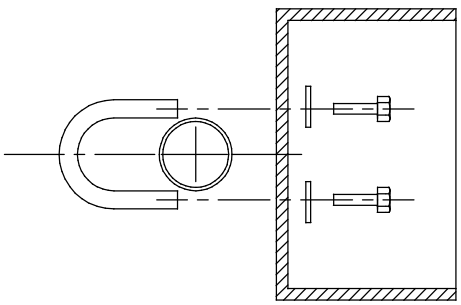


FIG. 4
POLE & MASTER BOX MOUNTING



TOP VIEW
OF CLAMP & BACK OF
MASTER BOX
MAX. TORQUE 6 in. lbs.

CAUTION: DO NOT OVERTIGHTEN NUTS; BACK MUST BE FLUSH WITH POLE BEFORE TIGHTENING. REPEAT FOR LOWER CLAMP.

13. RAISE POLE UPRIGHT, POSITION ON TOP OF ANCHOR BOLTS.
14. SECURE THE POLE WITH THE HEX NUTS, OVERWASHERS, AND LOCKWASHERS.
15. PLACE BOLT COVER, IF SUPPLIED, IN POSITION AND SECURE.
16. OPEN MASTER BOX AND REMOVE BACKPLATE.
17. PUSH ANTENNA CABLE AND GROUND STRAP THROUGH HOLE IN THE BACK OF THE BOX, LINE UP THE ANTENNA TUBE TO HOLE IN THE POLE.
18. POSITION THE MOUNTING CLAMP AROUND THE POLE SO THE HOLES IN CLAMP ALIGN WITH HOLES IN BACK OF BOX. FINISHED ENDS OF CLAMPS MUST BE PARALLEL TO BACK OF THE MASTER BOX. CLAMPS SHOULD BE SQUARE ON CENTER LINE OF POLE.
19. INSERT BOLT WITH SEALING WASHER THROUGH BACK OF BOX AND INTO CLAMPS. BACK OF THE BOX MUST BE FLUSH WITH THE POLE BEFORE TIGHTENING. TIGHTEN BOLTS UNTIL THEY ARE SNUG. 6 in.lbs. MAX. CAUTION: DO NOT OVERTIGHTEN BOLTS.
20. FILL ANTENNA TUBE WITH DUCT SEAL.

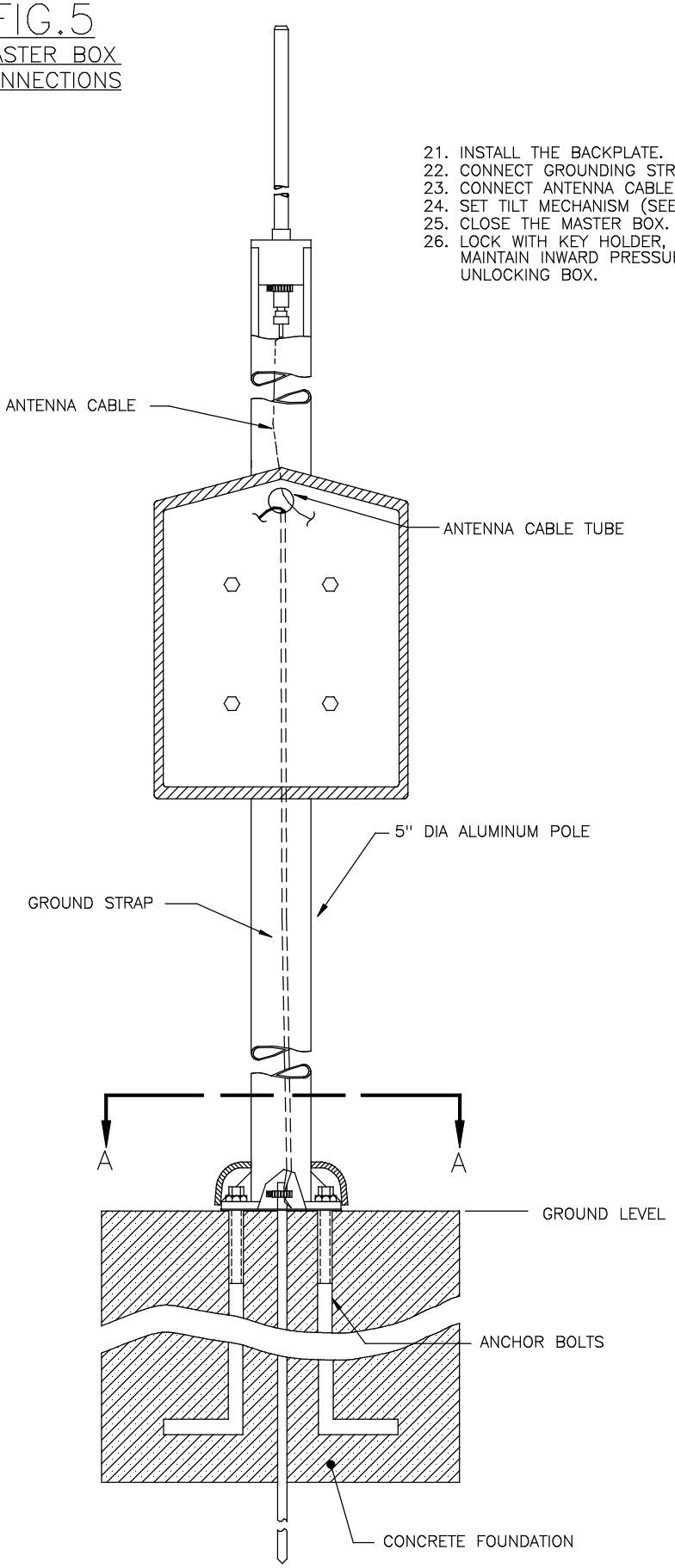
NOTE: POLE, POLE BASE, ANCHOR BOLTS AND FOUNDATION MAY VARY PER CONTRACT.
* REFER TO SPEC. FOR DIMENSIONS.

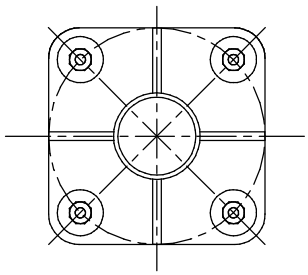
DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE none		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE TYPICAL MASTER BOX INSTALLATION	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/2/92
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000-0568 / CAD FILE NO. 1000\0568-02A	SHEET 2 OF 3 / REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	RFD #338	BJC	

FIG.5
MASTER BOX CONNECTIONS

21. INSTALL THE BACKPLATE.
22. CONNECT GROUNDING STRAP TO BACKPLATE.
23. CONNECT ANTENNA CABLE TO TRANSMITTER.
24. SET TILT MECHANISM (SEE SERVICE MANUAL).
25. CLOSE THE MASTER BOX.
26. LOCK WITH KEY HOLDER, HAND TIGHT, REVERSE TURN TO REMOVE KEY. MAINTAIN INWARD PRESSURE ON KEY HOLDER WHILE LOCKING OR UNLOCKING BOX.





VIEW A–A

FOUR 3/4 IN. DIA. ANCHOR BOLTS EQUALLY SPACED ON A 7.5 IN., 8.0 IN. OR 8.5 IN. BOLT CIRCLE

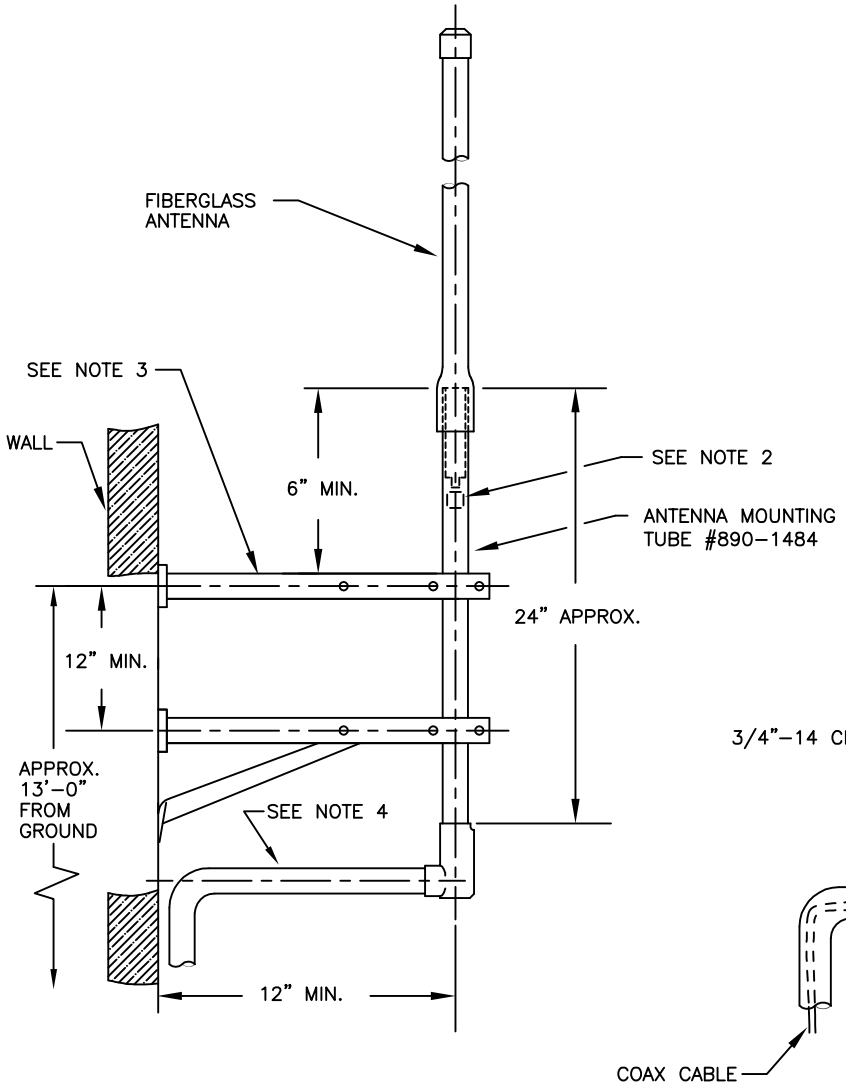
NOTE: POLE, POLE BASE, ANCHOR BOLTS AND FOUNDATION MAY VARY PER CONTRACT

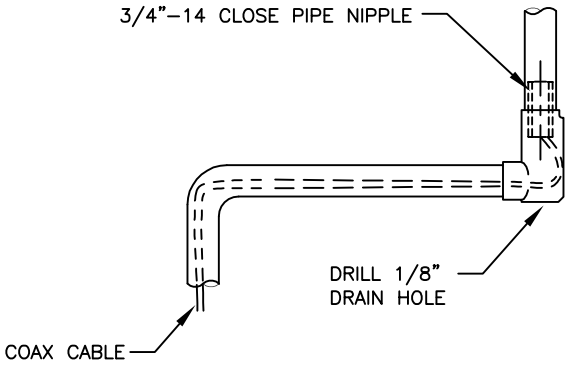
FOR FURTHER INSTALLATION INFO:	
MASTER BOX	DRAWING #
8MTJ	1000–0563
8MTJ–A–16	1000–0557

DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE TYPICAL MASTER BOX INSTALLATION	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/8/92
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000–0568 / CAD FILE NO. 1000\0568–03A	SHEET 3 OF 3 / REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	6/6/83		LB	
B	3/3/88	ECN 1245	JB	
C	1/1/91	ECN 1776	BJC	
D	8/10/92	ECN 1944	BJC	
E	4/26/93	ECN 1987	FC	
F	12/18/96	ECN 2231	FC	
–	4/5/05	See note 2	FC	
G	1/10/06	ECN 2619	FC	

MUNICIPAL ANTENNA INSTALLATION





NOTES:

1. **THIS IS SIGCOM'S TYPICAL RECOMMENDED INSTALLATION ONLY. CONFORMANCE TO ANY STANDARD OR CODE IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR/ INSTALLER. SEE CONTRACT FOR SPECIFICATIONS.**

2. LOCATION OF ANTENNA CABLE CONNECTION. CONNECTOR PROVIDED BY SIGCOM. IT IS THE RESPONSIBILITY OF THE CONTRACTOR/INSTALLER TO ASSEMBLE CONNECTOR ONTO ANTENNA CABLE RUNNING TO BOX:
   ANTENNA CABLE PROVIDED BY CONTRACTOR, SHALL BE TO CONTRACT SPECS. TYPICALLY:
   G MAX 75'–RG213 OR EQUIVALENT
   CONSULT FACTORY FOR DISTANCES > 75'.

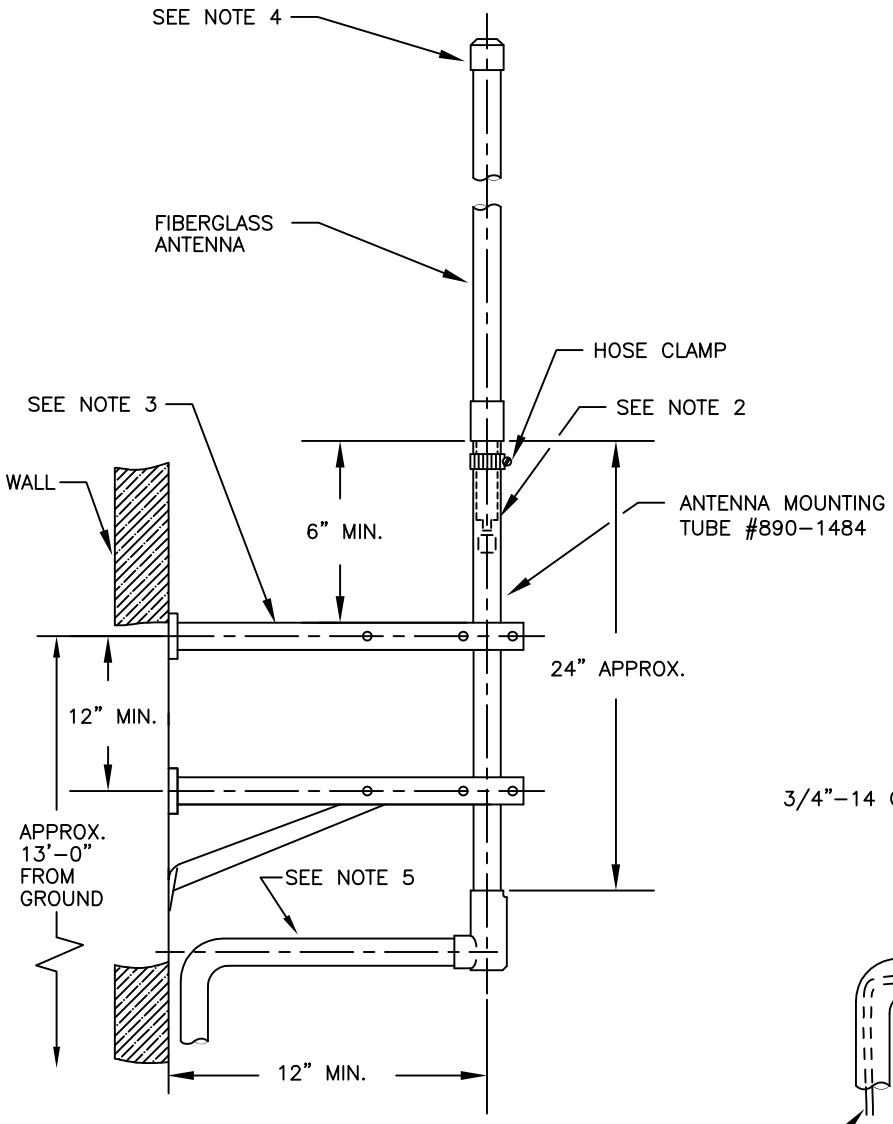
3. ANTENNA SUPPORT PROVIDED BY SIGCOM; #190–0392. INSTALLATION CONTRACTOR SHALL APPROPRIATELY ANCHOR ANTENNA BRACKET WITH SUFFICIENT STRENGTH TO WALL.

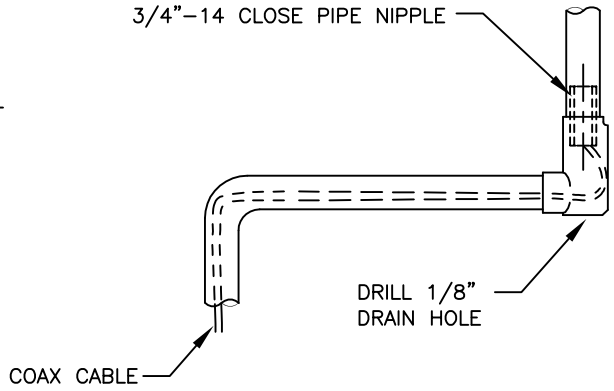
4. ANY EXPOSED ANTENNA CABLE SHALL BE COVERED WITH METAL CONDUIT ALL AROUND TO BOX. CONDUIT AND FITTINGS WILL BE PROVIDED BY INSTALLATION CONTRACTOR.

DRAWN BJC	*SIGNAL COMMUNICATIONS CORP.* WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE SURFACE MOUNTED ANTENNA INSTALLATION, MUNICIPAL	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 8/10/92
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000–0173–1; CAD FILE NO. 1000\0173–11G	SHEET 1 OF 1; REV G

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/10/02	RFD #916	FC	
–	4/5/05	SEE NOTE 2	FC	
B	1/12/06	ECN 2619	FC	

MILITARY ANTENNA INSTALLATION





NOTES:

1. **THIS IS SIGCOM'S TYPICAL RECOMMENDED INSTALLATION ONLY. CONFORMANCE TO ANY STANDARD OR CODE IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR/ INSTALLER. SEE CONTRACT FOR SPECIFICATIONS.**

2. LOCATION OF ANTENNA CABLE CONNECTION. CONNECTOR PROVIDED BY SIGCOM. IT IS THE RESPONSIBILITY OF THE CONTRACTOR/INSTALLER TO ASSEMBLE CONNECTOR ONTO ANTENNA CABLE RUNNING TO BOX:
   ANTENNA CABLE PROVIDED BY CONTRACTOR, SHALL BE TO CONTRACT SPECS. TYPICALLY:
   △B MAX 75'–RG213 OR EQUIVALENT
   CONSULT FACTORY FOR DISTANCES > 75'.

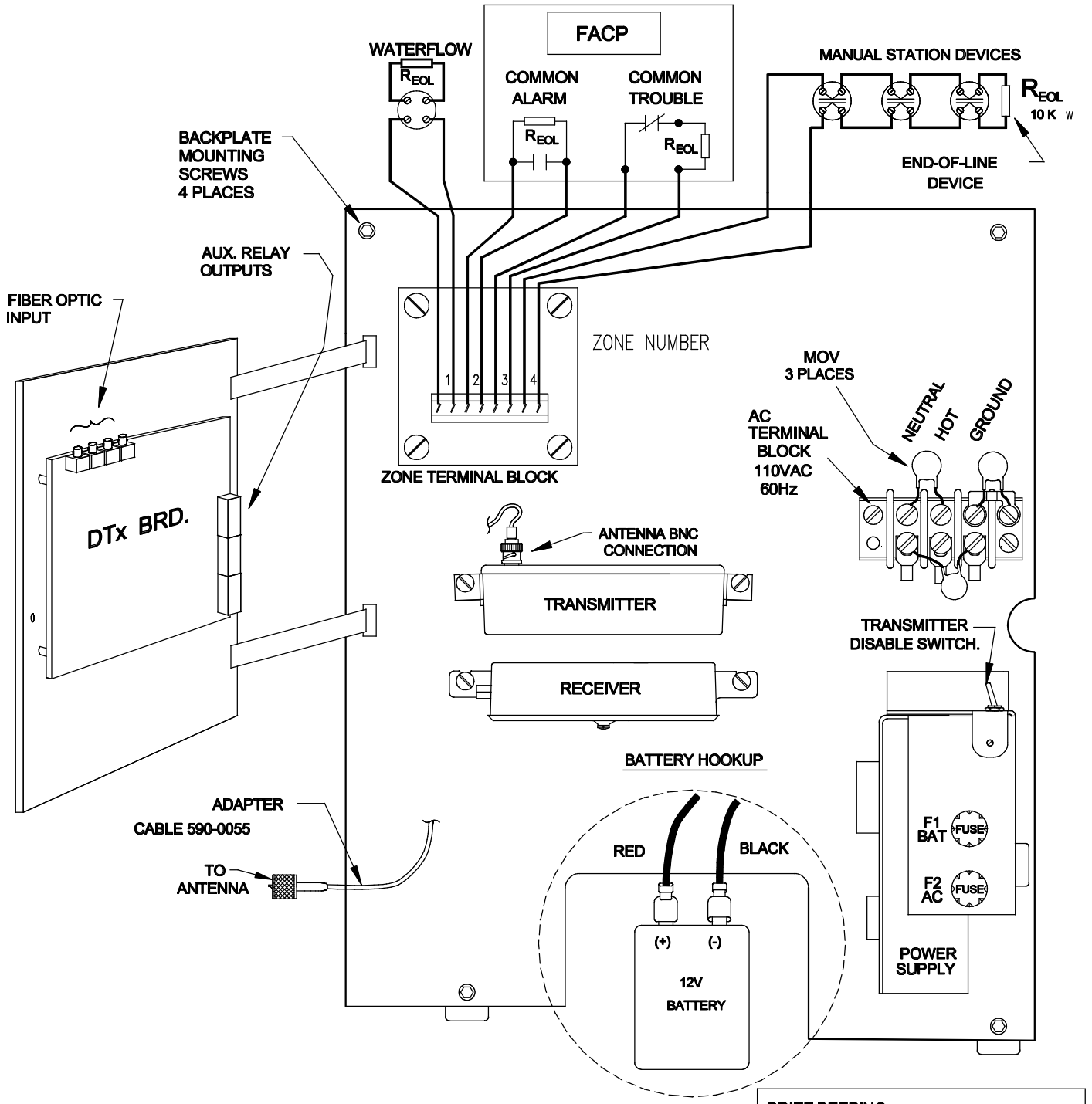
3. ANTENNA SUPPORT PROVIDED BY SIGCOM; #190–0392. INSTALLATION CONTRACTOR SHALL APPROPRIATELY ANCHOR ANTENNA BRACKET WITH SUFFICIENT STRENGTH TO WALL.

4. ANY EXPOSED ANTENNA CABLE SHALL BE COVERED WITH METAL CONDUIT ALL AROUND TO BOX. CONDUIT AND FITTINGS WILL BE PROVIDED BY INSTALLATION CONTRACTOR.

DRAWN FC	*SIGNAL COMMUNICATIONS CORP.* WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE SURFACE MOUNTED ANTENNA INSTALLATION, MILITARY	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/24/02
DO NOT SCALE PRINT	SIZE A · DRAWING NO. 1000–0173–2 · CAD FILE NO. 1000\0173–21B	SHEET 1 OF 1 · REV B

REV	DATE	DESCRIPTION	DR.	APPRVL
A	10/15/01	RFD # 863	FC	

TYPICAL CONFIGURATIONS



BRIEF BEEPING :
INDICATES SIGNAL SENT

CONTINUOUS TONE OR BEEPING:
NOTIFY FIRE DEPARTMENT
ALARM SYSTEM MUST BE INSPECTED

IMPORTANT:

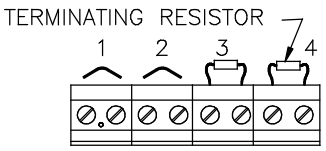
THIS DRAWING ILLUSTRATES SIGCOM'S TYPICAL RECOMMENDED INSTALLATION ONLY. IT DOES NOT REFLECT THE REQUIREMENTS OR ANY CONTRACT SPECIFICATION, FIRE STANDARD OR CODE. CONFORMANCE TO ANY SPECIFICATION, CONTRACT OR CODE SHALL REMAIN THE SOLE RESPONSIBILITY OF THE INSTALLER AND/OR AUTHORITY HAVING JURISDICTION.

DRAWN FC	SIGNAL COMMUNICATIONS CORP. WOBURN,MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE INSTALLATION, DTx BOX, NEMA 1/CAST ENCLOSURE	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 10/15/01
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000-0727 / CAD FILE NO. 1000\0727-01A	SHEET 1 OF 1 / REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	2/26/02	RFD # 893	FC	
B	6/24/04	ECH 2564		

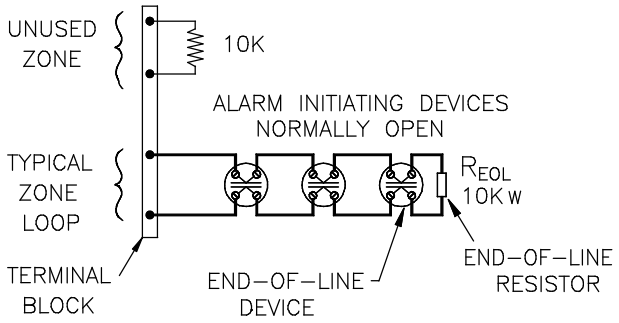
DTX ZONE INSTALLATION

DTX 4 ZONE BRD

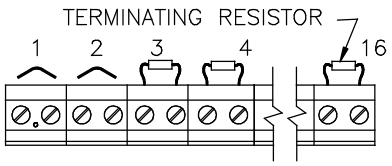


ZONE TERMINAL BLOCK

1. UNUSED ZONES MUST HAVE 10Kw TERMINATING RESISTOR INSTALLED AT THE ZONE TERMINAL BLOCK.
2. END-OF-LINE RESISTOR (10Kw 1/4w) MUST BE REMOVED FROM TERMINAL BLOCK. INSTALL THE 10K 1 WATT RESISTOR (SUPPLIED) AT THE END OF THE ZONE LOOP.
3. SERIES CONNECTED ALARM RESISTORS ARE NOT NECESSARY FOR NORMALLY OPEN DEVICES.
4. TERMINALS ACCEPT WIRE FROM 22 AWG UP TO 12 AWG, SOLID OR STRANDED.
5. USE A SCREWDRIVER WITH A FLAT BLADE 1/8'' WIDE TO SECURE WIRES OR RESISTORS.

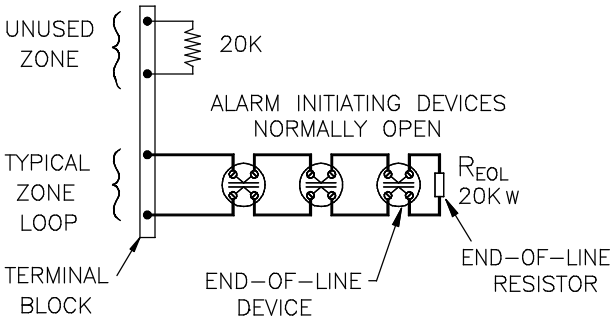


DTX 16 ZONE BRD



ZONE TERMINAL BLOCK

1. UNUSED ZONES MUST HAVE 20Kw TERMINATING RESISTOR INSTALLED AT THE ZONE TERMINAL BLOCK.
2. END-OF-LINE RESISTOR (20K w 1/4 W) MUST BE REMOVED FROM TERMINAL BLOCK. INSTALL THE 20K 1 WATT RESISTOR (SUPPLIED) AT THE END OF THE ZONE LOOP.
3. SERIES CONNECTED ALARM RESISTORS ARE NOT NECESSARY FOR NORMALLY OPEN DEVICES.
4. TERMINALS ACCEPT WIRE FROM 22 AWG UP TO 12 AWG, SOLID OR STRANDED.
5. USE A SCREWDRIVER WITH A FLAT BLADE 1/8'' WIDE TO SECURE WIRES OR RESISTORS.



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XP6-R Six Relay Control Module

SPECIFICATIONS

Normal Operating Voltage:	15-32VDC
Stand-By Current:	1.90 mA @ 24V
Alarm Current:	32 mA (assumes all six relays have been switched once and all six LEDs solid on)
Temperature Range:	32°F to 120°F (0°C to 49°C)
Humidity:	10 to 93% Non-condensing
Dimensions:	6.8″H × 5.8″W × 1.0″D
Accessories:	CHS-6 Chassis; BB-25 Cabinet; BB-XP Cabinet; CAB-3 Series Cabinets; CAB-4 Series Cabinets
Wire Gauge:	12-18 AWG
Relay Current:	30 mA/Relay Pulse (15.6 mS pulse duration) pulse under panel control

RELAY CONTACT RATINGS:

CURRENT RATING	MAXIMUM VOLTAGE	LOAD DESCRIPTION	APPLICATION
2 A	25 VAC	PF = 0.35	Non-coded
3 A	30 VDC	Resistive	Non-coded
2 A	30 VDC	Resistive	Coded
0.46 A	30 VDC	(L/R = 20ms)	Non-coded
0.7 A	70.7 VAC	PF = 0.35	Non-coded
0.9 A	125 VDC	Resistive	Non-coded
0.5 A	125 VAC	PF = 0.75	Non-coded
0.3 A	125 VAC	PF = 0.35	Non-coded

⚠WARNING

All relay switch contacts are shipped in the standby state (open) state, but may have transferred to the activated (closed) state during shipping. To ensure that the switch contacts are in their correct state, modules must be made to communicate with the panel before connecting circuits controlled by the module.

BEFORE INSTALLING

If the modules will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect the power to the control panel before installing the modules. This system contains static sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. The housing cabinet should be metallic and suitably grounded.

NOTICE: This manual should be left with the owner/user of this equipment.

GENERAL DESCRIPTION

The XP6-R Six Relay Control Module is intended for use in an intelligent alarm system. Each module is intended for Form-C switching applications, which do not require wiring supervision for the load circuit. A single isolated set of dry relay contacts is provided for each module, which is capable of being wired for either normally open or normally closed for each operation. Each module has its own address. A pair of rotary code switches is used to set the address of the first module from 01 to 154. The remaining modules are automatically assigned to the next five higher addresses. Provisions are included for disabling a maximum of three unused modules to release the addresses to be used elsewhere. Each XP6-R module also has panel controlled green LED indicators. The panel can cause the LEDs to blink, latch on, or latch off.

CONTENTS INCLUDE:

(6) 1 × 3 Terminal Blocks
(1) 1 × 4 Terminal Blocks
(2) 11/4″ (32mm) Stand offs
(4) Machine Screws
(2) Nuts
(1) Shunt (NOTE: For the disable position, not more than one shunt shall be installed at the same time)

COMPATIBILITY REQUIREMENTS

To ensure proper operation, this module shall be connected to a compatible Notifier system control panel.

COMPONENTS

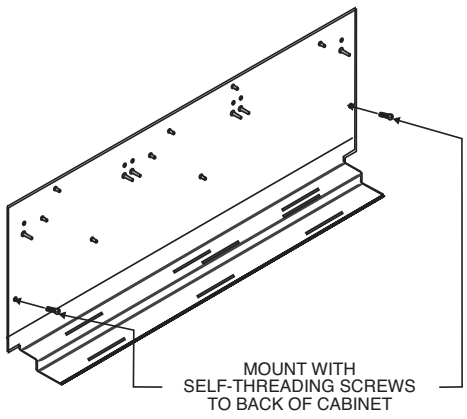
Following are descriptions of the XP6-R mounting frameworks. There are two mounting options for XP6-R modules:

- Up to six XP6-R modules can be installed on a CHS-6 in a CAB-3, CAB-4 or BB-25 cabinet
- One or two XP6-R modules can be installed in a BB-XP cabinet

Chassis

The CHS-6 chassis is used to mount XP6-R modules in a BB-25, CAB-3 or CAB-4 Series cabinet. It accommodates up to six XP6-R modules in a single cabinet row three modules wide and two modules deep.

FIGURE 1. CHS-6 CHASSIS:



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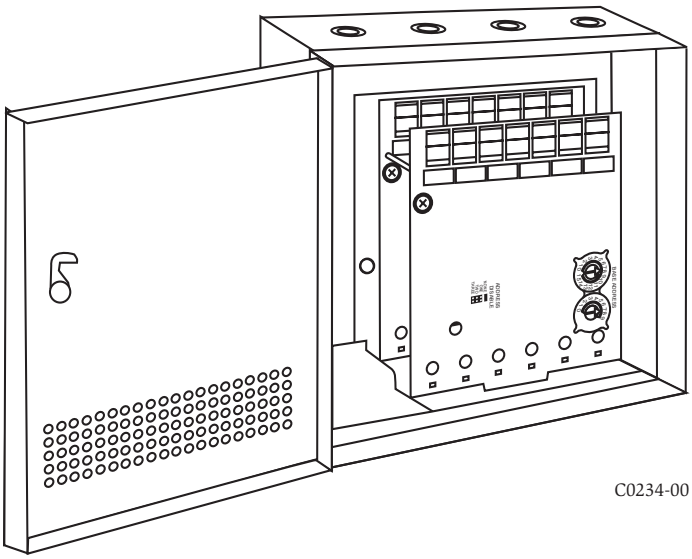
The BB-XP cabinet has a built-in chassis that will accommodate one or two XP6-R modules.

FIGURE 2. BB-XP CABINET:



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The front XP6-R module positions of each chassis are offset below the rear XP6-R module positions so that all of the status indicators are visible.

Cabinets

A BB-25, CAB-3 or CAB-4 Series cabinet will house the CHS-6 chassis with up to six XP6-R modules installed on it. Refer to cabinet installation documents for dimensions.

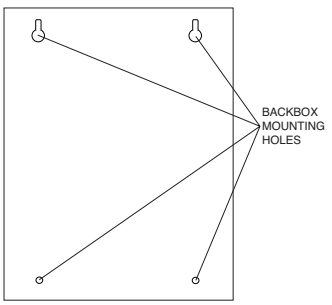
The BB-XP cabinet houses one or two XP6-R modules on the internal chassis that is part of the cabinet. Refer to cabinet installation documents for dimensions.

INSTALLATION STEPS

1. Cabinet Mounting

In a clean, dry area, mount the backbox using the four holes provided in the back surface of the cabinet.

FIGURE 3. TYPICAL MOUNTING HOLE LOCATIONS:



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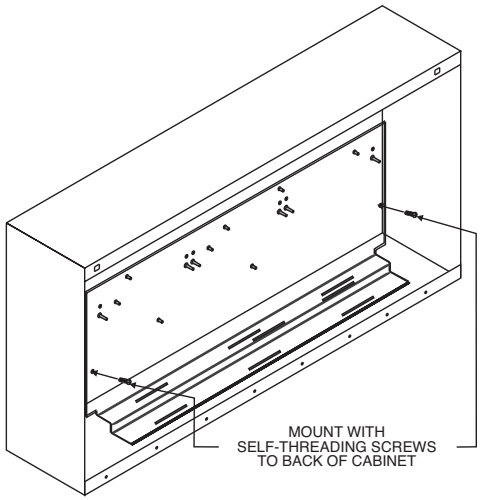
2. Chassis Installation

The CHS-6 chassis is mounted in the BB-25, CAB-3 or CAB-4 Series cabinets. It is shipped with two self-threading screws, which are used to fasten the chassis to the back wall of the cabinet (see Figure 4).

FIGURE 4: MOUNTING THE CHS-6 CHASSIS



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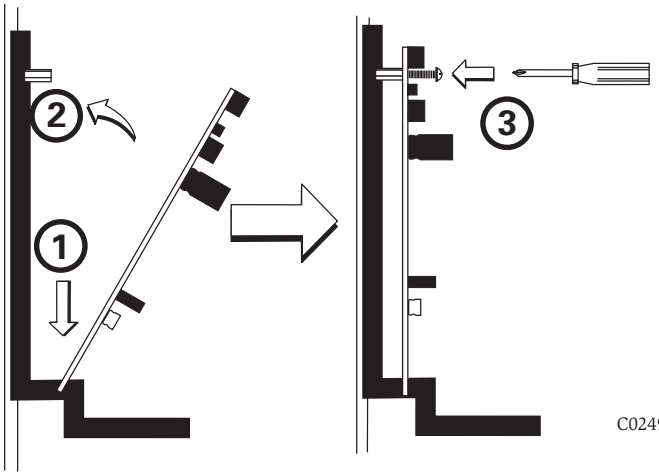
The BB-XP cabinet comes with the chassis already installed, so no mounting is necessary.

3. Module Installation

There are two methods for installing a module in the rear position of a chassis. Method one is for installation of a rear module only, when no module will be installed in front of it. Refer to Figure 5 for instructions. Method two is for installation of a rear module when another module will be installed in the chassis position in front of it. Refer to Figures 6a and 6b for method two. All necessary screws and standoffs are supplied with the modules.

FIGURE 5. INSTALLATION OF REAR MODULE ONLY, METHOD ONE:



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Step 1: Insert the bottom of the XP6-R module down into a rear slot on the chassis.

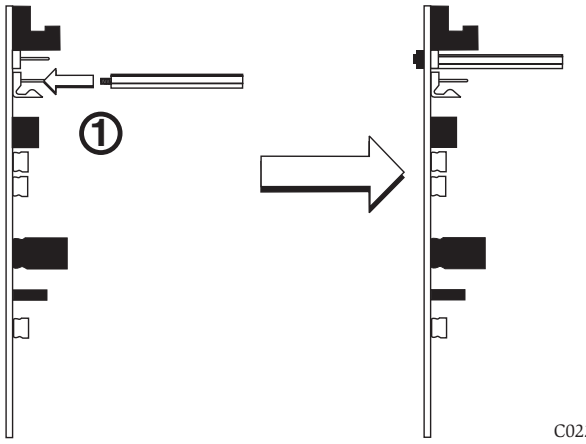
Step 2: Carefully swing the upper edge of the board back towards the back of the chassis until it touches the two standoffs.

Step 3: Align two 4-40 screws with the two standoffs and tighten.

Step 4: Address and wire the modules according to the instructions in this manual.

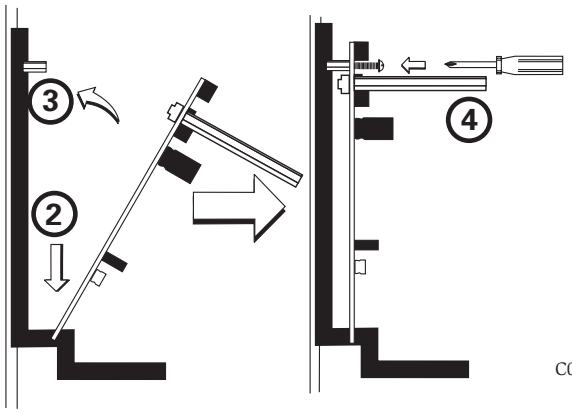
The steps in Figures 6A – 6C describe and illustrate module installation when the rear chassis position and the position in front of it will be filled. Front position installation is possible only if the rear position is filled with an XP module.

FIGURE 6A. INSTALLATION OF XP6-R MODULE IN A REAR CHASSIS POSITION, METHOD TWO:



Step 1: Install two long standoffs in the lower mounting holes using two 4-40 nuts as shown.

FIGURE 6B.



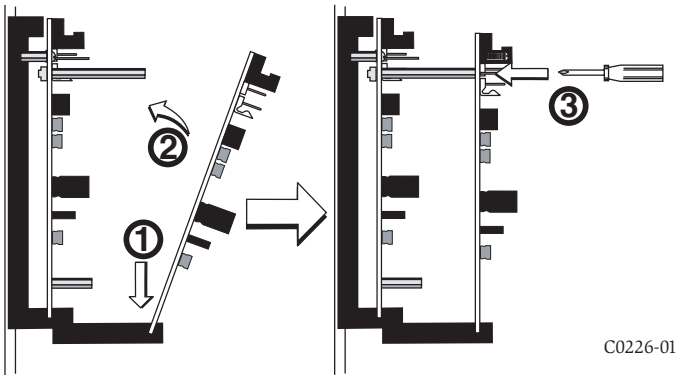
Step 2: Insert the bottom of the XP6-R module down into a rear slot on the chassis.

Step 3: Carefully swing the upper edge of the board back towards the back of the chassis until it touches the two standoffs on the board.

Step 4: Align two 4-40 screws with the two standoffs on the chassis and tighten.

Step 5: Address and wire the modules according to the instructions in this manual.

FIGURE 6C. INSTALLATION OF XP6-R MODULE IN FRONT CHASSIS POSITION:



Step 1: Insert the bottom edge of the XP6-R module down into a front slot of the chassis.

Step 2: Carefully swing the upper edge of the board towards the back of the chassis until it touches the 11/4″ (31.75mm) standoffs installed on the rear module.

Step 3: Align two 4-40 screws with the two standoffs and tighten.

Step 4: Address and wire the modules according to the instructions in this manual.

WIRING

NOTE: All wiring must conform to applicable local codes, ordinances, and regulations.

1. Install module wiring in accordance with the job drawings and appropriate wiring diagrams.
2. Make electrical connections by stripping approximately ¼″ (6.35mm) of insulation from the end of the wire sliding the bare end of the wire under the clamping plate, and tightening the clamping plate screw.
3. Set the address on the modules per the job drawing. Use the rotary code switches to set the address of the first module (between 01 and 154). The remaining modules are automatically assigned to the next five higher addresses. For example, if the base address switch is set to 28, the next five modules will be addressed to 29, 30, 31, 32, and 33. DO NOT set the lowest address above 154, as the other modules will be assigned to nonexistent addresses.

NOTE: Some panels support extended addressing. In order to set the module above address 99 on compatible systems, carefully remove the stop on the upper rotary switch. If the panel does not support extended addressing, do not set the lowest addressabove 94.

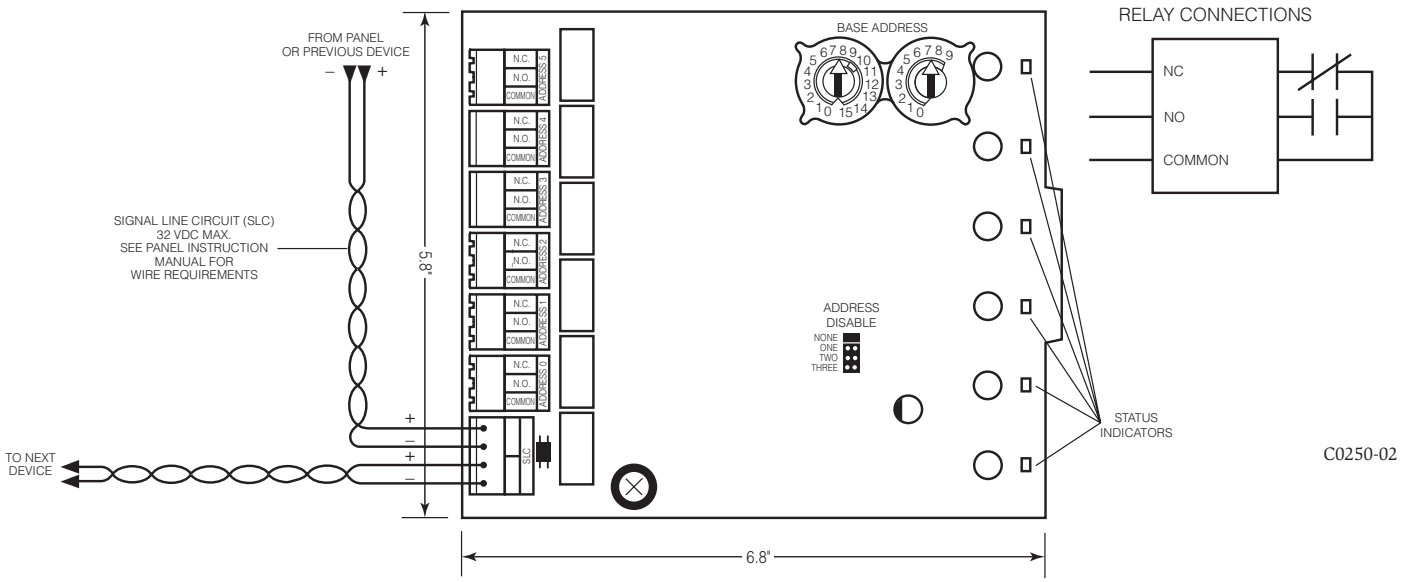
4. A shunt is provided to disable a maximum of three unused modules. Modules are disabled from the highest address and work downward. If two modules are disabled, the lowest four addresses will be functional, while the highest two will be disabled. For example, if the shunt for Address Disable is placed on “two” and the base address switch is set to 28, the modules will be assigned to 28, 29, 30 and 31.

NOTE: Power must not be applied to the unit when changing functionality of the shunts.

NOTE: The XP6-R must have power cycled for shunt changes to take effect.

NOTE: All references to power limited represent “Power Limited (Class 2)”.

FIGURE 7. WIRING AND PROGRAMMING THE XP6-R MODULE:



NOTES:

- The relay contacts on the XP6-R may be connected to either a power-limited or non power-limited source, this wiring must remain separated by at least 1/4″ (6.35 mm) from all power-limited wiring.
- Power-limited circuits must employ type FPL, FPLR, or FPLP cable as required by Article 760 of the NEC.
- For easier wiring, assign all power-limited wiring to one side rather than alternating with non power-limited.

PROGRAMMING

The XP6-R module operates with the following Fire Alarm Control Panels:

- AM2020/AFP1010
- AFP-200
- AFP-300/AFP-400
- System 5000 with AIM-200
- AFC-600
- NFS-640
- NFS-3030

The modules are programmed as FRM-1 modules in each system according to the programming instructions in the appropriate FACP manual.

FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

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